Navy_CLEAN_PFAS_FOIA_request_covers_Nov2019.indd

NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, and the Sample Location Report, SDG 1803659

Marine Corps Air Station Yuma
Yuma, Arizona

November 2019

APPROVED FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

November 29, 2018

Vista Work Order No. 1803659

Ms. Sabina Sudoko
Tetra Tech EC, Inc.
17885 Von Karman Avenue, Suite 500
Irvine, CA 92614

Dear Ms. Sudoko,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on November 15, 2018 under your Project Name '4663.3803'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 1803659
Case Narrative

Sample Condition on Receipt:

Seven water samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

PFAS Isotope Dilution Method

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method (Modified EPA Method 537). The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD) were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 of the LOQ concentrations. The LCS/LCSD recoveries were within the acceptance criteria.

The extracts of samples "A1-MW-07-SA2", "A1-MW-23-SA2" and "A1-MW-25-SA2" were re-injected because one or more Injection Internal Standard Analyte response areas were outside of criteria. The results for "A1-MW-07-SA2" and "A1-MW-25-SA2" were similar in the second injection and the results from the original injections have been reported. The area criteria passed for the second injection for "A1-MW-23-SA2" and the results from the re-injection have been reported.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1803659-01	A1-MW-07-SA2	14-Nov-18 09:07	15-Nov-18 13:29	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1803659-02	A1-MW-23-SA2	14-Nov-18 10:03	15-Nov-18 13:29	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1803659-03	A1-MW-25-SA2	14-Nov-18 12:15	15-Nov-18 13:29	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1803659-04	A1-MW-27-SA2	14-Nov-18 13:03	15-Nov-18 13:29	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1803659-05	A1-MW-55-SA2	14-Nov-18 11:02	15-Nov-18 13:29	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1803659-06	A1-MW-54-SA2	14-Nov-18 15:17	15-Nov-18 13:29	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1803659-07	FRB-20181114	14-Nov-18 14:20	15-Nov-18 13:29	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Matrix: Aqueous

Laboratory Data

Lab Sample: B8K0144-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFHxA	307-24-4	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFHpA	375-85-9	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFHxS	355-46-4	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFOA	335-67-1	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFNA	375-95-1	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFOS	1763-23-1	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFDA	335-76-2	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
MeFOSAA	2355-31-9	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
EtFOSAA	2991-50-6	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFUnA	2058-94-8	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFDoA	307-55-1	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFTrDA	72629-94-8	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
PFTeDA	376-06-7	ND	0.00274	0.00400	0.00800	U	B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	93.8	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
13C2-PFHxA	IS	94.2	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
13C4-PFHpA	IS	96.2	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
18O2-PFHxS	IS	88.1	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
13C2-PFOA	IS	93.9	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
13C5-PFNA	IS	84.8	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
13C8-PFOS	IS	91.0	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
13C2-PFDA	IS	74.8	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
d3-MeFOSAA	IS	76.7	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
d5-EtFOSAA	IS	83.6	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
13C2-PFUnA	IS	76.0	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
13C2-PFDoA	IS	83.3	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1
13C2-PFTeDA	IS	84.1	50 - 150		B8K0144	22-Nov-18	0.125 L	26-Nov-18 15:51	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: LCSD **PFAS Isotope Dilution Method**

Name:	Tetra Tech EC, Inc.	Lab Sample:	B8K0144-BS1/B8K0144-BSD1		
Project:	4663.3803	QC Batch:	B8K0144	Date Extracted:	22-Nov-18
Matrix:	Aqueous	Samp Size:	0.125/0.125 L	Column:	BEH C18

Analyte	CAS Number	LCS (ug/L)	LCS Spike Amt	LCS % Rec	LCS Quals	LCSD (ug/L)	LCSD Spike Amt	LCSD % Rec	RPD	LCSD Quals	%Rec Limits	RPD Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
PFBS	375-73-5	0.0785	0.0800	98.2		0.0834	0.0800	104	5.99		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFHxA	307-24-4	0.0819	0.0800	102		0.0874	0.0800	109	6.51		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFHpA	375-85-9	0.0824	0.0800	103		0.0849	0.0800	106	3.07		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFHxS	355-46-4	0.0837	0.0800	105		0.0866	0.0800	108	3.42		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFOA	335-67-1	0.0829	0.0800	104		0.0863	0.0800	108	4.12		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFNA	375-95-1	0.0810	0.0800	101		0.0843	0.0800	105	3.94		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFOS	1763-23-1	0.0880	0.0800	110		0.0866	0.0800	108	1.61		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFDA	335-76-2	0.0887	0.0800	111		0.0812	0.0800	101	8.92		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
MeFOSAA	2355-31-9	0.0828	0.0800	104		0.0915	0.0800	114	9.97		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
EtFOSAA	2991-50-6	0.0860	0.0800	108		0.0923	0.0800	115	7.04		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFUnA	2058-94-8	0.0820	0.0800	103		0.0824	0.0800	103	0.455		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFDoA	307-55-1	0.0797	0.0800	99.6		0.0790	0.0800	98.7	0.851		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFTrDA	72629-94-8	0.0762	0.0800	95.2		0.0865	0.0800	108	12.7		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1
PFTeDA	376-06-7	0.0846	0.0800	106		0.0850	0.0800	106	0.448		70-130	30	26-Nov-18 15:29	1	26-Nov-18 15:41	1

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C3-PFBS	IS	95.7		95.2		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
13C2-PFHxA	IS	92.1		91.6		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
13C4-PFHpA	IS	89.8		94.3		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
18O2-PFHxS	IS	93.9		94.4		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
13C2-PFOA	IS	88.7		94.6		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
13C5-PFNA	IS	85.3		82.3		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
13C8-PFOS	IS	87.3		94.4		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
13C2-PFDA	IS	73.6		78.4		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
d3-MeFOSAA	IS	77.1		83.8		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
d5-EtFOSAA	IS	84.7		89.5		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
13C2-PFUnA	IS	74.3		78.3		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
13C2-PFDoA	IS	74.1		92.5		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1
13C2-PFTeDA	IS	65.5		85.7		50-150	26-Nov-18 15:29	1	26-Nov-18 15:41	1

Sample ID: A1-MW-07-SA2

PFAS Isotope Dilution Method

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Location: YUMA, AZ

Matrix: Water
Date Collected: 14-Nov-18 09:07

Laboratory Data

Lab Sample: 1803659-01
Date Received: 15-Nov-18 13:29

Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	0.114	0.00293	0.00427	0.00854		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFHxA	307-24-4	0.366	0.00293	0.00427	0.00854		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFHpA	375-85-9	0.0448	0.00293	0.00427	0.00854		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFHxS	355-46-4	0.234	0.00293	0.00427	0.00854		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFOA	335-67-1	0.0488	0.00293	0.00427	0.00854		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFNA	375-95-1	ND	0.00293	0.00427	0.00854	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFOS	1763-23-1	0.0403	0.00293	0.00427	0.00854		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFDA	335-76-2	ND	0.00293	0.00427	0.00854	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
MeFOSAA	2355-31-9	ND	0.00293	0.00427	0.00854	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
EtFOSAA	2991-50-6	ND	0.00293	0.00427	0.00854	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFUnA	2058-94-8	ND	0.00293	0.00427	0.00854	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFDoA	307-55-1	ND	0.00293	0.00427	0.00854	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFTrDA	72629-94-8	ND	0.00293	0.00427	0.00854	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
PFTeDA	376-06-7	ND	0.00293	0.00427	0.00854	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	94.7	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
13C2-PFHxA	IS	88.8	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
13C4-PFHpA	IS	87.5	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
18O2-PFHxS	IS	97.5	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
13C2-PFOA	IS	84.9	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
13C5-PFNA	IS	82.6	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
13C8-PFOS	IS	90.7	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
13C2-PFDA	IS	77.4	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
d3-MeFOSAA	IS	100	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
d5-EtFOSAA	IS	107	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
13C2-PFUnA	IS	80.7	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
13C2-PFDoA	IS	90.3	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1
13C2-PFTeDA	IS	57.9	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:02	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: A1-MW-23-SA2

PFAS Isotope Dilution Method

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Location: YUMA, AZ

Matrix: Water
Date Collected: 14-Nov-18 10:03

Laboratory Data

Lab Sample: 1803659-02
Date Received: 15-Nov-18 13:29

Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFHxA	307-24-4	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFHpA	375-85-9	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFHxS	355-46-4	0.00594	0.00291	0.00424	0.00849	J	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFOA	335-67-1	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFNA	375-95-1	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFOS	1763-23-1	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFDA	335-76-2	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
MeFOSAA	2355-31-9	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
EtFOSAA	2991-50-6	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFUnA	2058-94-8	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFDoA	307-55-1	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFTrDA	72629-94-8	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
PFTeDA	376-06-7	ND	0.00291	0.00424	0.00849	U	B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	88.4	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
13C2-PFHxA	IS	90.8	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
13C4-PFHpA	IS	85.0	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
18O2-PFHxS	IS	93.5	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
13C2-PFOA	IS	82.3	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
13C5-PFNA	IS	82.0	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
13C8-PFOS	IS	97.6	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
13C2-PFDA	IS	73.4	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
d3-MeFOSAA	IS	97.3	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
d5-EtFOSAA	IS	99.9	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
13C2-PFUnA	IS	78.9	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
13C2-PFDoA	IS	94.5	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1
13C2-PFTeDA	IS	84.0	50 - 150		B8K0144	22-Nov-18	0.118 L	27-Nov-18 13:04	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: A1-MW-25-SA2

PFAS Isotope Dilution Method

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Location: YUMA, AZ

Matrix: Water
Date Collected: 14-Nov-18 12:15

Laboratory Data

Lab Sample: 1803659-03
Date Received: 15-Nov-18 13:29

Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	0.299	0.00300	0.00439	0.00875		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFHxA	307-24-4	1.20	0.00300	0.00439	0.00875		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFHpA	375-85-9	0.0780	0.00300	0.00439	0.00875		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFHxS	355-46-4	0.453	0.00300	0.00439	0.00875		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFOA	335-67-1	0.0612	0.00300	0.00439	0.00875		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFNA	375-95-1	ND	0.00300	0.00439	0.00875	U	B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFOS	1763-23-1	0.0195	0.00300	0.00439	0.00875	Q	B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFDA	335-76-2	ND	0.00300	0.00439	0.00875	U	B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
MeFOSAA	2355-31-9	ND	0.00300	0.00439	0.00875	U	B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
EtFOSAA	2991-50-6	ND	0.00300	0.00439	0.00875	U	B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFUnA	2058-94-8	ND	0.00300	0.00439	0.00875	U	B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFDoA	307-55-1	ND	0.00300	0.00439	0.00875	U	B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFTrDA	72629-94-8	ND	0.00300	0.00439	0.00875	U	B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
PFTeDA	376-06-7	ND	0.00300	0.00439	0.00875	U	B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	89.2	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
13C2-PFHxA	IS	93.4	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
13C4-PFHpA	IS	79.4	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
18O2-PFHxS	IS	87.0	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
13C2-PFOA	IS	88.1	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
13C5-PFNA	IS	87.8	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
13C8-PFOS	IS	92.4	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
13C2-PFDA	IS	72.6	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
d3-MeFOSAA	IS	107	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
d5-EtFOSAA	IS	114	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
13C2-PFUnA	IS	77.2	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
13C2-PFDoA	IS	94.7	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1
13C2-PFTeDA	IS	85.8	50 - 150		B8K0144	22-Nov-18	0.114 L	26-Nov-18 16:23	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: A1-MW-27-SA2

PFAS Isotope Dilution Method

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Location: YUMA, AZ

Matrix: Water
Date Collected: 14-Nov-18 13:03

Laboratory Data

Lab Sample: 1803659-04
Date Received: 15-Nov-18 13:29

Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	0.0730	0.00292	0.00427	0.00852		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFHxA	307-24-4	0.255	0.00292	0.00427	0.00852		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFHpA	375-85-9	0.0256	0.00292	0.00427	0.00852		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFHxS	355-46-4	0.136	0.00292	0.00427	0.00852		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFOA	335-67-1	0.0329	0.00292	0.00427	0.00852		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFNA	375-95-1	ND	0.00292	0.00427	0.00852	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFOS	1763-23-1	0.0136	0.00292	0.00427	0.00852		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFDA	335-76-2	ND	0.00292	0.00427	0.00852	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
MeFOSAA	2355-31-9	ND	0.00292	0.00427	0.00852	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
EtFOSAA	2991-50-6	ND	0.00292	0.00427	0.00852	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFUnA	2058-94-8	ND	0.00292	0.00427	0.00852	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFDoA	307-55-1	ND	0.00292	0.00427	0.00852	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFTrDA	72629-94-8	ND	0.00292	0.00427	0.00852	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
PFTeDA	376-06-7	ND	0.00292	0.00427	0.00852	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	93.3	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
13C2-PFHxA	IS	93.1	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
13C4-PFHpA	IS	87.2	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
18O2-PFHxS	IS	90.8	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
13C2-PFOA	IS	87.9	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
13C5-PFNA	IS	90.1	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
13C8-PFOS	IS	96.3	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
13C2-PFDA	IS	76.9	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
d3-MeFOSAA	IS	87.0	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
d5-EtFOSAA	IS	90.3	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
13C2-PFUnA	IS	78.1	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
13C2-PFDoA	IS	91.5	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1
13C2-PFTeDA	IS	74.4	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 16:34	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: A1-MW-55-SA2

PFAS Isotope Dilution Method

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Location: YUMA, AZ

Matrix: Water
Date Collected: 14-Nov-18 11:02

Laboratory Data

Lab Sample: 1803659-05
Date Received: 15-Nov-18 13:29

Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFHxA	307-24-4	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFHpA	375-85-9	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFHxS	355-46-4	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFOA	335-67-1	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFNA	375-95-1	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFOS	1763-23-1	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFDA	335-76-2	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
MeFOSAA	2355-31-9	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
EtFOSAA	2991-50-6	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFUnA	2058-94-8	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFDoA	307-55-1	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFTrDA	72629-94-8	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
PFTeDA	376-06-7	ND	0.00289	0.00424	0.00844	U	B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	89.8	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
13C2-PFHxA	IS	91.6	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
13C4-PFHpA	IS	90.1	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
18O2-PFHxS	IS	89.4	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
13C2-PFOA	IS	90.2	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
13C5-PFNA	IS	84.8	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
13C8-PFOS	IS	82.6	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
13C2-PFDA	IS	81.2	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
d3-MeFOSAA	IS	78.9	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
d5-EtFOSAA	IS	88.0	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
13C2-PFUnA	IS	85.3	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
13C2-PFDoA	IS	86.4	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1
13C2-PFTeDA	IS	83.2	50 - 150		B8K0144	22-Nov-18	0.118 L	26-Nov-18 16:44	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: A1-MW-54-SA2

PFAS Isotope Dilution Method

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Location: YUMA, AZ

Matrix: Water
Date Collected: 14-Nov-18 15:17

Laboratory Data

Lab Sample: 1803659-06
Date Received: 15-Nov-18 13:29

Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	0.462	0.00293	0.00427	0.00856		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFHxA	307-24-4	1.51	0.00293	0.00427	0.00856		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFHpA	375-85-9	0.107	0.00293	0.00427	0.00856		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFHxS	355-46-4	0.899	0.00293	0.00427	0.00856		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFOA	335-67-1	0.230	0.00293	0.00427	0.00856		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFNA	375-95-1	ND	0.00293	0.00427	0.00856	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFOS	1763-23-1	0.0150	0.00293	0.00427	0.00856	Q	B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFDA	335-76-2	ND	0.00293	0.00427	0.00856	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
MeFOSAA	2355-31-9	ND	0.00293	0.00427	0.00856	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
EtFOSAA	2991-50-6	ND	0.00293	0.00427	0.00856	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFUnA	2058-94-8	ND	0.00293	0.00427	0.00856	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFDoA	307-55-1	ND	0.00293	0.00427	0.00856	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFTrDA	72629-94-8	ND	0.00293	0.00427	0.00856	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
PFTeDA	376-06-7	ND	0.00293	0.00427	0.00856	U	B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	95.2	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
13C2-PFHxA	IS	91.4	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
13C4-PFHpA	IS	89.2	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
18O2-PFHxS	IS	98.8	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
13C2-PFOA	IS	94.5	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
13C5-PFNA	IS	82.6	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
13C8-PFOS	IS	89.5	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
13C2-PFDA	IS	75.0	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
d3-MeFOSAA	IS	65.3	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
d5-EtFOSAA	IS	71.6	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
13C2-PFUnA	IS	67.6	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
13C2-PFDoA	IS	61.2	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1
13C2-PFTeDA	IS	58.0	50 - 150		B8K0144	22-Nov-18	0.117 L	26-Nov-18 17:16	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: FRB-20181114 **PFAS Isotope Dilution Method**

Client Data

Name: Tetra Tech EC, Inc.
Project: 4663.3803
Location: YUMA, AZ

Matrix: Water
Date Collected: 14-Nov-18 14:20

Laboratory Data

Lab Sample: 1803659-07
Date Received: 15-Nov-18 13:29

Column: BEH C18

Analyte	CAS Number	Conc. (ug/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFHxA	307-24-4	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFHpA	375-85-9	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFHxS	355-46-4	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFOA	335-67-1	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFNA	375-95-1	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFOS	1763-23-1	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFDA	335-76-2	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
MeFOSAA	2355-31-9	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
EtFOSAA	2991-50-6	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFUnA	2058-94-8	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFDoA	307-55-1	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFTrDA	72629-94-8	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
PFTeDA	376-06-7	ND	0.00297	0.00435	0.00866	U	B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	101	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
13C2-PFHxA	IS	92.4	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
13C4-PFHpA	IS	88.3	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
18O2-PFHxS	IS	97.0	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
13C2-PFOA	IS	94.0	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
13C5-PFNA	IS	88.6	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
13C8-PFOS	IS	100	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
13C2-PFDA	IS	80.7	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
d3-MeFOSAA	IS	84.4	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
d5-EtFOSAA	IS	86.7	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
13C2-PFUnA	IS	80.4	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
13C2-PFDoA	IS	82.1	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1
13C2-PFTeDA	IS	82.2	50 - 150		B8K0144	22-Nov-18	0.115 L	26-Nov-18 17:27	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	**This compound was also detected in the method blank**
Conc.	**Concentration**
D	**Dilution**
DL	**Detection limit**
E	**The associated compound concentration exceeded the calibration range of the instrument**
H	**Recovery and/or RPD was outside laboratory acceptance limits**
I	**Chemical Interference**
J	**The amount detected is below the Reporting Limit/LOQ**
LOD	**Limits of Detection**
LOQ	**Limits of Quantitation**
M	**Estimated Maximum Possible Concentration (CA Region 2 projects only)**
NA	**Not applicable**
ND	**Not Detected**
Q	**Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)**
TEQ	**Toxic Equivalency**
U	**Not Detected (specific projects only)**
*****	**See Cover Letter**

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	18-008-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-009
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-18-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1803659 Temp: 6.0 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: 4663.3803 PO#: 1152405 Sampler: Spencer Doolittle (name)

TAT (check one): Standard: ☐ 21 days Rush (surcharge may apply) ☐ 14 days ☐ 7 days Specify: 10 BD

Invoice to: Name	Company	Address	City	State	Ph#	Fax#
Accts Payable	Tetra Tech EC, Inc.	1230 Columbia St. Suite 750	San Diego	CA	619-234-8696	

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
M. O'HARE	11.14.18	1630	FEDEX	11.14.18	1630
FedEx			B. Benedict	11/15/18	1329

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106

ATTN: SAMPLE RECEIVING

Method of Shipment: FED EX

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	Mod. EPA Method 537 PFOA/ PFOS	UCMR3 PFAS List:6	537 List: 14	Full List of 26	Other: Please List Below	EPA Method 537(DW only) PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
A1-MW-07-SA2	11/14/18	0907	YUMA, AZ	2	P	W			X						
A1-MW-23-SA2	11/14/18	1003	YUMA, AZ	2	P	W			X						
A1-MW-25-SA2	11/14/18	1215	YUMA, AZ	2	P	W			X						
A1-MW-27-SA2	11/14/18	1303	YUMA, AZ	2	P	W			X						
A1-MW-55-SA2	11/14/18	1102	YUMA, AZ	2	P	W			X						
~~EB-20181114~~ A1-MW-54-SA2	11.14.18	1517	YUMA, AZ	2	P	W			X						
FRB-20181114	11/14/18	1420	YUMA, AZ	2	P	W			X						

Special Instructions/Comments:

SEND DOCUMENTATION AND RESULTS TO:

Name: Sabina Sudoko
Company: Tetra Tech EC, Inc.
Address: 17885 Von Karman Avenue, Suite 500
City: Irvine State: CA Zip: 92614
Phone: 949-809-5022 Fax:
Email: sabina.sudoko@tetratech.com

Container Types: P= HDPE, PJ= HDPE Jar, O = Other:

Bottle Preservation Type: T = Thiosulfate, TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: W - WATER

Vista Analytical Laboratory

Sample Log-In Checklist

Vista Work Order #: 1803659 Page # 1 of 1 TAT Std

Samples Arrival:	**Date/Time** 11/15/18 1329	**Initials:** BLB	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 11/16/18 1105	**Initials:** KE	**Location:** WR-2 **Shelf/Rack:** A3/F3

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None

Temp °C: 0.0 (uncorrected)	**Probe used:** (Y) / N	**Thermometer ID:** DT-3
Temp °C: 0.0 (corrected)		

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill — Trk # 7837 8358 557	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	✓

If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓
Preservation Documented: $Na_2S_2O_3$ Trizma None Other	Yes	No	(NA)
Shipping Container: (Vista) Client (Retain) Return Dispose			

Comments:

ORIGIN ID:YUMA (619) 252-0460
TETRA TECH

1230 COLUMBIA ST STE 750

SAN DIEGO, CA 92101
UNITED STATES US

SHIP DATE: 14NOV18
ACTWGT: 39.00 LB
CAD: 006995180/SSFE1922
DIMS: 23x14x13 IN

BILL THIRD PARTY

TO VISTA ANALYTICAL
VISTA ANALYTICAL
1104 WINDFIELD WAY

EL DORADO HILLS CA 95762
(916) 673-1520

INV:
PO:
REF:
DEPT:

FedEx Express

J18211808150luv

TRK# 0201 7837 8358 5574

THU - 15 NOV 10:30A
PRIORITY OVERNIGHT

WD MHRA

95762
CA-US SMF

EXTRACTION INFORMATION

Process Sheet

Workorder: 1803659

RUSH

Prep Expiration: 2018-Nov-28

Client: Tetra Tech EC, Inc.

Workorder Due: 30-Nov-18 00:00

TAT: 15

Method: **537M PFAS DOD (LOQ as mRL)**

Matrix: **Aqueous**

Prep Batch: B8K0144

Prep Data Entered: QE 11/23/18 (Date and Initials)

Version: 537 (14 Analyte)

DoD: DoD QSM 5.1

Initial Sequence: S8K0064

LabSampID	A/B	Prep Rec	Spike Rec	ClientSampleID	Comments	Location	Container
1803659-01	A	☑	☑	A1-MW-07-SA2		WR-2 A-3	HDPE Bottle, 125 mL
1803659-02		☑	☑	A1-MW-23-SA2		WR-2 A-3	HDPE Bottle, 125 mL
1803659-03		☑	☑	A1-MW-25-SA2		WR-2 A-3	HDPE Bottle, 125 mL
1803659-04		☑	☑	A1-MW-27-SA2		WR-2 A-3	HDPE Bottle, 125 mL
1803659-05		☑	☑	A1-MW-55-SA2		WR-2 A-3	HDPE Bottle, 125 mL
1803659-06		☑	☑	A1-MW-54-SA2		WR-2 A-3	HDPE Bottle, 125 mL
1803659-07		☑	☑	FRB-20181114		WR-2 A-3	HDPE Bottle, 125 mL

NO Comments: **Internal COC**

Pre-Prep Check Out: LT 11/21/18

Pre-Prep Check In: LT 11/21/18

Prep Check Out: MJ 11/22/18

Prep Check In: NA

Prep Reconciled Initals/Date: LT 11/21/18

Spike Reconciled Initals/Date: MJ 11/22/18

VialBoxID: Cherry Garcia

Internal Chain of Custody

1803659

Vista Analytical Laboratory

Client: Tetra Tech EC, Inc. | Project Number: 4663.3803 | Received: 15-Nov-18 13:29 | Received By: Bettina Benedict

		Sample				Extract	
Vista Sample ID	Bottle	Initials Date/Time New Location	Initials Date/Time New Location	Initials Date/Time New Location	Initials Date/Time New Location	Initials Date/Time New Location	Initials Date/Time New Location
1803659-01	A/B	KE 11/16/18 1105 A:A3 B:F3 WR2	LT 11/21/18 1102 Prep	LT 11/21/18 1212 WR-2 Prep Shelf	MJ 11/22/18 10:22 Prep Lab 2	AM 11/20/18 1315 Instrument M	
1803659-02	A/B	KE 11/16/18 1105 WR-2 A:A3 B:F3	LT 11/21/18 1102 Prep	LT 11/21/18 1212 WR-2 Prep Shelf			
1803659-03	A/B	KE 11/16/18 1105 WR-2 A:A3 B:F3	LT 11/21/18 1102 Prep	LT 11/21/18 1212 WR-2 Prep Shelf			
1803659-04	A/B	KE 11/16/18 1105 WR-2 A:A3 B:F3	LT 11/21/18 1102 Prep	LT 11/21/18 1212 WR-2 Prep Shelf			
1803659-05	A/B	KE 11/16/18 1105 WR-2 A:A3 B:F3	LT 11/21/18 1102 Prep	LT 11/21/18 1212 WR-2 Prep Shelf			
1803659-06	A/B	KE 11/16/18 1105 WR-2 A:A3 B:F3	LT 11/21/18 1102 Prep	LT 11/21/18 1212 WR-2 Prep Shelf			
1803659-07	A/B	KE 11/16/18 1105 WR-2 A:A3 B:F3	LT 11/21/18 1102 Prep	LT 11/21/18 1212 WR-2 Prep Shelf			

* Samples placed in F-7 at 13:32 by TR TR 11/22/18
* Samples placed on Nevap #1 by AE at 09:00 AE 11/23/18
* Samples placed in R-7 at 17:55 MJ 11/23/18

Note in grid if sample or extract are depleted. See Login Checklist for initial location.

Matrix: Aqueous

Method: 537M PFAS DOD (LOQ as mRL)

PREPARATION BENCH SHEET

B8K0144

Chemist: MJ

Prep Date: 11/22/18

Prep Time: 10:31

Prepared using: ☐ Sonication ☐ Shaker ☑ SPE Extraction ☐ Centrifuge ID: _____

Date/Initals: LT 11/21/18 | BalanceID: HRMS-10

Cen	VISTA Sample ID	pH Before	pH After	Chlorine (Cl)	Drops HCl Added	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	SPE	ENVI-Carb	RS CHEM/WIT DATE
☐	B8K0144-BLK1	5	2	0	1	N/A	N/A	0.125	MJ 7R 11/22/18	MJ 11/22/18	MJ 11/22/18	MJ 7R 11/22/18
☐	B8K0144-BS1	5	2	0	1	↓	↓	0.125	↓	↓	↓	↓
☐	B8K0144-BSD1	5	2	0	1	↓	↓	0.125	↓	↓	↓	↓
☐	1803659-01	5	2	0	3	144.06	27.02	0.11704	↓	↓	↓	↓
☐	1803659-02	5	2	0	3	144.83	27.03	0.11780	↓	↓	↓	↓
☐	1803659-03	5	2	0	3	141.17	26.91	0.11426	↓	↓	↓	↓
☐	1803659-04	5	2	0	3	144.25	26.94	0.11731	↓	↓	↓	↓
☐	1803659-05	5	2	0	2	145.38	26.92	0.11846	↓	↓	↓	↓
☐	1803659-06	5	2	0	3	143.78	26.95	0.11683	↓	↓	↓	↓
☐	1803659-07	5	2	0	1	142.43	26.94	0.11549	↓	↓	↓	↓

IS: IBJ1502, 10mL (V3)

IS SUP: NA

NS: IBJ1505, 10mL (V2)

NS SUP: NA

RS: IBJ1503, 10mL (V3)

SPE Chem: Strata-X-AW 33µm 200mg 6mL

SPE Lot#: SIB-004499

ENVI-Carb Lot#: 10262101

Ele SOLV: MeOH/0.5%NH4OH in MeOH

Final Volume(s) 1 mL

Notes:

Comments: Assume 1 g = 1 mL

Cen = Centrifuged

1 = Sample centrifuged twice
2 = Sample deeply colored after centrifuge
3 = Cartridge sorbent discolored after SPE
4 = Sample clogged cartridge, additioanl cartridge(s) used
5 = Sample recombined at final volume
6 = Sample took longer to SPE, required stronger vacuum
7 = Required Nitrogen line to finish SPE
8 = Required Nitrogen line to finish elution
9 = Sample arrived with low volume
10 = Trizma added to QC (5g/L)

Matrix: Aqueous

Method: 537M PFAS DOD (LOQ as mRL)

PREPARATION BENCH SHEET

B8K0144

Chemist: _____

Prep Date: _____

Prep Time: _____

Prepared using: ☐ Sonication ☐ Shaker ☐ SPE Extraction ☐ Centrifuge ID: _____

Date/Initals: LT 11/21/18 | BalanceID: HRMS - 10

Cen	VISTA Sample ID	pH Before	pH After	Chlorine (Cl)	Drops HCl Added	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	SPE	ENVI-Carb	RS CHEM/WIT DATE
☐	B8K0144-BLK1	5	2	0	1	N/A	N/A	0.125				
☐	B8K0144-BS1	5	2	0	1	↓	↓	0.125				
☐	1803659-01	5	2	0	3	149.06						
☐	1803659-02	5	2	0	3	144.83						
☐	1803659-03	5	2	0	3	141.17						
☐	1803659-04	5	2	0	3	149.25						
☐	1803659-05	5	2	0	2	145.38						
☐	1803659-06	5	2	0	3	143.78						
☐	1803659-07	5	2	0	1	142.43						

IS: _____

IS SUP: _____

NS: _____

NS SUP: _____

RS: _____

SPE Chem: _____

SPE Lot#: _____

ENVI-Carb Lot#: _____

Ele SOLV: MeOH/0.5%NH4OH in MeOH

Final Volume(s) _____mL

Notes:

Comments: Assume 1 g = 1 mL
Cen = Centrifuged

1 = Sample centrifuged twice
2 = Sample deeply colored after centrifuge
3 = Cartridge sorbent discolored after SPE
4 = Sample clogged cartridge, additioanl cartridge(s) used
5 = Sample recombined at final volume
6 = Sample took longer to SPE, required stronger vacuum
7 = Required Nitrogen line to finish SPE
8 = Required Nitrogen line to finish elution
9 = Sample arrived with low volume
10 = Trizma added to QC (5g/L)

Batch: B8K0144

Matrix: Aqueous

LabNumber	WetWeight (Initial)	% Solids (Extraction Solids)	DryWeight	Final	Extracted	Ext By	Spike	SpikeAmount	ClientMatrix	Analysis
1803659-01	0.11704 ✓	N/A	N/A	1000	22-Nov-18 10:31	NY			Water	537M PFAS DOD (LOQ as
1803659-02	0.1178 ✓			1000	22-Nov-18 10:31	NY			Water	537M PFAS DOD (LOQ as
1803659-03	0.11426 ✓			1000	22-Nov-18 10:31	NY			Water	537M PFAS DOD (LOQ as
1803659-04	0.11731 ✓			1000	22-Nov-18 10:31	NY			Water	537M PFAS DOD (LOQ as
1803659-05	0.11846 ✓			1000	22-Nov-18 10:31	NY			Water	537M PFAS DOD (LOQ as
1803659-06	0.11683 ✓			1000	22-Nov-18 10:31	NY			Water	537M PFAS DOD (LOQ as
1803659-07	0.11549 ✓			1000	22-Nov-18 10:31	NY			Water	537M PFAS DOD (LOQ as
B8K0144-BLK1	0.125 ✓			1000	22-Nov-18 10:31	NY				QC
B8K0144-BS1	0.125 ✓			1000	22-Nov-18 10:31	NY	18J1505 ✓	10 ✓		QC
B8K0144-BSD1	0.125 ✓			1000	22-Nov-18 10:31	NY	18J1505 ✓	10 ✓		QC

11/23/18
AE

Sample Data – PFAS Isotope Dilution Method

Vista Analytical Laboratory L14

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-25.qld

Last Altered: Wednesday, November 28, 2018 09:58:09 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:59:05 Pacific Standard Time

GM 11/29/2018

Name: 181126M1_25, Date: 26-Nov-2018, Time: 15:51:53, ID: B8K0144-BLK1 Method Blank 0.125, Description: Method Blank

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	3	PFBS	299.0 > 79.7		1.29e3	0.125		2.82						
2	5	PFHxA	313 > 269	2.60e1	6.35e3	0.125		3.38	3.38	0.0204			14.001	NO
3	7	PFHpA	363.0 > 318.9		8.81e3	0.125		4.03						
4	8	L-PFHxS	398.9 > 79.6	1.07e1	1.01e3	0.125		4.17	4.17	0.132	0.5491		39.807	YES
5	68	Total PFHxS	398.9 > 79.6	1.07e1	1.01e3	0.125		4.28		0.132	0.5491			
6	11	L-PFOA	412.8 > 368.9	5.93e1	1.49e4	0.125		4.47	4.52	0.0498			2.482	NO
7	69	Total PFOA	412.8 > 368.9	5.93e1	1.49e4	0.125		4.62		0.000				
8	38	13C3-PFBS	302. > 98.8	1.29e3	2.56e3	0.125	0.537	2.72	2.82	6.29	93.7598	93.8		
9	40	13C2-PFHxA	315 > 270	6.35e3	1.71e4	0.125	0.988	3.30	3.38	4.65	37.6638	94.2		
10	41	13C4-PFHpA	367.2 > 321.8	8.81e3	1.71e4	0.125	0.537	3.97	4.03	6.45	96.2092	96.2		
11	42	18O2-PFHxS	403.0 > 102.6	1.01e3	2.56e3	0.125	0.448	4.11	4.17	4.93	88.0639	88.1		
12	42	18O2-PFHxS	403.0 > 102.6	1.01e3	2.56e3	0.125	0.448	4.11	4.17	4.93	88.0639	88.1		
13	44	13C2-PFOA	414.9 > 369.7	1.49e4	2.10e4	0.125	0.755	4.46	4.52	8.86	93.9473	93.9		
14	44	13C2-PFOA	414.9 > 369.7	1.49e4	2.10e4	0.125	0.755	4.46	4.52	8.86	93.9473	93.9		
15	-1													
16	14	PFNA	463.0 > 418.8		1.30e4	0.125		4.90						
17	16	L-PFOS	498.9 > 79.9		2.32e3	0.125		5.02						
18	70	Total PFOS	498.9 > 79.9	0.00e0	2.32e3	0.125		5.13		0.000				
19	18	PFDA	513 > 468.8	3.28e1	1.14e4	0.125		5.28	5.33	0.0358	0.0548		21.961	YES
20	21	L-MeFOSAA	570 > 419		2.07e3	0.125		5.43						
21	71	Total N-MeFOSAA	570. > 419	0.00e0	2.07e3	0.125		5.57		0.000				
22	25	PFUdA	563.0 > 518.9	4.74e1	1.45e4	0.125		5.61	5.65	0.0407			43.931	YES
23	45	13C5-PFNA	468.2 > 422.9	1.30e4	1.55e4	0.125	0.991	4.90	4.95	10.5	84.8385	84.8		
24	47	13C8-PFOS	507.0 > 79.9	2.32e3	2.45e3	0.125	1.042	4.98	5.03	11.8	90.9706	91.0		
25	47	13C8-PFOS	507.0 > 79.9	2.32e3	2.45e3	0.125	1.042	4.98	5.03	11.8	90.9706	91.0		
26	48	13C2-PFDA	515.1 > 469.9	1.14e4	1.70e4	0.125	0.902	5.28	5.33	8.44	74.8367	74.8		
27	50	d3-N-MeFOSAA	573.3 > 419	2.07e3	2.00e4	0.125	0.135	5.43	5.48	1.29	76.7450	76.7		
28	50	d3-N-MeFOSAA	573.3 > 419	2.07e3	2.00e4	0.125	0.135	5.43	5.48	1.29	76.7450	76.7		
29	51	13C2-PFUdA	565 > 519.8	1.45e4	2.00e4	0.125	0.957	5.61	5.65	9.09	75.9756	76.0		
30	-1													
31	23	L-EtFOSAA	584.1 > 419	4.64e0	3.10e3	0.125		5.51	5.64	0.0187			0.365	YES
32	72	Total N-EtFOSAA	584.1 > 419	4.64e0	3.10e3	0.125		5.72		0.000				
33	29	PFTrDA	662.9 > 618.9		1.48e4	0.125		6.15						
34	27	PFDoA	612.9 > 569.0		1.48e4	0.125		5.90						
35	30	PFTeDA	713.0 > 669.0		9.53e3	0.125		6.37						
36	73	TCDA	498.3>106.9			0.125		5.15						

CGH 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-25.qld

Last Altered: Wednesday, November 28, 2018 09:58:09 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:59:05 Pacific Standard Time

GM 11/29/2018

Name: 181126M1_25, Date: 26-Nov-2018, Time: 15:51:53, ID: B8K0144-BLK1 Method Blank 0.125, Description: Method Blank

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	61	13C5-PFHxA	318 > 272.9	1.71e4	1.71e4	0.125	1.000	3.30	3.38	12.5	100.0000	100.0		
38	52	d5-N-EtFOSAA	589.3 > 419	3.10e3	2.00e4	0.125	0.185	5.59	5.63	1.94	83.5997	83.6		
39	52	d5-N-EtFOSAA	589.3 > 419	3.10e3	2.00e4	0.125	0.185	5.59	5.63	1.94	83.5997	83.6		
40	53	13C2-PFDoA	615.0 > 569.7	1.48e4	1.70e4	0.125	1.047	5.90	5.93	10.9	83.2955	83.3		
41	53	13C2-PFDoA	615.0 > 569.7	1.48e4	1.70e4	0.125	1.047	5.90	5.93	10.9	83.2955	83.3		
42	55	13C2-PFTeDA	715.1 > 669.7	9.53e3	2.00e4	0.125	0.567	6.37	6.40	5.96	84.0771	84.1		
43	47	13C8-PFOS	507.0 > 79.9	2.32e3	2.45e3	0.125	1.042	4.98	5.03	11.8	90.9706	91.0		
44	63	13C8-PFOA	420.9 > 376	2.10e4	2.10e4	0.125	1.000	4.46	4.52	12.5	100.0000	100.0		
45	-1													
46	62	13C3-PFHxS	401.8 > 79.9	2.56e3	2.56e3	0.125	1.000	4.11	4.17	12.5	100.0000	100.0		
47	64	13C9-PFNA	472.2 > 426.9	1.55e4	1.55e4	0.125	1.000	4.90	4.95	12.5	100.0000	100.0		
48	65	13C4-PFOS	503 > 79.9	2.45e3	2.45e3	0.125	1.000	4.98	5.03	12.5	100.0000	100.0		
49	66	13C6-PFDA	519.1 > 473.7	1.70e4	1.70e4	0.125	1.000	5.28	5.33	12.5	100.0000	100.0		
50	67	13C7-PFUdA	570.1 > 524.8	2.00e4	2.00e4	0.125	1.000	5.61	5.65	12.5	100.0000	100.0		

Vista Analytical Laboratory L14

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-25.qld

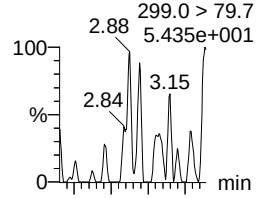
Last Altered: Wednesday, November 28, 2018 09:58:09 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:59:05 Pacific Standard Time

GM 11/29/2018

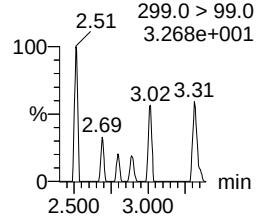
Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_25, Date: 26-Nov-2018, Time: 15:51:53, ID: B8K0144-BLK1 Method Blank 0.125, Description: Method Blank

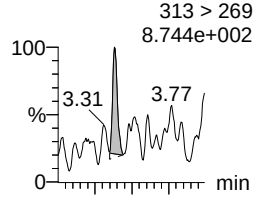
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
5.435e+001



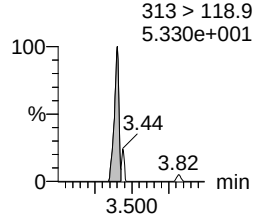
F7:MRM of 2 channels,ES-
299.0 > 99.0
3.268e+001



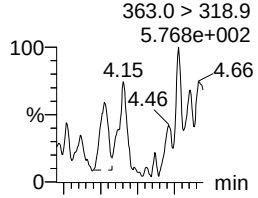
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
8.744e+002



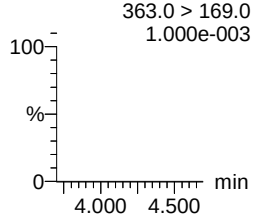
F9:MRM of 2 channels,ES-
313 > 118.9
5.330e+001



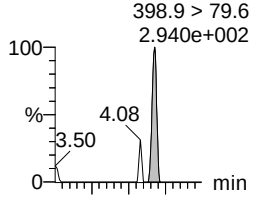
PFHpA
F16:MRM of 2 channels,ES-
363.0 > 318.9
5.768e+002



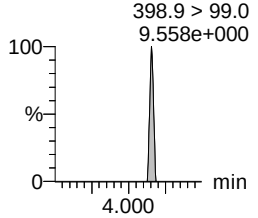
F16:MRM of 2 channels,ES-
363.0 > 169.0
1.000e-003



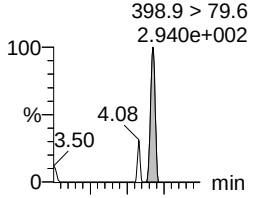
L-PFHxS
F18:MRM of 2 channels,ES-
398.9 > 79.6
2.940e+002



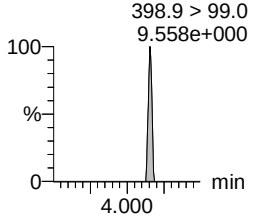
F18:MRM of 2 channels,ES-
398.9 > 99.0
9.558e+000



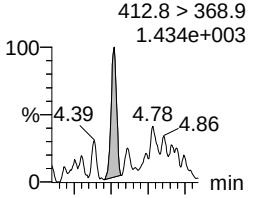
Total PFHxS
F18:MRM of 2 channels,ES-
398.9 > 79.6
2.940e+002



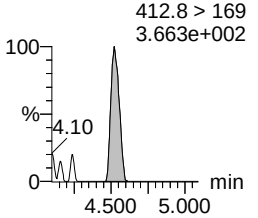
F18:MRM of 2 channels,ES-
398.9 > 99.0
9.558e+000



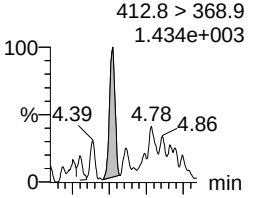
L-PFOA
F21:MRM of 2 channels,ES-
412.8 > 368.9
1.434e+003



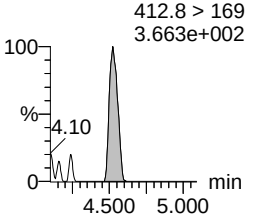
F21:MRM of 2 channels,ES-
412.8 > 169
3.663e+002



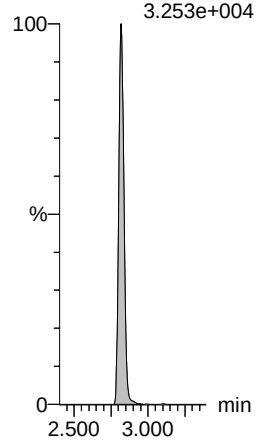
Total PFOA
F21:MRM of 2 channels,ES-
412.8 > 368.9
1.434e+003



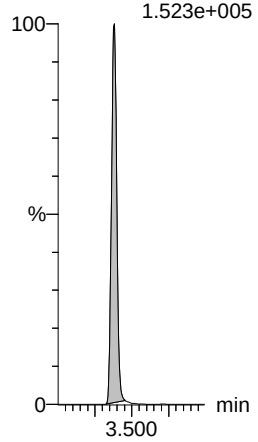
F21:MRM of 2 channels,ES-
412.8 > 169
3.663e+002



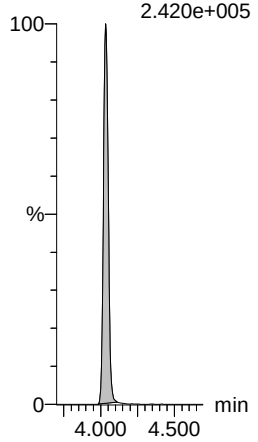
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.253e+004



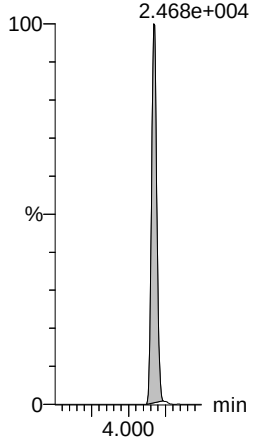
13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
1.523e+005



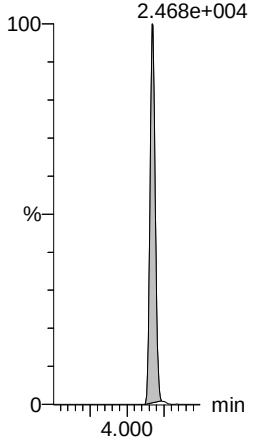
13C4-PFHpA
F17:MRM of 1 channel,ES-
367.2 > 321.8
2.420e+005



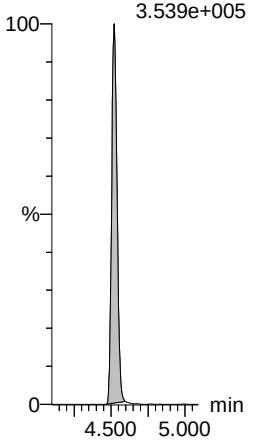
18O2-PFHxS
F20:MRM of 1 channel,ES-
403.0 > 102.6
2.468e+004



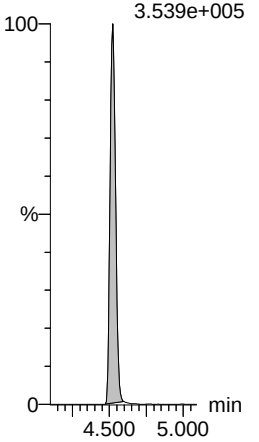
18O2-PFHxS
F20:MRM of 1 channel,ES-
403.0 > 102.6
2.468e+004



13C2-PFOA
F22:MRM of 1 channel,ES-
414.9 > 369.7
3.539e+005



13C2-PFOA
F22:MRM of 1 channel,ES-
414.9 > 369.7
3.539e+005



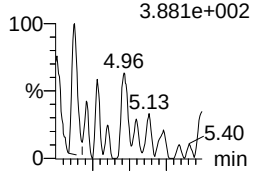
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-25.qld

Last Altered: Wednesday, November 28, 2018 09:58:09 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:59:05 Pacific Standard Time

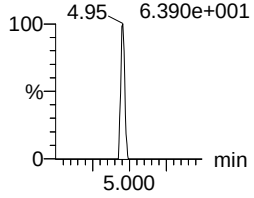
GM 11/29/2018

Name: 181126M1_25, Date: 26-Nov-2018, Time: 15:51:53, ID: B8K0144-BLK1 Method Blank 0.125, Description: Method Blank

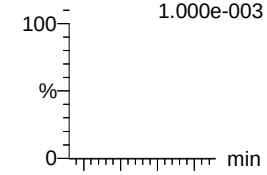
PFNA
F27:MRM of 2 channels,ES-
463.0 > 418.8
3.881e+002



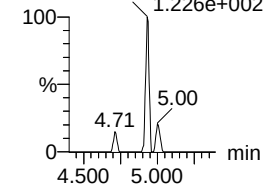
F27:MRM of 2 channels,ES-
463.0 > 219.0
6.390e+001



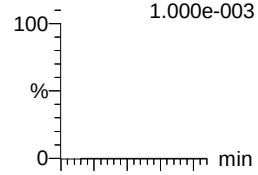
L-PFOS
F32:MRM of 2 channels,ES-
498.9 > 79.9
1.000e-003



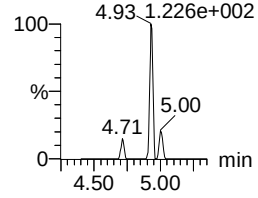
F32:MRM of 2 channels,ES-
498.9 > 99
1.226e+002



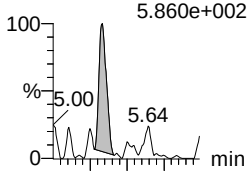
Total PFOS
F32:MRM of 2 channels,ES-
498.9 > 79.9
1.000e-003



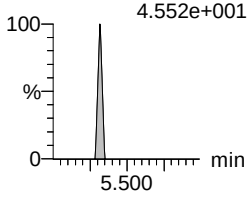
F32:MRM of 2 channels,ES-
498.9 > 99
1.226e+002



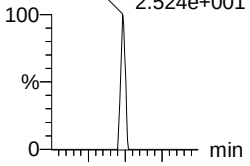
PFDA
F37:MRM of 2 channels,ES-
513 > 468.8
5.860e+002



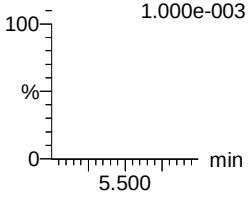
F37:MRM of 2 channels,ES-
513 > 219
4.552e+001



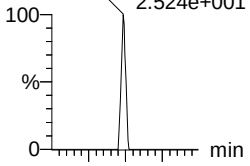
L-MeFOSAA
F48:MRM of 2 channels,ES-
570 > 419
2.524e+001



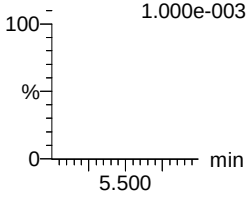
F48:MRM of 2 channels,ES-
570. > 512
1.000e-003



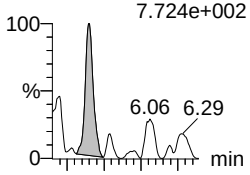
Total N-MeFOSAA
F48:MRM of 2 channels,ES-
570 > 419
2.524e+001



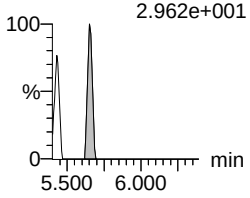
F48:MRM of 2 channels,ES-
570. > 512
1.000e-003



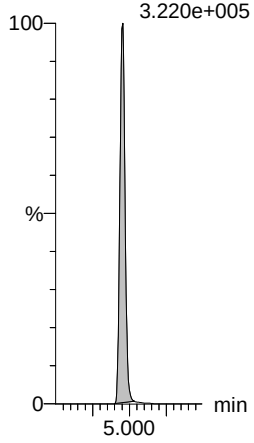
PFUdA
F46:MRM of 2 channels,ES-
563.0 > 518.9
7.724e+002



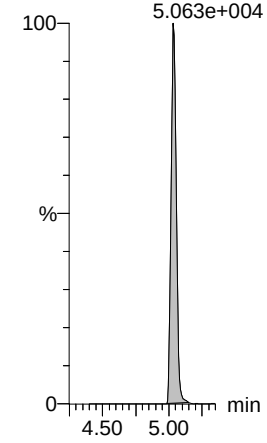
F46:MRM of 2 channels,ES-
563.0 > 269
2.962e+001



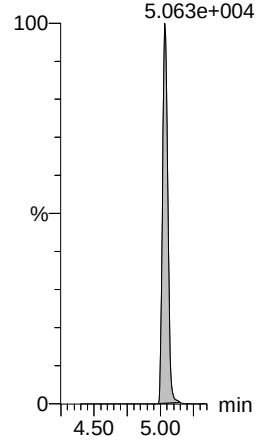
13C5-PFNA
F28:MRM of 1 channel,ES-
468.2 > 422.9
3.220e+005



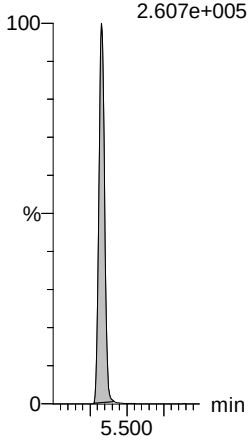
13C8-PFOS
F35:MRM of 1 channel,ES-
507.0 > 79.9
5.063e+004



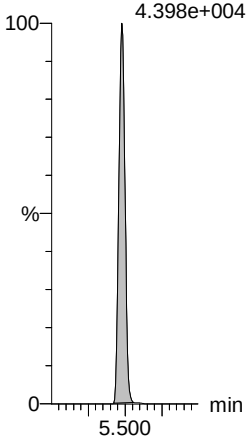
13C8-PFOS
F35:MRM of 1 channel,ES-
507.0 > 79.9
5.063e+004



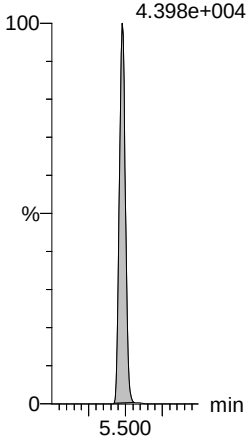
13C2-PFDA
F38:MRM of 1 channel,ES-
515.1 > 469.9
2.607e+005



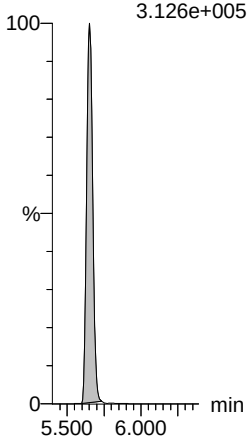
d3-N-MeFOSAA
F50:MRM of 1 channel,ES-
573.3 > 419
4.398e+004



d3-N-MeFOSAA
F50:MRM of 1 channel,ES-
573.3 > 419
4.398e+004



13C2-PFUdA
F47:MRM of 1 channel,ES-
565 > 519.8
3.126e+005



CGH 11/28/2018

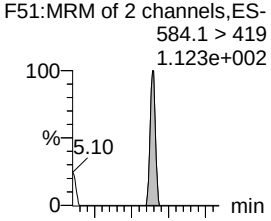
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-25.qld

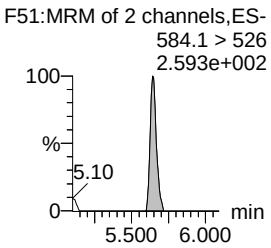
Last Altered: Wednesday, November 28, 2018 09:58:09 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:59:05 Pacific Standard Time

GM 11/29/2018

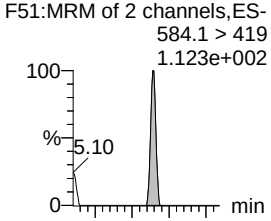
Name: 181126M1_25, Date: 26-Nov-2018, Time: 15:51:53, ID: B8K0144-BLK1 Method Blank 0.125, Description: Method Blank

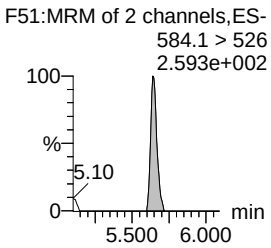
L-EtFOSAA



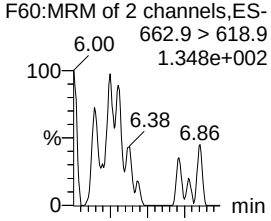


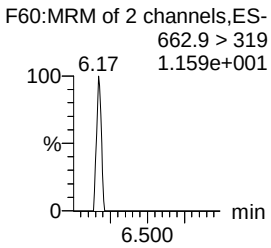
Total N-EtFOSAA



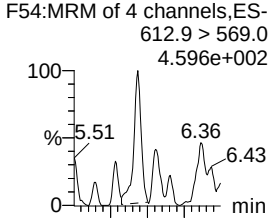


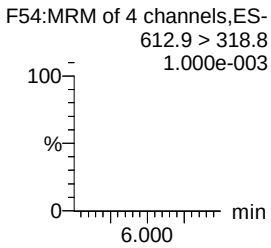
PFTrDA



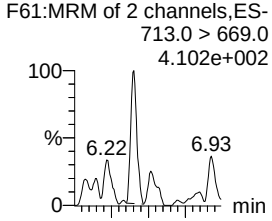


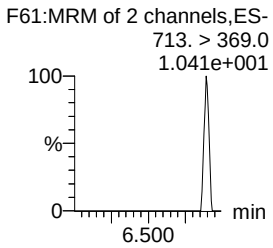
PFDoA



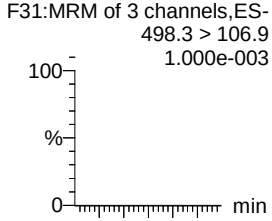


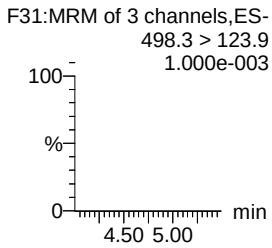
PFTeDA



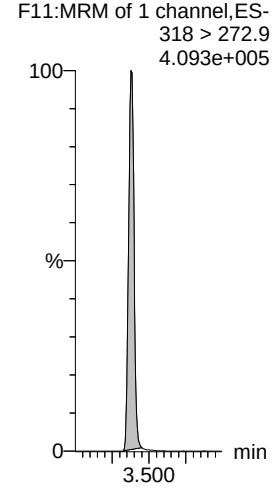


TCDA

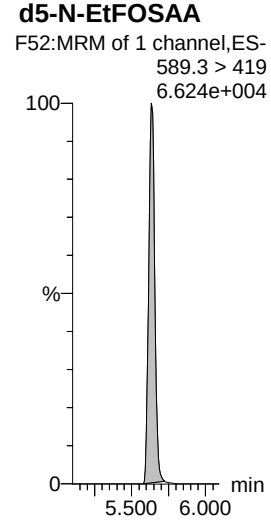




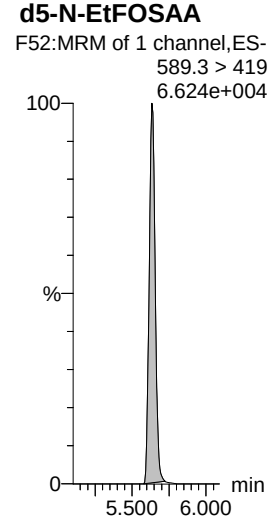
13C5-PFHxA



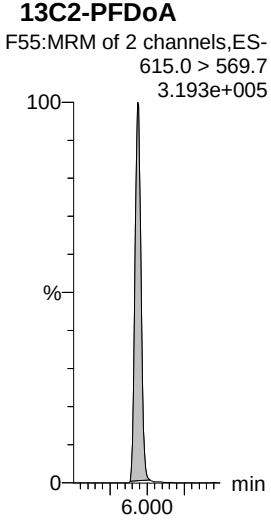
d5-N-EtFOSAA



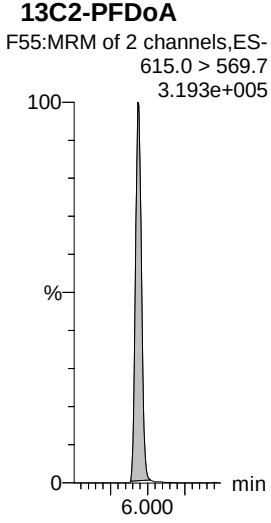
d5-N-EtFOSAA



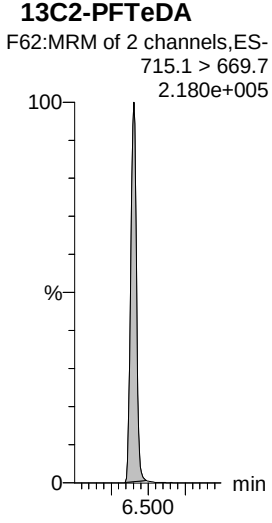
13C2-PFDoA



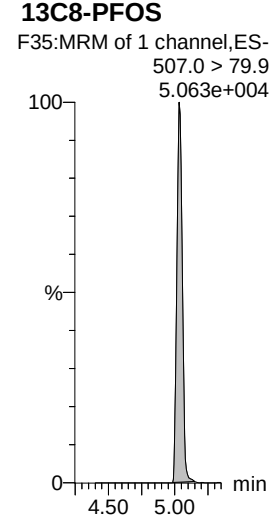
13C2-PFDoA



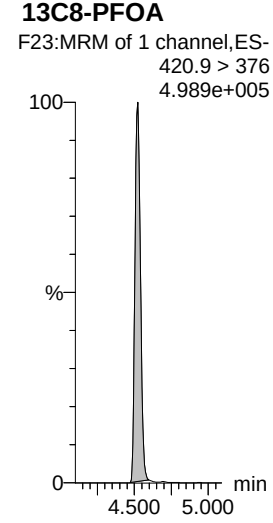
13C2-PFTeDA



13C8-PFOS



13C8-PFOA



CGH 11/28/2018

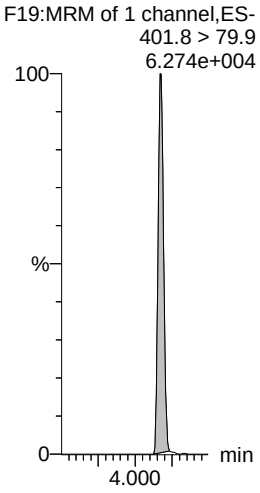
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-25.qld

Last Altered: Wednesday, November 28, 2018 09:58:09 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:59:05 Pacific Standard Time

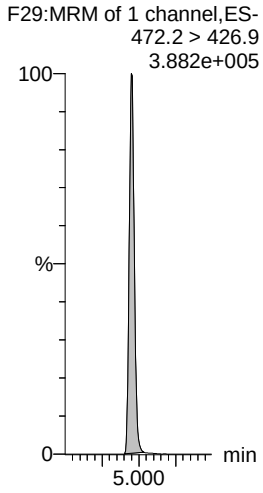
GM 11/29/2018

Name: 181126M1_25, Date: 26-Nov-2018, Time: 15:51:53, ID: B8K0144-BLK1 Method Blank 0.125, Description: Method Blank

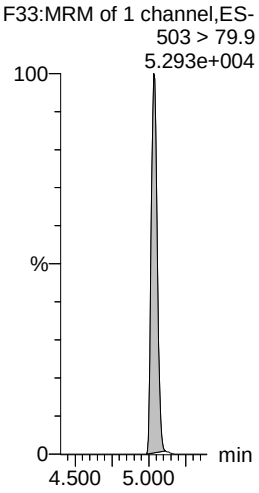
13C3-PFHxS



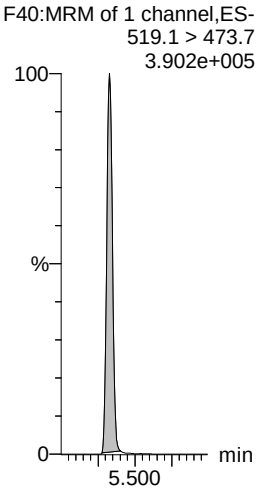
13C9-PFNA



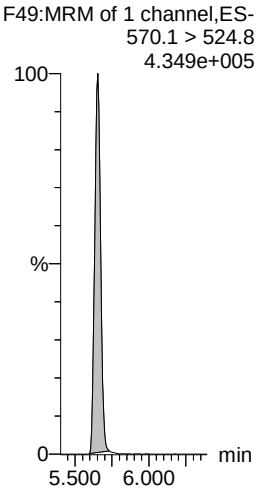
13C4-PFOS



13C6-PFDA



13C7-PFUdA



CGH 11/28/2018

Vista Analytical Laboratory L14

ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-23.qld

Last Altered: Wednesday, November 28, 2018 09:46:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:47:32 Pacific Standard Time

Name: 181126M1_23, Date: 26-Nov-2018, Time: 15:29:49, ID: B8K0144-BS1 OPR 0.125, Description: OPR

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	3	PFBS	299.0 > 79.7	2.17e3	1.34e3	0.125		2.82	2.83	20.3	78.5232	98.2	2.647	NO
2	5	PFHxA	313 > 269	1.32e4	6.81e3	0.125		3.39	3.39	9.69	81.8514	102.3	14.548	NO
3	7	PFHpA	363.0 > 318.9	9.77e3	9.01e3	0.125		4.02	4.02	13.6	82.3816	103.0	13.287	NO
4	8	L-PFHxS	398.9 > 79.6	1.79e3	1.10e3	0.125		4.16	4.16	20.3	83.6564	104.6	1.699	NO
5	68	Total PFHxS	398.9 > 79.6	1.79e3	1.10e3	0.125		4.28		20.3	83.6564			
6	11	L-PFOA	412.8 > 368.9	1.70e4	1.49e4	0.125		4.47	4.52	14.2	82.8508	103.6	3.170	NO
7	69	Total PFOA	412.8 > 368.9	1.70e4	1.49e4	0.125		4.62		14.2	82.8508			
8	38	13C3-PFBS	302. > 98.8	1.34e3	2.61e3	0.125	0.537	2.72	2.82	6.42	95.7033	95.7		
9	40	13C2-PFHxA	315 > 270	6.81e3	1.87e4	0.125	0.988	3.30	3.39	4.55	36.8400	92.1		
10	41	13C4-PFHpA	367.2 > 321.8	9.01e3	1.87e4	0.125	0.537	3.97	4.03	6.02	89.7593	89.8		
11	42	18O2-PFHxS	403.0 > 102.6	1.10e3	2.61e3	0.125	0.448	4.11	4.16	5.26	93.9115	93.9		
12	42	18O2-PFHxS	403.0 > 102.6	1.10e3	2.61e3	0.125	0.448	4.11	4.16	5.26	93.9115	93.9		
13	44	13C2-PFOA	414.9 > 369.7	1.49e4	2.23e4	0.125	0.755	4.46	4.52	8.37	88.6619	88.7		
14	44	13C2-PFOA	414.9 > 369.7	1.49e4	2.23e4	0.125	0.755	4.46	4.52	8.37	88.6619	88.7		
15	-1													
16	14	PFNA	463.0 > 418.8	1.34e4	1.32e4	0.125		4.90	4.95	12.7	81.0344	101.3	4.323	NO
17	16	L-PFOS	498.9 > 79.9	2.32e3	2.39e3	0.125		5.02	5.03	12.1	87.9862	110.0	2.014	NO
18	70	Total PFOS	498.9 > 79.9	2.32e3	2.39e3	0.125		5.13		12.1	87.9862			
19	18	PFDA	513 > 468.8	1.40e4	1.20e4	0.125		5.28	5.33	14.6	88.7436	110.9	5.573	NO
20	21	L-MeFOSAA	570 > 419	5.07e3	2.10e3	0.125		5.43	5.48	30.1	82.8197	103.5	2.488	NO
21	71	Total N-MeFOSAA	570. > 419	5.07e3	2.10e3	0.125		5.57		30.1	82.8197			
22	25	PFUdA	563.0 > 518.9	1.15e4	1.44e4	0.125		5.61	5.65	9.99	82.0130	102.5	9.333	NO
23	45	13C5-PFNA	468.2 > 422.9	1.32e4	1.56e4	0.125	0.991	4.90	4.95	10.6	85.3006	85.3		
24	47	13C8-PFOS	507.0 > 79.9	2.39e3	2.63e3	0.125	1.042	4.98	5.03	11.4	87.3338	87.3		
25	47	13C8-PFOS	507.0 > 79.9	2.39e3	2.63e3	0.125	1.042	4.98	5.03	11.4	87.3338	87.3		
26	48	13C2-PFDA	515.1 > 469.9	1.20e4	1.80e4	0.125	0.902	5.28	5.33	8.30	73.5682	73.6		
27	50	d3-N-MeFOSAA	573.3 > 419	2.10e3	2.03e4	0.125	0.135	5.43	5.48	1.30	77.0963	77.1		
28	50	d3-N-MeFOSAA	573.3 > 419	2.10e3	2.03e4	0.125	0.135	5.43	5.48	1.30	77.0963	77.1		
29	51	13C2-PFUdA	565 > 519.8	1.44e4	2.03e4	0.125	0.957	5.61	5.65	8.90	74.3432	74.3		
30	-1													
31	23	L-EtFOSAA	584.1 > 419	4.44e3	3.18e3	0.125		5.51	5.64	17.4	86.0353	107.5	1.440	NO
32	72	Total N-EtFOSAA	584.1 > 419	4.44e3	3.18e3	0.125		5.72		17.4	86.0353			
33	29	PFTrDA	662.9 > 618.9	1.24e4	1.40e4	0.125		6.15	6.18	11.1	76.1902	95.2	24.695	NO
34	27	PFDoA	612.9 > 569.0	1.30e4	1.40e4	0.125		5.90	5.93	11.6	79.6603	99.6	8.257	NO
35	30	PFTeDA	713.0 > 669.0	1.04e4	7.54e3	0.125		6.37	6.40	17.3	84.6077	105.8	12.920	NO
36	73	TCDA	498.3>106.9			0.125		5.15						

CGH 11/28/2018

ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-23.qld

Last Altered: Wednesday, November 28, 2018 09:46:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:47:32 Pacific Standard Time

Name: 181126M1_23, Date: 26-Nov-2018, Time: 15:29:49, ID: B8K0144-BS1 OPR 0.125, Description: OPR

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	61	13C5-PFHxA	318 > 272.9	1.87e4	1.87e4	0.125	1.000	3.30	3.39	12.5	100.0000	100.0		
38	52	d5-N-EtFOSAA	589.3 > 419	3.18e3	2.03e4	0.125	0.185	5.59	5.63	1.96	84.7026	84.7		
39	52	d5-N-EtFOSAA	589.3 > 419	3.18e3	2.03e4	0.125	0.185	5.59	5.63	1.96	84.7026	84.7		
40	53	13C2-PFDoA	615.0 > 569.7	1.40e4	1.80e4	0.125	1.047	5.90	5.93	9.69	74.0865	74.1		
41	53	13C2-PFDoA	615.0 > 569.7	1.40e4	1.80e4	0.125	1.047	5.90	5.93	9.69	74.0865	74.1		
42	55	13C2-PFTeDA	715.1 > 669.7	7.54e3	2.03e4	0.125	0.567	6.37	6.40	4.64	65.5363	65.5		
43	47	13C8-PFOS	507.0 > 79.9	2.39e3	2.63e3	0.125	1.042	4.98	5.03	11.4	87.3338	87.3		
44	63	13C8-PFOA	420.9 > 376	2.23e4	2.23e4	0.125	1.000	4.46	4.52	12.5	100.0000	100.0		
45	-1													
46	62	13C3-PFHxS	401.8 > 79.9	2.61e3	2.61e3	0.125	1.000	4.11	4.16	12.5	100.0000	100.0		
47	64	13C9-PFNA	472.2 > 426.9	1.56e4	1.56e4	0.125	1.000	4.90	4.95	12.5	100.0000	100.0		
48	65	13C4-PFOS	503 > 79.9	2.63e3	2.63e3	0.125	1.000	4.98	5.03	12.5	100.0000	100.0		
49	66	13C6-PFDA	519.1 > 473.7	1.80e4	1.80e4	0.125	1.000	5.28	5.33	12.5	100.0000	100.0		
50	67	13C7-PFUdA	570.1 > 524.8	2.03e4	2.03e4	0.125	1.000	5.61	5.65	12.5	100.0000	100.0		

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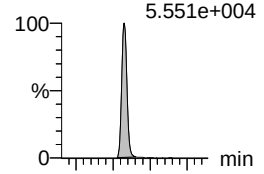
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-23.qld

Last Altered: Wednesday, November 28, 2018 09:46:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:47:32 Pacific Standard Time

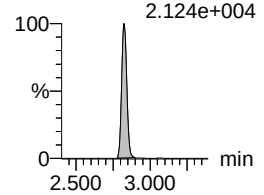
Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_23, Date: 26-Nov-2018, Time: 15:29:49, ID: B8K0144-BS1 OPR 0.125, Description: OPR

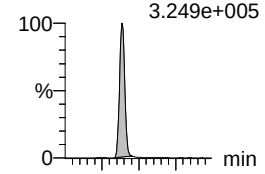
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
5.551e+004



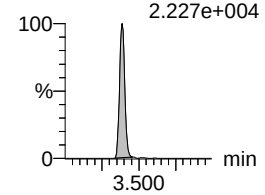
F7:MRM of 2 channels,ES-
299.0 > 99.0
2.124e+004



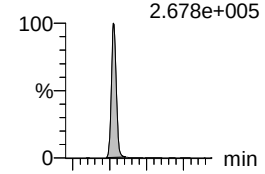
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
3.249e+005



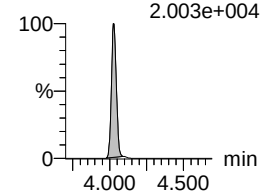
F9:MRM of 2 channels,ES-
313 > 118.9
2.227e+004



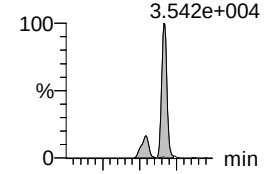
PFHpA
F16:MRM of 2 channels,ES-
363.0 > 318.9
2.678e+005



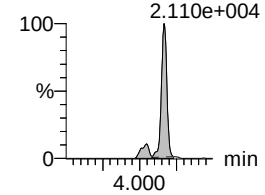
F16:MRM of 2 channels,ES-
363.0 > 169.0
2.003e+004



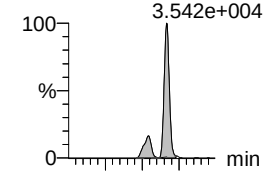
L-PFHxS
F18:MRM of 2 channels,ES-
398.9 > 79.6
3.542e+004



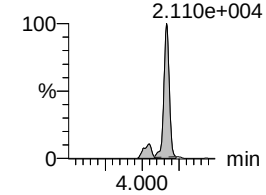
F18:MRM of 2 channels,ES-
398.9 > 99.0
2.110e+004



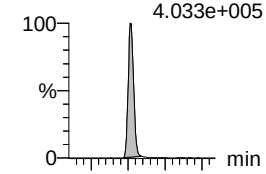
Total PFHxS
F18:MRM of 2 channels,ES-
398.9 > 79.6
3.542e+004



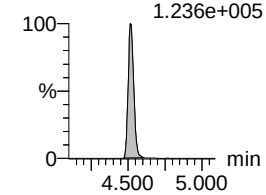
F18:MRM of 2 channels,ES-
398.9 > 99.0
2.110e+004



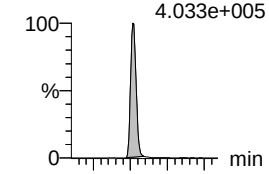
L-PFOA
F21:MRM of 2 channels,ES-
412.8 > 368.9
4.033e+005



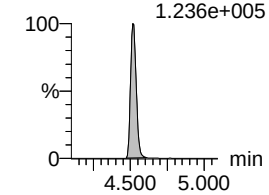
F21:MRM of 2 channels,ES-
412.8 > 169
1.236e+005



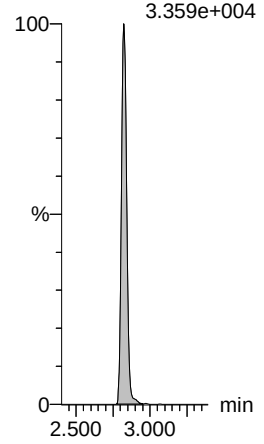
Total PFOA
F21:MRM of 2 channels,ES-
412.8 > 368.9
4.033e+005



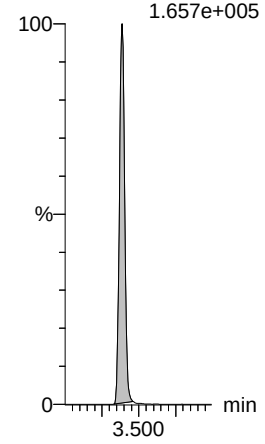
F21:MRM of 2 channels,ES-
412.8 > 169
1.236e+005



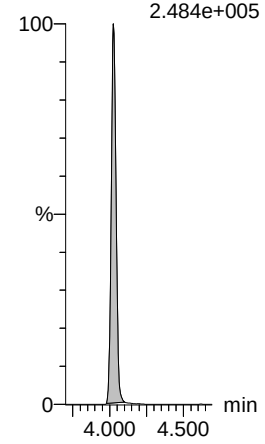
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.359e+004



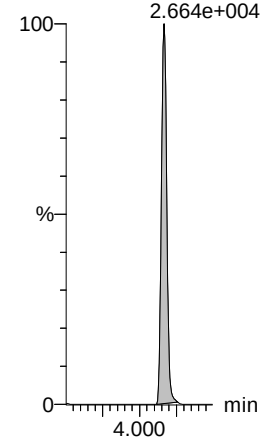
13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
1.657e+005



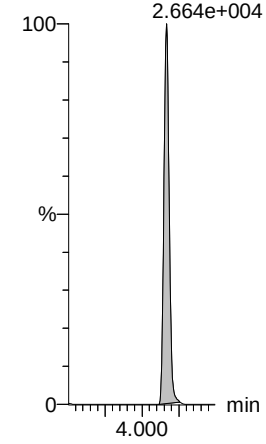
13C4-PFHpA
F17:MRM of 1 channel,ES-
367.2 > 321.8
2.484e+005



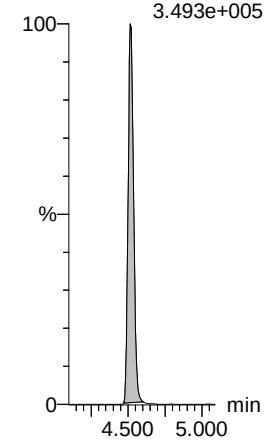
18O2-PFHxS
F20:MRM of 1 channel,ES-
403.0 > 102.6
2.664e+004



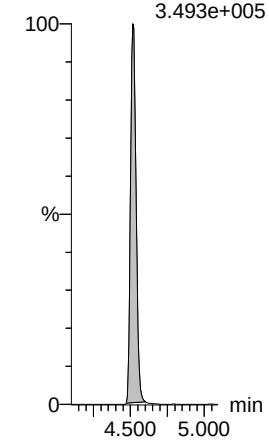
18O2-PFHxS
F20:MRM of 1 channel,ES-
403.0 > 102.6
2.664e+004



13C2-PFOA
F22:MRM of 1 channel,ES-
414.9 > 369.7
3.493e+005



13C2-PFOA
F22:MRM of 1 channel,ES-
414.9 > 369.7
3.493e+005



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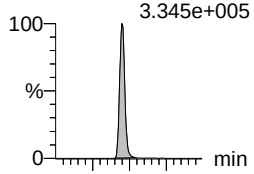
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-23.qld

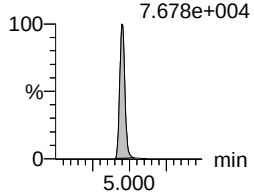
Last Altered: Wednesday, November 28, 2018 09:46:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:47:32 Pacific Standard Time

Name: 181126M1_23, Date: 26-Nov-2018, Time: 15:29:49, ID: B8K0144-BS1 OPR 0.125, Description: OPR

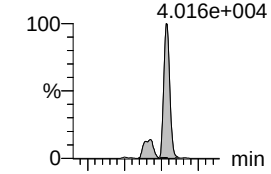
PFNA
F27:MRM of 2 channels,ES-
463.0 > 418.8
3.345e+005



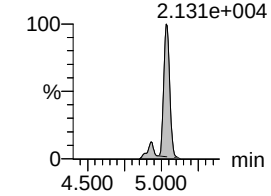
F27:MRM of 2 channels,ES-
463.0 > 219.0
7.678e+004



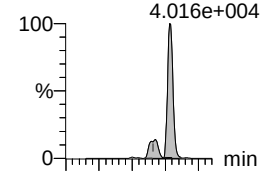
L-PFOS
F32:MRM of 2 channels,ES-
498.9 > 79.9
4.016e+004



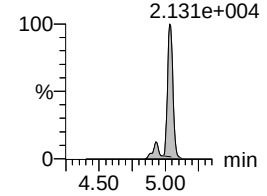
F32:MRM of 2 channels,ES-
498.9 > 99
2.131e+004



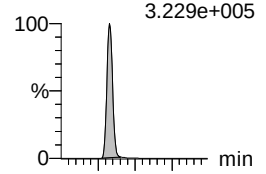
Total PFOS
F32:MRM of 2 channels,ES-
498.9 > 79.9
4.016e+004



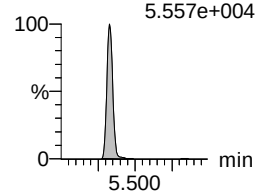
F32:MRM of 2 channels,ES-
498.9 > 99
2.131e+004



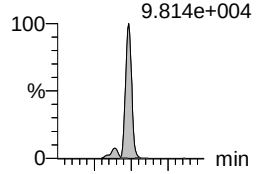
PFDA
F37:MRM of 2 channels,ES-
513 > 468.8
3.229e+005



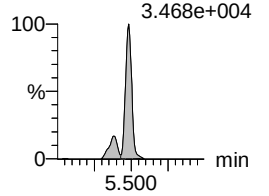
F37:MRM of 2 channels,ES-
513 > 219
5.557e+004



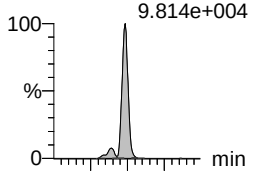
L-MeFOSAA
F48:MRM of 2 channels,ES-
570 > 419
9.814e+004



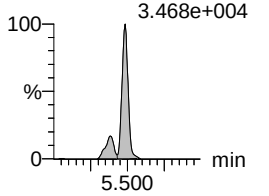
F48:MRM of 2 channels,ES-
570. > 512
3.468e+004



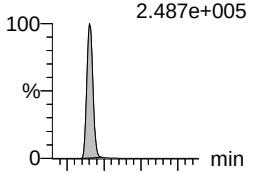
Total N-MeFOSAA
F48:MRM of 2 channels,ES-
570 > 419
9.814e+004



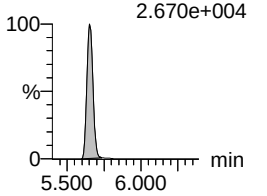
F48:MRM of 2 channels,ES-
570. > 512
3.468e+004



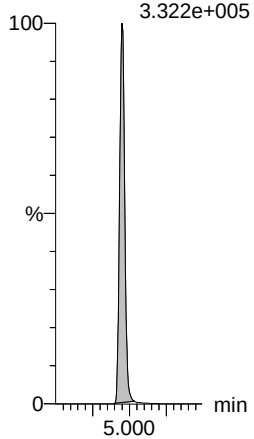
PFUdA
F46:MRM of 2 channels,ES-
563.0 > 518.9
2.487e+005



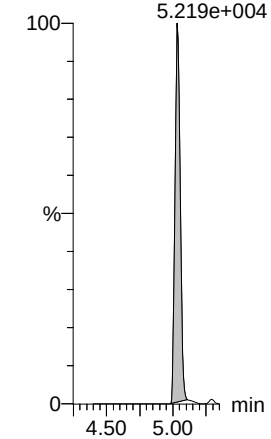
F46:MRM of 2 channels,ES-
563.0 > 269
2.670e+004



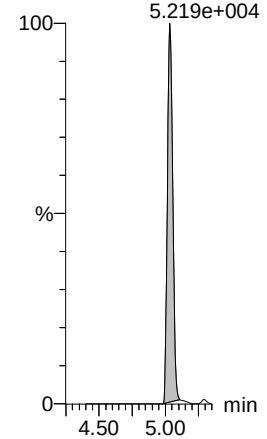
13C5-PFNA
F28:MRM of 1 channel,ES-
468.2 > 422.9
3.322e+005



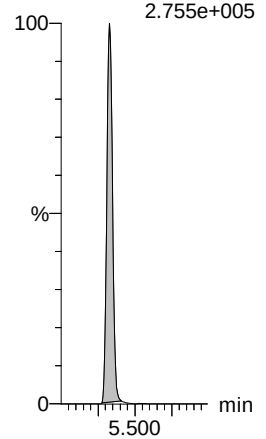
13C8-PFOS
F35:MRM of 1 channel,ES-
507.0 > 79.9
5.219e+004



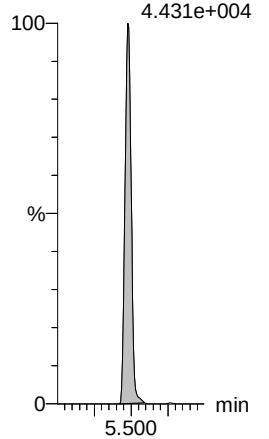
13C8-PFOS
F35:MRM of 1 channel,ES-
507.0 > 79.9
5.219e+004



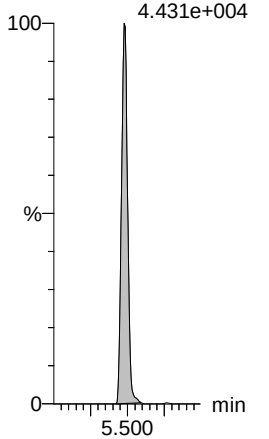
13C2-PFDA
F38:MRM of 1 channel,ES-
515.1 > 469.9
2.755e+005



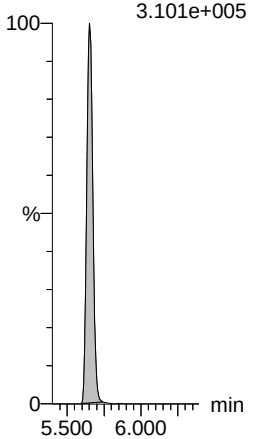
d3-N-MeFOSAA
F50:MRM of 1 channel,ES-
573.3 > 419
4.431e+004



d3-N-MeFOSAA
F50:MRM of 1 channel,ES-
573.3 > 419
4.431e+004



13C2-PFUdA
F47:MRM of 1 channel,ES-
565 > 519.8
3.101e+005



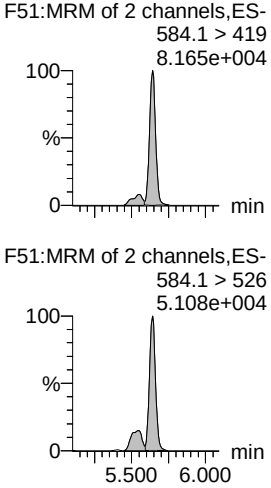
CGH 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-23.qld

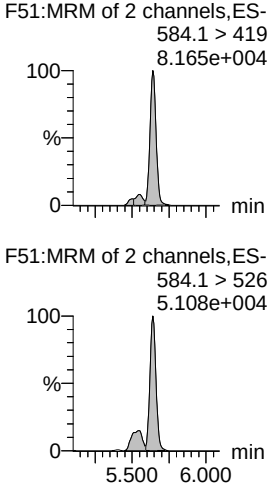
Last Altered: Wednesday, November 28, 2018 09:46:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:47:32 Pacific Standard Time

Name: 181126M1_23, Date: 26-Nov-2018, Time: 15:29:49, ID: B8K0144-BS1 OPR 0.125, Description: OPR

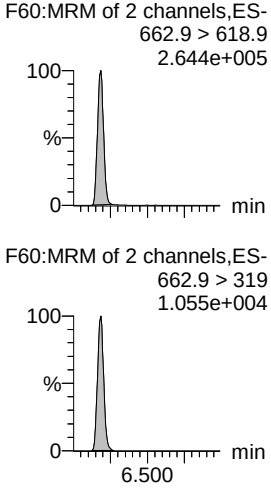
L-EtFOSAA



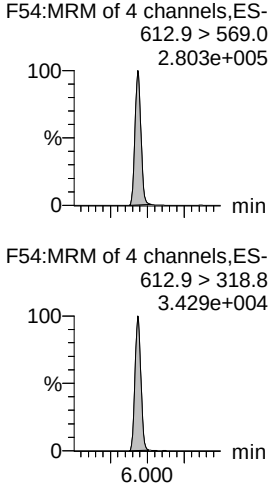
Total N-EtFOSAA



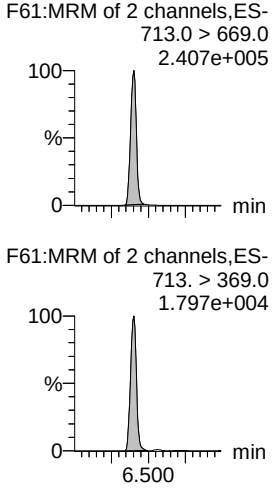
PFTrDA



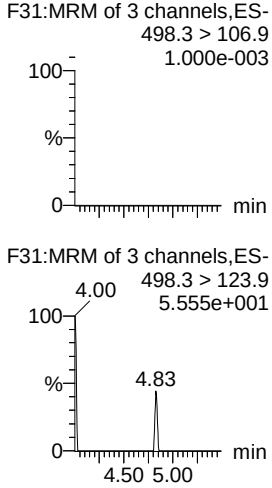
PFDoA



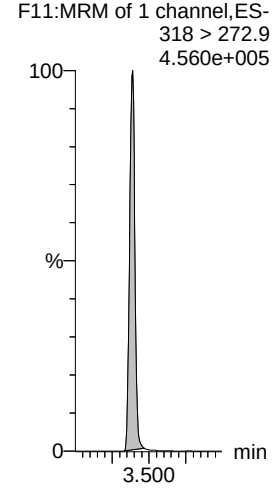
PFTeDA



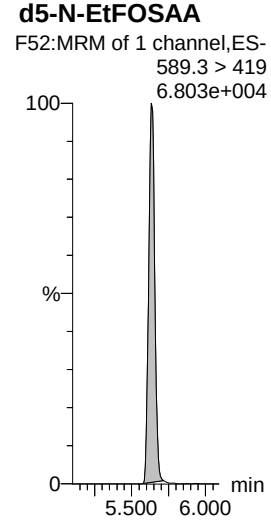
TCDA



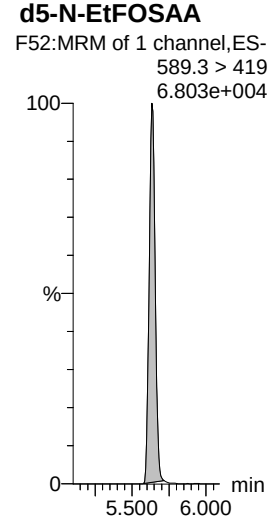
13C5-PFHxA



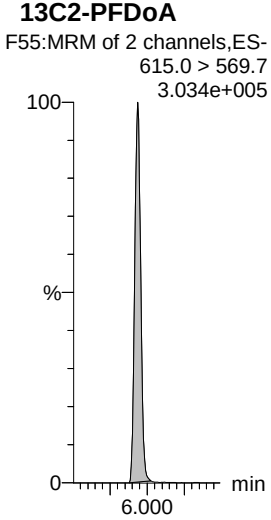
d5-N-EtFOSAA



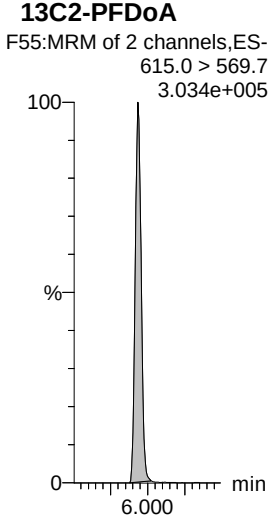
d5-N-EtFOSAA



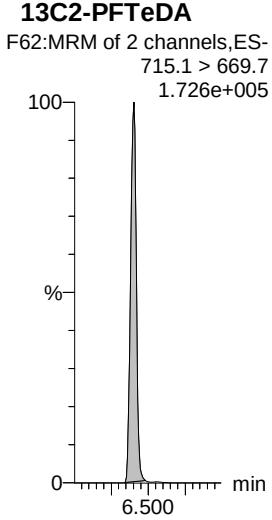
13C2-PFDoA



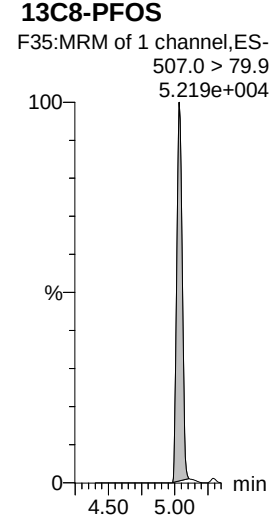
13C2-PFDoA



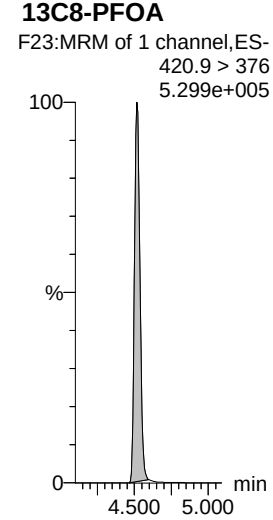
13C2-PFTeDA



13C8-PFOS



13C8-PFOA



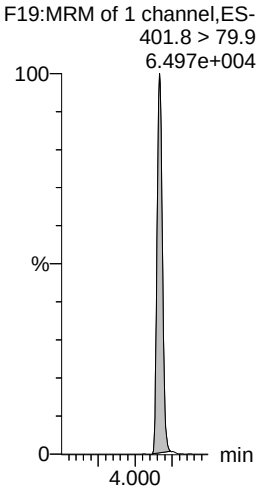
ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-23.qld

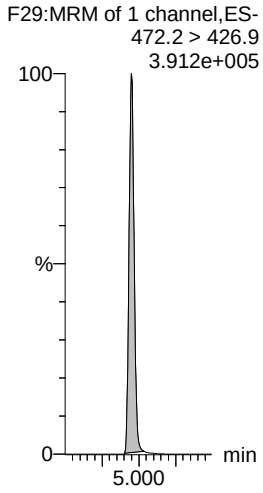
Last Altered: Wednesday, November 28, 2018 09:46:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:47:32 Pacific Standard Time

Name: 181126M1_23, Date: 26-Nov-2018, Time: 15:29:49, ID: B8K0144-BS1 OPR 0.125, Description: OPR

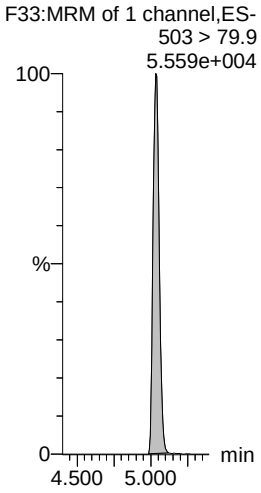
13C3-PFHxS



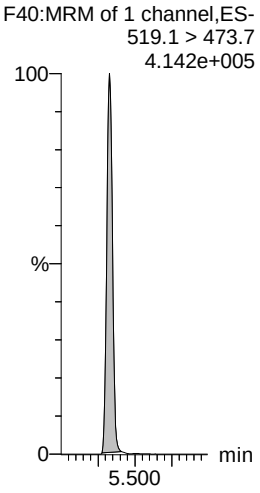
13C9-PFNA



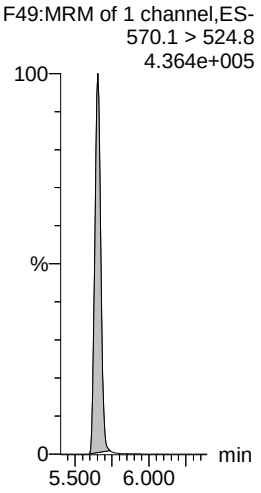
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-24.qld

Last Altered: Wednesday, November 28, 2018 09:53:29 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:54:15 Pacific Standard Time

Name: 181126M1_24, Date: 26-Nov-2018, Time: 15:41:20, ID: B8K0144-BSD1 LCSD 0.125, Description: LCSD

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	3	PFBS	299.0 > 79.7	2.10e3	1.22e3	0.125		2.83	2.83	21.5	83.3725	104.2	2.809	NO
2	5	PFHxA	313 > 269	1.25e4	6.03e3	0.125		3.39	3.39	10.3	87.3630	109.2	16.000	NO
3	7	PFHpA	363.0 > 318.9	9.41e3	8.41e3	0.125		4.03	4.03	14.0	84.9462	106.2	12.778	NO
4	8	L-PFHxS	398.9 > 79.6	1.70e3	1.01e3	0.125		4.17	4.17	21.0	86.5666	108.2	1.708	NO
5	68	Total PFHxS	398.9 > 79.6	1.70e3	1.01e3	0.125		4.28		21.0	86.5666			
6	11	L-PFOA	412.8 > 368.9	1.59e4	1.34e4	0.125		4.47	4.52	14.8	86.3345	107.9	3.251	NO
7	69	Total PFOA	412.8 > 368.9	1.59e4	1.34e4	0.125		4.62		14.8	86.3345			
8	38	13C3-PFBS	302. > 98.8	1.22e3	2.39e3	0.125	0.537	2.72	2.83	6.39	95.2003	95.2		
9	40	13C2-PFHxA	315 > 270	6.03e3	1.66e4	0.125	0.988	3.30	3.39	4.53	36.6506	91.6		
10	41	13C4-PFHpA	367.2 > 321.8	8.41e3	1.66e4	0.125	0.537	3.97	4.03	6.32	94.2587	94.3		
11	42	18O2-PFHxS	403.0 > 102.6	1.01e3	2.39e3	0.125	0.448	4.11	4.17	5.28	94.3541	94.4		
12	42	18O2-PFHxS	403.0 > 102.6	1.01e3	2.39e3	0.125	0.448	4.11	4.17	5.28	94.3541	94.4		
13	44	13C2-PFOA	414.9 > 369.7	1.34e4	1.88e4	0.125	0.755	4.46	4.52	8.93	94.6086	94.6		
14	44	13C2-PFOA	414.9 > 369.7	1.34e4	1.88e4	0.125	0.755	4.46	4.52	8.93	94.6086	94.6		
15	-1													
16	14	PFNA	463.0 > 418.8	1.14e4	1.08e4	0.125		4.90	4.95	13.2	84.2926	105.4	4.477	NO
17	16	L-PFOS	498.9 > 79.9	2.27e3	2.39e3	0.125		5.02	5.03	11.9	86.5825	108.2	2.003	NO
18	70	Total PFOS	498.9 > 79.9	2.27e3	2.39e3	0.125		5.13		11.9	86.5825			
19	18	PFDA	513 > 468.8	1.13e4	1.06e4	0.125		5.28	5.32	13.3	81.1641	101.5	5.517	NO
20	21	L-MeFOSAA	570 > 419	5.52e3	2.08e3	0.125		5.43	5.48	33.2	91.5068	114.4	2.759	NO
21	71	Total N-MeFOSAA	570. > 419	5.52e3	2.08e3	0.125		5.57		33.2	91.5068			
22	25	PFUdA	563.0 > 518.9	1.11e4	1.38e4	0.125		5.61	5.65	10.0	82.3869	103.0	9.725	NO
23	45	13C5-PFNA	468.2 > 422.9	1.08e4	1.33e4	0.125	0.991	4.90	4.95	10.2	82.3064	82.3		
24	47	13C8-PFOS	507.0 > 79.9	2.39e3	2.43e3	0.125	1.042	4.98	5.03	12.3	94.3971	94.4		
25	47	13C8-PFOS	507.0 > 79.9	2.39e3	2.43e3	0.125	1.042	4.98	5.03	12.3	94.3971	94.4		
26	48	13C2-PFDA	515.1 > 469.9	1.06e4	1.50e4	0.125	0.902	5.28	5.32	8.85	78.4499	78.4		
27	50	d3-N-MeFOSAA	573.3 > 419	2.08e3	1.84e4	0.125	0.135	5.43	5.47	1.41	83.7654	83.8		
28	50	d3-N-MeFOSAA	573.3 > 419	2.08e3	1.84e4	0.125	0.135	5.43	5.47	1.41	83.7654	83.8		
29	51	13C2-PFUdA	565 > 519.8	1.38e4	1.84e4	0.125	0.957	5.61	5.65	9.37	78.3375	78.3		
30	-1													
31	23	L-EtFOSAA	584.1 > 419	4.57e3	3.05e3	0.125		5.51	5.63	18.7	92.3146	115.4	1.545	NO
32	72	Total N-EtFOSAA	584.1 > 419	4.57e3	3.05e3	0.125		5.72		18.7	92.3146			
33	29	PFTrDA	662.9 > 618.9	1.45e4	1.45e4	0.125		6.15	6.18	12.6	86.4964	108.1	25.192	NO
34	27	PFDoA	612.9 > 569.0	1.33e4	1.45e4	0.125		5.90	5.93	11.5	78.9850	98.7	7.703	NO
35	30	PFTeDA	713.0 > 669.0	1.24e4	8.95e3	0.125		6.37	6.40	17.4	84.9875	106.2	12.484	NO
36	73	TCDA	498.3>106.9			0.125		5.15						

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Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-24.qld

Last Altered: Wednesday, November 28, 2018 09:53:29 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:54:15 Pacific Standard Time

Name: 181126M1_24, Date: 26-Nov-2018, Time: 15:41:20, ID: B8K0144-BSD1 LCSD 0.125, Description: LCSD

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	61	13C5-PFHxA	318 > 272.9	1.66e4	1.66e4	0.125	1.000	3.30	3.39	12.5	100.0000	100.0		
38	52	d5-N-EtFOSAA	589.3 > 419	3.05e3	1.84e4	0.125	0.185	5.59	5.63	2.07	89.5246	89.5		
39	52	d5-N-EtFOSAA	589.3 > 419	3.05e3	1.84e4	0.125	0.185	5.59	5.63	2.07	89.5246	89.5		
40	53	13C2-PFDoA	615.0 > 569.7	1.45e4	1.50e4	0.125	1.047	5.90	5.93	12.1	92.4820	92.5		
41	53	13C2-PFDoA	615.0 > 569.7	1.45e4	1.50e4	0.125	1.047	5.90	5.93	12.1	92.4820	92.5		
42	55	13C2-PFTeDA	715.1 > 669.7	8.95e3	1.84e4	0.125	0.567	6.37	6.40	6.08	85.7489	85.7		
43	47	13C8-PFOS	507.0 > 79.9	2.39e3	2.43e3	0.125	1.042	4.98	5.03	12.3	94.3971	94.4		
44	63	13C8-PFOA	420.9 > 376	1.88e4	1.88e4	0.125	1.000	4.46	4.52	12.5	100.0000	100.0		
45	-1													
46	62	13C3-PFHxS	401.8 > 79.9	2.39e3	2.39e3	0.125	1.000	4.11	4.17	12.5	100.0000	100.0		
47	64	13C9-PFNA	472.2 > 426.9	1.33e4	1.33e4	0.125	1.000	4.90	4.95	12.5	100.0000	100.0		
48	65	13C4-PFOS	503 > 79.9	2.43e3	2.43e3	0.125	1.000	4.98	5.03	12.5	100.0000	100.0		
49	66	13C6-PFDA	519.1 > 473.7	1.50e4	1.50e4	0.125	1.000	5.28	5.32	12.5	100.0000	100.0		
50	67	13C7-PFUdA	570.1 > 524.8	1.84e4	1.84e4	0.125	1.000	5.61	5.65	12.5	100.0000	100.0		

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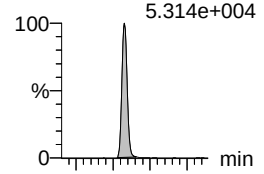
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-24.qld

Last Altered: Wednesday, November 28, 2018 09:53:29 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:54:15 Pacific Standard Time

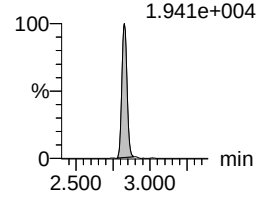
Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_24, Date: 26-Nov-2018, Time: 15:41:20, ID: B8K0144-BSD1 LCSD 0.125, Description: LCSD

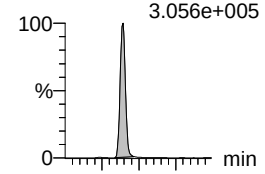
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
5.314e+004



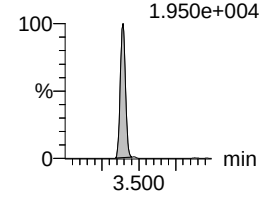
F7:MRM of 2 channels,ES-
299.0 > 99.0
1.941e+004



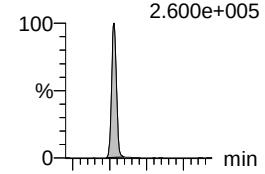
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
3.056e+005



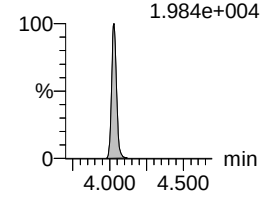
F9:MRM of 2 channels,ES-
313 > 118.9
1.950e+004



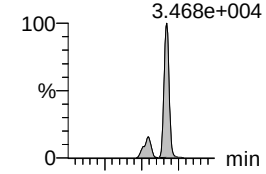
PFHpA
F16:MRM of 2 channels,ES-
363.0 > 318.9
2.600e+005



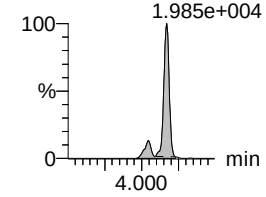
F16:MRM of 2 channels,ES-
363.0 > 169.0
1.984e+004



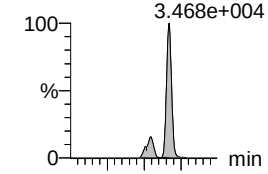
L-PFHxS
F18:MRM of 2 channels,ES-
398.9 > 79.6
3.468e+004



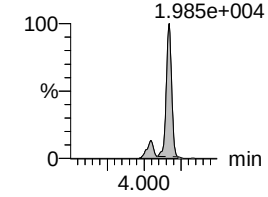
F18:MRM of 2 channels,ES-
398.9 > 99.0
1.985e+004



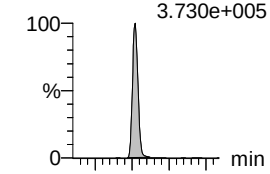
Total PFHxS
F18:MRM of 2 channels,ES-
398.9 > 79.6
3.468e+004



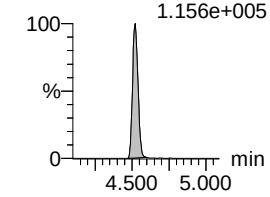
F18:MRM of 2 channels,ES-
398.9 > 99.0
1.985e+004



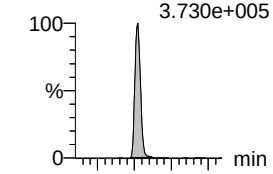
L-PFOA
F21:MRM of 2 channels,ES-
412.8 > 368.9
3.730e+005



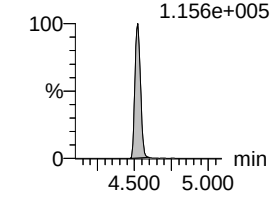
F21:MRM of 2 channels,ES-
412.8 > 169
1.156e+005



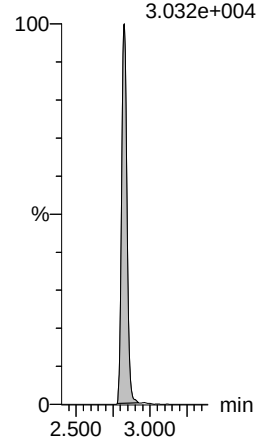
Total PFOA
F21:MRM of 2 channels,ES-
412.8 > 368.9
3.730e+005



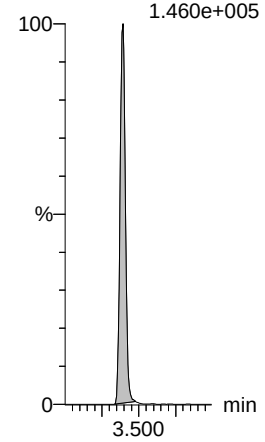
F21:MRM of 2 channels,ES-
412.8 > 169
1.156e+005



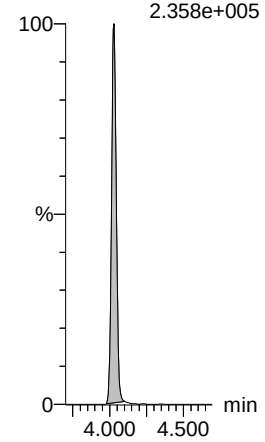
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.032e+004



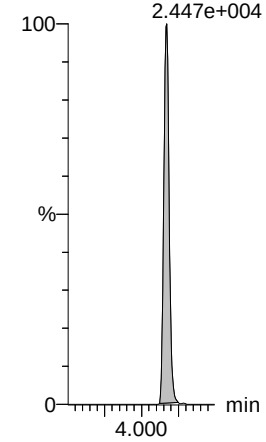
13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
1.460e+005



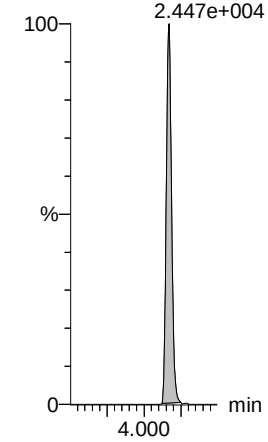
13C4-PFHpA
F17:MRM of 1 channel,ES-
367.2 > 321.8
2.358e+005



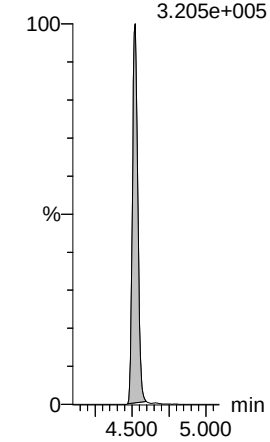
18O2-PFHxS
F20:MRM of 1 channel,ES-
403.0 > 102.6
2.447e+004



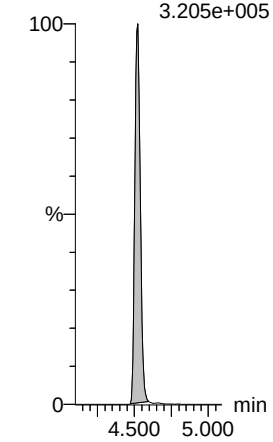
18O2-PFHxS
F20:MRM of 1 channel,ES-
403.0 > 102.6
2.447e+004



13C2-PFOA
F22:MRM of 1 channel,ES-
414.9 > 369.7
3.205e+005



13C2-PFOA
F22:MRM of 1 channel,ES-
414.9 > 369.7
3.205e+005



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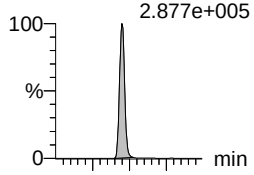
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-24.qld

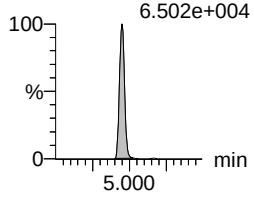
Last Altered: Wednesday, November 28, 2018 09:53:29 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:54:15 Pacific Standard Time

Name: 181126M1_24, Date: 26-Nov-2018, Time: 15:41:20, ID: B8K0144-BSD1 LCSD 0.125, Description: LCSD

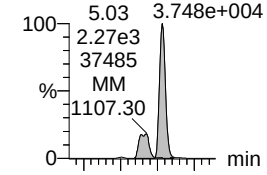
PFNA
F27:MRM of 2 channels,ES-
463.0 > 418.8
2.877e+005



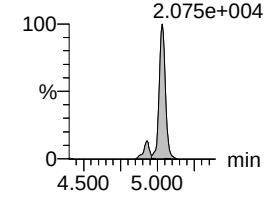
F27:MRM of 2 channels,ES-
463.0 > 219.0
6.502e+004



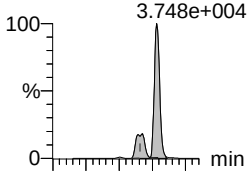
L-PFOS
F32:MRM of 2 channels,ES-
L-PFOS 498.9 > 79.9
5.03 3.748e+004
2.27e3
37485
MM
1107.30



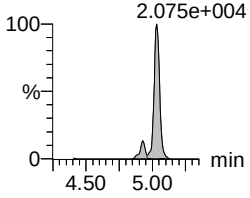
F32:MRM of 2 channels,ES-
498.9 > 99
2.075e+004



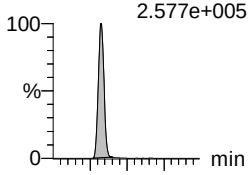
Total PFOS
F32:MRM of 2 channels,ES-
498.9 > 79.9
3.748e+004



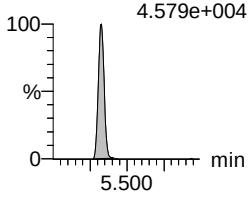
F32:MRM of 2 channels,ES-
498.9 > 99
2.075e+004



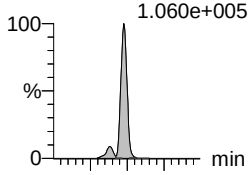
PFDA
F37:MRM of 2 channels,ES-
513 > 468.8
2.577e+005



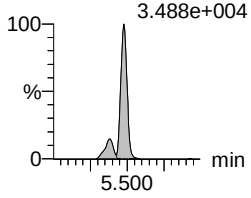
F37:MRM of 2 channels,ES-
513 > 219
4.579e+004



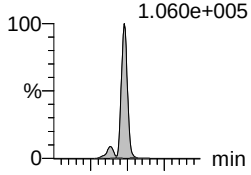
L-MeFOSAA
F48:MRM of 2 channels,ES-
570 > 419
1.060e+005



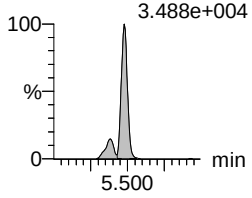
F48:MRM of 2 channels,ES-
570. > 512
3.488e+004



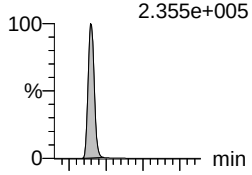
Total N-MeFOSAA
F48:MRM of 2 channels,ES-
570 > 419
1.060e+005



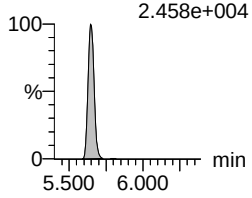
F48:MRM of 2 channels,ES-
570. > 512
3.488e+004



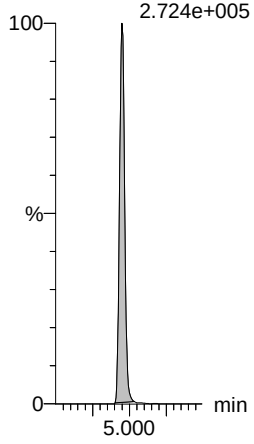
PFUdA
F46:MRM of 2 channels,ES-
563.0 > 518.9
2.355e+005



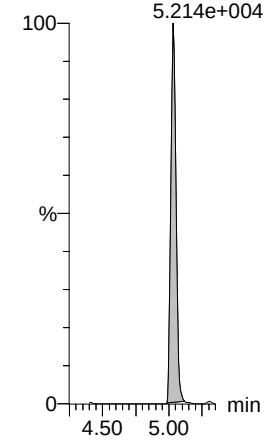
F46:MRM of 2 channels,ES-
563.0 > 269
2.458e+004



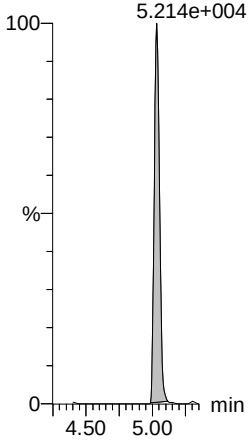
13C5-PFNA
F28:MRM of 1 channel,ES-
468.2 > 422.9
2.724e+005



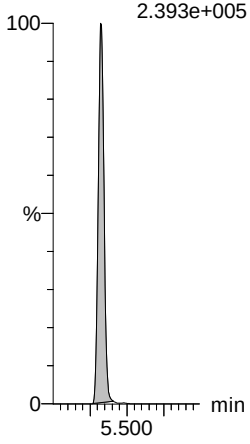
13C8-PFOS
F35:MRM of 1 channel,ES-
507.0 > 79.9
5.214e+004



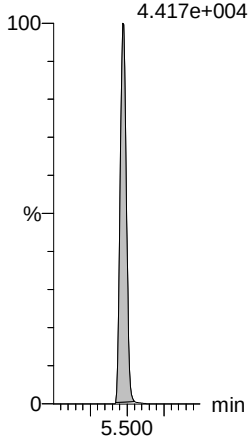
13C8-PFOS
F35:MRM of 1 channel,ES-
507.0 > 79.9
5.214e+004



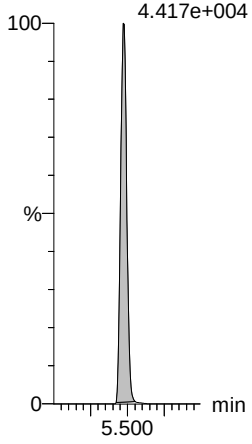
13C2-PFDA
F38:MRM of 1 channel,ES-
515.1 > 469.9
2.393e+005



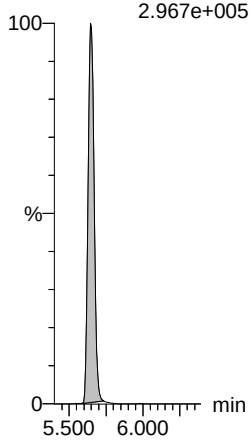
d3-N-MeFOSAA
F50:MRM of 1 channel,ES-
573.3 > 419
4.417e+004



d3-N-MeFOSAA
F50:MRM of 1 channel,ES-
573.3 > 419
4.417e+004



13C2-PFUdA
F47:MRM of 1 channel,ES-
565 > 519.8
2.967e+005



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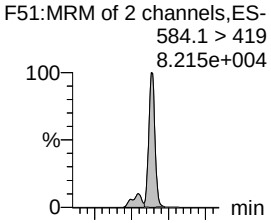
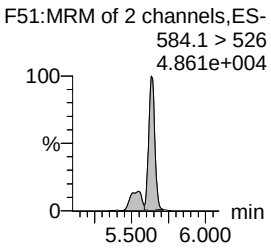
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-24.qld

Last Altered: Wednesday, November 28, 2018 09:53:29 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:54:15 Pacific Standard Time

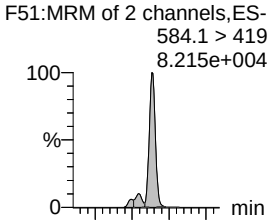
Name: 181126M1_24, Date: 26-Nov-2018, Time: 15:41:20, ID: B8K0144-BSD1 LCSD 0.125, Description: LCSD

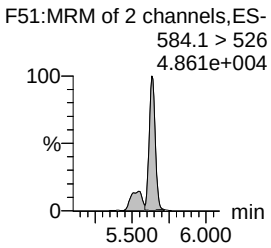
L-EtFOSAA



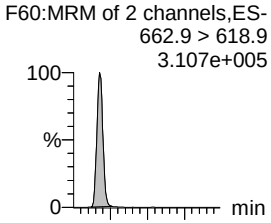


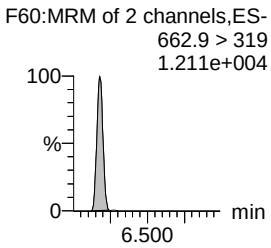
Total N-EtFOSAA



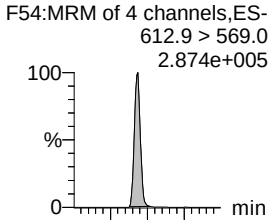


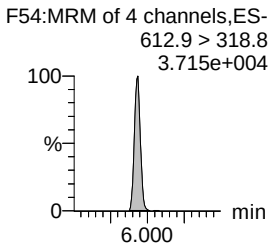
PFTrDA



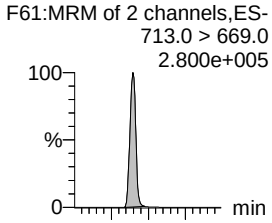


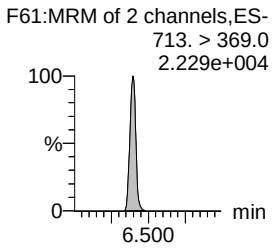
PFDoA



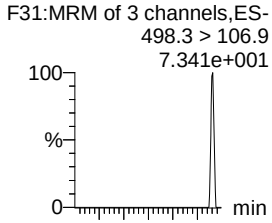


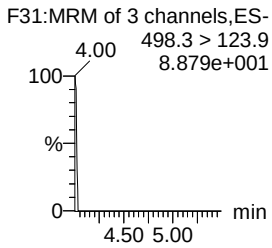
PFTeDA



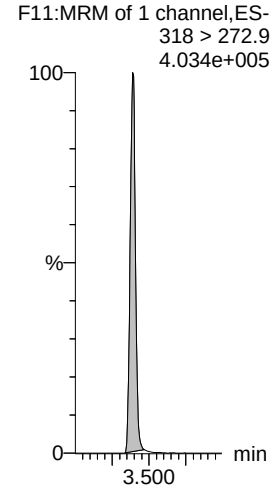


TCDA

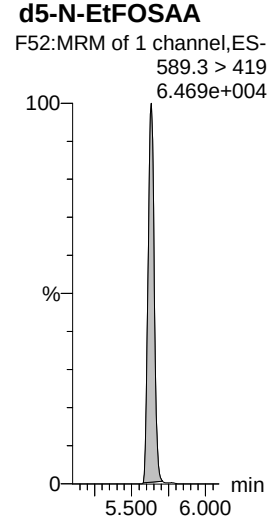




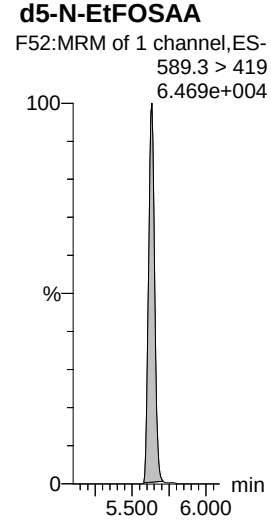
13C5-PFHxA



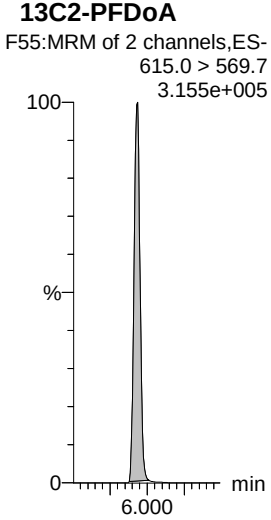
d5-N-EtFOSAA



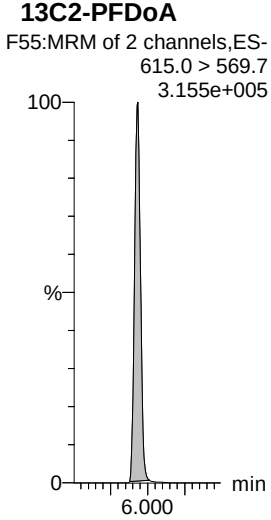
d5-N-EtFOSAA



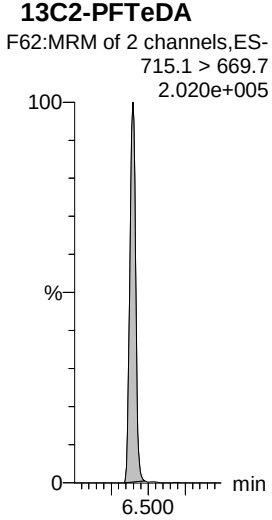
13C2-PFDoA



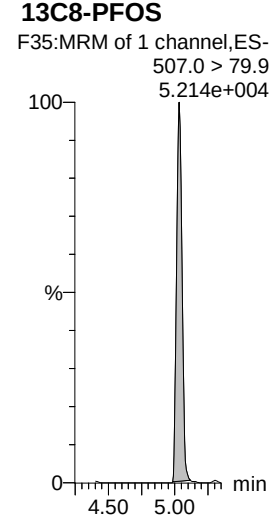
13C2-PFDoA



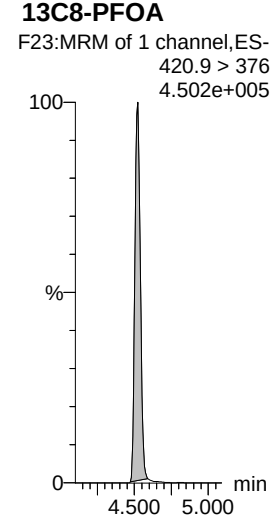
13C2-PFTeDA



13C8-PFOS



13C8-PFOA



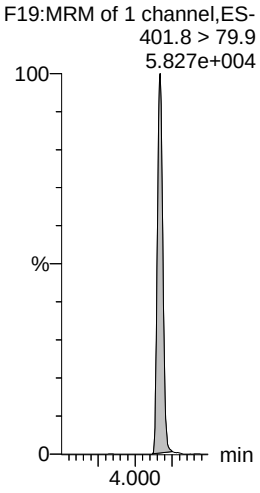
CGH 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-24.qld

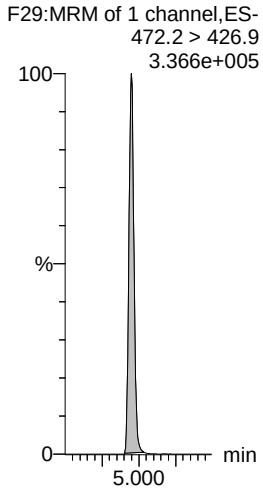
Last Altered: Wednesday, November 28, 2018 09:53:29 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:54:15 Pacific Standard Time

Name: 181126M1_24, Date: 26-Nov-2018, Time: 15:41:20, ID: B8K0144-BSD1 LCSD 0.125, Description: LCSD

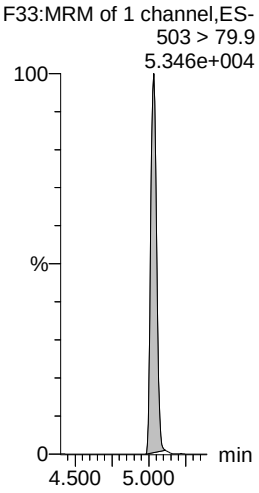
13C3-PFHxS



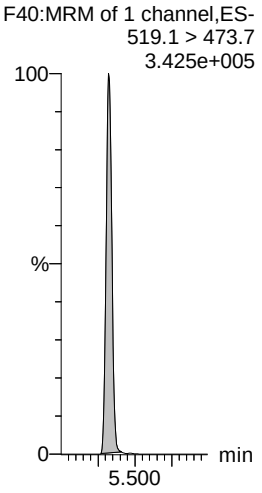
13C9-PFNA



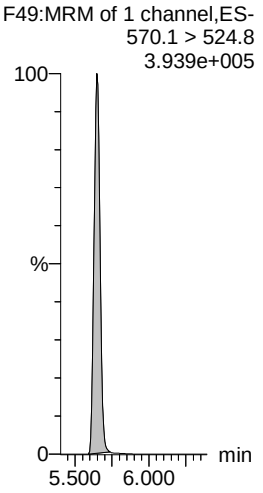
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-26.qld

Last Altered: Wednesday, November 28, 2018 10:03:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:03:51 Pacific Standard Time

Name: 181126M1_26, Date: 26-Nov-2018, Time: 16:02:31, ID: 1803659-01 A1-MW-07-SA2 0.11704, Description: A1-MW-07-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	3	PFBS	299.0 > 79.7	2.68e3	1.22e3	0.117		2.82	2.82	27.4	113.6809		2.714	NO
2	5	PFHxA	313 > 269	3.64e4	4.52e3	0.117		3.38	3.38	40.3	366.3834		14.421	NO
3	7	PFHpA	363.0 > 318.9	3.36e3	6.04e3	0.117		4.03	4.03	6.95	44.7683		15.357	NO
4	8	L-PFHxS	398.9 > 79.6	4.48e3	1.05e3	0.117		4.17	4.17	53.3	234.0039		1.811	NO
5	68	Total PFHxS	398.9 > 79.6	4.48e3	1.05e3	0.117		4.28		53.3	234.0039			
6	11	L-PFOA	412.8 > 368.9	5.93e3	9.37e3	0.117		4.47	4.52	7.91	48.8243		2.942	NO
7	69	Total PFOA	412.8 > 368.9	5.93e3	9.37e3	0.117		4.62		7.91	48.8243			
8	38	13C3-PFBS	302. > 98.8	1.22e3	2.40e3	0.117	0.537	2.72	2.82	6.36	101.1453	94.7		
9	40	13C2-PFHxA	315 > 270	4.52e3	1.29e4	0.117	0.988	3.30	3.38	4.39	37.9470	88.8		
10	41	13C4-PFHpA	367.2 > 321.8	6.04e3	1.29e4	0.117	0.537	3.97	4.03	5.87	93.3995	87.5		
11	42	18O2-PFHxS	403.0 > 102.6	1.05e3	2.40e3	0.117	0.448	4.11	4.17	5.46	104.1496	97.5		
12	42	18O2-PFHxS	403.0 > 102.6	1.05e3	2.40e3	0.117	0.448	4.11	4.17	5.46	104.1496	97.5		
13	44	13C2-PFOA	414.9 > 369.7	9.37e3	1.46e4	0.117	0.755	4.46	4.52	8.01	90.6377	84.9		
14	44	13C2-PFOA	414.9 > 369.7	9.37e3	1.46e4	0.117	0.755	4.46	4.52	8.01	90.6377	84.9		
15	-1													
16	14	PFNA	463.0 > 418.8	8.37e1	7.51e3	0.117		4.90	4.95	0.139	0.6544		7.049	YES
17	16	L-PFOS	498.9 > 79.9	9.00e2	2.16e3	0.117		5.02	5.04	5.20	40.2541		1.975	NO
18	70	Total PFOS	498.9 > 79.9	9.00e2	2.16e3	0.117		5.13		5.20	40.2541			
19	18	PFDA	513 > 468.8		6.91e3	0.117		5.28						
20	21	L-MeFOSAA	570 > 419		1.72e3	0.117		5.43						
21	71	Total N-MeFOSAA	570. > 419	0.00e0	1.72e3	0.117		5.57		0.000				
22	25	PFUdA	563.0 > 518.9		9.83e3	0.117		5.61						
23	45	13C5-PFNA	468.2 > 422.9	7.51e3	9.17e3	0.117	0.991	4.90	4.95	10.2	88.2286	82.6		
24	47	13C8-PFOS	507.0 > 79.9	2.16e3	2.29e3	0.117	1.042	4.98	5.03	11.8	96.8917	90.7		
25	47	13C8-PFOS	507.0 > 79.9	2.16e3	2.29e3	0.117	1.042	4.98	5.03	11.8	96.8917	90.7		
26	48	13C2-PFDA	515.1 > 469.9	6.91e3	9.90e3	0.117	0.902	5.28	5.33	8.73	82.6287	77.4		
27	50	d3-N-MeFOSAA	573.3 > 419	1.72e3	1.27e4	0.117	0.135	5.43	5.48	1.69	107.2014	100.4		
28	50	d3-N-MeFOSAA	573.3 > 419	1.72e3	1.27e4	0.117	0.135	5.43	5.48	1.69	107.2014	100.4		
29	51	13C2-PFUdA	565 > 519.8	9.83e3	1.27e4	0.117	0.957	5.61	5.65	9.66	86.2037	80.7		
30	-1													
31	23	L-EtFOSAA	584.1 > 419		2.52e3	0.117		5.51						
32	72	Total N-EtFOSAA	584.1 > 419	0.00e0	2.52e3	0.117		5.72		0.000				
33	29	PFTrDA	662.9 > 618.9		9.36e3	0.117		6.15						
34	27	PFDoA	612.9 > 569.0		9.36e3	0.117		5.90						
35	30	PFTeDA	713.0 > 669.0		4.17e3	0.117		6.37						
36	73	TCDA	498.3>106.9			0.117		5.15						

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Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-26.qld

Last Altered: Wednesday, November 28, 2018 10:03:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:03:51 Pacific Standard Time

Name: 181126M1_26, Date: 26-Nov-2018, Time: 16:02:31, ID: 1803659-01 A1-MW-07-SA2 0.11704, Description: A1-MW-07-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	61	13C5-PFHxA	318 > 272.9	1.29e4	1.29e4	0.117	1.000	3.30	3.38	12.5	106.8011	100.0		
38	52	d5-N-EtFOSAA	589.3 > 419	2.52e3	1.27e4	0.117	0.185	5.59	5.63	2.47	114.1340	106.9		
39	52	d5-N-EtFOSAA	589.3 > 419	2.52e3	1.27e4	0.117	0.185	5.59	5.63	2.47	114.1340	106.9		
40	53	13C2-PFDoA	615.0 > 569.7	9.36e3	9.90e3	0.117	1.047	5.90	5.93	11.8	96.4671	90.3		
41	53	13C2-PFDoA	615.0 > 569.7	9.36e3	9.90e3	0.117	1.047	5.90	5.93	11.8	96.4671	90.3		
42	55	13C2-PFTeDA	715.1 > 669.7	4.17e3	1.27e4	0.117	0.567	6.37	6.40	4.10	61.7965	57.9		
43	47	13C8-PFOS	507.0 > 79.9	2.16e3	2.29e3	0.117	1.042	4.98	5.03	11.8	96.8917	90.7		
44	63	13C8-PFOA	420.9 > 376	1.46e4	1.46e4	0.117	1.000	4.46	4.52	12.5	106.8011	100.0		
45	-1													
46	62	13C3-PFHxS	401.8 > 79.9	2.40e3	2.40e3	0.117	1.000	4.11	4.17	12.5	106.8011	100.0		
47	64	13C9-PFNA	472.2 > 426.9	9.17e3	9.17e3	0.117	1.000	4.90	4.95	12.5	106.8011	100.0		
48	65	13C4-PFOS	503 > 79.9	2.29e3	2.29e3	0.117	1.000	4.98	5.04	12.5	106.8011	100.0		
49	66	13C6-PFDA	519.1 > 473.7	9.90e3	9.90e3	0.117	1.000	5.28	5.33	12.5	106.8011	100.0		
50	67	13C7-PFUdA	570.1 > 524.8	1.27e4	1.27e4	0.117	1.000	5.61	5.65	12.5	106.8011	100.0		

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ANP 11/28/2018

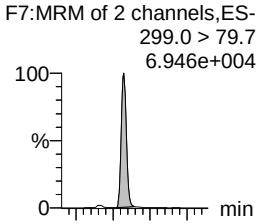
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-26.qld

Last Altered: Wednesday, November 28, 2018 10:03:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:03:51 Pacific Standard Time

Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_26, Date: 26-Nov-2018, Time: 16:02:31, ID: 1803659-01 A1-MW-07-SA2 0.11704, Description: A1-MW-07-SA2

PFBS



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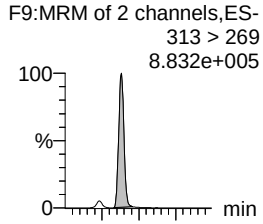

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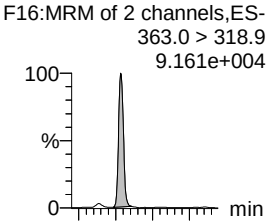

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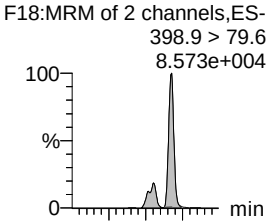

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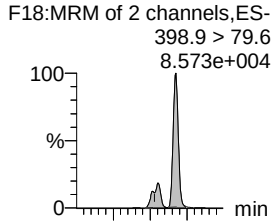
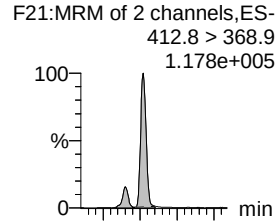


L-PFOA



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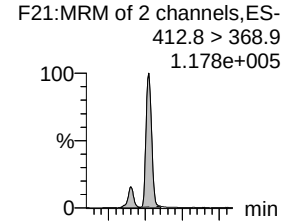
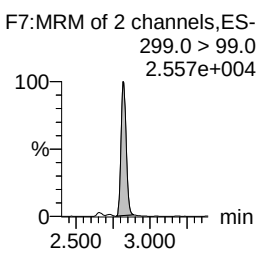
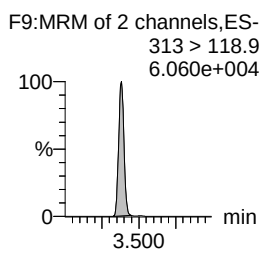
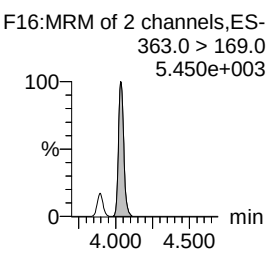
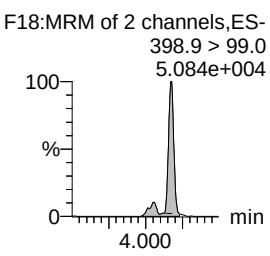
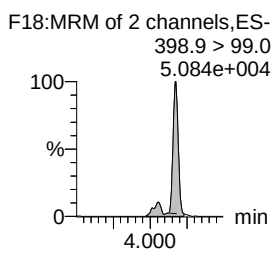


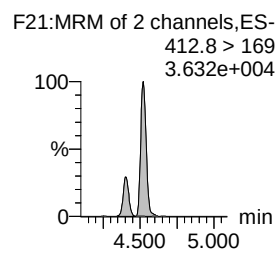


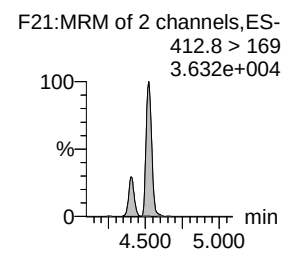




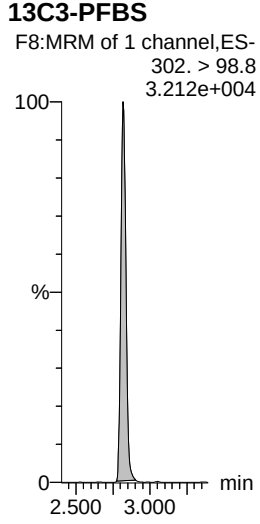








13C3-PFBS



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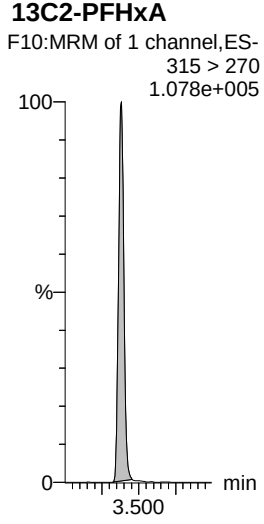

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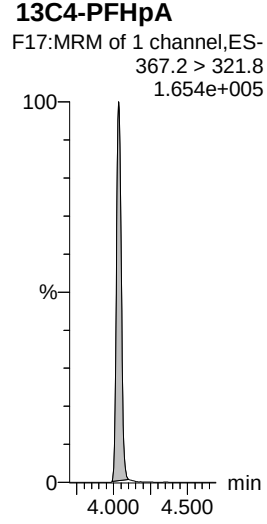
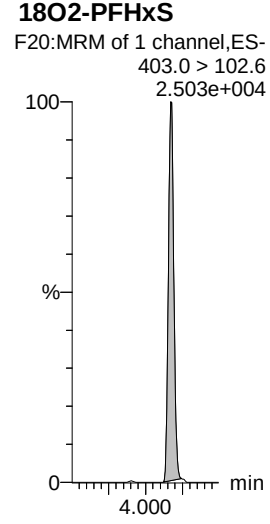


18O2-PFHxS



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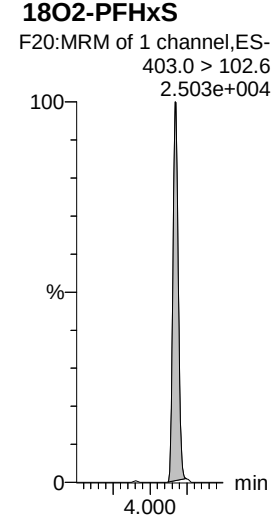

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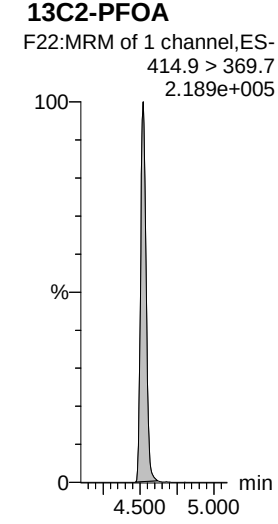

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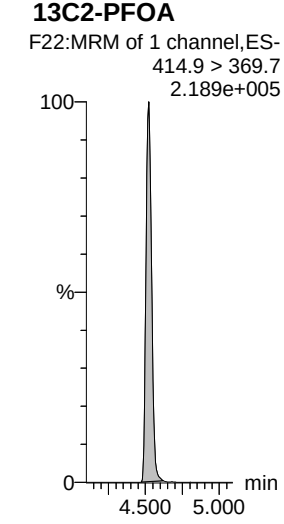


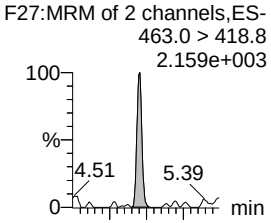
CGH 11/28/2018

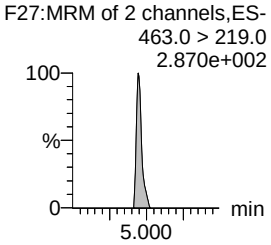
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-26.qld

Last Altered: Wednesday, November 28, 2018 10:03:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:03:51 Pacific Standard Time

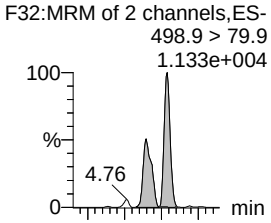
Name: 181126M1_26, Date: 26-Nov-2018, Time: 16:02:31, ID: 1803659-01 A1-MW-07-SA2 0.11704, Description: A1-MW-07-SA2

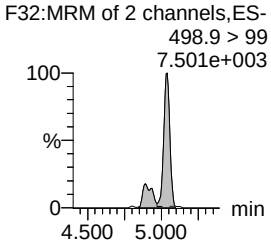
PFNA



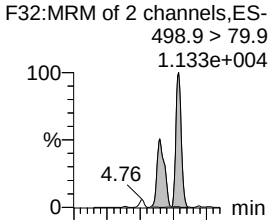


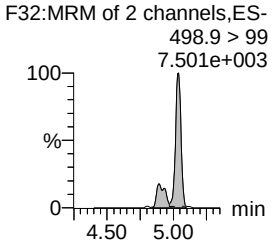
L-PFOS



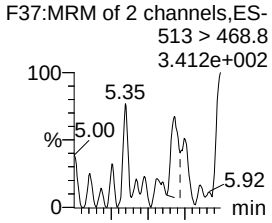


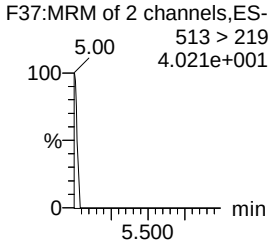
Total PFOS



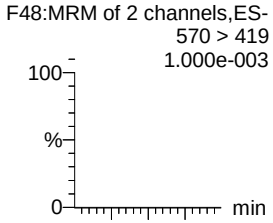


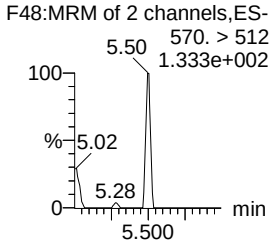
PFDA



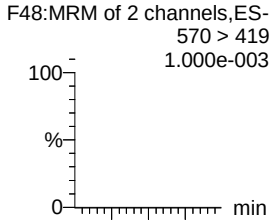


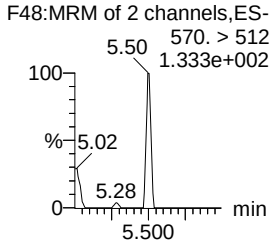
L-MeFOSAA



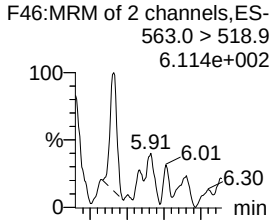


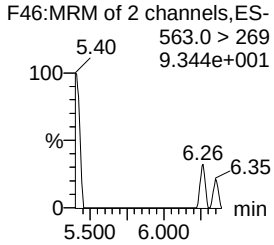
Total N-MeFOSAA



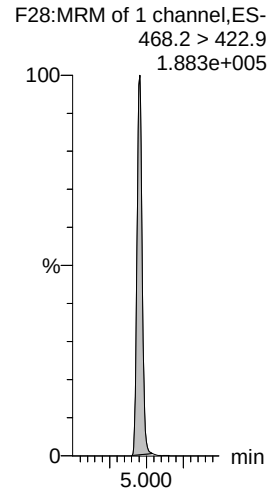


PFUdA

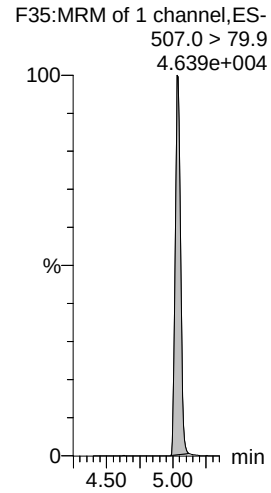




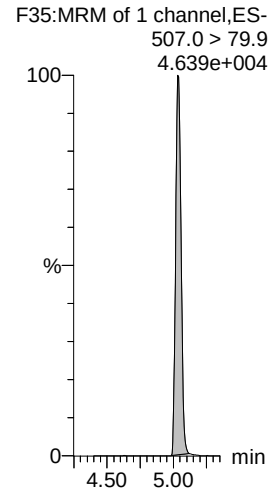
13C5-PFNA



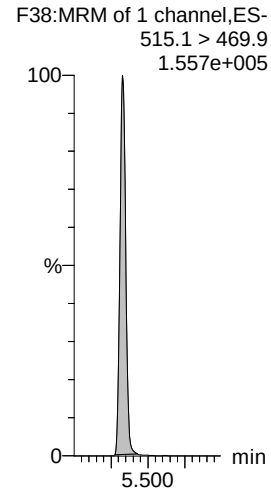
13C8-PFOS



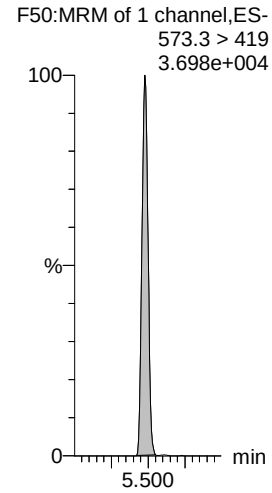
13C8-PFOS



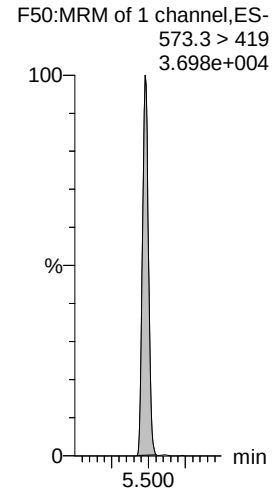
13C2-PFDA



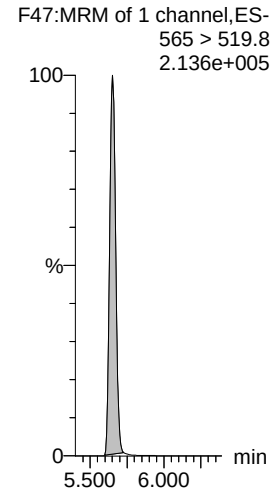
d3-N-MeFOSAA



d3-N-MeFOSAA



13C2-PFUdA



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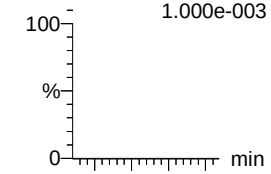
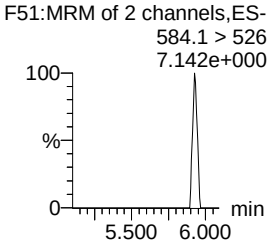
Printed: Wednesday, November 28, 2018 10:03:51 Pacific Standard Time

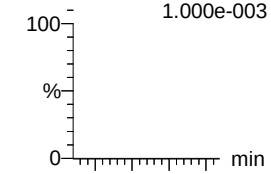
Name: 181126M1_26, Date: 26-Nov-2018, Time: 16:02:31, ID: 1803659-01 A1-MW-07-SA2 0.11704, Description: A1-MW-07-SA2

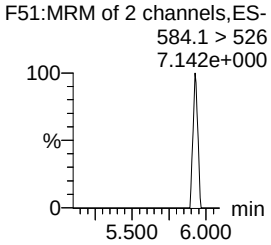
L-EtFOSAA



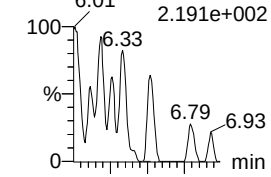


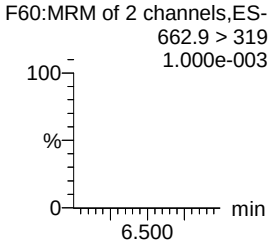
Total N-EtFOSAA



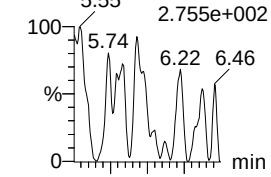


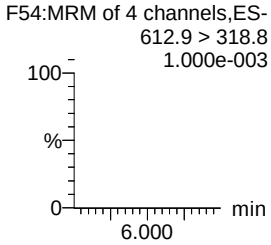
PFTrDA



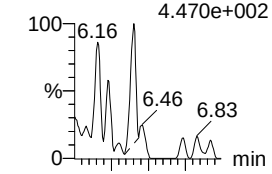


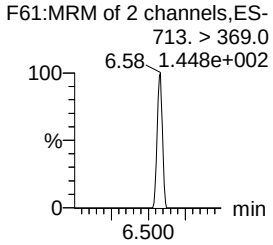
PFDoA



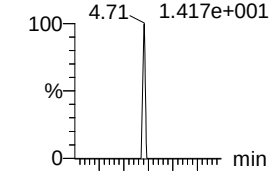


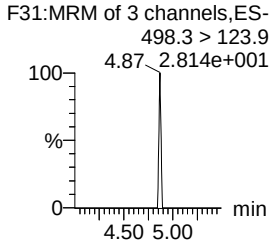
PFTeDA





TCDA





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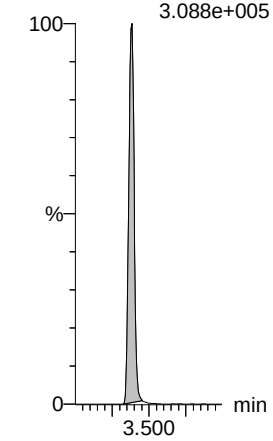
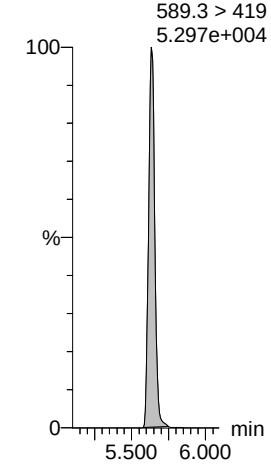


d5-N-EtFOSAA



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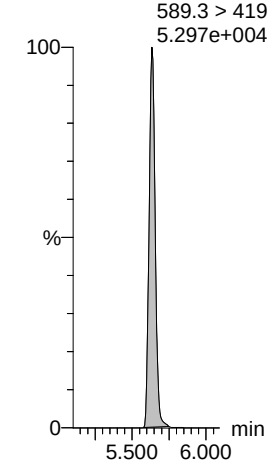
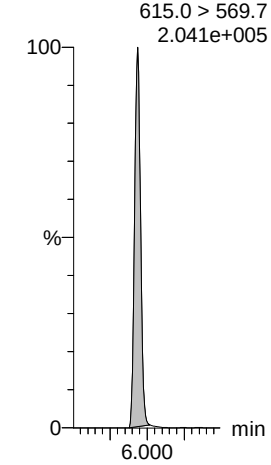
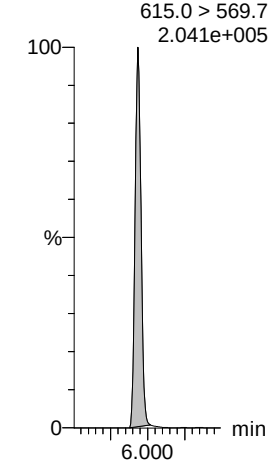


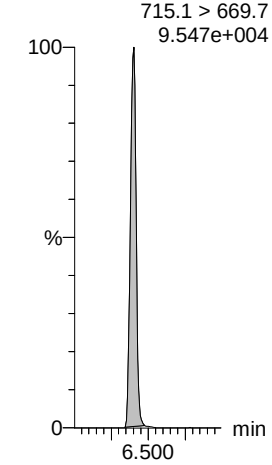
13C2-PFDoA



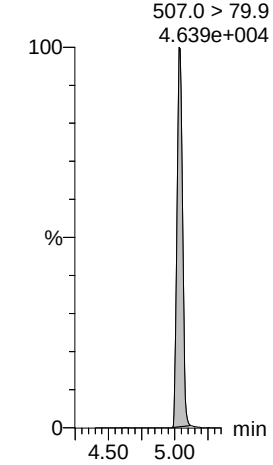
13C2-PFDoA



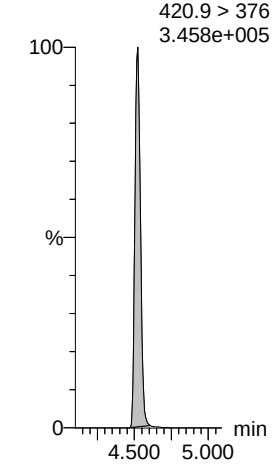
13C2-PFTeDA



13C8-PFOS



13C8-PFOA



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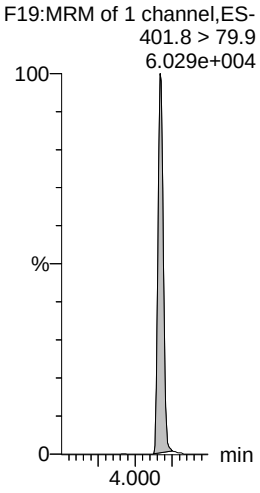
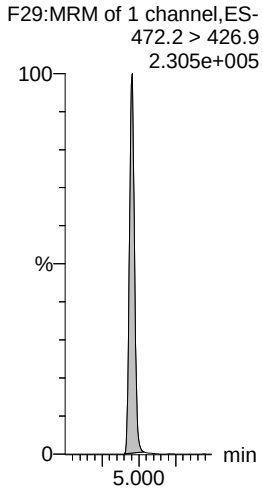
Last Altered: Wednesday, November 28, 2018 10:03:01 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:03:51 Pacific Standard Time

Name: 181126M1_26, Date: 26-Nov-2018, Time: 16:02:31, ID: 1803659-01 A1-MW-07-SA2 0.11704, Description: A1-MW-07-SA2

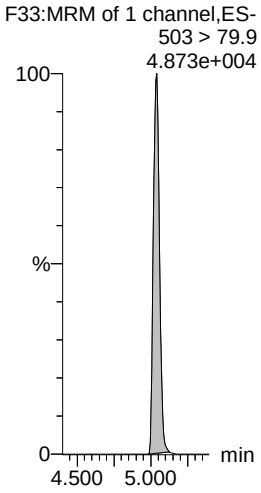
13C3-PFHxS



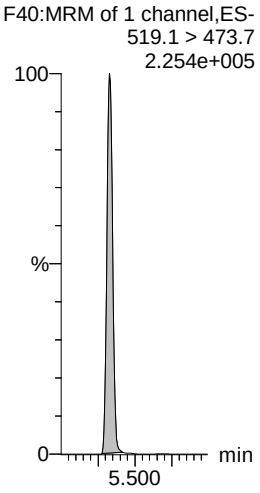
13C9-PFNA



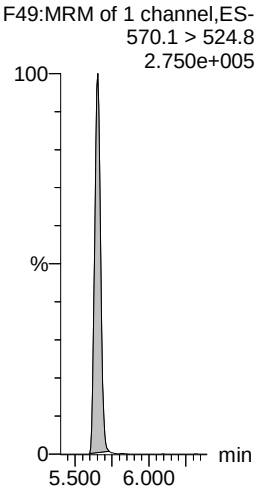
13C4-PFOS



13C6-PFDA



13C7-PFUdA



Vista Analytical Laboratory L14

ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181127M1\181127M1-6.qld

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Printed: Wednesday, November 28, 2018 09:40:05 Pacific Standard Time

Name: 181127M1_6, Date: 27-Nov-2018, Time: 13:04:43, ID: 1803659-02 A1-MW-23-SA2 0.1178, Description: A1-MW-23-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	3	PFBS	299.0 > 79.7	1.80e1	1.13e3	0.118		2.76	2.76	0.198	0.6970		3.302	NO
2	5	PFHxA	313 > 269		5.07e3	0.118		3.33						
3	7	PFHpA	363.0 > 318.9		6.44e3	0.118		4.00						
4	8	L-PFHxS	398.9 > 79.6	1.09e2	9.99e2	0.118		4.14	4.14	1.36	5.9396		1.831	NO
5	68	Total PFHxS	398.9 > 79.6	1.09e2	9.99e2	0.118		4.28		1.36	5.9396			
6	11	L-PFOA	412.8 > 368.9	4.52e1	1.06e4	0.118		4.47	4.49	0.0534			15.639	YES
7	69	Total PFOA	412.8 > 368.9	4.52e1	1.06e4	0.118		4.62		0.000				
8	38	13C3-PFBS	302. > 98.8	1.13e3	2.38e3	0.118	0.537	2.72	2.77	5.93	93.7623	88.4		
9	40	13C2-PFHxA	315 > 270	5.07e3	1.41e4	0.118	0.988	3.30	3.33	4.49	38.5368	90.8		
10	41	13C4-PFHpA	367.2 > 321.8	6.44e3	1.41e4	0.118	0.537	3.97	4.00	5.70	90.1800	85.0		
11	42	18O2-PFHxS	403.0 > 102.6	9.99e2	2.38e3	0.118	0.448	4.11	4.14	5.24	99.2132	93.5		
12	42	18O2-PFHxS	403.0 > 102.6	9.99e2	2.38e3	0.118	0.448	4.11	4.14	5.24	99.2132	93.5		
13	44	13C2-PFOA	414.9 > 369.7	1.06e4	1.70e4	0.118	0.755	4.46	4.49	7.76	87.3033	82.3		
14	44	13C2-PFOA	414.9 > 369.7	1.06e4	1.70e4	0.118	0.755	4.46	4.49	7.76	87.3033	82.3		
15	-1													
16	14	PFNA	463.0 > 418.8	2.67e1	8.95e3	0.118		4.90	4.92	0.0373			52.231	YES
17	16	L-PFOS	498.9 > 79.9		2.33e3	0.118		5.02						
18	70	Total PFOS	498.9 > 79.9	0.00e0	2.33e3	0.118		5.13		0.000				
19	18	PFDA	513 > 468.8		7.80e3	0.118		5.28						
20	21	L-MeFOSAA	570 > 419		1.98e3	0.118		5.43						
21	71	Total N-MeFOSAA	570. > 419	0.00e0	1.98e3	0.118		5.57		0.000				
22	25	PFUdA	563.0 > 518.9	3.93e1	1.14e4	0.118		5.61	5.63	0.0429			10.529	NO
23	45	13C5-PFNA	468.2 > 422.9	8.95e3	1.10e4	0.118	0.991	4.90	4.92	10.2	86.9789	82.0		
24	47	13C8-PFOS	507.0 > 79.9	2.33e3	2.29e3	0.118	1.042	4.98	5.01	12.7	103.5679	97.6		
25	47	13C8-PFOS	507.0 > 79.9	2.33e3	2.29e3	0.118	1.042	4.98	5.01	12.7	103.5679	97.6		
26	48	13C2-PFDA	515.1 > 469.9	7.80e3	1.18e4	0.118	0.902	5.28	5.30	8.28	77.8635	73.4		
27	50	d3-N-MeFOSAA	573.3 > 419	1.98e3	1.51e4	0.118	0.135	5.43	5.45	1.64	103.2504	97.3		
28	50	d3-N-MeFOSAA	573.3 > 419	1.98e3	1.51e4	0.118	0.135	5.43	5.45	1.64	103.2504	97.3		
29	51	13C2-PFUdA	565 > 519.8	1.14e4	1.51e4	0.118	0.957	5.61	5.63	9.45	83.7646	78.9		
30	-1													
31	23	L-EtFOSAA	584.1 > 419		2.80e3	0.118		5.51						
32	72	Total N-EtFOSAA	584.1 > 419	0.00e0	2.80e3	0.118		5.72		0.000				
33	29	PFTrDA	662.9 > 618.9		1.17e4	0.118		6.15						
34	27	PFDoA	612.9 > 569.0		1.17e4	0.118		5.90						
35	30	PFTeDA	713.0 > 669.0		7.22e3	0.118		6.37						
36	73	TCDA	498.3>106.9			0.118		5.15						

CGH 11/28/2018

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Dataset: Z:\Projects\PFAS.PRO\Results\181127M1\181127M1-6.qld

Last Altered: Wednesday, November 28, 2018 09:38:59 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:40:05 Pacific Standard Time

Name: 181127M1_6, Date: 27-Nov-2018, Time: 13:04:43, ID: 1803659-02 A1-MW-23-SA2 0.1178, Description: A1-MW-23-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	61	13C5-PFHxA	318 > 272.9	1.41e4	1.41e4	0.118	1.000	3.30	3.33	12.5	106.1121	100.0		
38	52	d5-N-EtFOSAA	589.3 > 419	2.80e3	1.51e4	0.118	0.185	5.59	5.61	2.31	105.9686	99.9		
39	52	d5-N-EtFOSAA	589.3 > 419	2.80e3	1.51e4	0.118	0.185	5.59	5.61	2.31	105.9686	99.9		
40	53	13C2-PFDoA	615.0 > 569.7	1.17e4	1.18e4	0.118	1.047	5.90	5.91	12.4	100.2860	94.5		
41	53	13C2-PFDoA	615.0 > 569.7	1.17e4	1.18e4	0.118	1.047	5.90	5.91	12.4	100.2860	94.5		
42	55	13C2-PFTeDA	715.1 > 669.7	7.22e3	1.51e4	0.118	0.567	6.37	6.38	5.96	89.1860	84.0		
43	47	13C8-PFOS	507.0 > 79.9	2.33e3	2.29e3	0.118	1.042	4.98	5.01	12.7	103.5679	97.6		
44	63	13C8-PFOA	420.9 > 376	1.70e4	1.70e4	0.118	1.000	4.46	4.49	12.5	106.1121	100.0		
45	-1													
46	62	13C3-PFHxS	401.8 > 79.9	2.38e3	2.38e3	0.118	1.000	4.11	4.14	12.5	106.1121	100.0		
47	64	13C9-PFNA	472.2 > 426.9	1.10e4	1.10e4	0.118	1.000	4.90	4.92	12.5	106.1121	100.0		
48	65	13C4-PFOS	503 > 79.9	2.29e3	2.29e3	0.118	1.000	4.98	5.01	12.5	106.1121	100.0		
49	66	13C6-PFDA	519.1 > 473.7	1.18e4	1.18e4	0.118	1.000	5.28	5.30	12.5	106.1121	100.0		
50	67	13C7-PFUdA	570.1 > 524.8	1.51e4	1.51e4	0.118	1.000	5.61	5.63	12.5	106.1121	100.0		

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Vista Analytical Laboratory L14

ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181127M1\181127M1-6.qld

Last Altered: Wednesday, November 28, 2018 09:38:59 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:40:05 Pacific Standard Time

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Name: 181127M1_6, Date: 27-Nov-2018, Time: 13:04:43, ID: 1803659-02 A1-MW-23-SA2 0.1178, Description: A1-MW-23-SA2

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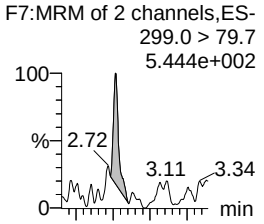

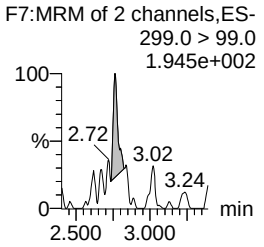

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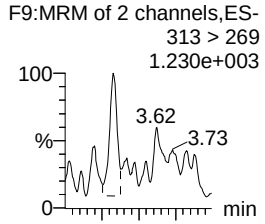

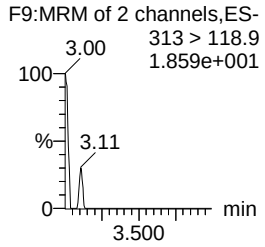

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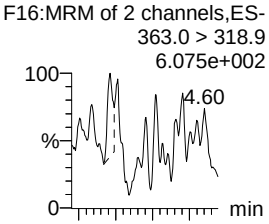

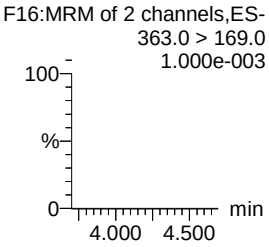

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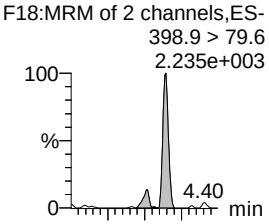

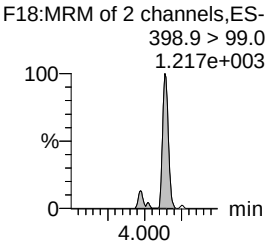

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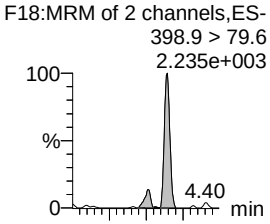

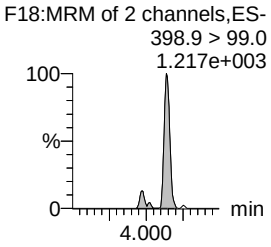

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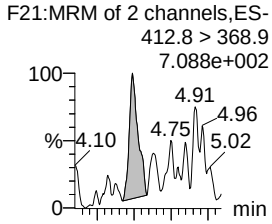

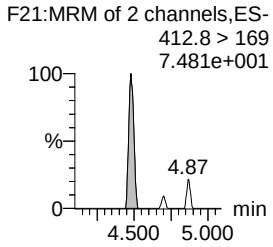

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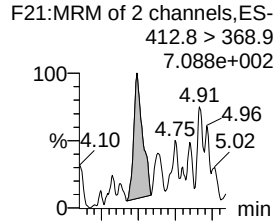

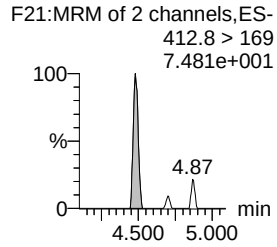

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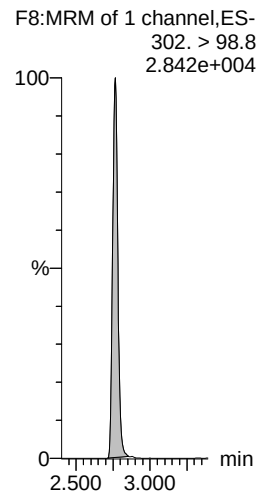

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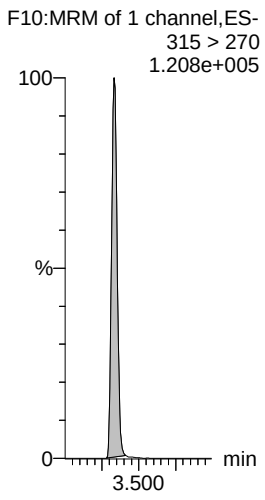

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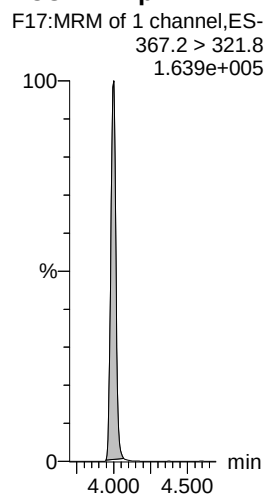

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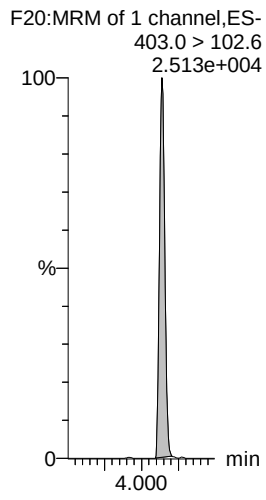

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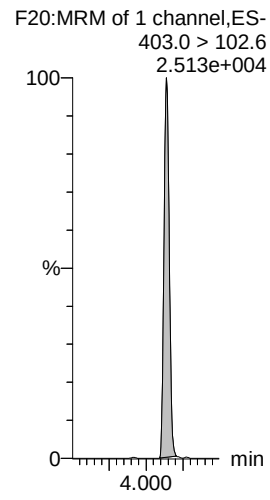

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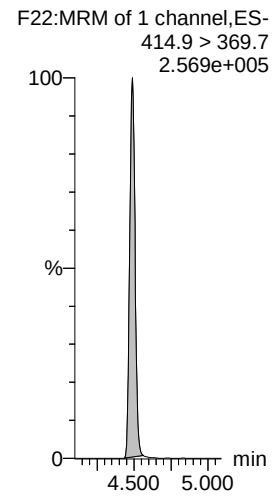

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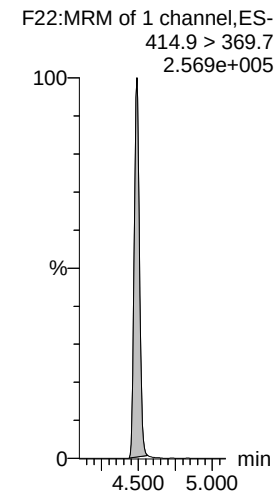

CGH 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181127M1\181127M1-6.qld

Last Altered: Wednesday, November 28, 2018 09:38:59 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:40:05 Pacific Standard Time

Name: 181127M1_6, Date: 27-Nov-2018, Time: 13:04:43, ID: 1803659-02 A1-MW-23-SA2 0.1178, Description: A1-MW-23-SA2

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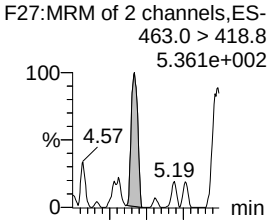

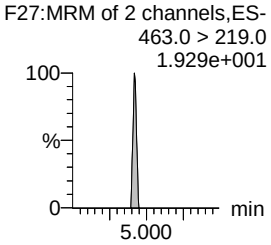

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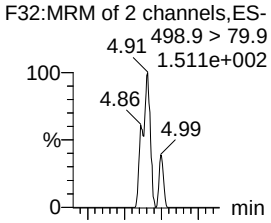

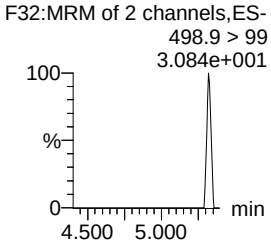

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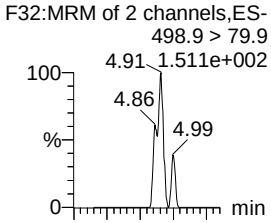

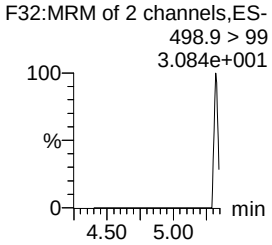

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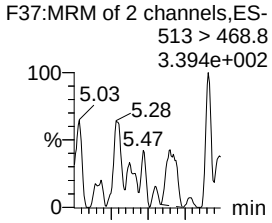

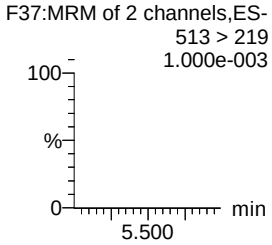

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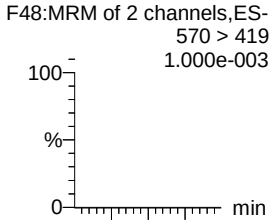

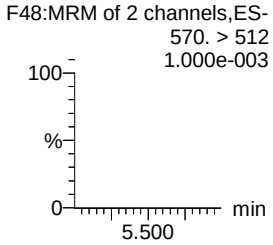

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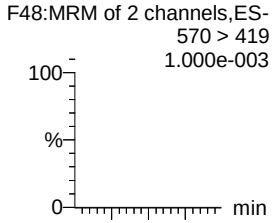

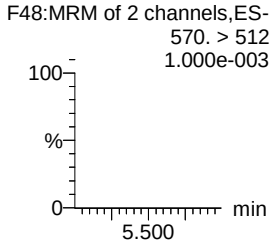

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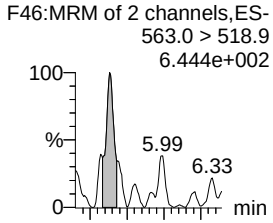

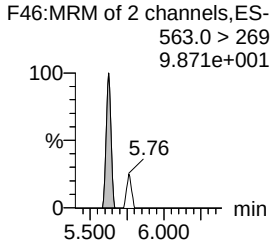

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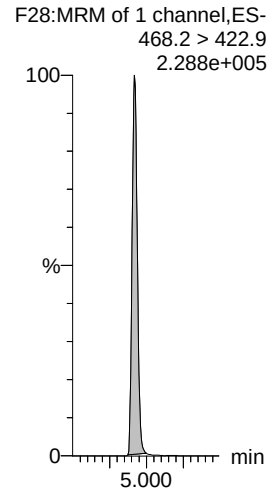

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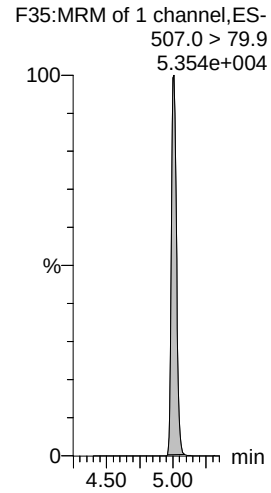

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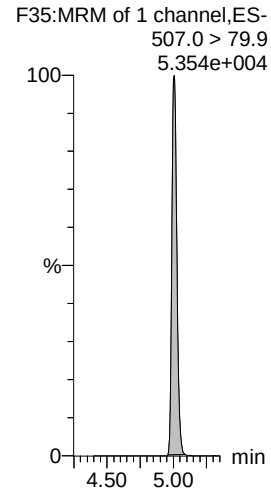

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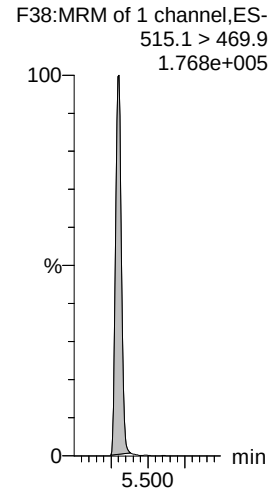

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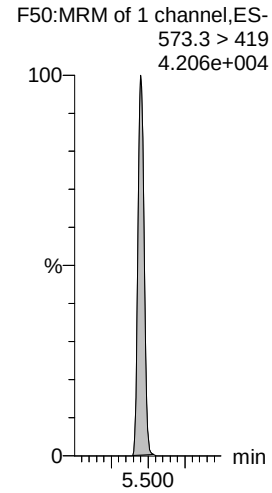

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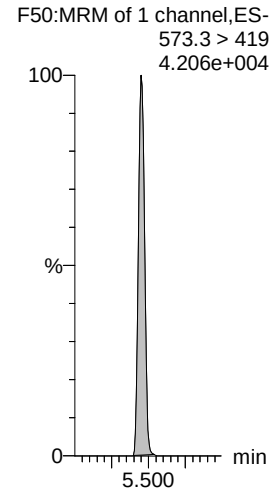

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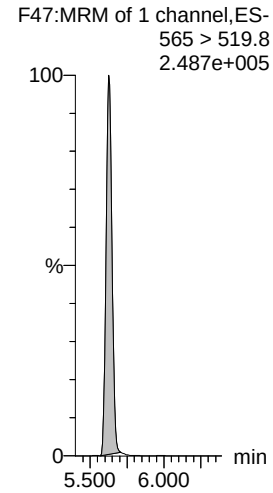
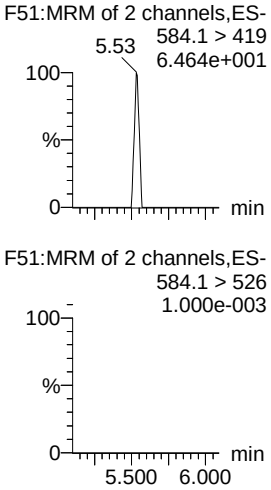


Dataset: Z:\Projects\PFAS.PRO\Results\181127M1\181127M1-6.qld

Last Altered: Wednesday, November 28, 2018 09:38:59 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:40:05 Pacific Standard Time

Name: 181127M1_6, Date: 27-Nov-2018, Time: 13:04:43, ID: 1803659-02 A1-MW-23-SA2 0.1178, Description: A1-MW-23-SA2

L-EtFOSAA



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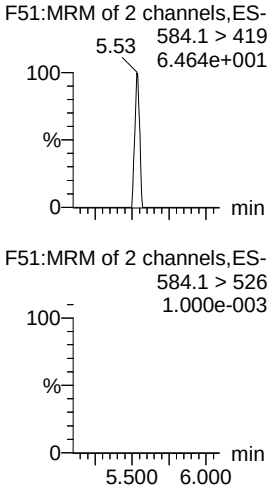

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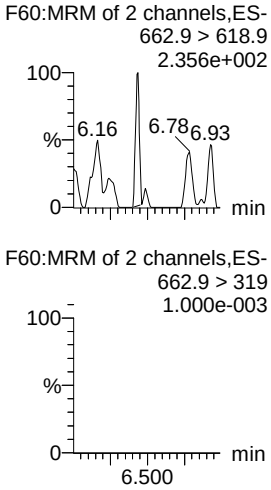

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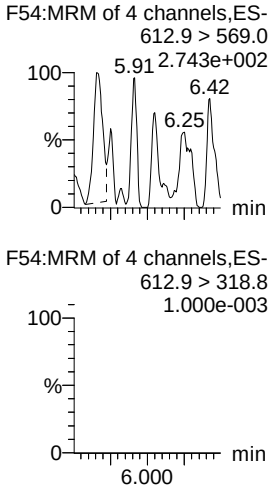

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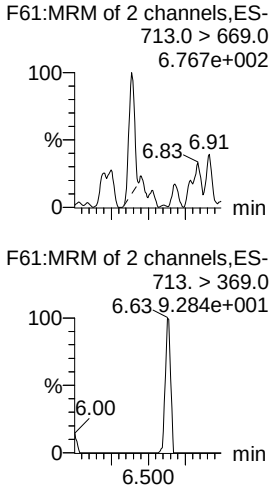

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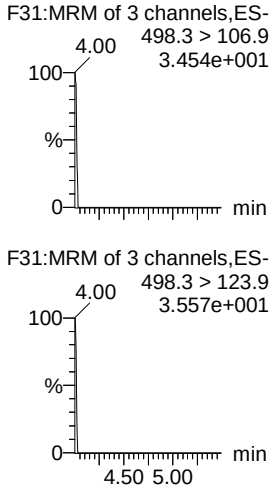

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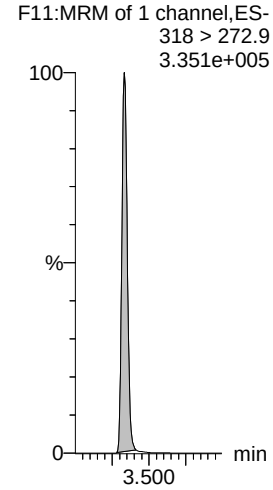

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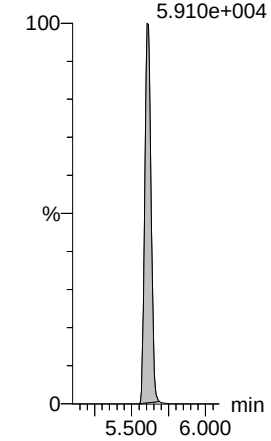

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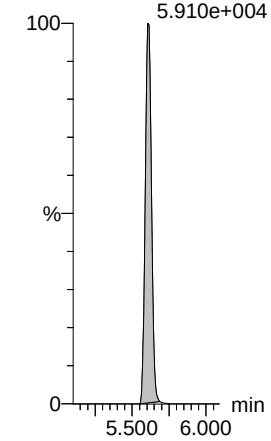

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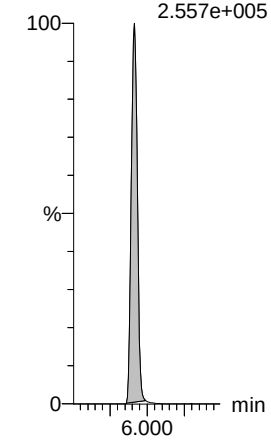

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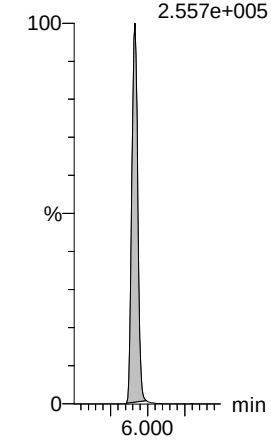

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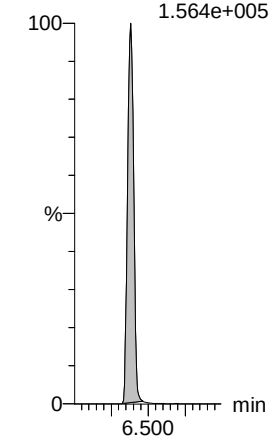

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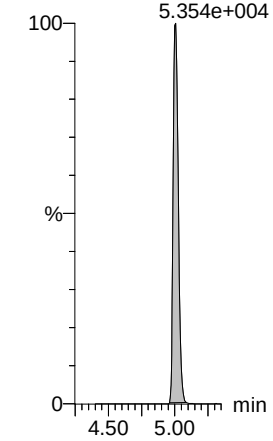

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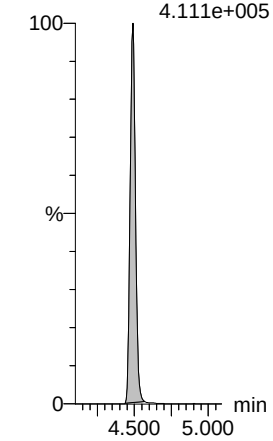
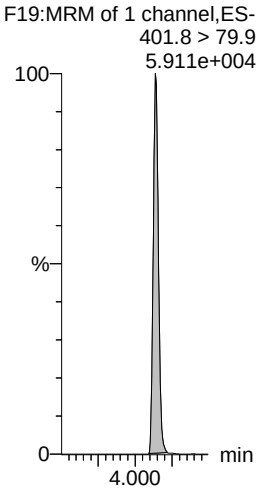


Dataset: Z:\Projects\PFAS.PRO\Results\181127M1\181127M1-6.qld

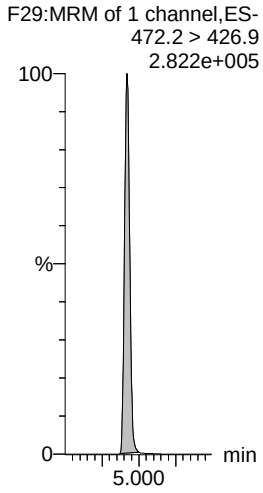
Last Altered: Wednesday, November 28, 2018 09:38:59 Pacific Standard Time
Printed: Wednesday, November 28, 2018 09:40:05 Pacific Standard Time

Name: 181127M1_6, Date: 27-Nov-2018, Time: 13:04:43, ID: 1803659-02 A1-MW-23-SA2 0.1178, Description: A1-MW-23-SA2

13C3-PFHxS



13C9-PFNA



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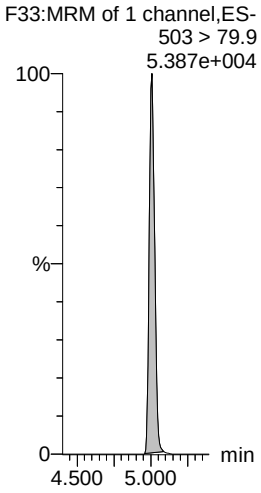

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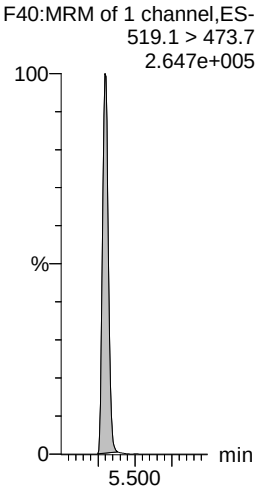

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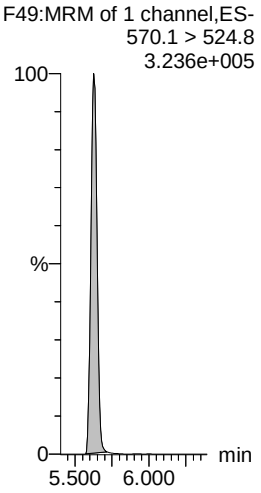

Vista Analytical Laboratory L14

ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-28.qld

Last Altered: Wednesday, November 28, 2018 16:32:36 Pacific Standard Time
Printed: Wednesday, November 28, 2018 16:35:30 Pacific Standard Time

Name: 181126M1_28, Date: 26-Nov-2018, Time: 16:23:43, ID: 1803659-03 A1-MW-25-SA2 0.11426, Description: A1-MW-25-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	3	PFBS	299.0 > 79.7	6.81e3	1.21e3	0.114		2.76	2.76	70.2	298.7773		2.572	NO
2	5	PFHxA	313 > 269	1.13e5	4.42e3	0.114		3.33	3.33	127	1200.4435		15.649	NO
3	7	PFHpA	363.0 > 318.9	4.80e3	5.10e3	0.114		4.00	4.00	11.8	78.0399		14.656	NO
4	8	L-PFHxS	398.9 > 79.6	7.96e3	9.86e2	0.114		4.14	4.14	101	453.4633		1.785	NO
5	68	Total PFHxS	398.9 > 79.6	7.96e3	9.86e2	0.114		4.28		101	453.4633			
6	11	L-PFOA	412.8 > 368.9	6.63e3	8.58e3	0.114		4.47	4.49	9.66	61.2482		3.086	NO
7	69	Total PFOA	412.8 > 368.9	6.63e3	8.58e3	0.114		4.62		9.66	61.2482			
8	38	13C3-PFBS	302. > 98.8	1.21e3	2.53e3	0.114	0.537	2.72	2.77	5.99	97.5591	89.2		
9	40	13C2-PFHxA	315 > 270	4.42e3	1.20e4	0.114	0.988	3.30	3.33	4.61	40.8560	93.4		
10	41	13C4-PFHpA	367.2 > 321.8	5.10e3	1.20e4	0.114	0.537	3.97	4.00	5.33	86.8734	79.4		
11	42	18O2-PFHxS	403.0 > 102.6	9.86e2	2.53e3	0.114	0.448	4.11	4.14	4.87	95.1546	87.0		
12	42	18O2-PFHxS	403.0 > 102.6	9.86e2	2.53e3	0.114	0.448	4.11	4.14	4.87	95.1546	87.0		
13	44	13C2-PFOA	414.9 > 369.7	8.58e3	1.29e4	0.114	0.755	4.46	4.49	8.31	96.3627	88.1		
14	44	13C2-PFOA	414.9 > 369.7	8.58e3	1.29e4	0.114	0.755	4.46	4.49	8.31	96.3627	88.1		
15	-1													
16	14	PFNA	463.0 > 418.8	3.86e1	7.35e3	0.114		4.90	4.91	0.0656	0.1535		33.120	YES
17	16	L-PFOS	498.9 > 79.9	4.78e2	2.41e3	0.114		5.02	5.01	2.48	19.4910		2.868	YES
18	70	Total PFOS	498.9 > 79.9	4.78e2	2.41e3	0.114		5.13		2.48	19.4910			
19	18	PFDA	513 > 468.8		7.08e3	0.114		5.28						
20	21	L-MeFOSAA	570 > 419		2.02e3	0.114		5.43						
21	71	Total N-MeFOSAA	570. > 419	0.00e0	2.02e3	0.114		5.57		0.000				
22	25	PFUdA	563.0 > 518.9		1.04e4	0.114		5.61						
23	45	13C5-PFNA	468.2 > 422.9	7.35e3	8.45e3	0.114	0.991	4.90	4.92	10.9	96.0608	87.8		
24	47	13C8-PFOS	507.0 > 79.9	2.41e3	2.50e3	0.114	1.042	4.98	5.00	12.0	101.0898	92.4		
25	47	13C8-PFOS	507.0 > 79.9	2.41e3	2.50e3	0.114	1.042	4.98	5.00	12.0	101.0898	92.4		
26	48	13C2-PFDA	515.1 > 469.9	7.08e3	1.08e4	0.114	0.902	5.28	5.30	8.18	79.3803	72.6		
27	50	d3-N-MeFOSAA	573.3 > 419	2.02e3	1.41e4	0.114	0.135	5.43	5.45	1.80	116.7858	106.8		
28	50	d3-N-MeFOSAA	573.3 > 419	2.02e3	1.41e4	0.114	0.135	5.43	5.45	1.80	116.7858	106.8		
29	51	13C2-PFUdA	565 > 519.8	1.04e4	1.41e4	0.114	0.957	5.61	5.63	9.24	84.4626	77.2		
30	-1													
31	23	L-EtFOSAA	584.1 > 419		2.98e3	0.114		5.51						
32	72	Total N-EtFOSAA	584.1 > 419	0.00e0	2.98e3	0.114		5.72		0.000				
33	29	PFTrDA	662.9 > 618.9		1.07e4	0.114		6.15						
34	27	PFDoA	612.9 > 569.0		1.07e4	0.114		5.90						
35	30	PFTeDA	713.0 > 669.0		6.84e3	0.114		6.37						
36	73	TCDA	498.3>106.9			0.114		5.15						

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ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-28.qld

Last Altered: Wednesday, November 28, 2018 16:32:36 Pacific Standard Time
Printed: Wednesday, November 28, 2018 16:35:30 Pacific Standard Time

Name: 181126M1_28, Date: 26-Nov-2018, Time: 16:23:43, ID: 1803659-03 A1-MW-25-SA2 0.11426, Description: A1-MW-25-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	61	13C5-PFHxA	318 > 272.9	1.20e4	1.20e4	0.114	1.000	3.30	3.33	12.5	109.3996	100.0		
38	52	d5-N-EtFOSAA	589.3 > 419	2.98e3	1.41e4	0.114	0.185	5.59	5.61	2.65	125.1096	114.4		
39	52	d5-N-EtFOSAA	589.3 > 419	2.98e3	1.41e4	0.114	0.185	5.59	5.61	2.65	125.1096	114.4		
40	53	13C2-PFDoA	615.0 > 569.7	1.07e4	1.08e4	0.114	1.047	5.90	5.91	12.4	103.5624	94.7		
41	53	13C2-PFDoA	615.0 > 569.7	1.07e4	1.08e4	0.114	1.047	5.90	5.91	12.4	103.5624	94.7		
42	55	13C2-PFTeDA	715.1 > 669.7	6.84e3	1.41e4	0.114	0.567	6.37	6.38	6.08	93.8392	85.8		
43	47	13C8-PFOS	507.0 > 79.9	2.41e3	2.50e3	0.114	1.042	4.98	5.00	12.0	101.0898	92.4		
44	63	13C8-PFOA	420.9 > 376	1.29e4	1.29e4	0.114	1.000	4.46	4.49	12.5	109.3996	100.0		
45	-1													
46	62	13C3-PFHxS	401.8 > 79.9	2.53e3	2.53e3	0.114	1.000	4.11	4.14	12.5	109.3996	100.0		
47	64	13C9-PFNA	472.2 > 426.9	8.45e3	8.45e3	0.114	1.000	4.90	4.92	12.5	109.3996	100.0		
48	65	13C4-PFOS	503 > 79.9	2.50e3	2.50e3	0.114	1.000	4.98	5.00	12.5	109.3996	100.0		
49	66	13C6-PFDA	519.1 > 473.7	1.08e4	1.08e4	0.114	1.000	5.28	5.30	12.5	109.3996	100.0		
50	67	13C7-PFUdA	570.1 > 524.8	1.41e4	1.41e4	0.114	1.000	5.61	5.63	12.5	109.3996	100.0		

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ANP 11/28/2018

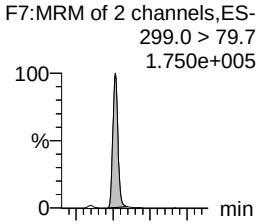
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-28.qld

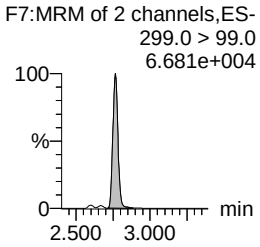
Last Altered: Wednesday, November 28, 2018 16:32:36 Pacific Standard Time
Printed: Wednesday, November 28, 2018 16:35:30 Pacific Standard Time

Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_28, Date: 26-Nov-2018, Time: 16:23:43, ID: 1803659-03 A1-MW-25-SA2 0.11426, Description: A1-MW-25-SA2

PFBS





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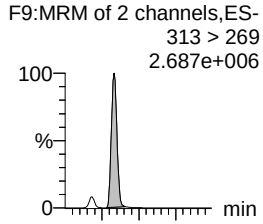

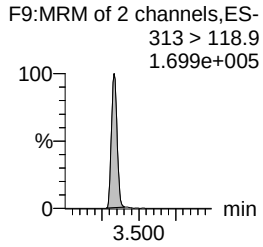

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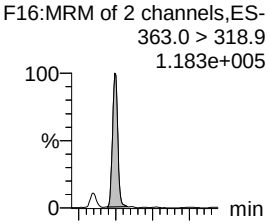

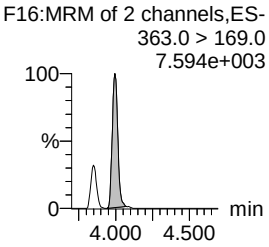

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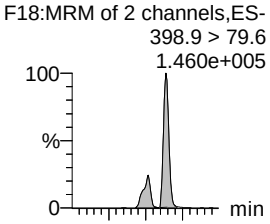
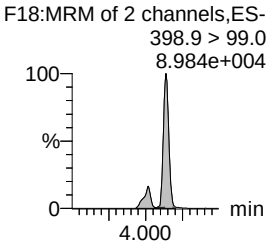
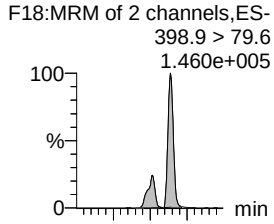
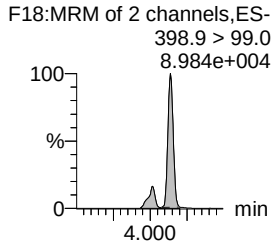


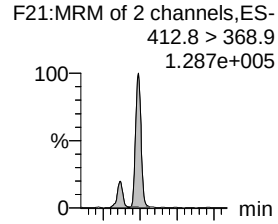


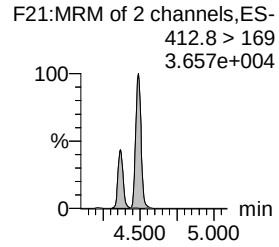
Total PFHxS



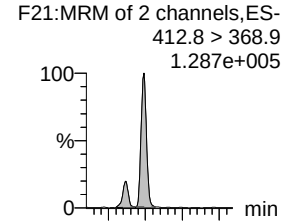


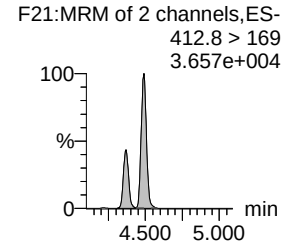
L-PFOA



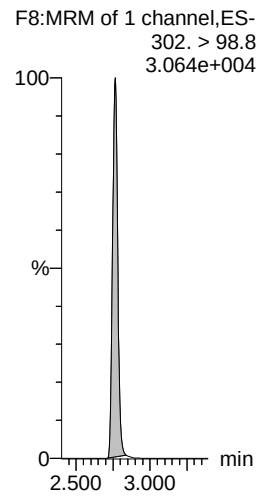


Total PFOA

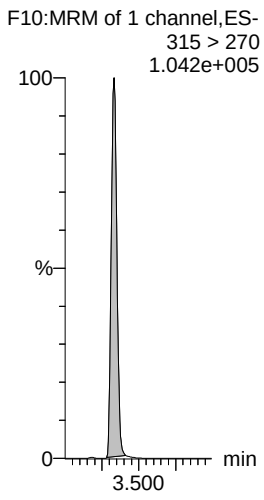




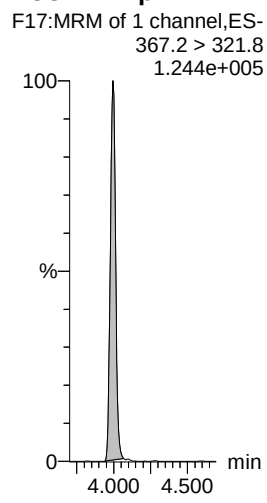
13C3-PFBS



13C2-PFHxA



13C4-PFHpA



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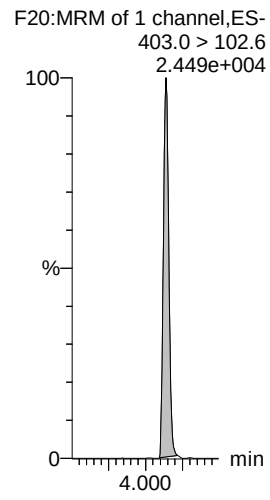

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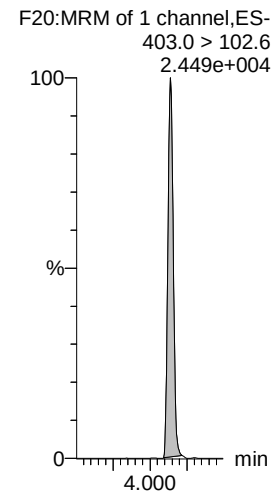

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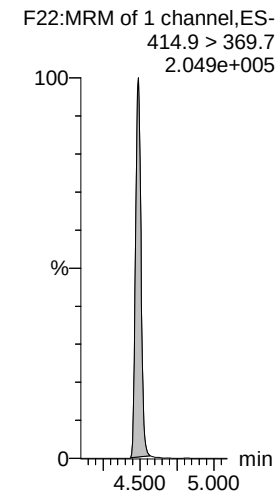

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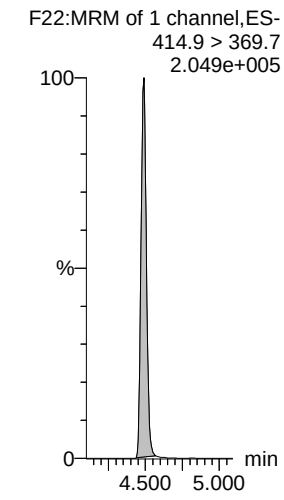


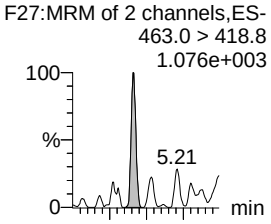
CGH 11/28/2018

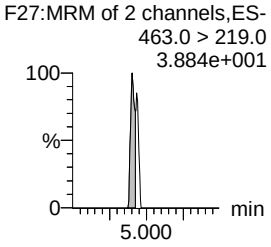
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-28.qld

Last Altered: Wednesday, November 28, 2018 16:32:36 Pacific Standard Time
Printed: Wednesday, November 28, 2018 16:35:30 Pacific Standard Time

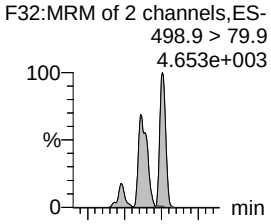
Name: 181126M1_28, Date: 26-Nov-2018, Time: 16:23:43, ID: 1803659-03 A1-MW-25-SA2 0.11426, Description: A1-MW-25-SA2

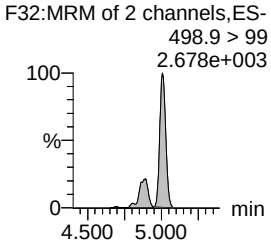
PFNA





L-PFOS





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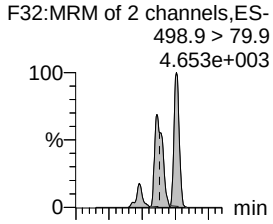

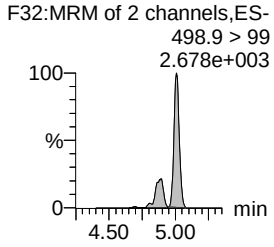

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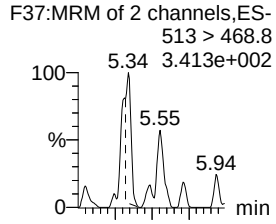
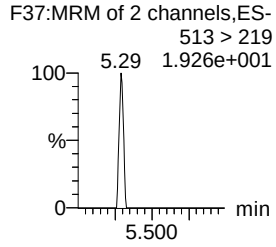
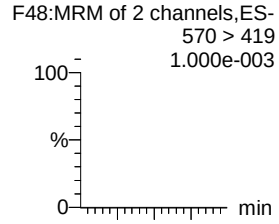
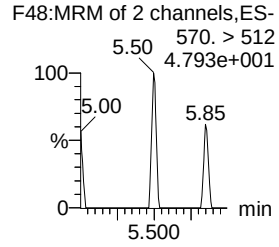




L-MeFOSAA





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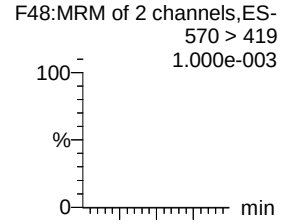
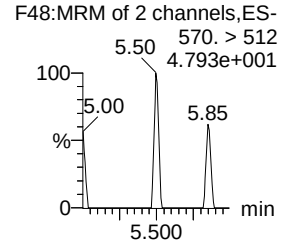
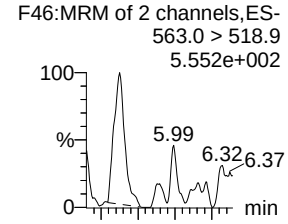
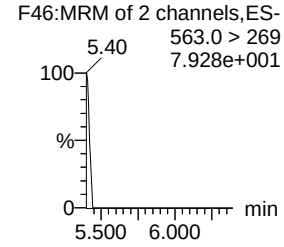


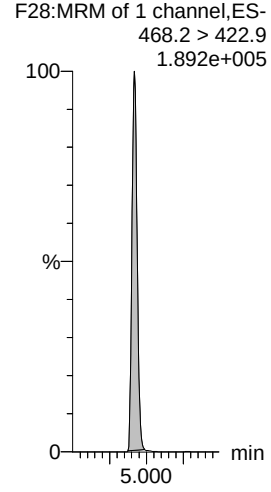


PFUdA

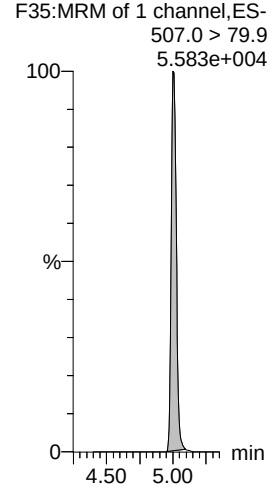




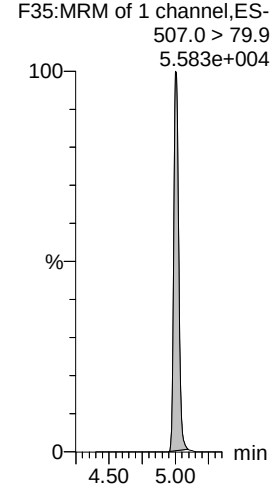
13C5-PFNA



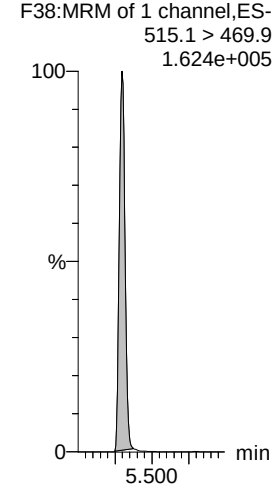
13C8-PFOS



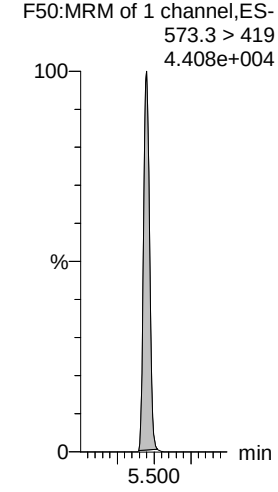
13C8-PFOS



13C2-PFDA



d3-N-MeFOSAA



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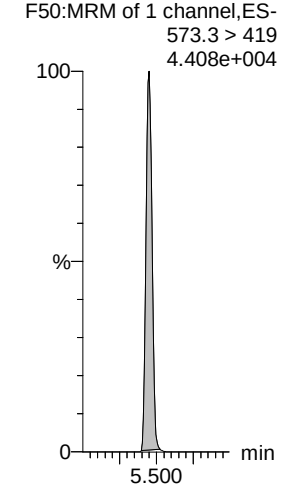
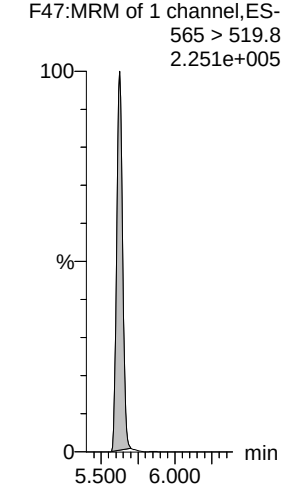


13C2-PFUdA



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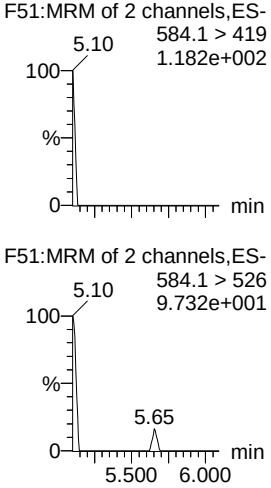
Printed: Wednesday, November 28, 2018 16:35:30 Pacific Standard Time

Name: 181126M1_28, Date: 26-Nov-2018, Time: 16:23:43, ID: 1803659-03 A1-MW-25-SA2 0.11426, Description: A1-MW-25-SA2

L-EtFOSAA



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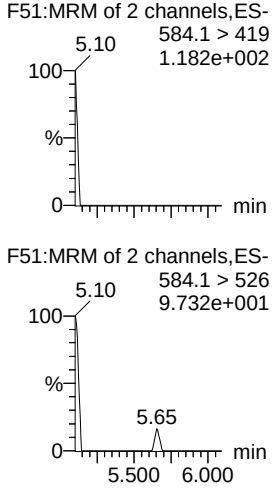

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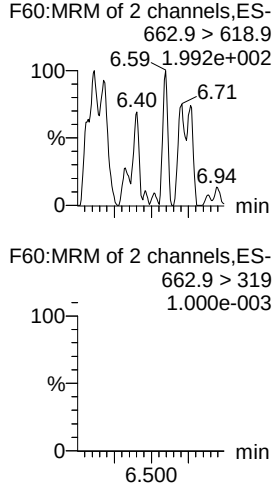
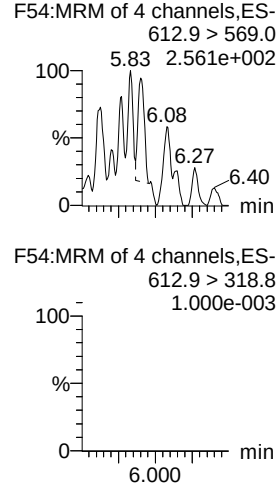


PFDoA



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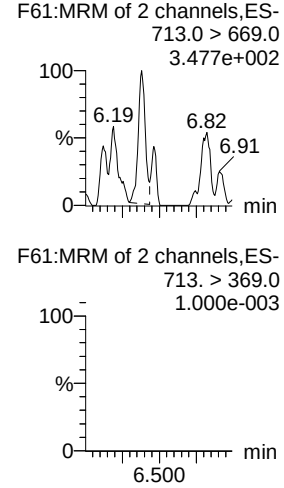
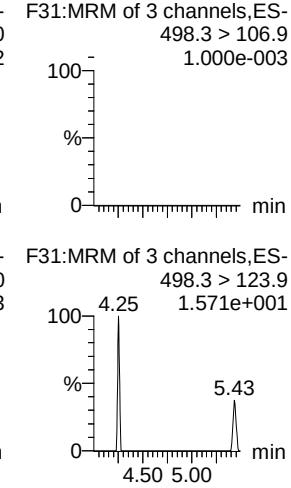
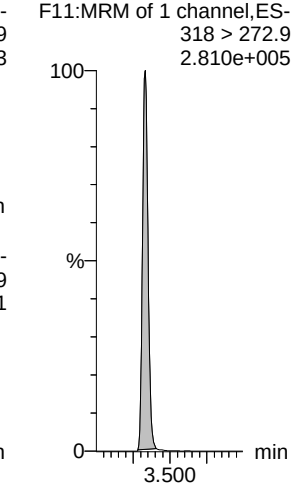


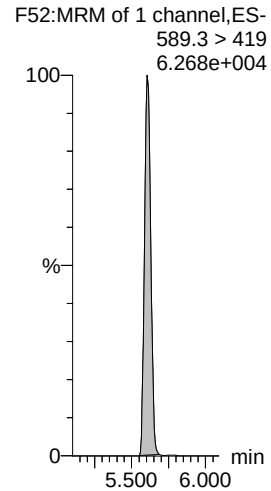
TCDA



13C5-PFHxA



d5-N-EtFOSAA



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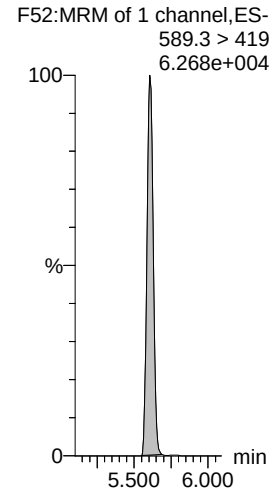

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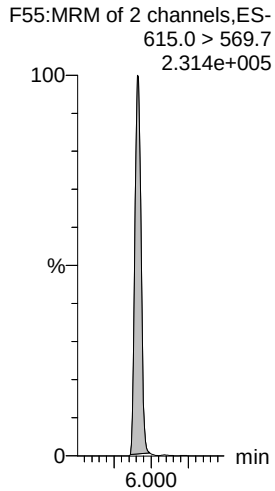

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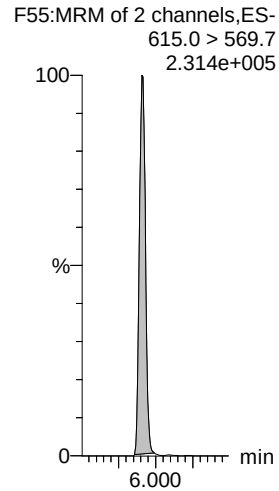

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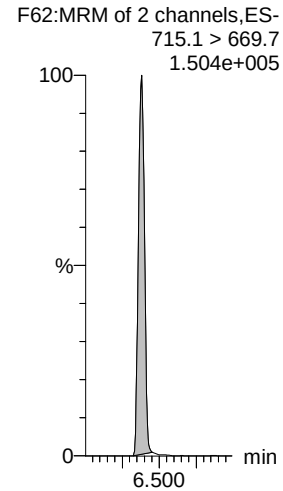
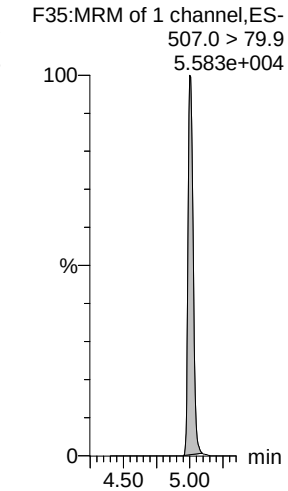


13C8-PFOS



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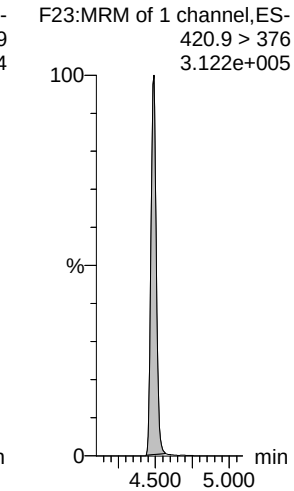

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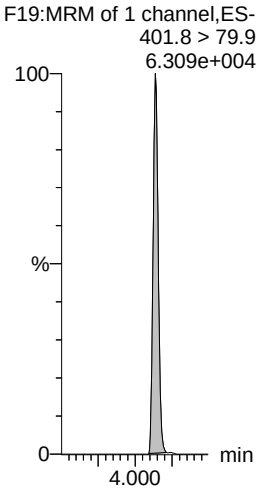
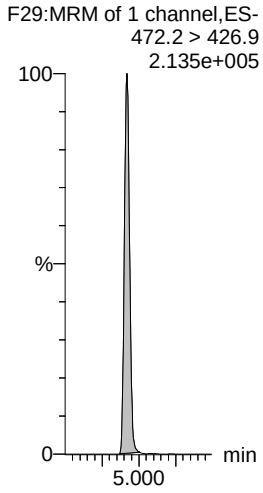
Last Altered: Wednesday, November 28, 2018 16:32:36 Pacific Standard Time
Printed: Wednesday, November 28, 2018 16:35:30 Pacific Standard Time

Name: 181126M1_28, Date: 26-Nov-2018, Time: 16:23:43, ID: 1803659-03 A1-MW-25-SA2 0.11426, Description: A1-MW-25-SA2

13C3-PFHxS



13C9-PFNA



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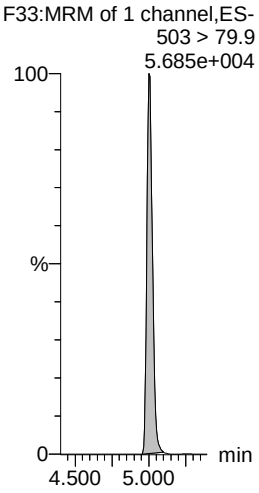

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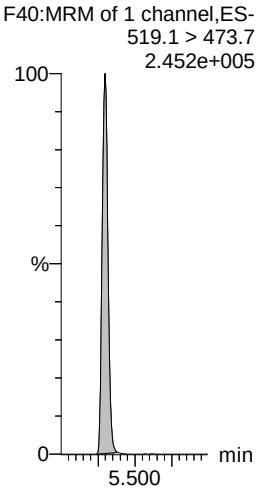
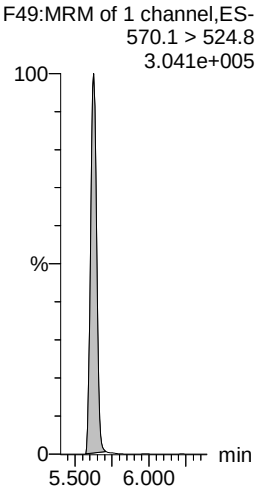


13C7-PFUdA



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ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-29.qld

Last Altered: Wednesday, November 28, 2018 10:26:52 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:28:39 Pacific Standard Time

Name: 181126M1_29, Date: 26-Nov-2018, Time: 16:34:21, ID: 1803659-04 A1-MW-27-SA2 0.11731, Description: A1-MW-27-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	3	PFBS	299.0 > 79.7	1.78e3	1.26e3	0.117		2.76	2.76	17.7	73.0095		2.569	NO
2	5	PFHxA	313 > 269	2.80e4	4.97e3	0.117		3.33	3.33	28.2	254.9698		15.188	NO
3	7	PFHpA	363.0 > 318.9	2.03e3	6.32e3	0.117		4.00	3.99	4.02	25.5949		12.023	NO
4	8	L-PFHxS	398.9 > 79.6	2.54e3	1.02e3	0.117		4.14	4.14	31.1	136.1710		1.799	NO
5	68	Total PFHxS	398.9 > 79.6	2.54e3	1.02e3	0.117		4.28		31.1	136.1710			
6	11	L-PFOA	412.8 > 368.9	4.72e3	1.09e4	0.117		4.47	4.49	5.39	32.8784		2.879	NO
7	69	Total PFOA	412.8 > 368.9	4.72e3	1.09e4	0.117		4.62		5.39	32.8784			
8	38	13C3-PFBS	302. > 98.8	1.26e3	2.51e3	0.117	0.537	2.72	2.76	6.26	99.4335	93.3		
9	40	13C2-PFHxA	315 > 270	4.97e3	1.35e4	0.117	0.988	3.30	3.33	4.60	39.6650	93.1		
10	41	13C4-PFHpA	367.2 > 321.8	6.32e3	1.35e4	0.117	0.537	3.97	4.00	5.85	92.9435	87.2		
11	42	18O2-PFHxS	403.0 > 102.6	1.02e3	2.51e3	0.117	0.448	4.11	4.14	5.08	96.7040	90.8		
12	42	18O2-PFHxS	403.0 > 102.6	1.02e3	2.51e3	0.117	0.448	4.11	4.14	5.08	96.7040	90.8		
13	44	13C2-PFOA	414.9 > 369.7	1.09e4	1.65e4	0.117	0.755	4.46	4.49	8.30	93.7002	87.9		
14	44	13C2-PFOA	414.9 > 369.7	1.09e4	1.65e4	0.117	0.755	4.46	4.49	8.30	93.7002	87.9		
15	-1													
16	14	PFNA	463.0 > 418.8	2.10e1	9.77e3	0.117		4.90	4.92	0.0269			6.082	NO
17	16	L-PFOS	498.9 > 79.9	3.37e2	2.36e3	0.117		5.02	5.00	1.79	13.5669		2.783	NO
18	70	Total PFOS	498.9 > 79.9	3.37e2	2.36e3	0.117		5.13		1.79	13.5669			
19	18	PFDA	513 > 468.8		9.23e3	0.117		5.28						
20	21	L-MeFOSAA	570 > 419		1.95e3	0.117		5.43						
21	71	Total N-MeFOSAA	570. > 419	0.00e0	1.95e3	0.117		5.57		0.000				
22	25	PFUdA	563.0 > 518.9	3.94e1	1.25e4	0.117		5.61	5.62	0.0396			11.006	NO
23	45	13C5-PFNA	468.2 > 422.9	9.77e3	1.09e4	0.117	0.991	4.90	4.92	11.2	96.0515	90.1		
24	47	13C8-PFOS	507.0 > 79.9	2.36e3	2.35e3	0.117	1.042	4.98	5.01	12.5	102.6054	96.3		
25	47	13C8-PFOS	507.0 > 79.9	2.36e3	2.35e3	0.117	1.042	4.98	5.01	12.5	102.6054	96.3		
26	48	13C2-PFDA	515.1 > 469.9	9.23e3	1.33e4	0.117	0.902	5.28	5.30	8.67	81.9467	76.9		
27	50	d3-N-MeFOSAA	573.3 > 419	1.95e3	1.67e4	0.117	0.135	5.43	5.45	1.46	92.6507	87.0		
28	50	d3-N-MeFOSAA	573.3 > 419	1.95e3	1.67e4	0.117	0.135	5.43	5.45	1.46	92.6507	87.0		
29	51	13C2-PFUdA	565 > 519.8	1.25e4	1.67e4	0.117	0.957	5.61	5.63	9.35	83.2430	78.1		
30	-1													
31	23	L-EtFOSAA	584.1 > 419		2.79e3	0.117		5.51						
32	72	Total N-EtFOSAA	584.1 > 419	0.00e0	2.79e3	0.117		5.72		0.000				
33	29	PFTrDA	662.9 > 618.9		1.27e4	0.117		6.15						
34	27	PFDoA	612.9 > 569.0		1.27e4	0.117		5.90						
35	30	PFTeDA	713.0 > 669.0		7.02e3	0.117		6.37						
36	73	TCDA	498.3>106.9			0.117		5.15						

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Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-29.qld

Last Altered: Wednesday, November 28, 2018 10:26:52 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:28:39 Pacific Standard Time

Name: 181126M1_29, Date: 26-Nov-2018, Time: 16:34:21, ID: 1803659-04 A1-MW-27-SA2 0.11731, Description: A1-MW-27-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	61	13C5-PFHxA	318 > 272.9	1.35e4	1.35e4	0.117	1.000	3.30	3.33	12.5	106.5553	100.0		
38	52	d5-N-EtFOSAA	589.3 > 419	2.79e3	1.67e4	0.117	0.185	5.59	5.61	2.09	96.2090	90.3		
39	52	d5-N-EtFOSAA	589.3 > 419	2.79e3	1.67e4	0.117	0.185	5.59	5.61	2.09	96.2090	90.3		
40	53	13C2-PFDoA	615.0 > 569.7	1.27e4	1.33e4	0.117	1.047	5.90	5.91	12.0	97.5194	91.5		
41	53	13C2-PFDoA	615.0 > 569.7	1.27e4	1.33e4	0.117	1.047	5.90	5.91	12.0	97.5194	91.5		
42	55	13C2-PFTeDA	715.1 > 669.7	7.02e3	1.67e4	0.117	0.567	6.37	6.38	5.27	79.2300	74.4		
43	47	13C8-PFOS	507.0 > 79.9	2.36e3	2.35e3	0.117	1.042	4.98	5.01	12.5	102.6054	96.3		
44	63	13C8-PFOA	420.9 > 376	1.65e4	1.65e4	0.117	1.000	4.46	4.49	12.5	106.5553	100.0		
45	-1													
46	62	13C3-PFHxS	401.8 > 79.9	2.51e3	2.51e3	0.117	1.000	4.11	4.14	12.5	106.5553	100.0		
47	64	13C9-PFNA	472.2 > 426.9	1.09e4	1.09e4	0.117	1.000	4.90	4.92	12.5	106.5553	100.0		
48	65	13C4-PFOS	503 > 79.9	2.35e3	2.35e3	0.117	1.000	4.98	5.01	12.5	106.5553	100.0		
49	66	13C6-PFDA	519.1 > 473.7	1.33e4	1.33e4	0.117	1.000	5.28	5.30	12.5	106.5553	100.0		
50	67	13C7-PFUdA	570.1 > 524.8	1.67e4	1.67e4	0.117	1.000	5.61	5.63	12.5	106.5553	100.0		

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Vista Analytical Laboratory L14

ANP 11/28/2018

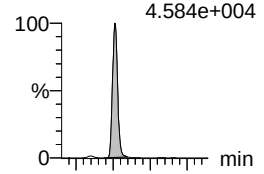
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-29.qld

Last Altered: Wednesday, November 28, 2018 10:26:52 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:28:39 Pacific Standard Time

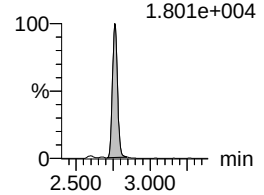
Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_29, Date: 26-Nov-2018, Time: 16:34:21, ID: 1803659-04 A1-MW-27-SA2 0.11731, Description: A1-MW-27-SA2

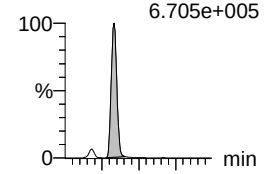
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
4.584e+004



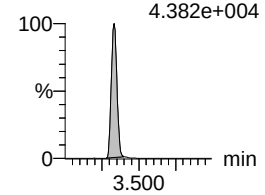
F7:MRM of 2 channels,ES-
299.0 > 99.0
1.801e+004



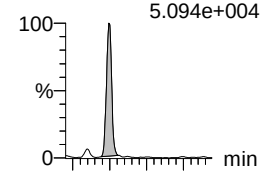
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
6.705e+005



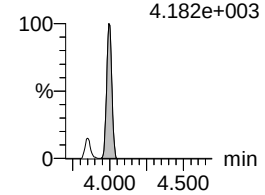
F9:MRM of 2 channels,ES-
313 > 118.9
4.382e+004



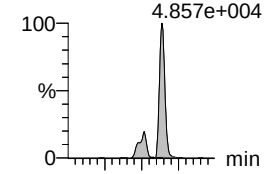
PFHpA
F16:MRM of 2 channels,ES-
363.0 > 318.9
5.094e+004



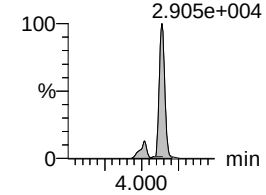
F16:MRM of 2 channels,ES-
363.0 > 169.0
4.182e+003



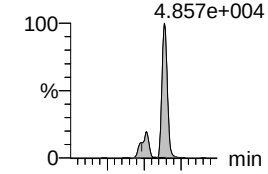
L-PFHxS
F18:MRM of 2 channels,ES-
398.9 > 79.6
4.857e+004



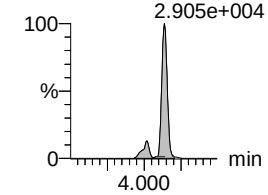
F18:MRM of 2 channels,ES-
398.9 > 99.0
2.905e+004



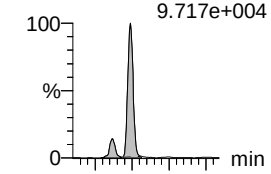
Total PFHxS
F18:MRM of 2 channels,ES-
398.9 > 79.6
4.857e+004



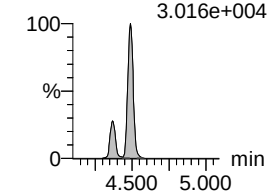
F18:MRM of 2 channels,ES-
398.9 > 99.0
2.905e+004



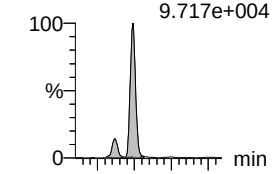
L-PFOA
F21:MRM of 2 channels,ES-
412.8 > 368.9
9.717e+004



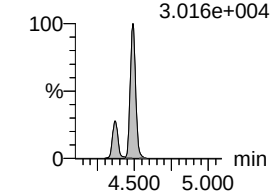
F21:MRM of 2 channels,ES-
412.8 > 169
3.016e+004



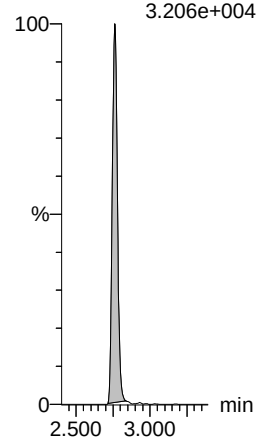
Total PFOA
F21:MRM of 2 channels,ES-
412.8 > 368.9
9.717e+004



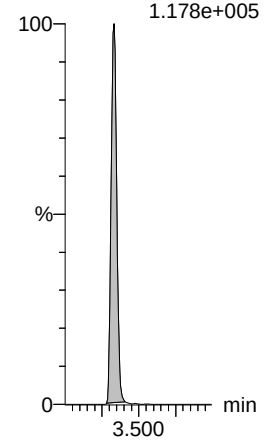
F21:MRM of 2 channels,ES-
412.8 > 169
3.016e+004



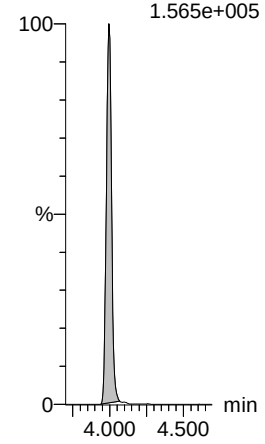
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.206e+004



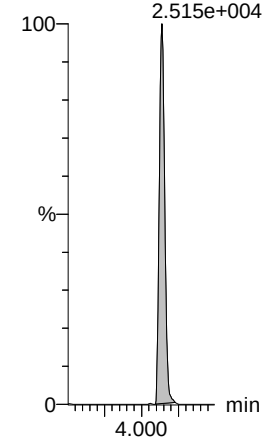
13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
1.178e+005



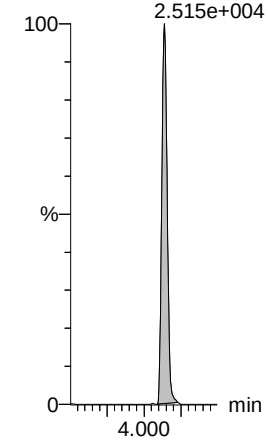
13C4-PFHpA
F17:MRM of 1 channel,ES-
367.2 > 321.8
1.565e+005



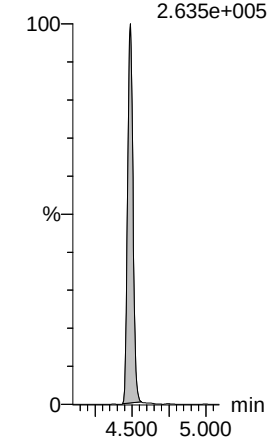
18O2-PFHxS
F20:MRM of 1 channel,ES-
403.0 > 102.6
2.515e+004



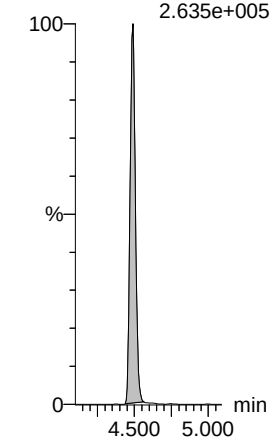
18O2-PFHxS
F20:MRM of 1 channel,ES-
403.0 > 102.6
2.515e+004



13C2-PFOA
F22:MRM of 1 channel,ES-
414.9 > 369.7
2.635e+005



13C2-PFOA
F22:MRM of 1 channel,ES-
414.9 > 369.7
2.635e+005



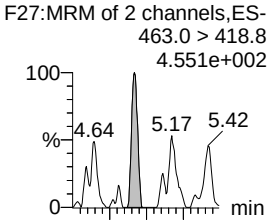
CGH 11/28/2018

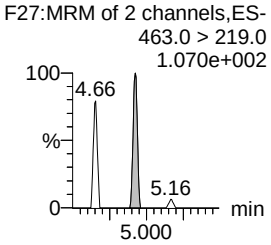
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-29.qld

Last Altered: Wednesday, November 28, 2018 10:26:52 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:28:39 Pacific Standard Time

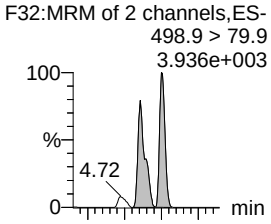
Name: 181126M1_29, Date: 26-Nov-2018, Time: 16:34:21, ID: 1803659-04 A1-MW-27-SA2 0.11731, Description: A1-MW-27-SA2

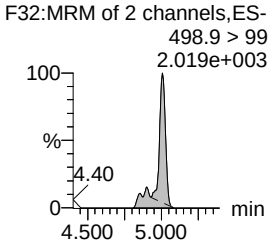
PFNA



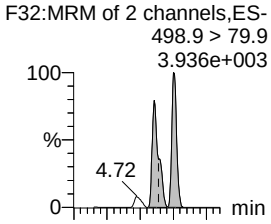


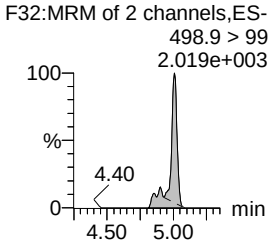
L-PFOS



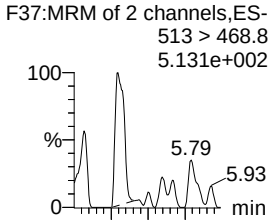


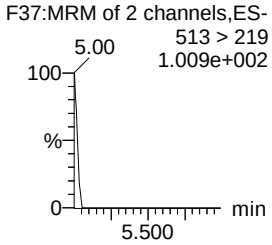
Total PFOS



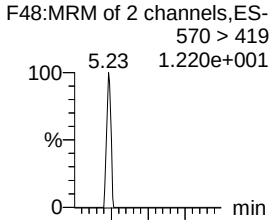


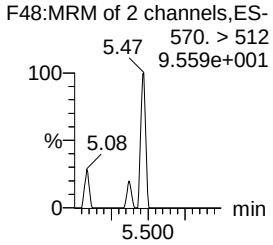
PFDA



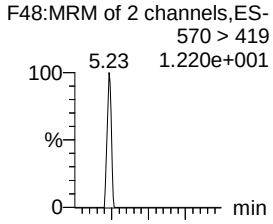


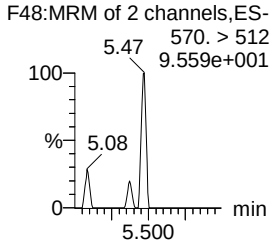
L-MeFOSAA



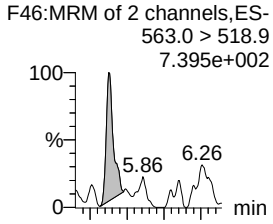


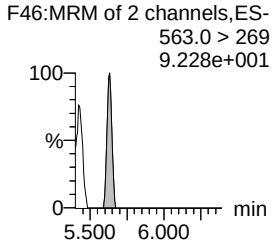
Total N-MeFOSAA



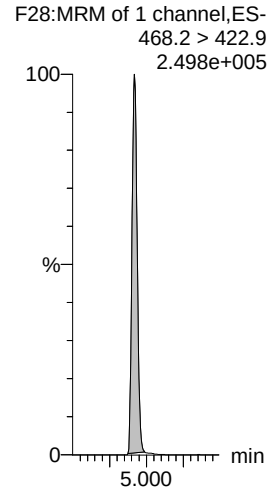


PFUdA

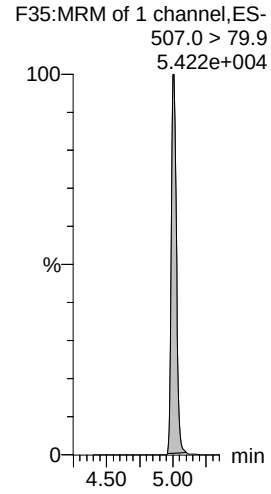




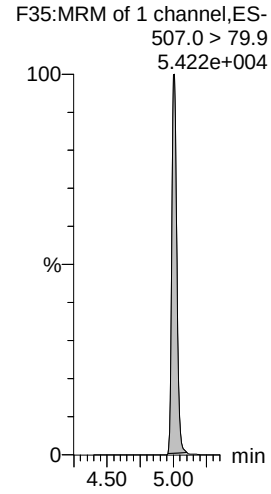
13C5-PFNA



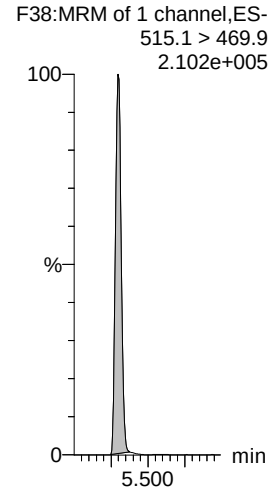
13C8-PFOS



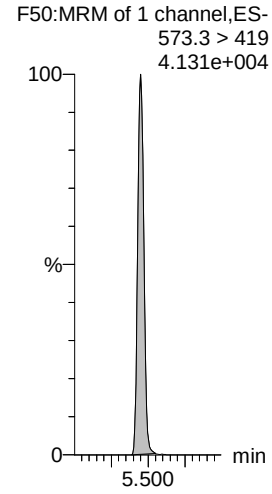
13C8-PFOS



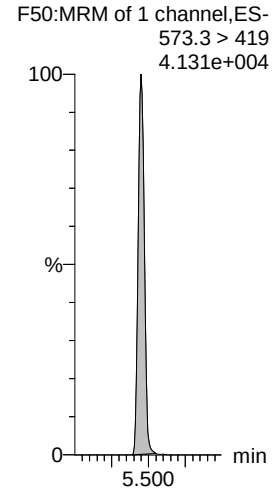
13C2-PFDA



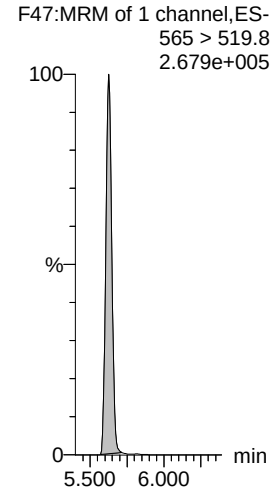
d3-N-MeFOSAA



d3-N-MeFOSAA



13C2-PFUdA



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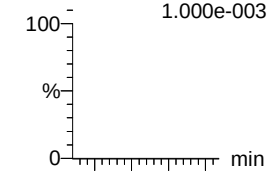
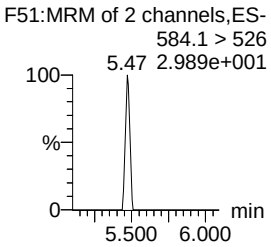
Last Altered: Wednesday, November 28, 2018 10:26:52 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:28:39 Pacific Standard Time

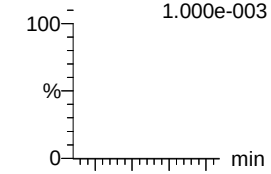
Name: 181126M1_29, Date: 26-Nov-2018, Time: 16:34:21, ID: 1803659-04 A1-MW-27-SA2 0.11731, Description: A1-MW-27-SA2

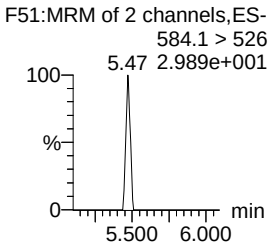
L-EtFOSAA



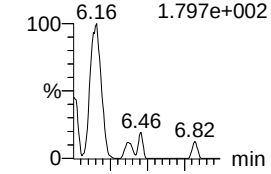


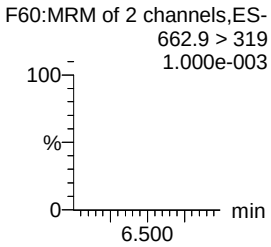
Total N-EtFOSAA



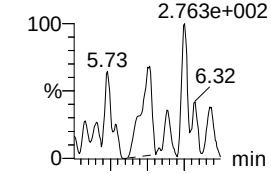


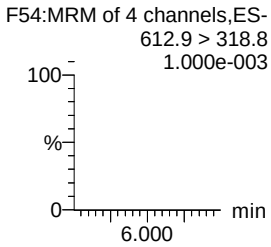
PFTrDA



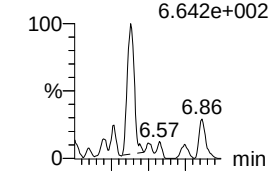


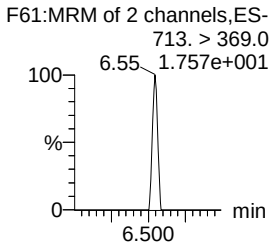
PFDoA



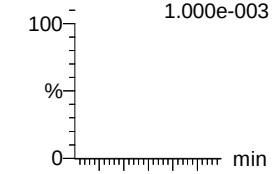


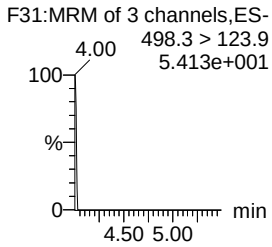
PFTeDA



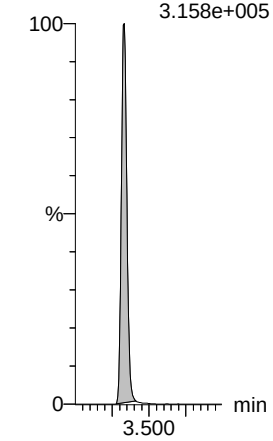


TCDA

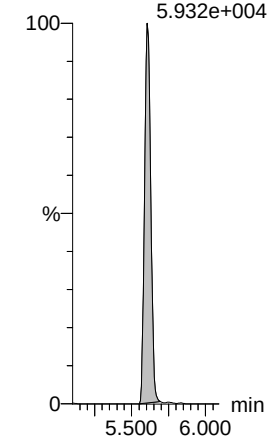




13C5-PFHxA



d5-N-EtFOSAA



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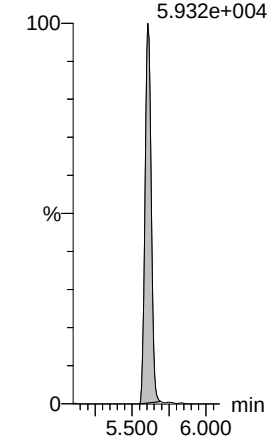
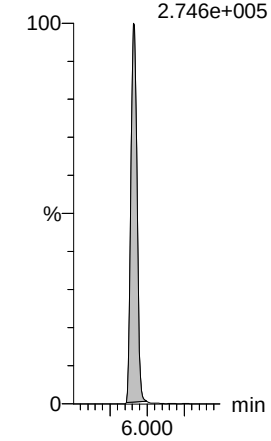
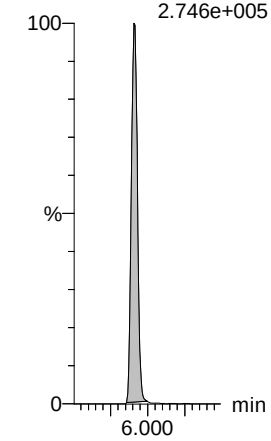


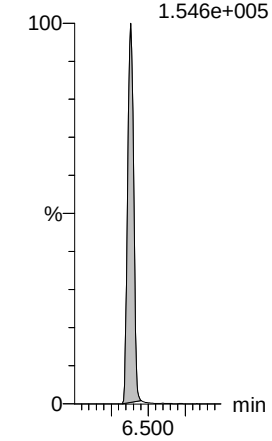
13C2-PFDoA



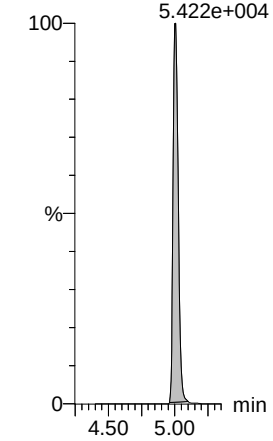
13C2-PFDoA



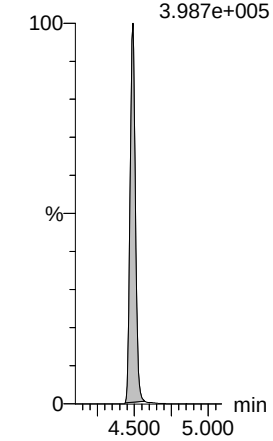
13C2-PFTeDA



13C8-PFOS



13C8-PFOA

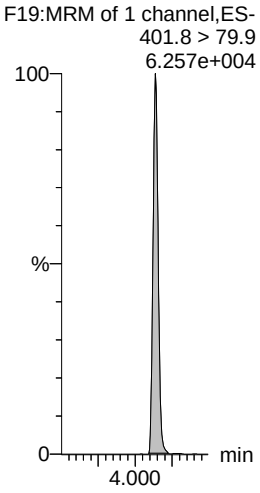


Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-29.qld

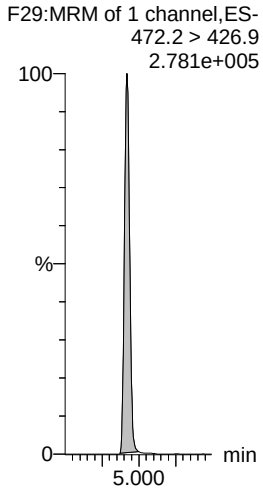
Last Altered: Wednesday, November 28, 2018 10:26:52 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:28:39 Pacific Standard Time

Name: 181126M1_29, Date: 26-Nov-2018, Time: 16:34:21, ID: 1803659-04 A1-MW-27-SA2 0.11731, Description: A1-MW-27-SA2

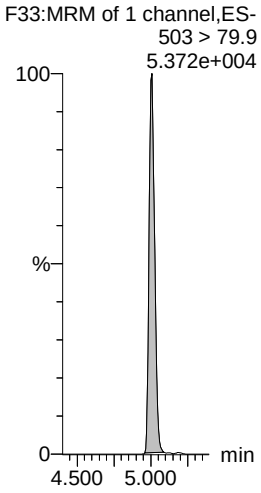
13C3-PFHxS



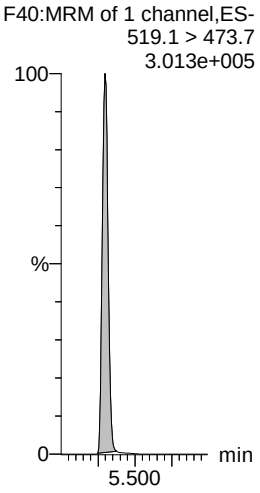
13C9-PFNA



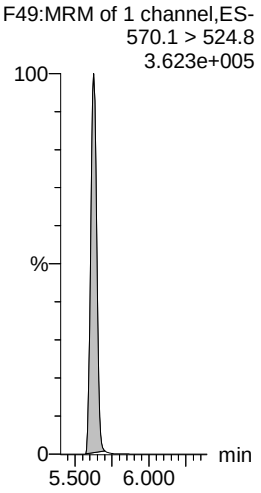
13C4-PFOS



13C6-PFDA



13C7-PFUdA



Vista Analytical Laboratory L14

ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-30.qld

Last Altered: Wednesday, November 28, 2018 10:32:04 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:33:04 Pacific Standard Time

Name: 181126M1_30, Date: 26-Nov-2018, Time: 16:44:53, ID: 1803659-05 A1-MW-55-SA2 0.11846, Description: A1-MW-55-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	3	PFBS	299.0 > 79.7		1.14e3	0.118		2.76						
2	5	PFHxA	313 > 269	4.01e1	6.18e3	0.118		3.33	3.33	0.0325			361.703	YES
3	7	PFHpA	363.0 > 318.9		8.25e3	0.118		3.99						
4	8	L-PFHxS	398.9 > 79.6	6.30e0	9.47e2	0.118		4.13	4.13	0.0832	0.3655		8.302	YES
5	68	Total PFHxS	398.9 > 79.6	6.30e0	9.47e2	0.118		4.28		0.0832	0.3655			
6	11	L-PFOA	412.8 > 368.9	6.08e1	1.42e4	0.118		4.47	4.49	0.0537			2.373	NO
7	69	Total PFOA	412.8 > 368.9	6.08e1	1.42e4	0.118		4.62		0.000				
8	38	13C3-PFBS	302. > 98.8	1.14e3	2.36e3	0.118	0.537	2.72	2.76	6.03	94.7763	89.8		
9	40	13C2-PFHxA	315 > 270	6.18e3	1.71e4	0.118	0.988	3.30	3.33	4.53	38.6553	91.6		
10	41	13C4-PFHpA	367.2 > 321.8	8.25e3	1.71e4	0.118	0.537	3.97	3.99	6.04	95.0902	90.1		
11	42	18O2-PFHxS	403.0 > 102.6	9.47e2	2.36e3	0.118	0.448	4.11	4.13	5.01	94.3173	89.4		
12	42	18O2-PFHxS	403.0 > 102.6	9.47e2	2.36e3	0.118	0.448	4.11	4.13	5.01	94.3173	89.4		
13	44	13C2-PFOA	414.9 > 369.7	1.42e4	2.08e4	0.118	0.755	4.46	4.48	8.52	95.2297	90.2		
14	44	13C2-PFOA	414.9 > 369.7	1.42e4	2.08e4	0.118	0.755	4.46	4.48	8.52	95.2297	90.2		
15	-1													
16	14	PFNA	463.0 > 418.8	2.23e1	1.19e4	0.118		4.90	4.91	0.0235			22.031	YES
17	16	L-PFOS	498.9 > 79.9		2.14e3	0.118		5.02						
18	70	Total PFOS	498.9 > 79.9	0.00e0	2.14e3	0.118		5.13		0.000				
19	18	PFDA	513 > 468.8		1.16e4	0.118		5.28						
20	21	L-MeFOSAA	570 > 419		1.92e3	0.118		5.43						
21	71	Total N-MeFOSAA	570. > 419	0.00e0	1.92e3	0.118		5.57		0.000				
22	25	PFUdA	563.0 > 518.9	5.00e1	1.47e4	0.118		5.61	5.62	0.0425			19.386	YES
23	45	13C5-PFNA	468.2 > 422.9	1.19e4	1.41e4	0.118	0.991	4.90	4.91	10.5	89.4389	84.8		
24	47	13C8-PFOS	507.0 > 79.9	2.14e3	2.49e3	0.118	1.042	4.98	5.00	10.8	87.1541	82.6		
25	47	13C8-PFOS	507.0 > 79.9	2.14e3	2.49e3	0.118	1.042	4.98	5.00	10.8	87.1541	82.6		
26	48	13C2-PFDA	515.1 > 469.9	1.16e4	1.58e4	0.118	0.902	5.28	5.30	9.15	85.6452	81.2		
27	50	d3-N-MeFOSAA	573.3 > 419	1.92e3	1.80e4	0.118	0.135	5.43	5.44	1.33	83.2789	78.9		
28	50	d3-N-MeFOSAA	573.3 > 419	1.92e3	1.80e4	0.118	0.135	5.43	5.44	1.33	83.2789	78.9		
29	51	13C2-PFUdA	565 > 519.8	1.47e4	1.80e4	0.118	0.957	5.61	5.63	10.2	89.9577	85.3		
30	-1													
31	23	L-EtFOSAA	584.1 > 419		2.94e3	0.118		5.51						
32	72	Total N-EtFOSAA	584.1 > 419	0.00e0	2.94e3	0.118		5.72		0.000				
33	29	PFTrDA	662.9 > 618.9		1.43e4	0.118		6.15						
34	27	PFDoA	612.9 > 569.0		1.43e4	0.118		5.90						
35	30	PFTeDA	713.0 > 669.0	2.27e1	8.51e3	0.118		6.37	6.38	0.0333			11.167	NO
36	73	TCDA	498.3>106.9			0.118		5.15						

CGH 11/28/2018

ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-30.qld

Last Altered: Wednesday, November 28, 2018 10:32:04 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:33:04 Pacific Standard Time

Name: 181126M1_30, Date: 26-Nov-2018, Time: 16:44:53, ID: 1803659-05 A1-MW-55-SA2 0.11846, Description: A1-MW-55-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	61	13C5-PFHxA	318 > 272.9	1.71e4	1.71e4	0.118	1.000	3.30	3.33	12.5	105.5209	100.0		
38	52	d5-N-EtFOSAA	589.3 > 419	2.94e3	1.80e4	0.118	0.185	5.59	5.61	2.04	92.8535	88.0		
39	52	d5-N-EtFOSAA	589.3 > 419	2.94e3	1.80e4	0.118	0.185	5.59	5.61	2.04	92.8535	88.0		
40	53	13C2-PFDoA	615.0 > 569.7	1.43e4	1.58e4	0.118	1.047	5.90	5.91	11.3	91.1241	86.4		
41	53	13C2-PFDoA	615.0 > 569.7	1.43e4	1.58e4	0.118	1.047	5.90	5.91	11.3	91.1241	86.4		
42	55	13C2-PFTeDA	715.1 > 669.7	8.51e3	1.80e4	0.118	0.567	6.37	6.38	5.89	87.7483	83.2		
43	47	13C8-PFOS	507.0 > 79.9	2.14e3	2.49e3	0.118	1.042	4.98	5.00	10.8	87.1541	82.6		
44	63	13C8-PFOA	420.9 > 376	2.08e4	2.08e4	0.118	1.000	4.46	4.48	12.5	105.5209	100.0		
45	-1													
46	62	13C3-PFHxS	401.8 > 79.9	2.36e3	2.36e3	0.118	1.000	4.11	4.14	12.5	105.5209	100.0		
47	64	13C9-PFNA	472.2 > 426.9	1.41e4	1.41e4	0.118	1.000	4.90	4.91	12.5	105.5209	100.0		
48	65	13C4-PFOS	503 > 79.9	2.49e3	2.49e3	0.118	1.000	4.98	5.00	12.5	105.5209	100.0		
49	66	13C6-PFDA	519.1 > 473.7	1.58e4	1.58e4	0.118	1.000	5.28	5.30	12.5	105.5209	100.0		
50	67	13C7-PFUdA	570.1 > 524.8	1.80e4	1.80e4	0.118	1.000	5.61	5.63	12.5	105.5209	100.0		

CGH 11/28/2018

Vista Analytical Laboratory L14

ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-30.qld

Last Altered: Wednesday, November 28, 2018 10:32:04 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:33:04 Pacific Standard Time

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Name: 181126M1_30, Date: 26-Nov-2018, Time: 16:44:53, ID: 1803659-05 A1-MW-55-SA2 0.11846, Description: A1-MW-55-SA2

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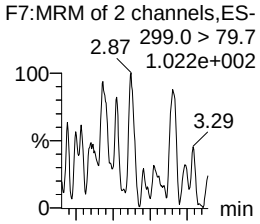

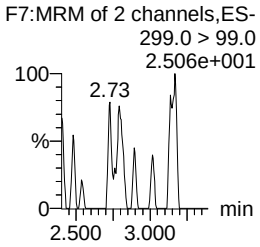

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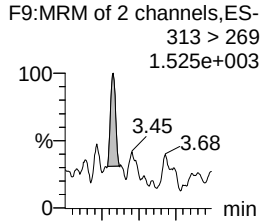

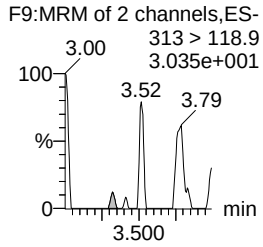

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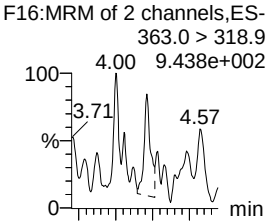

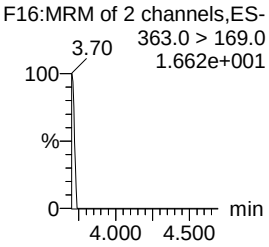

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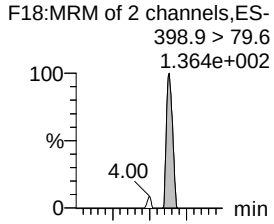

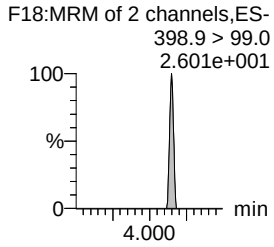

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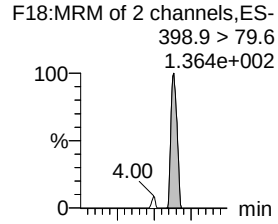

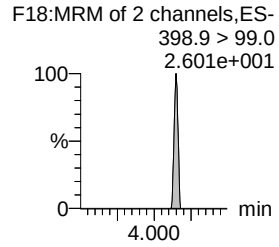

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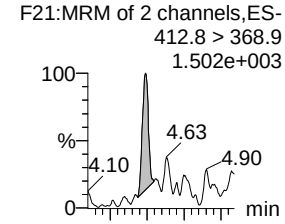

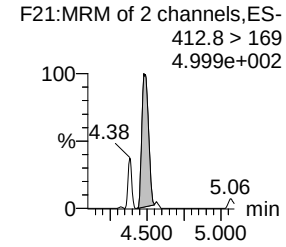

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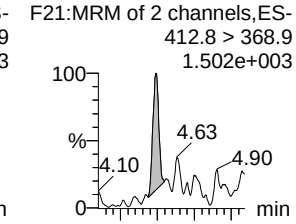

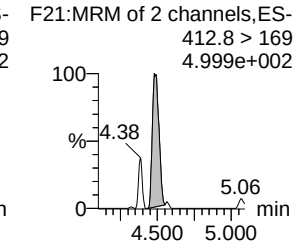

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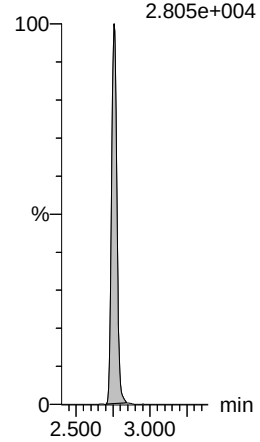

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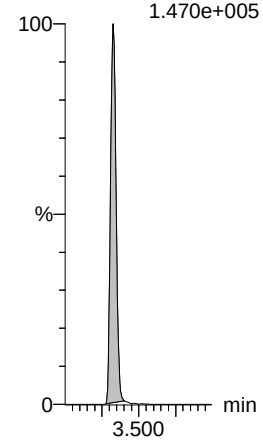

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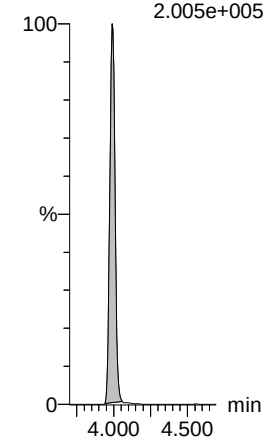

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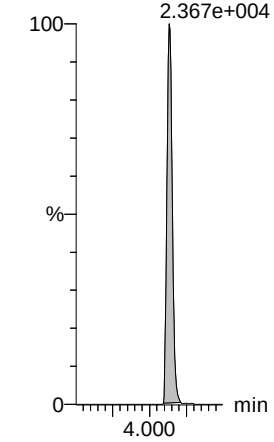

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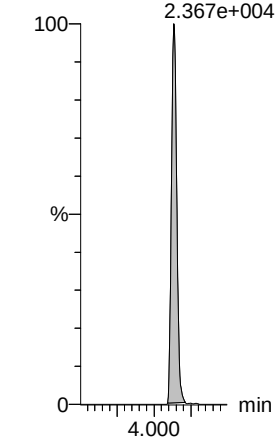

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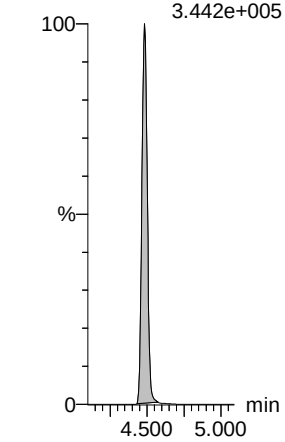

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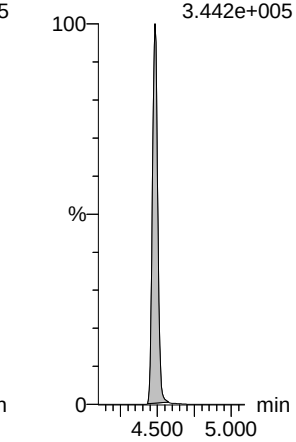

CGH 11/28/2018

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Last Altered: Wednesday, November 28, 2018 10:32:04 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:33:04 Pacific Standard Time

Name: 181126M1_30, Date: 26-Nov-2018, Time: 16:44:53, ID: 1803659-05 A1-MW-55-SA2 0.11846, Description: A1-MW-55-SA2

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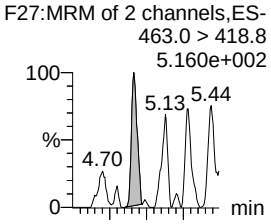

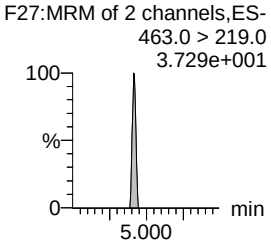

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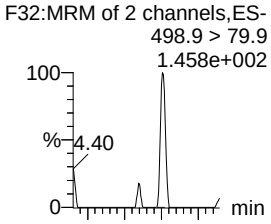

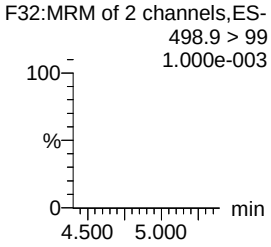

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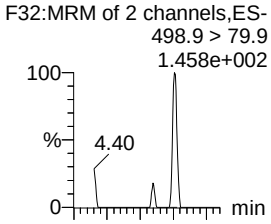

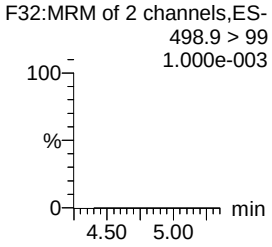

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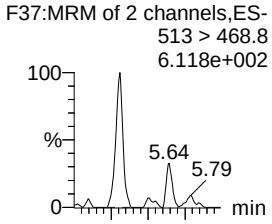

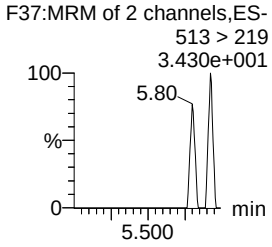

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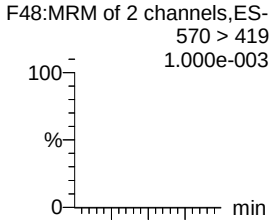

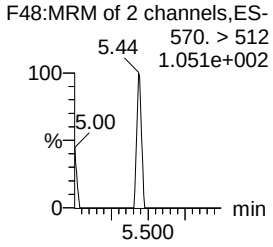

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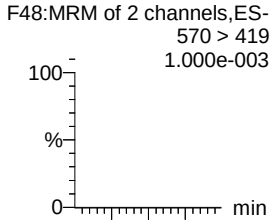

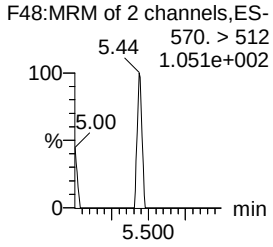

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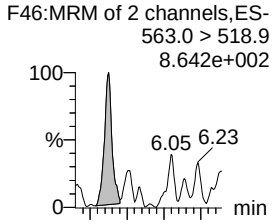

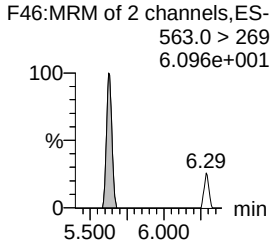

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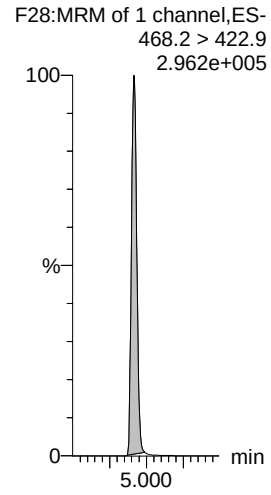

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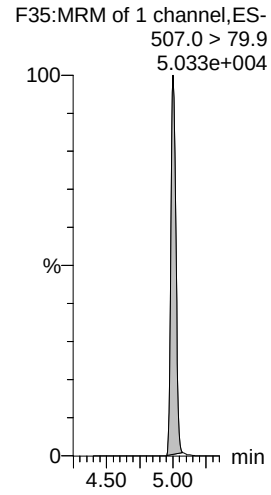

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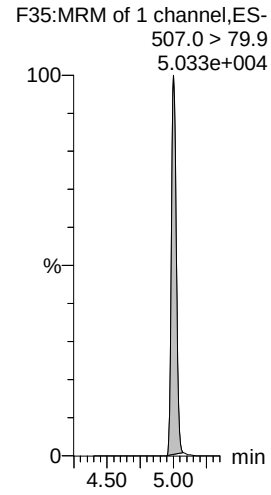

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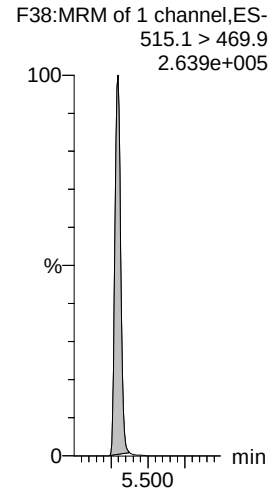

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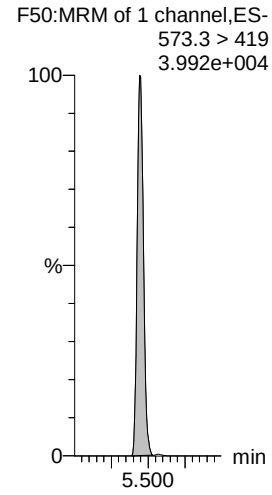

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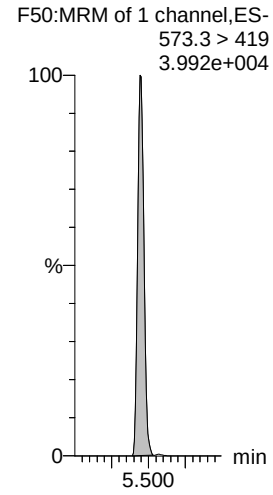

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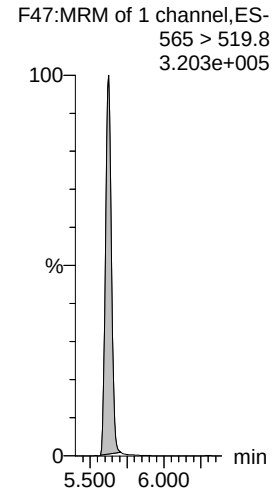

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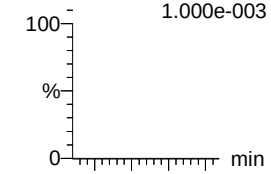
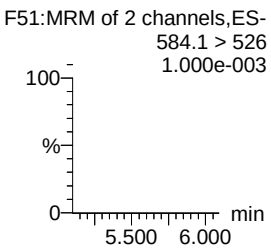
Printed: Wednesday, November 28, 2018 10:33:04 Pacific Standard Time

Name: 181126M1_30, Date: 26-Nov-2018, Time: 16:44:53, ID: 1803659-05 A1-MW-55-SA2 0.11846, Description: A1-MW-55-SA2

L-EtFOSAA





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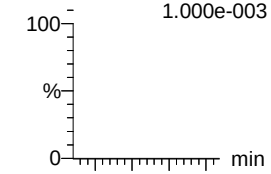

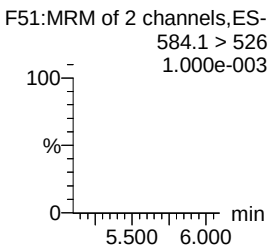

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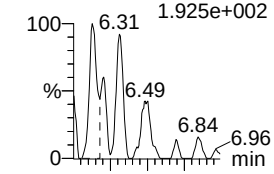

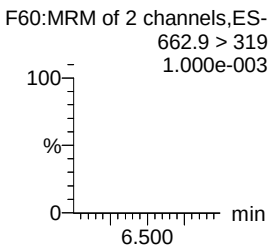

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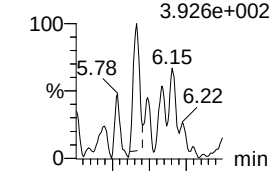

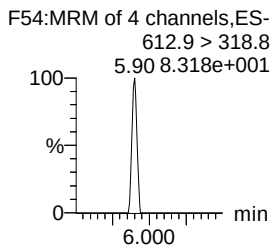

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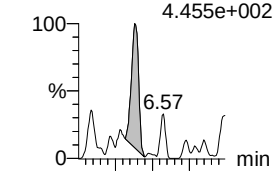
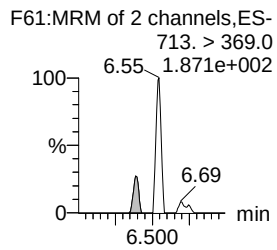
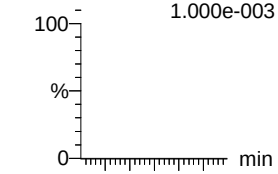
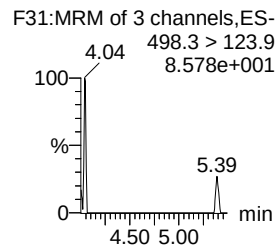


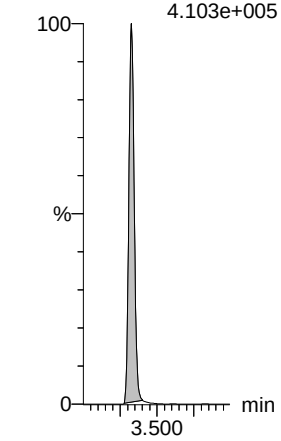


TCDA

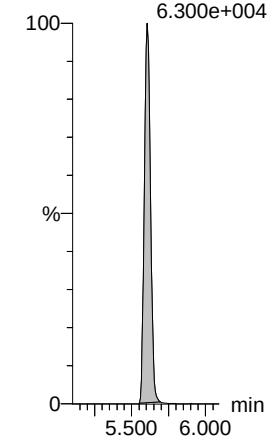




13C5-PFHxA



d5-N-EtFOSAA



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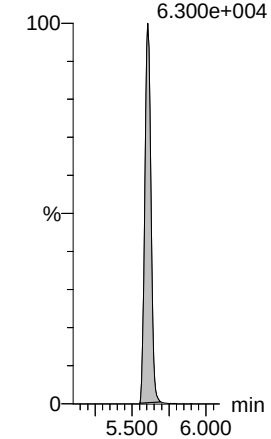
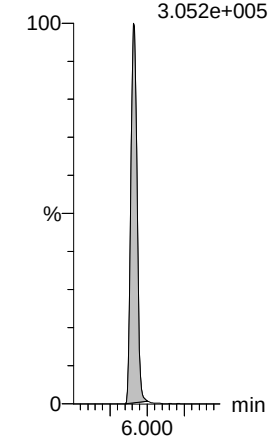


13C2-PFDoA



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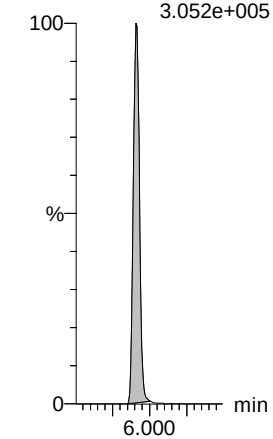
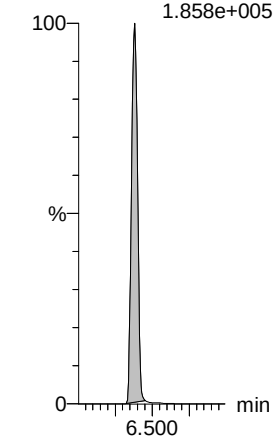
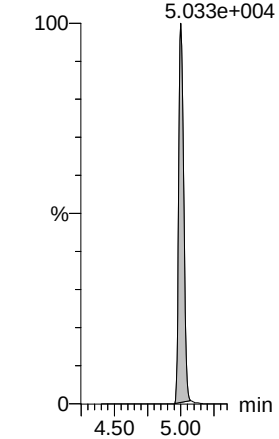


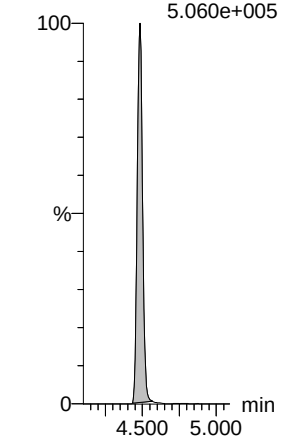
13C2-PFTeDA



13C8-PFOS



13C8-PFOA

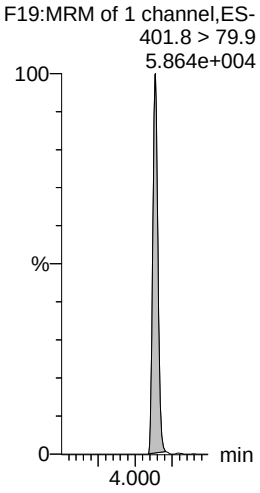


Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-30.qld

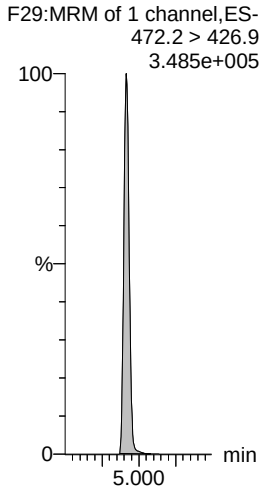
Last Altered: Wednesday, November 28, 2018 10:32:04 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:33:04 Pacific Standard Time

Name: 181126M1_30, Date: 26-Nov-2018, Time: 16:44:53, ID: 1803659-05 A1-MW-55-SA2 0.11846, Description: A1-MW-55-SA2

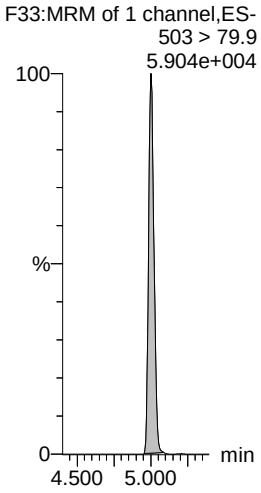
13C3-PFHxS



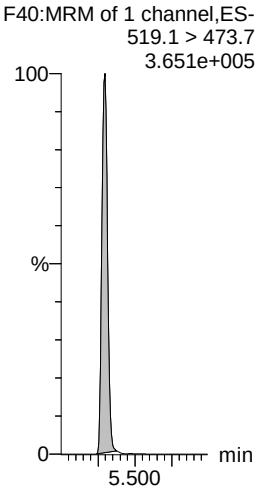
13C9-PFNA



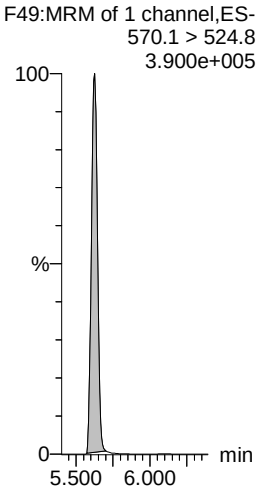
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-33.qld

Last Altered: Wednesday, November 28, 2018 10:46:47 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:47:45 Pacific Standard Time

Name: 181126M1_33, Date: 26-Nov-2018, Time: 17:16:44, ID: 1803659-06 A1-MW-54-SA2 0.11683, Description: A1-MW-54-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	3	PFBS	299.0 > 79.7	9.79e3	1.10e3	0.117		2.76	2.76	111	461.5011		2.667	NO
2	5	PFHxA	313 > 269	1.82e5	5.56e3	0.117		3.33	3.33	163	1512.2950		15.036	NO
3	7	PFHpA	363.0 > 318.9	9.71e3	7.36e3	0.117		4.00	4.00	16.5	107.2289		13.693	NO
4	8	L-PFHxS	398.9 > 79.6	1.57e4	9.57e2	0.117		4.13	4.14	205	898.5251		1.824	NO
5	68	Total PFHxS	398.9 > 79.6	1.57e4	9.57e2	0.117		4.28		205	898.5251			
6	11	L-PFOA	412.8 > 368.9	3.97e4	1.35e4	0.117		4.47	4.49	36.6	229.9503		2.957	NO
7	69	Total PFOA	412.8 > 368.9	3.97e4	1.35e4	0.117		4.62		36.6	229.9503			
8	38	13C3-PFBS	302. > 98.8	1.10e3	2.16e3	0.117	0.537	2.72	2.76	6.39	101.8697	95.2		
9	40	13C2-PFHxA	315 > 270	5.56e3	1.54e4	0.117	0.988	3.30	3.33	4.52	39.1312	91.4		
10	41	13C4-PFHpA	367.2 > 321.8	7.36e3	1.54e4	0.117	0.537	3.97	4.00	5.99	95.4828	89.2		
11	42	18O2-PFHxS	403.0 > 102.6	9.57e2	2.16e3	0.117	0.448	4.11	4.13	5.54	105.7613	98.8		
12	42	18O2-PFHxS	403.0 > 102.6	9.57e2	2.16e3	0.117	0.448	4.11	4.13	5.54	105.7613	98.8		
13	44	13C2-PFOA	414.9 > 369.7	1.35e4	1.90e4	0.117	0.755	4.46	4.48	8.92	101.1554	94.5		
14	44	13C2-PFOA	414.9 > 369.7	1.35e4	1.90e4	0.117	0.755	4.46	4.48	8.92	101.1554	94.5		
15	-1													
16	14	PFNA	463.0 > 418.8		1.09e4	0.117		4.90						
17	16	L-PFOS	498.9 > 79.9	3.58e2	2.29e3	0.117		5.02	4.86	1.96	14.9506		3.094	YES
18	70	Total PFOS	498.9 > 79.9	3.58e2	2.29e3	0.117		5.13		1.96	14.9506			
19	18	PFDA	513 > 468.8		9.88e3	0.117		5.28						
20	21	L-MeFOSAA	570 > 419		1.46e3	0.117		5.43						
21	71	Total N-MeFOSAA	570. > 419	0.00e0	1.46e3	0.117		5.57		0.000				
22	25	PFUdA	563.0 > 518.9	3.70e1	1.07e4	0.117		5.61	5.62	0.0430			23.910	YES
23	45	13C5-PFNA	468.2 > 422.9	1.09e4	1.33e4	0.117	0.991	4.90	4.92	10.2	88.4234	82.6		
24	47	13C8-PFOS	507.0 > 79.9	2.29e3	2.45e3	0.117	1.042	4.98	5.00	11.7	95.7873	89.5		
25	47	13C8-PFOS	507.0 > 79.9	2.29e3	2.45e3	0.117	1.042	4.98	5.00	11.7	95.7873	89.5		
26	48	13C2-PFDA	515.1 > 469.9	9.88e3	1.46e4	0.117	0.902	5.28	5.30	8.46	80.2470	75.0		
27	50	d3-N-MeFOSAA	573.3 > 419	1.46e3	1.66e4	0.117	0.135	5.43	5.45	1.10	69.8869	65.3		
28	50	d3-N-MeFOSAA	573.3 > 419	1.46e3	1.66e4	0.117	0.135	5.43	5.45	1.10	69.8869	65.3		
29	51	13C2-PFUdA	565 > 519.8	1.07e4	1.66e4	0.117	0.957	5.61	5.63	8.09	72.3063	67.6		
30	-1													
31	23	L-EtFOSAA	584.1 > 419		2.20e3	0.117		5.51						
32	72	Total N-EtFOSAA	584.1 > 419	0.00e0	2.20e3	0.117		5.72		0.000				
33	29	PFTrDA	662.9 > 618.9		9.35e3	0.117		6.15						
34	27	PFDoA	612.9 > 569.0		9.35e3	0.117		5.90						
35	30	PFTeDA	713.0 > 669.0	1.44e1	5.46e3	0.117		6.37	6.40	0.0329			38.616	YES
36	73	TCDA	498.3>106.9			0.117		5.15						

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Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-33.qld

Last Altered: Wednesday, November 28, 2018 10:46:47 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:47:45 Pacific Standard Time

Name: 181126M1_33, Date: 26-Nov-2018, Time: 17:16:44, ID: 1803659-06 A1-MW-54-SA2 0.11683, Description: A1-MW-54-SA2

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	61	13C5-PFHxA	318 > 272.9	1.54e4	1.54e4	0.117	1.000	3.30	3.33	12.5	106.9931	100.0		
38	52	d5-N-EtFOSAA	589.3 > 419	2.20e3	1.66e4	0.117	0.185	5.59	5.61	1.66	76.6137	71.6		
39	52	d5-N-EtFOSAA	589.3 > 419	2.20e3	1.66e4	0.117	0.185	5.59	5.61	1.66	76.6137	71.6		
40	53	13C2-PFDoA	615.0 > 569.7	9.35e3	1.46e4	0.117	1.047	5.90	5.91	8.01	65.4870	61.2		
41	53	13C2-PFDoA	615.0 > 569.7	9.35e3	1.46e4	0.117	1.047	5.90	5.91	8.01	65.4870	61.2		
42	55	13C2-PFTeDA	715.1 > 669.7	5.46e3	1.66e4	0.117	0.567	6.37	6.38	4.11	62.0178	58.0		
43	47	13C8-PFOS	507.0 > 79.9	2.29e3	2.45e3	0.117	1.042	4.98	5.00	11.7	95.7873	89.5		
44	63	13C8-PFOA	420.9 > 376	1.90e4	1.90e4	0.117	1.000	4.46	4.48	12.5	106.9931	100.0		
45	-1													
46	62	13C3-PFHxS	401.8 > 79.9	2.16e3	2.16e3	0.117	1.000	4.11	4.13	12.5	106.9931	100.0		
47	64	13C9-PFNA	472.2 > 426.9	1.33e4	1.33e4	0.117	1.000	4.90	4.91	12.5	106.9931	100.0		
48	65	13C4-PFOS	503 > 79.9	2.45e3	2.45e3	0.117	1.000	4.98	5.00	12.5	106.9931	100.0		
49	66	13C6-PFDA	519.1 > 473.7	1.46e4	1.46e4	0.117	1.000	5.28	5.30	12.5	106.9931	100.0		
50	67	13C7-PFUdA	570.1 > 524.8	1.66e4	1.66e4	0.117	1.000	5.61	5.63	12.5	106.9931	100.0		

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ANP 11/28/2018

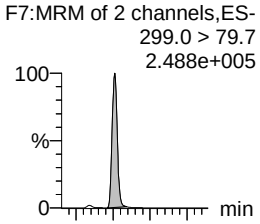
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-33.qld

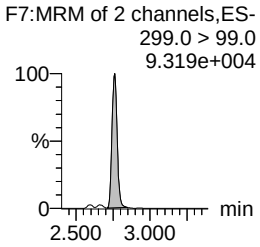
Last Altered: Wednesday, November 28, 2018 10:46:47 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:47:45 Pacific Standard Time

Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_33, Date: 26-Nov-2018, Time: 17:16:44, ID: 1803659-06 A1-MW-54-SA2 0.11683, Description: A1-MW-54-SA2

PFBS





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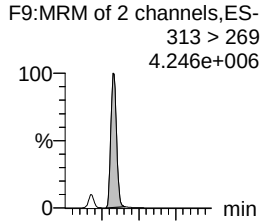

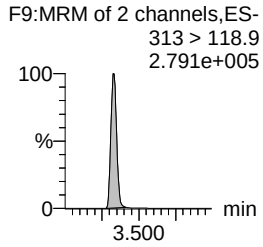

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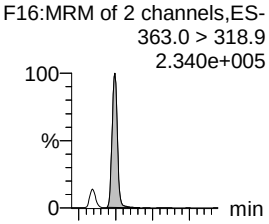
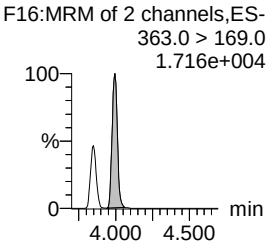
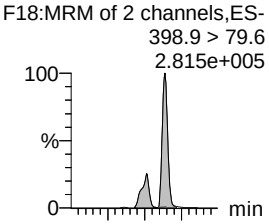
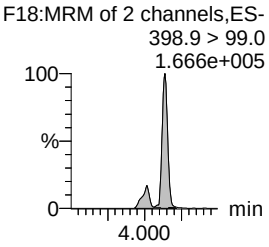


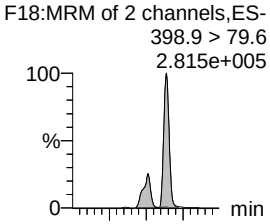


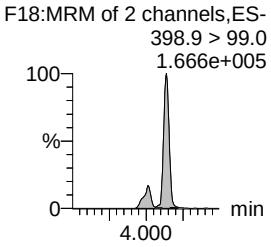
L-PFHxS



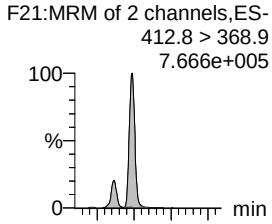


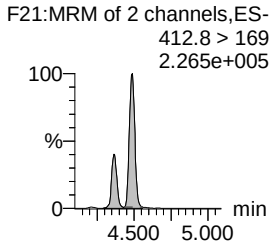
Total PFHxS



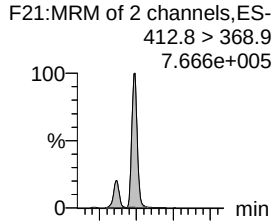


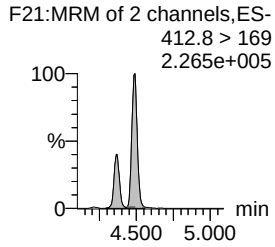
L-PFOA



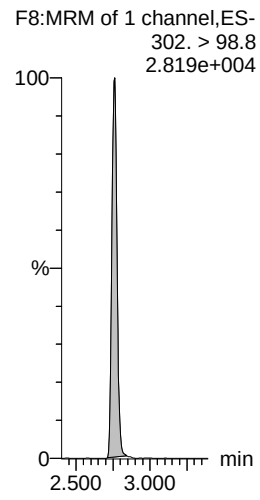


Total PFOA

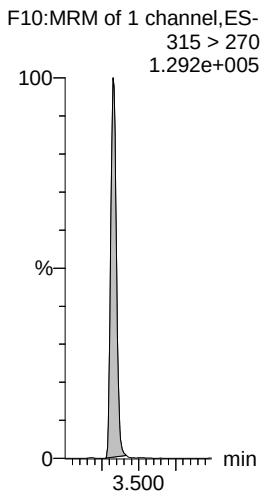




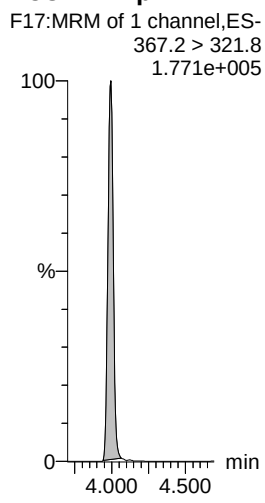
13C3-PFBS



13C2-PFHxA



13C4-PFHpA



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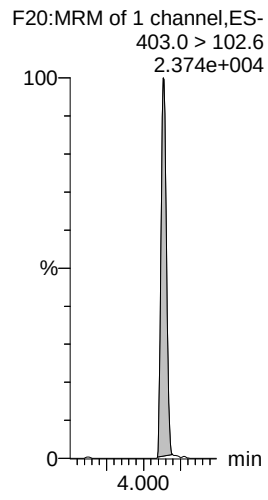

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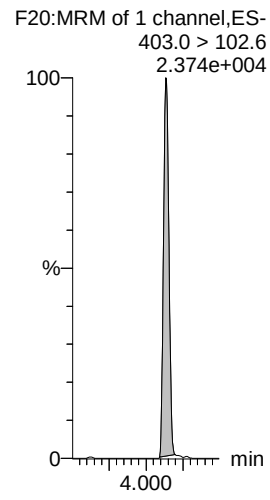

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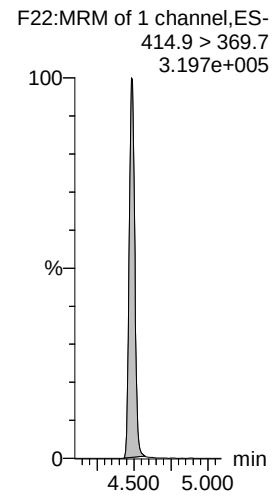

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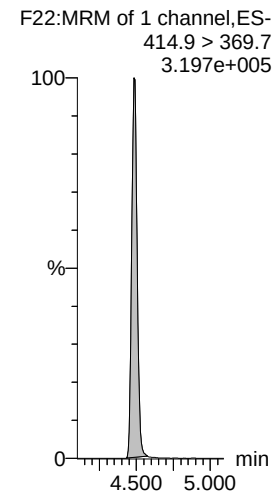

CGH 11/28/2018

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Printed: Wednesday, November 28, 2018 10:47:45 Pacific Standard Time

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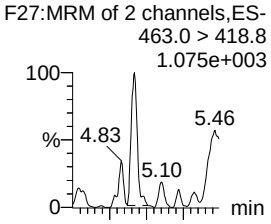

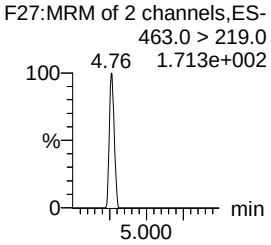

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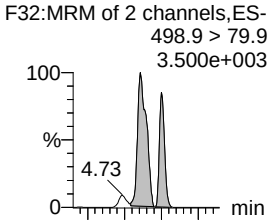

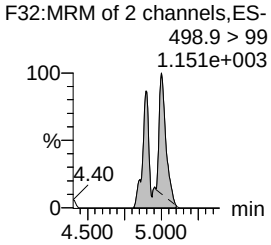

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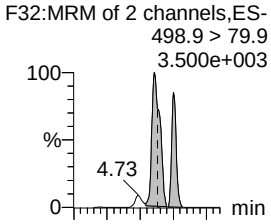

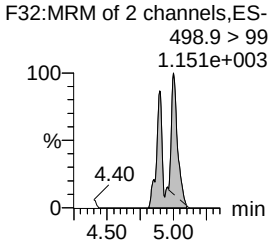

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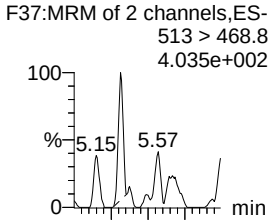

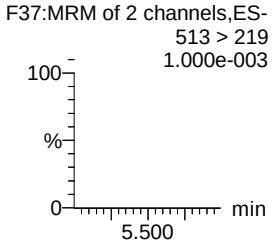

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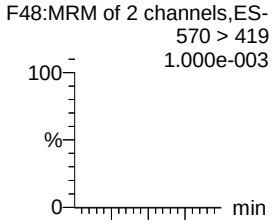

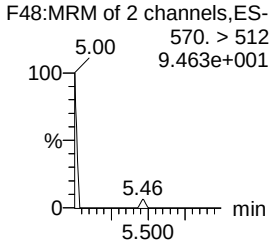

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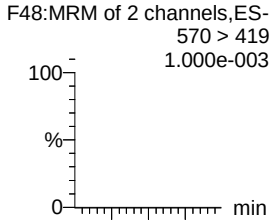

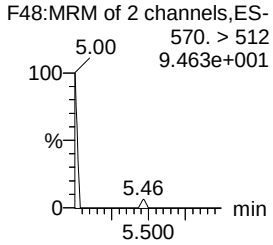

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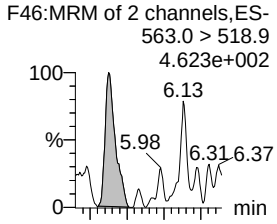

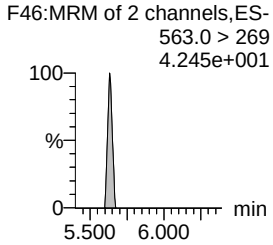

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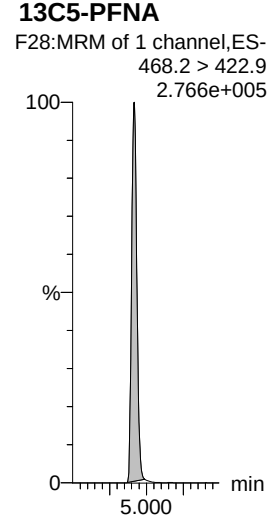

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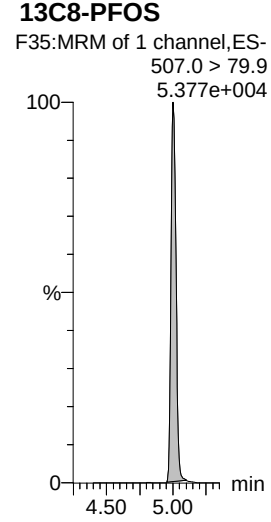

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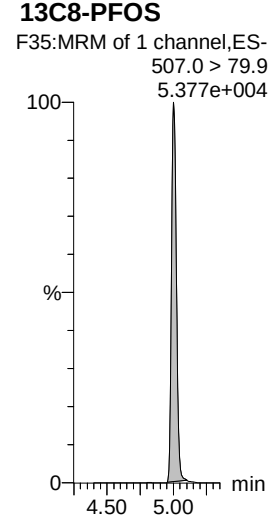

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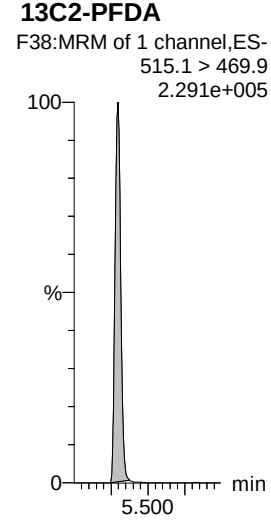

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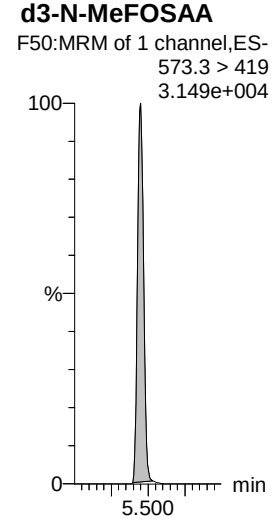

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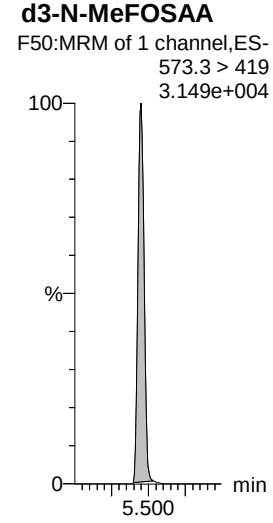

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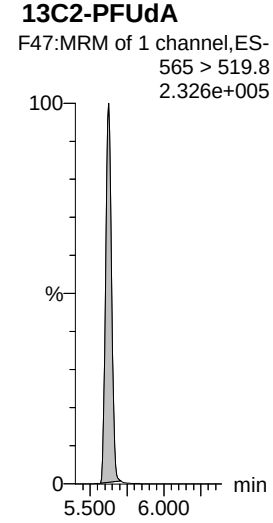

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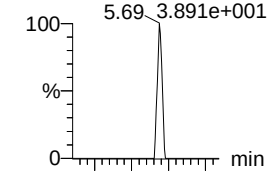
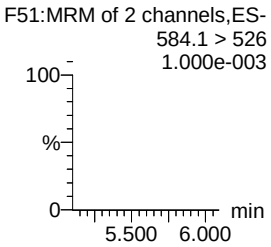
Name: 181126M1_33, Date: 26-Nov-2018, Time: 17:16:44, ID: 1803659-06 A1-MW-54-SA2 0.11683, Description: A1-MW-54-SA2

L-EtFOSAA





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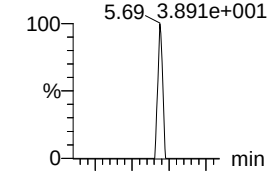

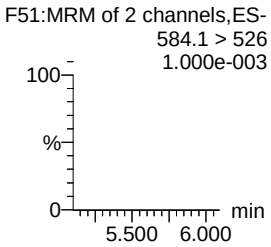

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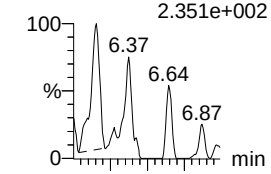
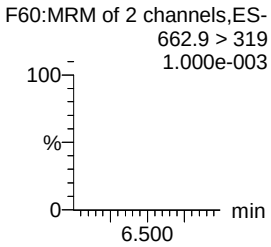
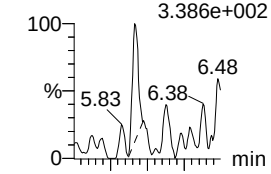
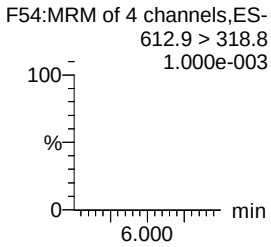




PFDoA





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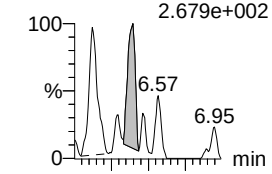

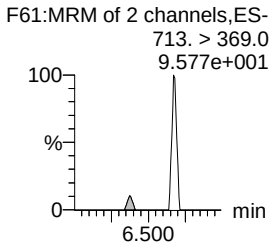

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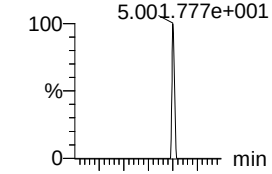

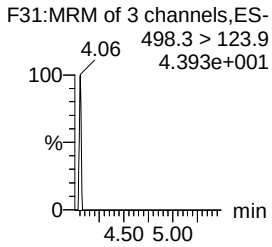

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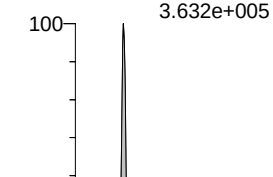

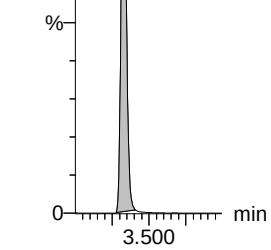

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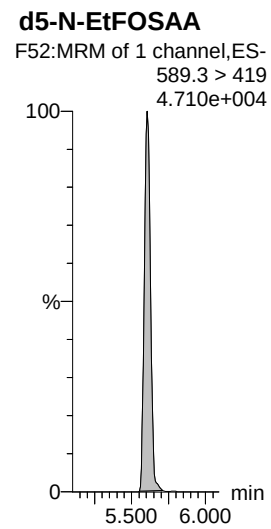

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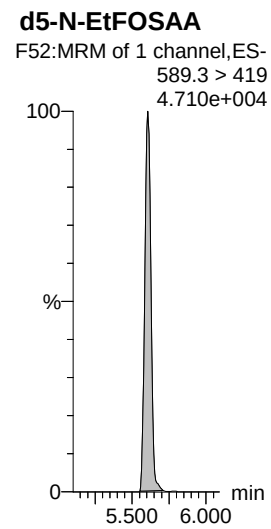

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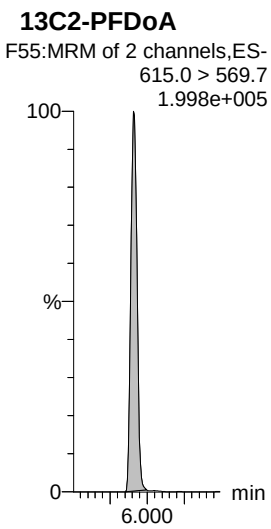

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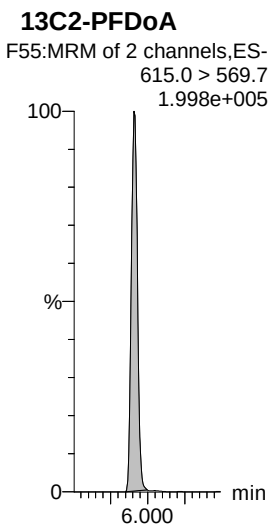

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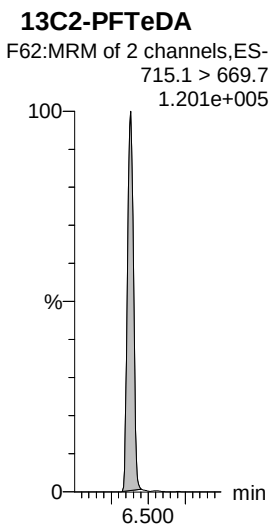

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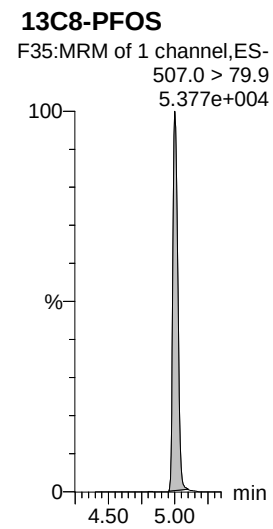

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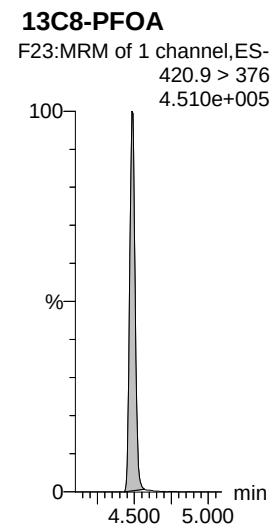

ANP 11/28/2018

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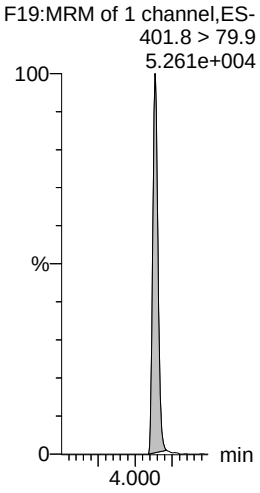
Printed: Wednesday, November 28, 2018 10:47:45 Pacific Standard Time

Name: 181126M1_33, Date: 26-Nov-2018, Time: 17:16:44, ID: 1803659-06 A1-MW-54-SA2 0.11683, Description: A1-MW-54-SA2

13C3-PFHxS



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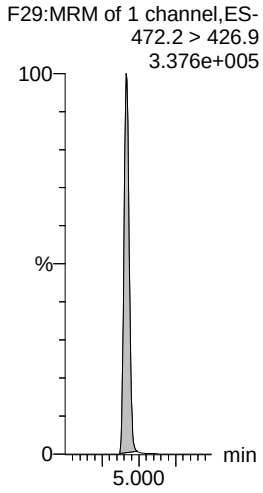

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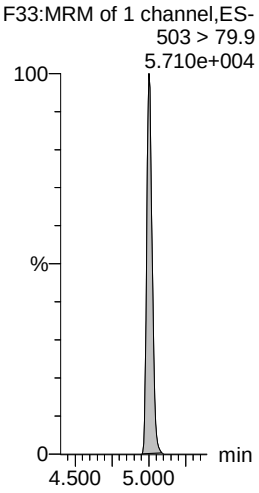

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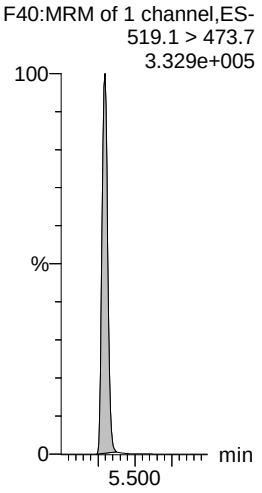

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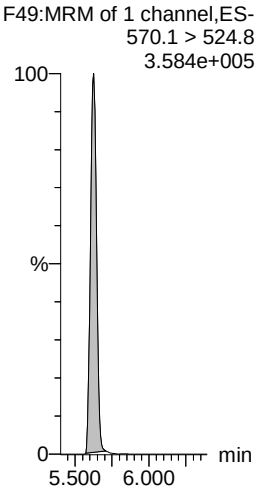

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ANP 11/28/2018

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Printed: Wednesday, November 28, 2018 10:56:07 Pacific Standard Time

Name: 181126M1_34, Date: 26-Nov-2018, Time: 17:27:17, ID: 1803659-07 FRB-20181114 0.11549, Description: FRB-20181114

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
1	3	PFBS	299.0 > 79.7	1.84e0	1.36e3	0.115		2.76	2.75	0.0169			0.423	YES
2	5	PFHxA	313 > 269	2.63e1	7.06e3	0.115		3.33	3.33	0.0186			5.739	YES
3	7	PFHpA	363.0 > 318.9		9.15e3	0.115		4.00						
4	8	L-PFHxS	398.9 > 79.6	7.66e0	1.10e3	0.115		4.14	4.14	0.0873	0.3934		20.542	YES
5	68	Total PFHxS	398.9 > 79.6	7.66e0	1.10e3	0.115		4.28		0.0873	0.3934			
6	11	L-PFOA	412.8 > 368.9	7.15e1	1.53e4	0.115		4.47	4.49	0.0584			12.222	YES
7	69	Total PFOA	412.8 > 368.9	7.15e1	1.53e4	0.115		4.62		0.000				
8	38	13C3-PFBS	302. > 98.8	1.36e3	2.52e3	0.115	0.537	2.72	2.76	6.75	108.7729	100.5		
9	40	13C2-PFHxA	315 > 270	7.06e3	1.93e4	0.115	0.988	3.30	3.33	4.57	40.0231	92.4		
10	41	13C4-PFHpA	367.2 > 321.8	9.15e3	1.93e4	0.115	0.537	3.97	4.00	5.92	95.5270	88.3		
11	42	18O2-PFHxS	403.0 > 102.6	1.10e3	2.52e3	0.115	0.448	4.11	4.14	5.43	104.9919	97.0		
12	42	18O2-PFHxS	403.0 > 102.6	1.10e3	2.52e3	0.115	0.448	4.11	4.14	5.43	104.9919	97.0		
13	44	13C2-PFOA	414.9 > 369.7	1.53e4	2.16e4	0.115	0.755	4.46	4.49	8.87	101.7685	94.0		
14	44	13C2-PFOA	414.9 > 369.7	1.53e4	2.16e4	0.115	0.755	4.46	4.49	8.87	101.7685	94.0		
15	-1													
16	14	PFNA	463.0 > 418.8	1.66e1	1.28e4	0.115		4.90	4.91	0.0162			59.586	YES
17	16	L-PFOS	498.9 > 79.9		2.64e3	0.115		5.02						
18	70	Total PFOS	498.9 > 79.9	0.00e0	2.64e3	0.115		5.13		0.000				
19	18	PFDA	513 > 468.8	2.73e1	1.21e4	0.115		5.28	5.30	0.0283	0.0098		14.076	YES
20	21	L-MeFOSAA	570 > 419		2.21e3	0.115		5.43						
21	71	Total N-MeFOSAA	570. > 419	0.00e0	2.21e3	0.115		5.57		0.000				
22	25	PFUdA	563.0 > 518.9	2.54e1	1.50e4	0.115		5.61	5.63	0.0212			22.739	YES
23	45	13C5-PFNA	468.2 > 422.9	1.28e4	1.46e4	0.115	0.991	4.90	4.92	11.0	95.8654	88.6		
24	47	13C8-PFOS	507.0 > 79.9	2.64e3	2.53e3	0.115	1.042	4.98	5.00	13.1	108.6177	100.4		
25	47	13C8-PFOS	507.0 > 79.9	2.64e3	2.53e3	0.115	1.042	4.98	5.00	13.1	108.6177	100.4		
26	48	13C2-PFDA	515.1 > 469.9	1.21e4	1.66e4	0.115	0.902	5.28	5.30	9.10	87.3446	80.7		
27	50	d3-N-MeFOSAA	573.3 > 419	2.21e3	1.95e4	0.115	0.135	5.43	5.45	1.42	91.3610	84.4		
28	50	d3-N-MeFOSAA	573.3 > 419	2.21e3	1.95e4	0.115	0.135	5.43	5.45	1.42	91.3610	84.4		
29	51	13C2-PFUdA	565 > 519.8	1.50e4	1.95e4	0.115	0.957	5.61	5.63	9.62	86.9839	80.4		
30	-1													
31	23	L-EtFOSAA	584.1 > 419		3.13e3	0.115		5.51						
32	72	Total N-EtFOSAA	584.1 > 419	0.00e0	3.13e3	0.115		5.72		0.000				
33	29	PFTrDA	662.9 > 618.9		1.43e4	0.115		6.15						
34	27	PFDoA	612.9 > 569.0		1.43e4	0.115		5.90						
35	30	PFTeDA	713.0 > 669.0	2.81e1	9.07e3	0.115		6.37	6.37	0.0387			9.049	NO
36	73	TCDA	498.3>106.9			0.115		5.15						

CGH 11/28/2018

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Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-34.qld

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Printed: Wednesday, November 28, 2018 10:56:07 Pacific Standard Time

Name: 181126M1_34, Date: 26-Nov-2018, Time: 17:27:17, ID: 1803659-07 FRB-20181114 0.11549, Description: FRB-20181114

	#	Name	Trace	Area	IS Area	wt/vol	RRF Mean	Pred.RT	RT	Response	Conc.	%Rec	Ion Ratio	Ratio Out?
37	61	13C5-PFHxA	318 > 272.9	1.93e4	1.93e4	0.115	1.000	3.30	3.33	12.5	108.2345	100.0		
38	52	d5-N-EtFOSAA	589.3 > 419	3.13e3	1.95e4	0.115	0.185	5.59	5.61	2.01	93.8823	86.7		
39	52	d5-N-EtFOSAA	589.3 > 419	3.13e3	1.95e4	0.115	0.185	5.59	5.61	2.01	93.8823	86.7		
40	53	13C2-PFDoA	615.0 > 569.7	1.43e4	1.66e4	0.115	1.047	5.90	5.91	10.7	88.9141	82.1		
41	53	13C2-PFDoA	615.0 > 569.7	1.43e4	1.66e4	0.115	1.047	5.90	5.91	10.7	88.9141	82.1		
42	55	13C2-PFTeDA	715.1 > 669.7	9.07e3	1.95e4	0.115	0.567	6.37	6.38	5.82	88.9237	82.2		
43	47	13C8-PFOS	507.0 > 79.9	2.64e3	2.53e3	0.115	1.042	4.98	5.00	13.1	108.6177	100.4		
44	63	13C8-PFOA	420.9 > 376	2.16e4	2.16e4	0.115	1.000	4.46	4.49	12.5	108.2345	100.0		
45	-1													
46	62	13C3-PFHxS	401.8 > 79.9	2.52e3	2.52e3	0.115	1.000	4.11	4.14	12.5	108.2345	100.0		
47	64	13C9-PFNA	472.2 > 426.9	1.46e4	1.46e4	0.115	1.000	4.90	4.92	12.5	108.2345	100.0		
48	65	13C4-PFOS	503 > 79.9	2.53e3	2.53e3	0.115	1.000	4.98	5.00	12.5	108.2345	100.0		
49	66	13C6-PFDA	519.1 > 473.7	1.66e4	1.66e4	0.115	1.000	5.28	5.30	12.5	108.2345	100.0		
50	67	13C7-PFUdA	570.1 > 524.8	1.95e4	1.95e4	0.115	1.000	5.61	5.63	12.5	108.2345	100.0		

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Vista Analytical Laboratory L14

ANP 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-34.qld

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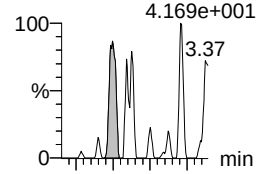
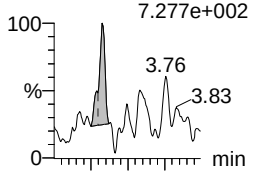
Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_34, Date: 26-Nov-2018, Time: 17:27:17, ID: 1803659-07 FRB-20181114 0.11549, Description: FRB-20181114

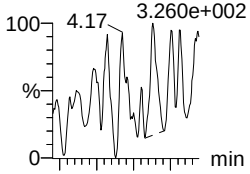
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
4.169e+001



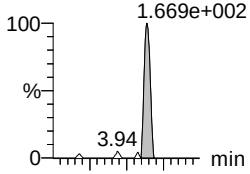
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
7.277e+002



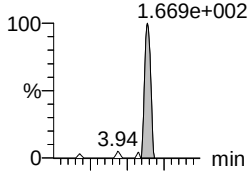
PFHpA
F16:MRM of 2 channels,ES-
363.0 > 318.9
3.260e+002



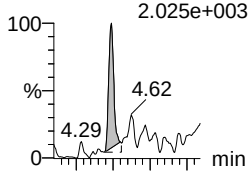
L-PFHxS
F18:MRM of 2 channels,ES-
398.9 > 79.6
1.669e+002



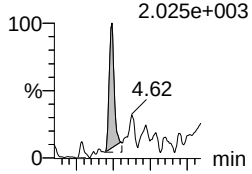
Total PFHxS
F18:MRM of 2 channels,ES-
398.9 > 79.6
1.669e+002



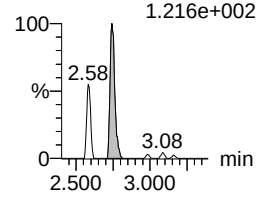
L-PFOA
F21:MRM of 2 channels,ES-
412.8 > 368.9
2.025e+003



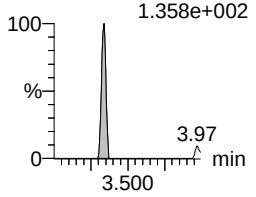
Total PFOA
F21:MRM of 2 channels,ES-
412.8 > 368.9
2.025e+003



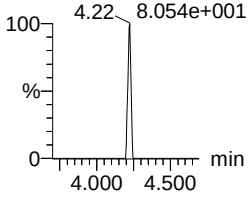
F7:MRM of 2 channels,ES-
299.0 > 99.0
1.216e+002



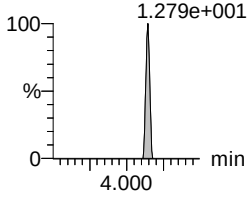
F9:MRM of 2 channels,ES-
313 > 118.9
1.358e+002



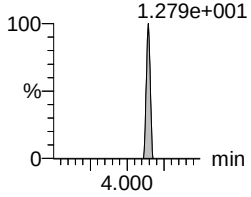
F16:MRM of 2 channels,ES-
363.0 > 169.0
8.054e+001



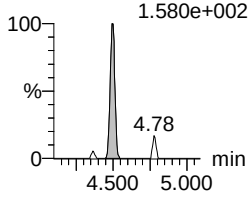
F18:MRM of 2 channels,ES-
398.9 > 99.0
1.279e+001



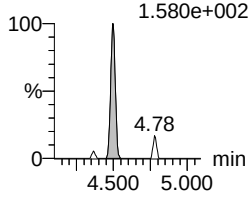
F18:MRM of 2 channels,ES-
398.9 > 99.0
1.279e+001



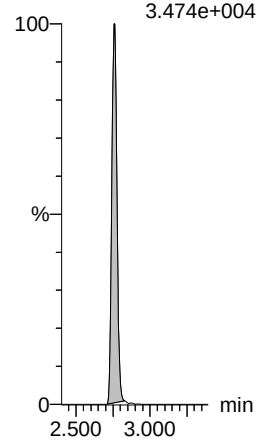
F21:MRM of 2 channels,ES-
412.8 > 169
1.580e+002



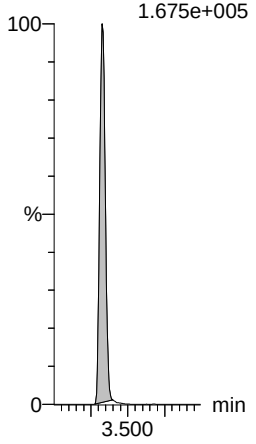
F21:MRM of 2 channels,ES-
412.8 > 169
1.580e+002



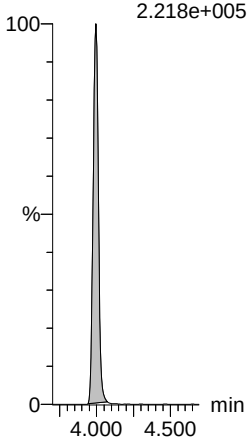
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.474e+004



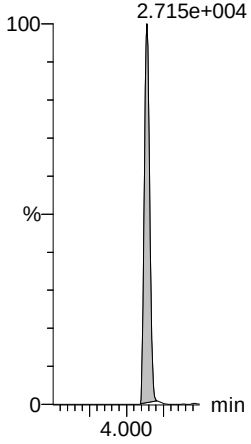
13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
1.675e+005



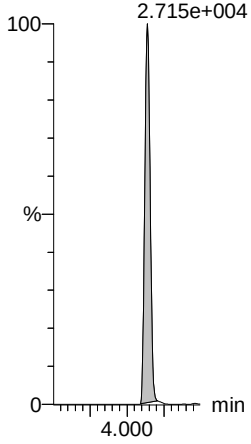
13C4-PFHpA
F17:MRM of 1 channel,ES-
367.2 > 321.8
2.218e+005



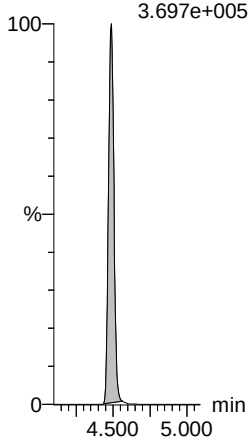
18O2-PFHxS
F20:MRM of 1 channel,ES-
403.0 > 102.6
2.715e+004



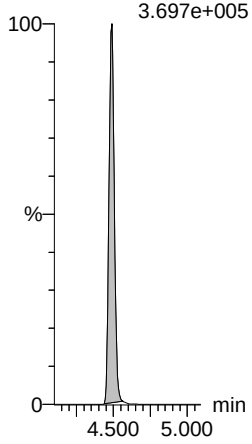
18O2-PFHxS
F20:MRM of 1 channel,ES-
403.0 > 102.6
2.715e+004



13C2-PFOA
F22:MRM of 1 channel,ES-
414.9 > 369.7
3.697e+005



13C2-PFOA
F22:MRM of 1 channel,ES-
414.9 > 369.7
3.697e+005



CGH 11/28/2018

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-34.qld

Last Altered: Wednesday, November 28, 2018 10:54:08 Pacific Standard Time
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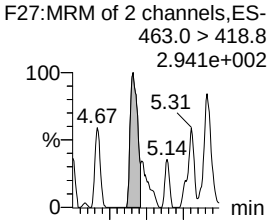
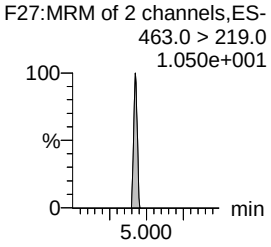
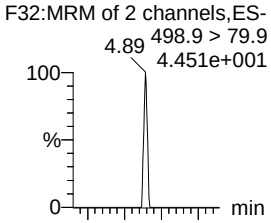
Name: 181126M1_34, Date: 26-Nov-2018, Time: 17:27:17, ID: 1803659-07 FRB-20181114 0.11549, Description: FRB-20181114

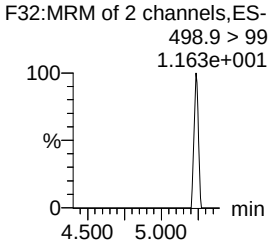
PFNA



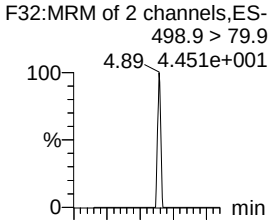


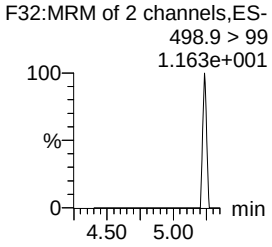
L-PFOS





Total PFOS





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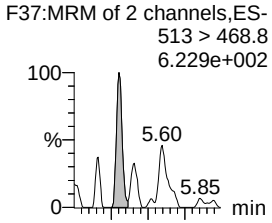
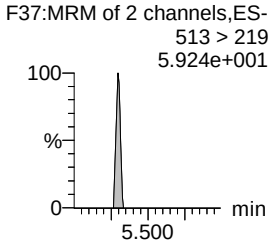
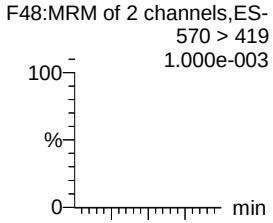
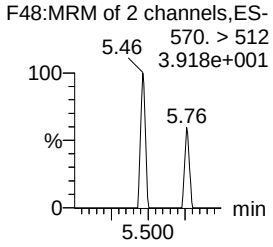


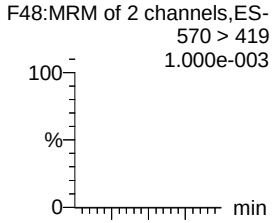


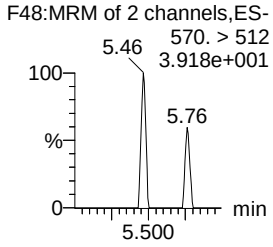
L-MeFOSAA



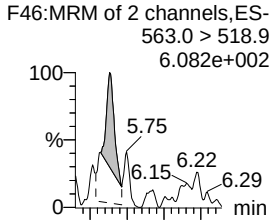


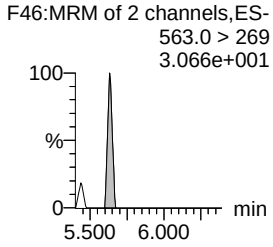
Total N-MeFOSAA



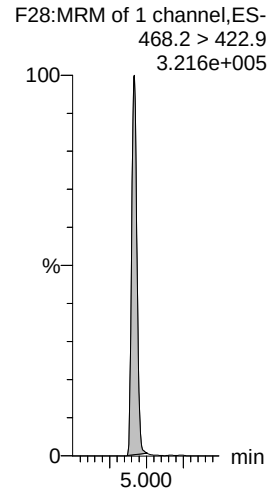


PFUdA

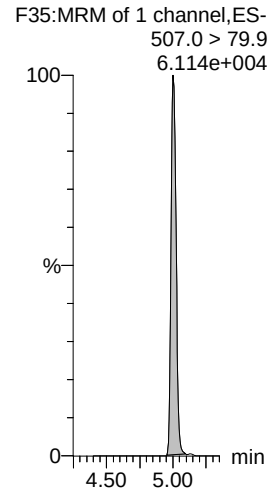




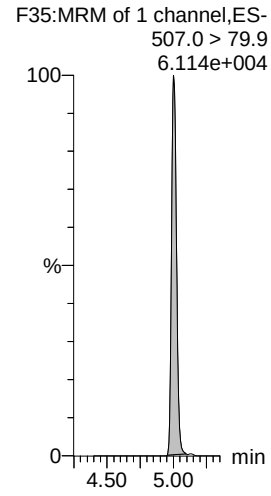
13C5-PFNA



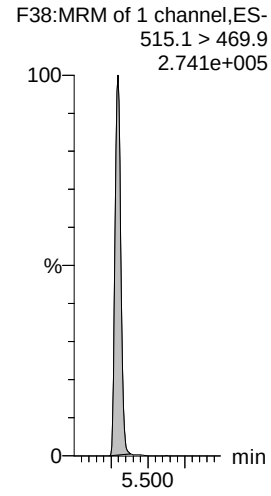
13C8-PFOS



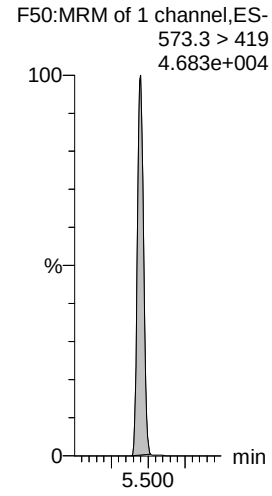
13C8-PFOS



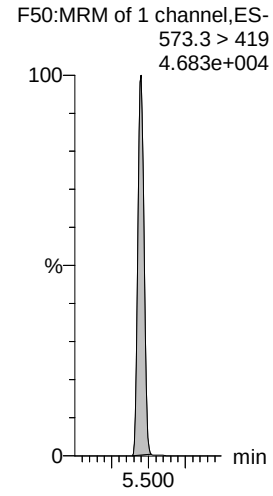
13C2-PFDA



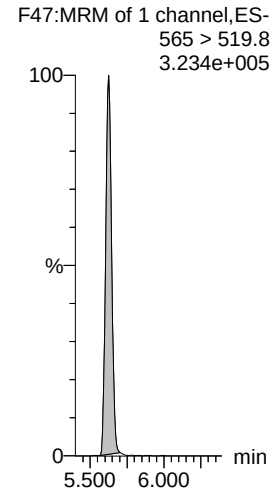
d3-N-MeFOSAA



d3-N-MeFOSAA



13C2-PFUdA

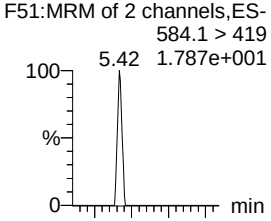


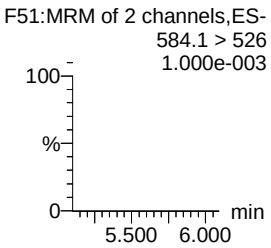
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-34.qld

Last Altered: Wednesday, November 28, 2018 10:54:08 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:56:07 Pacific Standard Time

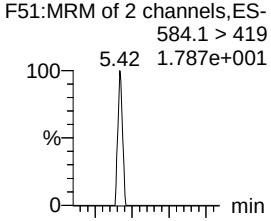
Name: 181126M1_34, Date: 26-Nov-2018, Time: 17:27:17, ID: 1803659-07 FRB-20181114 0.11549, Description: FRB-20181114

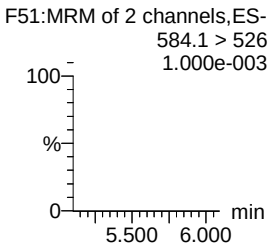
L-EtFOSAA



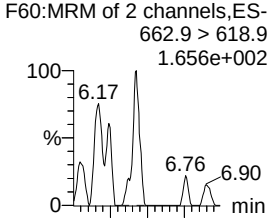


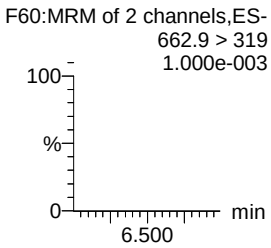
Total N-EtFOSAA



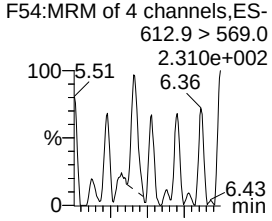


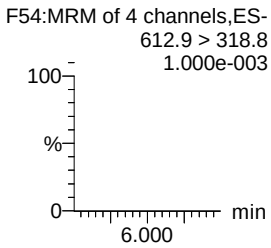
PFTrDA



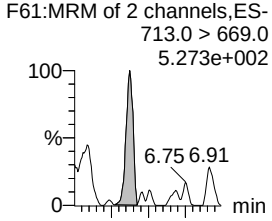


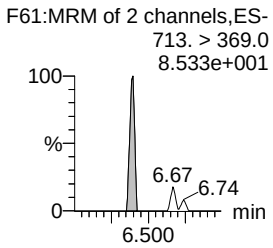
PFDoA



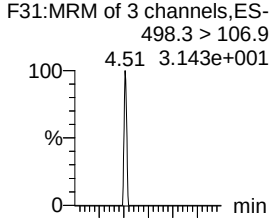


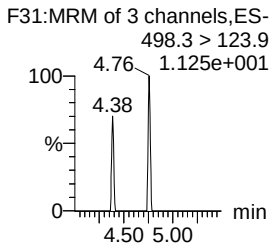
PFTeDA



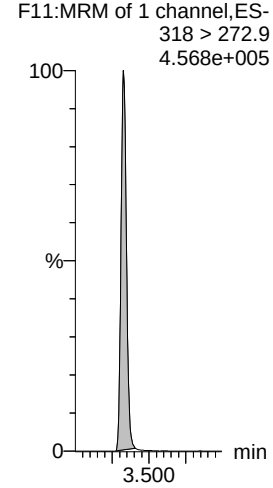


TCDA

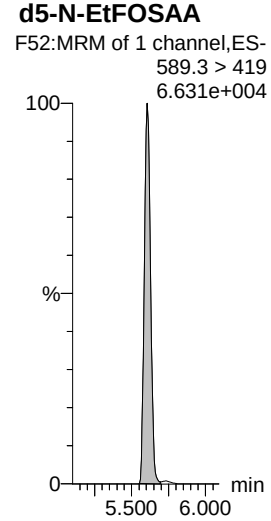




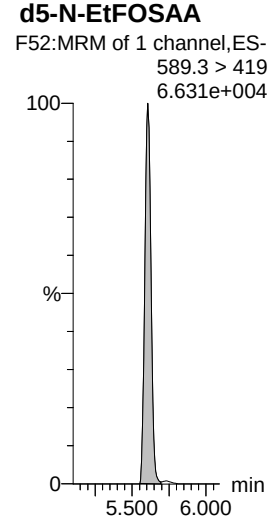
13C5-PFHxA



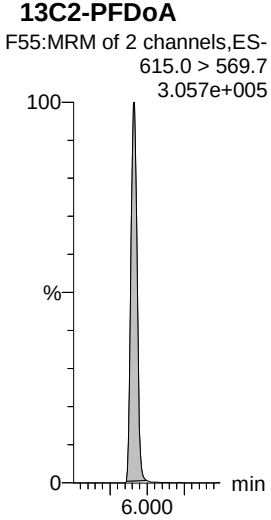
d5-N-EtFOSAA



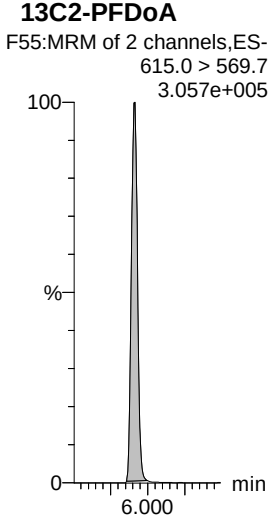
d5-N-EtFOSAA



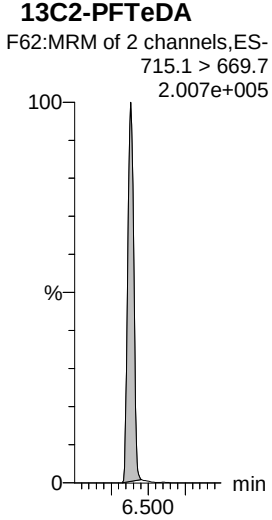
13C2-PFDoA



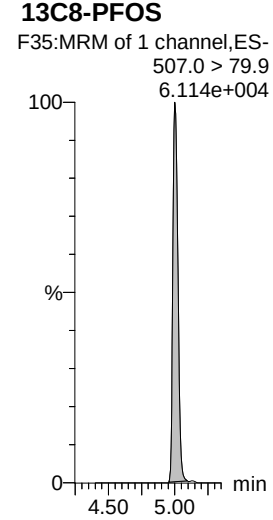
13C2-PFDoA



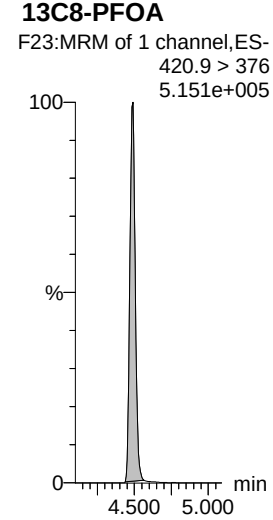
13C2-PFTeDA



13C8-PFOS



13C8-PFOA

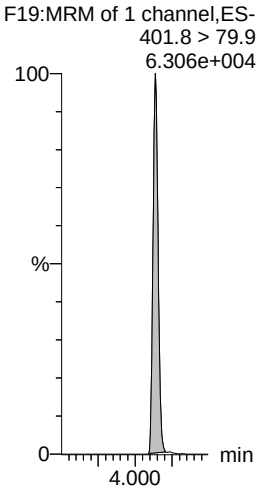


Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-34.qld

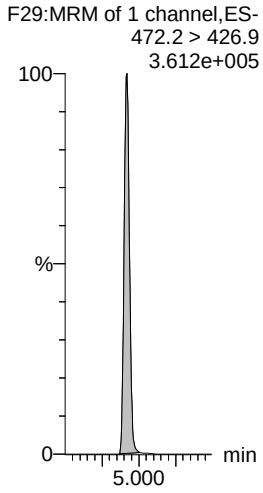
Last Altered: Wednesday, November 28, 2018 10:54:08 Pacific Standard Time
Printed: Wednesday, November 28, 2018 10:56:07 Pacific Standard Time

Name: 181126M1_34, Date: 26-Nov-2018, Time: 17:27:17, ID: 1803659-07 FRB-20181114 0.11549, Description: FRB-20181114

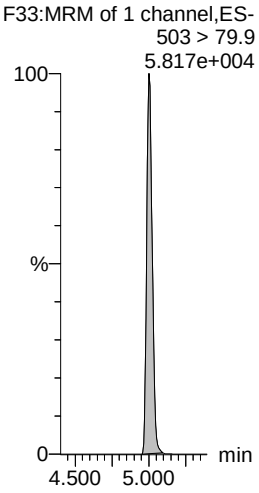
13C3-PFHxS



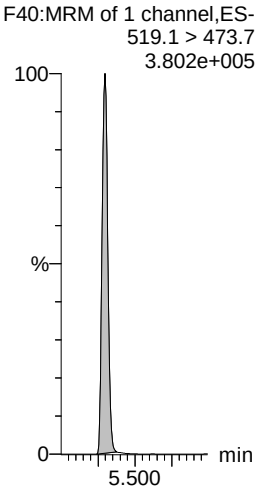
13C9-PFNA



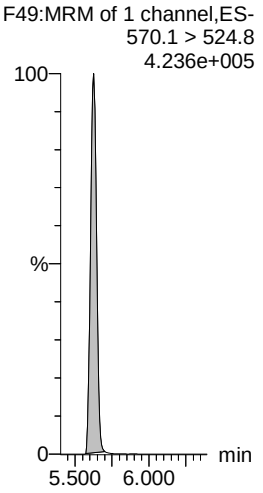
13C4-PFOS



13C6-PFDA



13C7-PFUdA



INJECTION INTERNAL STANDARD (IIS) AREAS,

INSTRUMENT BLANKS (IB)

AND

CONTINUTING CALIBRATION VERIFICATIONS CCV)

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-IIS AREA.qld

Last Altered: Tuesday, November 27, 2018 08:53:34 Pacific Standard Time
Printed: Tuesday, November 27, 2018 08:57:24 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_RS-11-14-18.mdb 14 Nov 2018 11:37:25
Calibration: 27 Nov 2018 08:53:34

Name: 181126M1_7, Date: 26-Nov-2018, Time: 12:38:59, ID: ST181126M2-6 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M2-6 PFC CS3 18K1906	8.41e3	98.4	NO
2	2	13C5-PFHxA	ST181126M2-6 PFC CS3 18K1906	2.53e4	100.0	NO
3	3	13C3-PFHxS	ST181126M2-6 PFC CS3 18K1906	3.33e3	100.0	NO
4	4	13C8-PFOA	ST181126M2-6 PFC CS3 18K1906	3.06e4	100.5	NO
5	5	13C9-PFNA	ST181126M2-6 PFC CS3 18K1906	2.16e4	99.0	NO
6	6	13C4-PFOS	ST181126M2-6 PFC CS3 18K1906	3.39e3	100.6	NO
7	7	13C6-PFDA	ST181126M2-6 PFC CS3 18K1906	2.38e4	101.3	NO
8	8	13C7-PFUdA	ST181126M2-6 PFC CS3 18K1906	2.72e4	101.8	NO

Name: 181126M1_8, Date: 26-Nov-2018, Time: 12:49:38, ID: ST181126M2-7 PFC CS4 1810907, Description: PFC CS4 18K1907

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M2-7 PFC CS4 1810907	8.78e3	102.7	NO
2	2	13C5-PFHxA	ST181126M2-7 PFC CS4 1810907	2.65e4	104.7	NO
3	3	13C3-PFHxS	ST181126M2-7 PFC CS4 1810907	3.60e3	108.3	NO
4	4	13C8-PFOA	ST181126M2-7 PFC CS4 1810907	3.30e4	108.4	NO
5	5	13C9-PFNA	ST181126M2-7 PFC CS4 1810907	2.27e4	104.2	NO
6	6	13C4-PFOS	ST181126M2-7 PFC CS4 1810907	3.54e3	104.8	NO
7	7	13C6-PFDA	ST181126M2-7 PFC CS4 1810907	2.48e4	105.4	NO
8	8	13C7-PFUdA	ST181126M2-7 PFC CS4 1810907	2.83e4	106.1	NO

Name: 181126M1_9, Date: 26-Nov-2018, Time: 13:00:11, ID: ST181126M2-8 PFC CS5 18K1908, Description: PFC CS5 18K1908

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M2-8 PFC CS5 18K1908	8.53e3	99.8	NO
2	2	13C5-PFHxA	ST181126M2-8 PFC CS5 18K1908	2.56e4	100.9	NO
3	3	13C3-PFHxS	ST181126M2-8 PFC CS5 18K1908	3.32e3	99.7	NO
4	4	13C8-PFOA	ST181126M2-8 PFC CS5 18K1908	3.00e4	98.5	NO
5	5	13C9-PFNA	ST181126M2-8 PFC CS5 18K1908	2.25e4	103.3	NO
6	6	13C4-PFOS	ST181126M2-8 PFC CS5 18K1908	3.35e3	99.2	NO
7	7	13C6-PFDA	ST181126M2-8 PFC CS5 18K1908	2.36e4	100.3	NO
8	8	13C7-PFUdA	ST181126M2-8 PFC CS5 18K1908	2.67e4	99.9	NO

Name: 181126M1_10, Date: 26-Nov-2018, Time: 13:10:49, ID: ST181126M2-9 PFC CS6 18K1909, Description: PFC CS6 18K1909

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M2-9 PFC CS6 18K1909	8.47e3	99.1	NO
2	2	13C5-PFHxA	ST181126M2-9 PFC CS6 18K1909	2.39e4	94.4	NO
3	3	13C3-PFHxS	ST181126M2-9 PFC CS6 18K1909	3.06e3	92.1	NO
4	4	13C8-PFOA	ST181126M2-9 PFC CS6 18K1909	2.82e4	92.6	NO
5	5	13C9-PFNA	ST181126M2-9 PFC CS6 18K1909	2.04e4	93.4	NO
6	6	13C4-PFOS	ST181126M2-9 PFC CS6 18K1909	3.22e3	95.4	NO
7	7	13C6-PFDA	ST181126M2-9 PFC CS6 18K1909	2.19e4	93.0	NO
8	8	13C7-PFUdA	ST181126M2-9 PFC CS6 18K1909	2.46e4	92.2	NO

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-IIS AREA.qld

Last Altered: Tuesday, November 27, 2018 08:53:34 Pacific Standard Time
Printed: Tuesday, November 27, 2018 08:57:24 Pacific Standard Time

Name: 181126M1_11, Date: 26-Nov-2018, Time: 13:21:23, ID: ST181126M2-10 PFC CS7 18K1910, Description: PFC CS7 18K1910

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M2-10 PFC CS7 18K1910	9.09e3	106.3	NO
2	2	13C5-PFHxA	ST181126M2-10 PFC CS7 18K1910	2.23e4	88.1	NO
3	3	13C3-PFHxS	ST181126M2-10 PFC CS7 18K1910	2.56e3	76.9	NO
4	4	13C8-PFOA	ST181126M2-10 PFC CS7 18K1910	2.57e4	84.5	NO
5	5	13C9-PFNA	ST181126M2-10 PFC CS7 18K1910	1.85e4	85.0	NO
6	6	13C4-PFOS	ST181126M2-10 PFC CS7 18K1910	2.86e3	84.7	NO
7	7	13C6-PFDA	ST181126M2-10 PFC CS7 18K1910	1.89e4	80.4	NO
8	8	13C7-PFUdA	ST181126M2-10 PFC CS7 18K1910	2.13e4	79.8	NO

Name: 181126M1_12, Date: 26-Nov-2018, Time: 13:32:01, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181126M1_13, Date: 26-Nov-2018, Time: 13:42:34, ID: ICV181126M2-1 PFC ICV 18K1911, Description: PFC ICV 18K1911

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ICV181126M2-1 PFC ICV 18K1911	9.00e3	105.3	NO
2	2	13C5-PFHxA	ICV181126M2-1 PFC ICV 18K1911	2.51e4	98.9	NO
3	3	13C3-PFHxS	ICV181126M2-1 PFC ICV 18K1911	3.19e3	95.9	NO
4	4	13C8-PFOA	ICV181126M2-1 PFC ICV 18K1911	2.94e4	96.5	NO
5	5	13C9-PFNA	ICV181126M2-1 PFC ICV 18K1911	2.13e4	97.6	NO
6	6	13C4-PFOS	ICV181126M2-1 PFC ICV 18K1911	3.20e3	94.9	NO
7	7	13C6-PFDA	ICV181126M2-1 PFC ICV 18K1911	2.29e4	97.2	NO
8	8	13C7-PFUdA	ICV181126M2-1 PFC ICV 18K1911	2.72e4	102.0	NO

Name: 181126M1_14, Date: 26-Nov-2018, Time: 13:53:12, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

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Name: 181126M1_15, Date: 26-Nov-2018, Time: 14:03:48, ID: B8K0097-BSD1 LCSD 0.125, Description: LCSD

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0097-BSD1 LCSD 0.125	1.44e4	168.3	YES
2	2	13C5-PFHxA	B8K0097-BSD1 LCSD 0.125	2.64e4	104.2	NO
3	3	13C3-PFHxS	B8K0097-BSD1 LCSD 0.125	3.49e3	104.8	NO
4	4	13C8-PFOA	B8K0097-BSD1 LCSD 0.125	3.11e4	102.2	NO
5	5	13C9-PFNA	B8K0097-BSD1 LCSD 0.125	2.25e4	103.1	NO
6	6	13C4-PFOS	B8K0097-BSD1 LCSD 0.125	3.46e3	102.6	NO
7	7	13C6-PFDA	B8K0097-BSD1 LCSD 0.125	2.43e4	103.1	NO
8	8	13C7-PFUdA	B8K0097-BSD1 LCSD 0.125	2.82e4	105.6	NO

Name: 181126M1_16, Date: 26-Nov-2018, Time: 14:14:24, ID: 1803629-06 REEPDW585 0.11471, Description: REEPDW585

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803629-06 REEPDW585 0.11471	1.39e4	163.0	YES
2	2	13C5-PFHxA	1803629-06 REEPDW585 0.11471	2.58e4	101.7	NO
3	3	13C3-PFHxS	1803629-06 REEPDW585 0.11471	3.33e3	100.0	NO
4	4	13C8-PFOA	1803629-06 REEPDW585 0.11471	3.10e4	101.9	NO
5	5	13C9-PFNA	1803629-06 REEPDW585 0.11471	2.05e4	94.2	NO
6	6	13C4-PFOS	1803629-06 REEPDW585 0.11471	3.51e3	104.0	NO
7	7	13C6-PFDA	1803629-06 REEPDW585 0.11471	2.22e4	94.5	NO
8	8	13C7-PFUdA	1803629-06 REEPDW585 0.11471	2.70e4	101.1	NO

Name: 181126M1_17, Date: 26-Nov-2018, Time: 14:25:02, ID: B8K0152-BS1 OPR 0.25, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0152-BS1 OPR 0.25	7.60e3	88.8	NO
2	2	13C5-PFHxA	B8K0152-BS1 OPR 0.25	1.74e4	68.8	NO
3	3	13C3-PFHxS	B8K0152-BS1 OPR 0.25	2.84e3	85.4	NO
4	4	13C8-PFOA	B8K0152-BS1 OPR 0.25	2.46e4	80.8	NO
5	5	13C9-PFNA	B8K0152-BS1 OPR 0.25	1.81e4	83.0	NO
6	6	13C4-PFOS	B8K0152-BS1 OPR 0.25	2.95e3	87.3	NO
7	7	13C6-PFDA	B8K0152-BS1 OPR 0.25	2.02e4	85.7	NO
8	8	13C7-PFUdA	B8K0152-BS1 OPR 0.25	2.39e4	89.6	NO

Name: 181126M1_18, Date: 26-Nov-2018, Time: 14:35:34, ID: B8K0152-BLK1 Method Blank 0.25, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0152-BLK1 Method Blank 0.25	6.96e3	81.4	NO
2	2	13C5-PFHxA	B8K0152-BLK1 Method Blank 0.25	1.74e4	68.5	NO
3	3	13C3-PFHxS	B8K0152-BLK1 Method Blank 0.25	2.94e3	88.4	NO
4	4	13C8-PFOA	B8K0152-BLK1 Method Blank 0.25	2.42e4	79.5	NO
5	5	13C9-PFNA	B8K0152-BLK1 Method Blank 0.25	1.76e4	80.7	NO
6	6	13C4-PFOS	B8K0152-BLK1 Method Blank 0.25	3.05e3	90.4	NO
7	7	13C6-PFDA	B8K0152-BLK1 Method Blank 0.25	2.07e4	88.0	NO
8	8	13C7-PFUdA	B8K0152-BLK1 Method Blank 0.25	2.37e4	89.0	NO

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Name: 181126M1_19, Date: 26-Nov-2018, Time: 14:46:12, ID: 1803729-01 WMP1811191026JSJ 0.23788, Description: WMP1811191026JSJ

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803729-01 WMP1811191026JSJ 0.23...	6.48e3	75.7	NO
2	2	13C5-PFHxA	1803729-01 WMP1811191026JSJ 0.23...	1.38e4	54.4	NO
3	3	13C3-PFHxS	1803729-01 WMP1811191026JSJ 0.23...	2.81e3	84.4	NO
4	4	13C8-PFOA	1803729-01 WMP1811191026JSJ 0.23...	1.64e4	54.0	NO
5	5	13C9-PFNA	1803729-01 WMP1811191026JSJ 0.23...	1.44e4	66.2	NO
6	6	13C4-PFOS	1803729-01 WMP1811191026JSJ 0.23...	2.70e3	80.1	NO
7	7	13C6-PFDA	1803729-01 WMP1811191026JSJ 0.23...	1.71e4	72.7	NO
8	8	13C7-PFUdA	1803729-01 WMP1811191026JSJ 0.23...	2.06e4	77.1	NO

Name: 181126M1_20, Date: 26-Nov-2018, Time: 14:56:45, ID: 1803729-02 WMP1811191035JSJ 0.23637, Description: WMP1811191035JSJ

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803729-02 WMP1811191035JSJ 0.23...	6.72e3	78.6	NO
2	2	13C5-PFHxA	1803729-02 WMP1811191035JSJ 0.23...	1.44e4	56.8	NO
3	3	13C3-PFHxS	1803729-02 WMP1811191035JSJ 0.23...	2.70e3	81.2	NO
4	4	13C8-PFOA	1803729-02 WMP1811191035JSJ 0.23...	1.95e4	64.3	NO
5	5	13C9-PFNA	1803729-02 WMP1811191035JSJ 0.23...	1.49e4	68.5	NO
6	6	13C4-PFOS	1803729-02 WMP1811191035JSJ 0.23...	2.70e3	80.0	NO
7	7	13C6-PFDA	1803729-02 WMP1811191035JSJ 0.23...	1.68e4	71.2	NO
8	8	13C7-PFUdA	1803729-02 WMP1811191035JSJ 0.23...	1.97e4	73.9	NO

Name: 181126M1_21, Date: 26-Nov-2018, Time: 15:07:48, ID: 1803729-03 WMP1811191043JSJ 0.23365, Description: WMP1811191043JSJ

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803729-03 WMP1811191043JSJ 0.23...	5.91e3	69.1	NO
2	2	13C5-PFHxA	1803729-03 WMP1811191043JSJ 0.23...	1.21e4	47.8	YES
3	3	13C3-PFHxS	1803729-03 WMP1811191043JSJ 0.23...	2.82e3	84.7	NO
4	4	13C8-PFOA	1803729-03 WMP1811191043JSJ 0.23...	1.91e4	62.7	NO
5	5	13C9-PFNA	1803729-03 WMP1811191043JSJ 0.23...	1.46e4	67.1	NO
6	6	13C4-PFOS	1803729-03 WMP1811191043JSJ 0.23...	2.87e3	85.2	NO
7	7	13C6-PFDA	1803729-03 WMP1811191043JSJ 0.23...	1.65e4	70.2	NO
8	8	13C7-PFUdA	1803729-03 WMP1811191043JSJ 0.23...	1.98e4	74.1	NO

Name: 181126M1_22, Date: 26-Nov-2018, Time: 15:18:26, ID: 1803730-01 WEF1811191106JSJ 0.24116, Description: WEF1811191106JSJ

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803730-01 WEF1811191106JSJ 0.241...	7.64e3	89.4	NO
2	2	13C5-PFHxA	1803730-01 WEF1811191106JSJ 0.241...	1.62e4	63.8	NO
3	3	13C3-PFHxS	1803730-01 WEF1811191106JSJ 0.241...	2.71e3	81.6	NO
4	4	13C8-PFOA	1803730-01 WEF1811191106JSJ 0.241...	2.17e4	71.5	NO
5	5	13C9-PFNA	1803730-01 WEF1811191106JSJ 0.241...	1.53e4	70.0	NO
6	6	13C4-PFOS	1803730-01 WEF1811191106JSJ 0.241...	2.85e3	84.5	NO
7	7	13C6-PFDA	1803730-01 WEF1811191106JSJ 0.241...	1.84e4	78.0	NO
8	8	13C7-PFUdA	1803730-01 WEF1811191106JSJ 0.241...	2.10e4	78.7	NO

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Name: 181126M1_23, Date: 26-Nov-2018, Time: 15:29:49, ID: B8K0144-BS1 OPR 0.125, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0144-BS1 OPR 0.125	9.68e3	113.2	NO
2	2	13C5-PFHxA	B8K0144-BS1 OPR 0.125	1.87e4	73.8	NO
3	3	13C3-PFHxS	B8K0144-BS1 OPR 0.125	2.61e3	78.4	NO
4	4	13C8-PFOA	B8K0144-BS1 OPR 0.125	2.23e4	73.3	NO
5	5	13C9-PFNA	B8K0144-BS1 OPR 0.125	1.56e4	71.4	NO
6	6	13C4-PFOS	B8K0144-BS1 OPR 0.125	2.63e3	78.0	NO
7	7	13C6-PFDA	B8K0144-BS1 OPR 0.125	1.80e4	76.6	NO
8	8	13C7-PFUdA	B8K0144-BS1 OPR 0.125	2.03e4	76.0	NO

Name: 181126M1_24, Date: 26-Nov-2018, Time: 15:41:20, ID: B8K0144-BSD1 LCSD 0.125, Description: LCSD

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0144-BSD1 LCSD 0.125	8.02e3	93.8	NO
2	2	13C5-PFHxA	B8K0144-BSD1 LCSD 0.125	1.66e4	65.7	NO
3	3	13C3-PFHxS	B8K0144-BSD1 LCSD 0.125	2.39e3	71.8	NO
4	4	13C8-PFOA	B8K0144-BSD1 LCSD 0.125	1.88e4	61.8	NO
5	5	13C9-PFNA	B8K0144-BSD1 LCSD 0.125	1.33e4	60.8	NO
6	6	13C4-PFOS	B8K0144-BSD1 LCSD 0.125	2.43e3	72.0	NO
7	7	13C6-PFDA	B8K0144-BSD1 LCSD 0.125	1.50e4	63.6	NO
8	8	13C7-PFUdA	B8K0144-BSD1 LCSD 0.125	1.84e4	69.0	NO

Name: 181126M1_25, Date: 26-Nov-2018, Time: 15:51:53, ID: B8K0144-BLK1 Method Blank 0.125, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0144-BLK1 Method Blank 0.125	8.24e3	96.4	NO
2	2	13C5-PFHxA	B8K0144-BLK1 Method Blank 0.125	1.71e4	67.4	NO
3	3	13C3-PFHxS	B8K0144-BLK1 Method Blank 0.125	2.56e3	77.0	NO
4	4	13C8-PFOA	B8K0144-BLK1 Method Blank 0.125	2.10e4	69.1	NO
5	5	13C9-PFNA	B8K0144-BLK1 Method Blank 0.125	1.55e4	70.8	NO
6	6	13C4-PFOS	B8K0144-BLK1 Method Blank 0.125	2.45e3	72.6	NO
7	7	13C6-PFDA	B8K0144-BLK1 Method Blank 0.125	1.70e4	72.1	NO
8	8	13C7-PFUdA	B8K0144-BLK1 Method Blank 0.125	2.00e4	74.9	NO

Name: 181126M1_26, Date: 26-Nov-2018, Time: 16:02:31, ID: 1803659-01 A1-MW-07-SA2 0.11704, Description: A1-MW-07-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803659-01 A1-MW-07-SA2 0.11704	6.88e3	80.5	NO
2	2	13C5-PFHxA	1803659-01 A1-MW-07-SA2 0.11704	1.29e4	50.8	NO
3	3	13C3-PFHxS	1803659-01 A1-MW-07-SA2 0.11704	2.40e3	72.2	NO
4	4	13C8-PFOA	1803659-01 A1-MW-07-SA2 0.11704	1.46e4	48.1	YES
5	5	13C9-PFNA	1803659-01 A1-MW-07-SA2 0.11704	9.17e3	42.0	YES
6	6	13C4-PFOS	1803659-01 A1-MW-07-SA2 0.11704	2.29e3	67.8	NO
7	7	13C6-PFDA	1803659-01 A1-MW-07-SA2 0.11704	9.90e3	42.1	YES
8	8	13C7-PFUdA	1803659-01 A1-MW-07-SA2 0.11704	1.27e4	47.7	YES

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Name: 181126M1_27, Date: 26-Nov-2018, Time: 16:13:04, ID: 1803659-02 A1-MW-23-SA2 0.1178, Description: A1-MW-23-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803659-02 A1-MW-23-SA2 0.1178	7.36e3	86.1	NO
2	2	13C5-PFHxA	1803659-02 A1-MW-23-SA2 0.1178	1.45e4	57.3	NO
3	3	13C3-PFHxS	1803659-02 A1-MW-23-SA2 0.1178	2.39e3	71.9	NO
4	4	13C8-PFOA	1803659-02 A1-MW-23-SA2 0.1178	1.68e4	55.1	NO
5	5	13C9-PFNA	1803659-02 A1-MW-23-SA2 0.1178	1.07e4	49.2	YES
6	6	13C4-PFOS	1803659-02 A1-MW-23-SA2 0.1178	2.46e3	72.8	NO
7	7	13C6-PFDA	1803659-02 A1-MW-23-SA2 0.1178	1.17e4	49.9	YES
8	8	13C7-PFUdA	1803659-02 A1-MW-23-SA2 0.1178	1.48e4	55.4	NO

Name: 181126M1_28, Date: 26-Nov-2018, Time: 16:23:43, ID: 1803659-03 A1-MW-25-SA2 0.11426, Description: A1-MW-25-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803659-03 A1-MW-25-SA2 0.11426	7.16e3	83.7	NO
2	2	13C5-PFHxA	1803659-03 A1-MW-25-SA2 0.11426	1.20e4	47.2	YES
3	3	13C3-PFHxS	1803659-03 A1-MW-25-SA2 0.11426	2.53e3	76.0	NO
4	4	13C8-PFOA	1803659-03 A1-MW-25-SA2 0.11426	1.29e4	42.4	YES
5	5	13C9-PFNA	1803659-03 A1-MW-25-SA2 0.11426	8.45e3	38.8	YES
6	6	13C4-PFOS	1803659-03 A1-MW-25-SA2 0.11426	2.50e3	74.1	NO
7	7	13C6-PFDA	1803659-03 A1-MW-25-SA2 0.11426	1.08e4	46.0	YES
8	8	13C7-PFUdA	1803659-03 A1-MW-25-SA2 0.11426	1.41e4	52.7	NO

Name: 181126M1_29, Date: 26-Nov-2018, Time: 16:34:21, ID: 1803659-04 A1-MW-27-SA2 0.11731, Description: A1-MW-27-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803659-04 A1-MW-27-SA2 0.11731	7.98e3	93.3	NO
2	2	13C5-PFHxA	1803659-04 A1-MW-27-SA2 0.11731	1.35e4	53.3	NO
3	3	13C3-PFHxS	1803659-04 A1-MW-27-SA2 0.11731	2.51e3	75.6	NO
4	4	13C8-PFOA	1803659-04 A1-MW-27-SA2 0.11731	1.65e4	54.2	NO
5	5	13C9-PFNA	1803659-04 A1-MW-27-SA2 0.11731	1.09e4	50.1	NO
6	6	13C4-PFOS	1803659-04 A1-MW-27-SA2 0.11731	2.35e3	69.7	NO
7	7	13C6-PFDA	1803659-04 A1-MW-27-SA2 0.11731	1.33e4	56.5	NO
8	8	13C7-PFUdA	1803659-04 A1-MW-27-SA2 0.11731	1.67e4	62.4	NO

Name: 181126M1_30, Date: 26-Nov-2018, Time: 16:44:53, ID: 1803659-05 A1-MW-55-SA2 0.11846, Description: A1-MW-55-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803659-05 A1-MW-55-SA2 0.11846	9.35e3	109.3	NO
2	2	13C5-PFHxA	1803659-05 A1-MW-55-SA2 0.11846	1.71e4	67.3	NO
3	3	13C3-PFHxS	1803659-05 A1-MW-55-SA2 0.11846	2.36e3	71.1	NO
4	4	13C8-PFOA	1803659-05 A1-MW-55-SA2 0.11846	2.08e4	68.3	NO
5	5	13C9-PFNA	1803659-05 A1-MW-55-SA2 0.11846	1.39e4	63.8	NO
6	6	13C4-PFOS	1803659-05 A1-MW-55-SA2 0.11846	2.49e3	73.9	NO
7	7	13C6-PFDA	1803659-05 A1-MW-55-SA2 0.11846	1.58e4	67.3	NO
8	8	13C7-PFUdA	1803659-05 A1-MW-55-SA2 0.11846	1.80e4	67.6	NO

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Name: 181126M1_31, Date: 26-Nov-2018, Time: 16:55:32, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181126M1_32, Date: 26-Nov-2018, Time: 17:06:06, ID: ST181126M1-11 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M1-11 PFC CS3 18K1906	8.81e3	103.0	NO
2	2	13C5-PFHxA	ST181126M1-11 PFC CS3 18K1906	2.71e4	107.1	NO
3	3	13C3-PFHxS	ST181126M1-11 PFC CS3 18K1906	3.64e3	109.5	NO
4	4	13C8-PFOA	ST181126M1-11 PFC CS3 18K1906	3.26e4	107.2	NO
5	5	13C9-PFNA	ST181126M1-11 PFC CS3 18K1906	2.24e4	102.6	NO
6	6	13C4-PFOS	ST181126M1-11 PFC CS3 18K1906	3.51e3	103.9	NO
7	7	13C6-PFDA	ST181126M1-11 PFC CS3 18K1906	2.53e4	107.4	NO
8	8	13C7-PFUdA	ST181126M1-11 PFC CS3 18K1906	2.86e4	107.0	NO

Name: 181126M1_33, Date: 26-Nov-2018, Time: 17:16:44, ID: 1803659-06 A1-MW-54-SA2 0.11683, Description: A1-MW-54-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803659-06 A1-MW-54-SA2 0.11683	8.84e3	103.4	NO
2	2	13C5-PFHxA	1803659-06 A1-MW-54-SA2 0.11683	1.54e4	60.7	NO
3	3	13C3-PFHxS	1803659-06 A1-MW-54-SA2 0.11683	2.16e3	64.9	NO
4	4	13C8-PFOA	1803659-06 A1-MW-54-SA2 0.11683	1.90e4	62.3	NO
5	5	13C9-PFNA	1803659-06 A1-MW-54-SA2 0.11683	1.33e4	60.8	NO
6	6	13C4-PFOS	1803659-06 A1-MW-54-SA2 0.11683	2.45e3	72.7	NO
7	7	13C6-PFDA	1803659-06 A1-MW-54-SA2 0.11683	1.46e4	62.0	NO
8	8	13C7-PFUdA	1803659-06 A1-MW-54-SA2 0.11683	1.66e4	62.2	NO

Name: 181126M1_34, Date: 26-Nov-2018, Time: 17:27:17, ID: 1803659-07 FRB-20181114 0.11549, Description: FRB-20181114

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803659-07 FRB-20181114 0.11549	1.03e4	119.9	NO
2	2	13C5-PFHxA	1803659-07 FRB-20181114 0.11549	1.93e4	76.3	NO
3	3	13C3-PFHxS	1803659-07 FRB-20181114 0.11549	2.52e3	75.8	NO
4	4	13C8-PFOA	1803659-07 FRB-20181114 0.11549	2.16e4	70.8	NO
5	5	13C9-PFNA	1803659-07 FRB-20181114 0.11549	1.46e4	67.0	NO
6	6	13C4-PFOS	1803659-07 FRB-20181114 0.11549	2.53e3	74.9	NO
7	7	13C6-PFDA	1803659-07 FRB-20181114 0.11549	1.66e4	70.5	NO
8	8	13C7-PFUdA	1803659-07 FRB-20181114 0.11549	1.95e4	73.0	NO

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Name: 181126M1_35, Date: 26-Nov-2018, Time: 17:37:55, ID: B8K0135-BS1 OPR 1, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0135-BS1 OPR 1	1.02e4	119.0	NO
2	2	13C5-PFHxA	B8K0135-BS1 OPR 1	1.85e4	72.9	NO
3	3	13C3-PFHxS	B8K0135-BS1 OPR 1	2.47e3	74.2	NO
4	4	13C8-PFOA	B8K0135-BS1 OPR 1	2.32e4	76.2	NO
5	5	13C9-PFNA	B8K0135-BS1 OPR 1	1.57e4	72.0	NO
6	6	13C4-PFOS	B8K0135-BS1 OPR 1	2.59e3	76.9	NO
7	7	13C6-PFDA	B8K0135-BS1 OPR 1	1.80e4	76.4	NO
8	8	13C7-PFUdA	B8K0135-BS1 OPR 1	2.04e4	76.4	NO

Name: 181126M1_36, Date: 26-Nov-2018, Time: 17:48:34, ID: B8K0135-BLK1 Method Blank 1, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0135-BLK1 Method Blank 1	1.04e4	121.9	NO
2	2	13C5-PFHxA	B8K0135-BLK1 Method Blank 1	1.90e4	75.1	NO
3	3	13C3-PFHxS	B8K0135-BLK1 Method Blank 1	2.41e3	72.5	NO
4	4	13C8-PFOA	B8K0135-BLK1 Method Blank 1	2.24e4	73.6	NO
5	5	13C9-PFNA	B8K0135-BLK1 Method Blank 1	1.61e4	73.6	NO
6	6	13C4-PFOS	B8K0135-BLK1 Method Blank 1	2.56e3	75.8	NO
7	7	13C6-PFDA	B8K0135-BLK1 Method Blank 1	1.80e4	76.5	NO
8	8	13C7-PFUdA	B8K0135-BLK1 Method Blank 1	1.99e4	74.6	NO

Name: 181126M1_37, Date: 26-Nov-2018, Time: 17:59:07, ID: 1803551-03 BS1810290940GC 5, Description: BS1810290940GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803551-03 BS1810290940GC 5	9.63e3	112.6	NO
2	2	13C5-PFHxA	1803551-03 BS1810290940GC 5	1.76e4	69.5	NO
3	3	13C3-PFHxS	1803551-03 BS1810290940GC 5	2.36e3	70.9	NO
4	4	13C8-PFOA	1803551-03 BS1810290940GC 5	2.16e4	71.0	NO
5	5	13C9-PFNA	1803551-03 BS1810290940GC 5	1.48e4	68.0	NO
6	6	13C4-PFOS	1803551-03 BS1810290940GC 5	2.39e3	70.8	NO
7	7	13C6-PFDA	1803551-03 BS1810290940GC 5	1.65e4	69.9	NO
8	8	13C7-PFUdA	1803551-03 BS1810290940GC 5	1.88e4	70.3	NO

Name: 181126M1_38, Date: 26-Nov-2018, Time: 18:09:45, ID: 1803581-03 BS1810311220GC 5.1, Description: BS1810311220GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803581-03 BS1810311220GC 5.1	1.06e4	123.4	NO
2	2	13C5-PFHxA	1803581-03 BS1810311220GC 5.1	1.42e4	56.1	NO
3	3	13C3-PFHxS	1803581-03 BS1810311220GC 5.1	2.39e3	71.8	NO
4	4	13C8-PFOA	1803581-03 BS1810311220GC 5.1	2.36e4	77.6	NO
5	5	13C9-PFNA	1803581-03 BS1810311220GC 5.1	1.58e4	72.5	NO
6	6	13C4-PFOS	1803581-03 BS1810311220GC 5.1	2.85e3	84.3	NO
7	7	13C6-PFDA	1803581-03 BS1810311220GC 5.1	1.68e4	71.4	NO
8	8	13C7-PFUdA	1803581-03 BS1810311220GC 5.1	1.61e4	60.2	NO

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Name: 181126M1_39, Date: 26-Nov-2018, Time: 18:20:24, ID: 1803581-04 BS1810311230GC 5.08, Description: BS1810311230GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803581-04 BS1810311230GC 5.08	1.07e4	125.0	NO
2	2	13C5-PFHxA	1803581-04 BS1810311230GC 5.08	1.92e4	75.6	NO
3	3	13C3-PFHxS	1803581-04 BS1810311230GC 5.08	2.59e3	77.9	NO
4	4	13C8-PFOA	1803581-04 BS1810311230GC 5.08	2.27e4	74.6	NO
5	5	13C9-PFNA	1803581-04 BS1810311230GC 5.08	1.52e4	69.7	NO
6	6	13C4-PFOS	1803581-04 BS1810311230GC 5.08	2.76e3	81.8	NO
7	7	13C6-PFDA	1803581-04 BS1810311230GC 5.08	1.67e4	71.0	NO
8	8	13C7-PFUdA	1803581-04 BS1810311230GC 5.08	1.71e4	63.9	NO

Name: 181126M1_40, Date: 26-Nov-2018, Time: 18:30:57, ID: B8K0049-BS1 OPR 1, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0049-BS1 OPR 1	1.27e4	148.0	NO
2	2	13C5-PFHxA	B8K0049-BS1 OPR 1	2.29e4	90.3	NO
3	3	13C3-PFHxS	B8K0049-BS1 OPR 1	3.27e3	98.1	NO
4	4	13C8-PFOA	B8K0049-BS1 OPR 1	2.76e4	90.7	NO
5	5	13C9-PFNA	B8K0049-BS1 OPR 1	2.00e4	91.7	NO
6	6	13C4-PFOS	B8K0049-BS1 OPR 1	3.50e3	103.8	NO
7	7	13C6-PFDA	B8K0049-BS1 OPR 1	2.17e4	92.3	NO
8	8	13C7-PFUdA	B8K0049-BS1 OPR 1	2.61e4	97.7	NO

Name: 181126M1_41, Date: 26-Nov-2018, Time: 18:41:36, ID: B8K0049-BLK1 Method Blank 1, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0049-BLK1 Method Blank 1	1.18e4	137.7	NO
2	2	13C5-PFHxA	B8K0049-BLK1 Method Blank 1	2.18e4	86.1	NO
3	3	13C3-PFHxS	B8K0049-BLK1 Method Blank 1	3.10e3	93.1	NO
4	4	13C8-PFOA	B8K0049-BLK1 Method Blank 1	2.61e4	85.9	NO
5	5	13C9-PFNA	B8K0049-BLK1 Method Blank 1	1.78e4	81.6	NO
6	6	13C4-PFOS	B8K0049-BLK1 Method Blank 1	2.98e3	88.2	NO
7	7	13C6-PFDA	B8K0049-BLK1 Method Blank 1	1.98e4	84.2	NO
8	8	13C7-PFUdA	B8K0049-BLK1 Method Blank 1	2.13e4	79.8	NO

Name: 181126M1_42, Date: 26-Nov-2018, Time: 18:52:09, ID: 1803520-01 HS-SB-939 (3-5)-EPA 1.51, Description: HS-SB-939 (3-5)-EPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803520-01 HS-SB-939 (3-5)-EPA 1.51	1.46e4	170.8	YES
2	2	13C5-PFHxA	1803520-01 HS-SB-939 (3-5)-EPA 1.51	2.30e4	91.0	NO
3	3	13C3-PFHxS	1803520-01 HS-SB-939 (3-5)-EPA 1.51	2.62e3	78.8	NO
4	4	13C8-PFOA	1803520-01 HS-SB-939 (3-5)-EPA 1.51	1.58e4	51.9	NO
5	5	13C9-PFNA	1803520-01 HS-SB-939 (3-5)-EPA 1.51	5.13e3	23.5	YES
6	6	13C4-PFOS	1803520-01 HS-SB-939 (3-5)-EPA 1.51	4.18e2	12.4	YES
7	7	13C6-PFDA	1803520-01 HS-SB-939 (3-5)-EPA 1.51	3.57e3	15.2	YES
8	8	13C7-PFUdA	1803520-01 HS-SB-939 (3-5)-EPA 1.51	1.60e3	6.0	YES

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Name: 181126M1_43, Date: 26-Nov-2018, Time: 19:02:47, ID: 1803553-04 BS1810291445GC 3.51, Description: BS1810291445GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803553-04 BS1810291445GC 3.51	1.27e4	148.6	NO
2	2	13C5-PFHxA	1803553-04 BS1810291445GC 3.51	3.04e4	120.2	NO
3	3	13C3-PFHxS	1803553-04 BS1810291445GC 3.51	4.25e3	127.7	NO
4	4	13C8-PFOA	1803553-04 BS1810291445GC 3.51	3.61e4	118.8	NO
5	5	13C9-PFNA	1803553-04 BS1810291445GC 3.51	2.37e4	108.4	NO
6	6	13C4-PFOS	1803553-04 BS1810291445GC 3.51	7.80e3	231.3	YES
7	7	13C6-PFDA	1803553-04 BS1810291445GC 3.51	2.45e4	104.0	NO
8	8	13C7-PFUdA	1803553-04 BS1810291445GC 3.51	1.76e4	66.1	NO

Name: 181126M1_44, Date: 26-Nov-2018, Time: 19:13:20, ID: 1803575-06 BS1810301040GC 1.48, Description: BS1810301040GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803575-06 BS1810301040GC 1.48	9.65e3	112.8	NO
2	2	13C5-PFHxA	1803575-06 BS1810301040GC 1.48	1.74e4	68.6	NO
3	3	13C3-PFHxS	1803575-06 BS1810301040GC 1.48	2.23e3	67.0	NO
4	4	13C8-PFOA	1803575-06 BS1810301040GC 1.48	2.01e4	66.1	NO
5	5	13C9-PFNA	1803575-06 BS1810301040GC 1.48	1.33e4	61.1	NO
6	6	13C4-PFOS	1803575-06 BS1810301040GC 1.48	2.13e3	63.1	NO
7	7	13C6-PFDA	1803575-06 BS1810301040GC 1.48	1.41e4	60.1	NO
8	8	13C7-PFUdA	1803575-06 BS1810301040GC 1.48	1.46e4	54.8	NO

Name: 181126M1_45, Date: 26-Nov-2018, Time: 19:23:58, ID: 1803577-05 BS1810301620GC 5.94, Description: BS1810301620GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803577-05 BS1810301620GC 5.94	9.16e3	107.1	NO
2	2	13C5-PFHxA	1803577-05 BS1810301620GC 5.94	1.60e4	63.2	NO
3	3	13C3-PFHxS	1803577-05 BS1810301620GC 5.94	2.11e3	63.3	NO
4	4	13C8-PFOA	1803577-05 BS1810301620GC 5.94	1.79e4	58.9	NO
5	5	13C9-PFNA	1803577-05 BS1810301620GC 5.94	1.25e4	57.1	NO
6	6	13C4-PFOS	1803577-05 BS1810301620GC 5.94	2.07e3	61.3	NO
7	7	13C6-PFDA	1803577-05 BS1810301620GC 5.94	1.25e4	53.0	NO
8	8	13C7-PFUdA	1803577-05 BS1810301620GC 5.94	1.35e4	50.6	NO

Name: 181126M1_46, Date: 26-Nov-2018, Time: 19:34:37, ID: B8K0118-BS1 OPR 0.125, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0118-BS1 OPR 0.125	1.52e4	177.9	YES
2	2	13C5-PFHxA	B8K0118-BS1 OPR 0.125	2.78e4	109.7	NO
3	3	13C3-PFHxS	B8K0118-BS1 OPR 0.125	3.32e3	99.7	NO
4	4	13C8-PFOA	B8K0118-BS1 OPR 0.125	2.97e4	97.7	NO
5	5	13C9-PFNA	B8K0118-BS1 OPR 0.125	1.61e4	74.0	NO
6	6	13C4-PFOS	B8K0118-BS1 OPR 0.125	1.10e3	32.7	YES
7	7	13C6-PFDA	B8K0118-BS1 OPR 0.125	6.67e3	28.4	YES
8	8	13C7-PFUdA	B8K0118-BS1 OPR 0.125	2.14e3	8.0	YES

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Name: 181126M1_47, Date: 26-Nov-2018, Time: 19:45:09, ID: B8K0118-BLK1 Method Blank 0.125, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0118-BLK1 Method Blank 0.125	1.50e4	175.7	YES
2	2	13C5-PFHxA	B8K0118-BLK1 Method Blank 0.125	2.76e4	109.0	NO
3	3	13C3-PFHxS	B8K0118-BLK1 Method Blank 0.125	3.42e3	102.8	NO
4	4	13C8-PFOA	B8K0118-BLK1 Method Blank 0.125	3.08e4	101.2	NO
5	5	13C9-PFNA	B8K0118-BLK1 Method Blank 0.125	1.84e4	84.4	NO
6	6	13C4-PFOS	B8K0118-BLK1 Method Blank 0.125	1.82e3	53.9	NO
7	7	13C6-PFDA	B8K0118-BLK1 Method Blank 0.125	1.09e4	46.3	YES
8	8	13C7-PFUdA	B8K0118-BLK1 Method Blank 0.125	3.61e3	13.5	YES

Name: 181126M1_48, Date: 26-Nov-2018, Time: 19:55:48, ID: 1803640-01 MW-2A 0.11056, Description: MW-2A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803640-01 MW-2A 0.11056	1.29e4	150.4	YES
2	2	13C5-PFHxA	1803640-01 MW-2A 0.11056	2.44e4	96.2	NO
3	3	13C3-PFHxS	1803640-01 MW-2A 0.11056	3.02e3	90.9	NO
4	4	13C8-PFOA	1803640-01 MW-2A 0.11056	2.69e4	88.3	NO
5	5	13C9-PFNA	1803640-01 MW-2A 0.11056	1.59e4	73.0	NO
6	6	13C4-PFOS	1803640-01 MW-2A 0.11056	1.82e3	53.9	NO
7	7	13C6-PFDA	1803640-01 MW-2A 0.11056	1.01e4	42.9	YES
8	8	13C7-PFUdA	1803640-01 MW-2A 0.11056	2.50e3	9.4	YES

Name: 181126M1_49, Date: 26-Nov-2018, Time: 20:06:21, ID: 1803640-02 MW-3 0.1163, Description: MW-3

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803640-02 MW-3 0.1163	1.35e4	157.4	YES
2	2	13C5-PFHxA	1803640-02 MW-3 0.1163	2.43e4	95.8	NO
3	3	13C3-PFHxS	1803640-02 MW-3 0.1163	3.02e3	90.8	NO
4	4	13C8-PFOA	1803640-02 MW-3 0.1163	2.70e4	88.6	NO
5	5	13C9-PFNA	1803640-02 MW-3 0.1163	1.67e4	76.5	NO
6	6	13C4-PFOS	1803640-02 MW-3 0.1163	2.05e3	60.9	NO
7	7	13C6-PFDA	1803640-02 MW-3 0.1163	1.06e4	45.2	YES
8	8	13C7-PFUdA	1803640-02 MW-3 0.1163	6.35e3	23.8	YES

Name: 181126M1_50, Date: 26-Nov-2018, Time: 20:16:59, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA	5.11e0	0.0	YES
8	8	13C7-PFUdA	IPA	6.16e0	0.0	YES

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Name: 181126M1_51, Date: 26-Nov-2018, Time: 20:27:33, ID: ST181126M1-12 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M1-12 PFC CS3 18K1906	9.00e3	105.3	NO
2	2	13C5-PFHxA	ST181126M1-12 PFC CS3 18K1906	2.77e4	109.2	NO
3	3	13C3-PFHxS	ST181126M1-12 PFC CS3 18K1906	3.48e3	104.4	NO
4	4	13C8-PFOA	ST181126M1-12 PFC CS3 18K1906	3.29e4	108.2	NO
5	5	13C9-PFNA	ST181126M1-12 PFC CS3 18K1906	2.27e4	104.2	NO
6	6	13C4-PFOS	ST181126M1-12 PFC CS3 18K1906	3.59e3	106.5	NO
7	7	13C6-PFDA	ST181126M1-12 PFC CS3 18K1906	2.50e4	106.2	NO
8	8	13C7-PFUdA	ST181126M1-12 PFC CS3 18K1906	2.93e4	109.7	NO

Name: 181126M1_52, Date: 26-Nov-2018, Time: 20:38:11, ID: 1803640-03 MW-4 0.11182, Description: MW-4

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803640-03 MW-4 0.11182	1.30e4	152.1	YES
2	2	13C5-PFHxA	1803640-03 MW-4 0.11182	2.39e4	94.2	NO
3	3	13C3-PFHxS	1803640-03 MW-4 0.11182	3.37e3	101.3	NO
4	4	13C8-PFOA	1803640-03 MW-4 0.11182	2.66e4	87.6	NO
5	5	13C9-PFNA	1803640-03 MW-4 0.11182	1.77e4	81.0	NO
6	6	13C4-PFOS	1803640-03 MW-4 0.11182	2.69e3	79.8	NO
7	7	13C6-PFDA	1803640-03 MW-4 0.11182	1.49e4	63.5	NO
8	8	13C7-PFUdA	1803640-03 MW-4 0.11182	7.77e3	29.1	YES

Name: 181126M1_53, Date: 26-Nov-2018, Time: 20:48:44, ID: 1803640-04 TS Well 0.11479, Description: TS Well

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803640-04 TS Well 0.11479	1.33e4	155.8	YES
2	2	13C5-PFHxA	1803640-04 TS Well 0.11479	2.52e4	99.3	NO
3	3	13C3-PFHxS	1803640-04 TS Well 0.11479	3.40e3	102.2	NO
4	4	13C8-PFOA	1803640-04 TS Well 0.11479	3.02e4	99.2	NO
5	5	13C9-PFNA	1803640-04 TS Well 0.11479	1.97e4	90.2	NO
6	6	13C4-PFOS	1803640-04 TS Well 0.11479	2.90e3	86.1	NO
7	7	13C6-PFDA	1803640-04 TS Well 0.11479	1.55e4	65.8	NO
8	8	13C7-PFUdA	1803640-04 TS Well 0.11479	9.09e3	34.1	YES

Name: 181126M1_54, Date: 26-Nov-2018, Time: 20:59:22, ID: 1803641-01 MW3S 0.11429, Description: MW3S

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803641-01 MW3S 0.11429	1.42e4	166.3	YES
2	2	13C5-PFHxA	1803641-01 MW3S 0.11429	2.49e4	98.2	NO
3	3	13C3-PFHxS	1803641-01 MW3S 0.11429	3.52e3	105.7	NO
4	4	13C8-PFOA	1803641-01 MW3S 0.11429	2.60e4	85.3	NO
5	5	13C9-PFNA	1803641-01 MW3S 0.11429	1.64e4	75.3	NO
6	6	13C4-PFOS	1803641-01 MW3S 0.11429	2.86e3	84.8	NO
7	7	13C6-PFDA	1803641-01 MW3S 0.11429	1.39e4	59.0	NO
8	8	13C7-PFUdA	1803641-01 MW3S 0.11429	8.46e3	31.7	YES

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Name: 181126M1_55, Date: 26-Nov-2018, Time: 21:09:56, ID: 1803641-02 MW6 0.11494, Description: MW6

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803641-02 MW6 0.11494	1.40e4	163.4	YES
2	2	13C5-PFHxA	1803641-02 MW6 0.11494	2.45e4	96.9	NO
3	3	13C3-PFHxS	1803641-02 MW6 0.11494	3.50e3	105.3	NO
4	4	13C8-PFOA	1803641-02 MW6 0.11494	2.66e4	87.5	NO
5	5	13C9-PFNA	1803641-02 MW6 0.11494	1.71e4	78.2	NO
6	6	13C4-PFOS	1803641-02 MW6 0.11494	3.07e3	91.1	NO
7	7	13C6-PFDA	1803641-02 MW6 0.11494	1.58e4	67.2	NO
8	8	13C7-PFUdA	1803641-02 MW6 0.11494	1.20e4	44.9	YES

Name: 181126M1_56, Date: 26-Nov-2018, Time: 21:20:34, ID: 1803641-03 MW7 0.11164, Description: MW7

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803641-03 MW7 0.11164	1.37e4	160.7	YES
2	2	13C5-PFHxA	1803641-03 MW7 0.11164	2.42e4	95.5	NO
3	3	13C3-PFHxS	1803641-03 MW7 0.11164	3.48e3	104.5	NO
4	4	13C8-PFOA	1803641-03 MW7 0.11164	2.67e4	87.6	NO
5	5	13C9-PFNA	1803641-03 MW7 0.11164	1.82e4	83.5	NO
6	6	13C4-PFOS	1803641-03 MW7 0.11164	3.24e3	96.1	NO
7	7	13C6-PFDA	1803641-03 MW7 0.11164	1.69e4	71.8	NO
8	8	13C7-PFUdA	1803641-03 MW7 0.11164	1.46e4	54.7	NO

Name: 181126M1_57, Date: 26-Nov-2018, Time: 21:31:07, ID: 1803641-04 SW2 0.11314, Description: SW2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803641-04 SW2 0.11314	1.37e4	160.7	YES
2	2	13C5-PFHxA	1803641-04 SW2 0.11314	2.56e4	101.1	NO
3	3	13C3-PFHxS	1803641-04 SW2 0.11314	3.26e3	97.9	NO
4	4	13C8-PFOA	1803641-04 SW2 0.11314	2.80e4	91.9	NO
5	5	13C9-PFNA	1803641-04 SW2 0.11314	1.83e4	84.0	NO
6	6	13C4-PFOS	1803641-04 SW2 0.11314	2.81e3	83.3	NO
7	7	13C6-PFDA	1803641-04 SW2 0.11314	1.61e4	68.4	NO
8	8	13C7-PFUdA	1803641-04 SW2 0.11314	1.19e4	44.8	YES

Name: 181126M1_58, Date: 26-Nov-2018, Time: 21:41:46, ID: 1803646-01 MW-1 0.11872, Description: MW-1

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803646-01 MW-1 0.11872	1.31e4	153.0	YES
2	2	13C5-PFHxA	1803646-01 MW-1 0.11872	2.37e4	93.7	NO
3	3	13C3-PFHxS	1803646-01 MW-1 0.11872	3.06e3	92.0	NO
4	4	13C8-PFOA	1803646-01 MW-1 0.11872	2.74e4	90.2	NO
5	5	13C9-PFNA	1803646-01 MW-1 0.11872	1.75e4	80.3	NO
6	6	13C4-PFOS	1803646-01 MW-1 0.11872	2.31e3	68.5	NO
7	7	13C6-PFDA	1803646-01 MW-1 0.11872	1.53e4	65.0	NO
8	8	13C7-PFUdA	1803646-01 MW-1 0.11872	8.64e3	32.4	YES

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Name: 181126M1_59, Date: 26-Nov-2018, Time: 21:52:19, ID: 1803646-02 MW-4S 0.11549, Description: MW-4S

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803646-02 MW-4S 0.11549	1.34e4	156.6	YES
2	2	13C5-PFHxA	1803646-02 MW-4S 0.11549	2.50e4	98.5	NO
3	3	13C3-PFHxS	1803646-02 MW-4S 0.11549	3.08e3	92.6	NO
4	4	13C8-PFOA	1803646-02 MW-4S 0.11549	2.81e4	92.5	NO
5	5	13C9-PFNA	1803646-02 MW-4S 0.11549	1.77e4	81.4	NO
6	6	13C4-PFOS	1803646-02 MW-4S 0.11549	2.05e3	60.8	NO
7	7	13C6-PFDA	1803646-02 MW-4S 0.11549	1.11e4	47.2	YES
8	8	13C7-PFUdA	1803646-02 MW-4S 0.11549	2.97e3	11.1	YES

Name: 181126M1_60, Date: 26-Nov-2018, Time: 22:02:57, ID: 1803646-03 Thorne 0.11815, Description: Thorne

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803646-03 Thorne 0.11815	1.37e4	160.2	YES
2	2	13C5-PFHxA	1803646-03 Thorne 0.11815	2.36e4	93.3	NO
3	3	13C3-PFHxS	1803646-03 Thorne 0.11815	3.25e3	97.8	NO
4	4	13C8-PFOA	1803646-03 Thorne 0.11815	2.71e4	89.2	NO
5	5	13C9-PFNA	1803646-03 Thorne 0.11815	1.71e4	78.5	NO
6	6	13C4-PFOS	1803646-03 Thorne 0.11815	2.48e3	73.6	NO
7	7	13C6-PFDA	1803646-03 Thorne 0.11815	1.40e4	59.6	NO
8	8	13C7-PFUdA	1803646-03 Thorne 0.11815	7.77e3	29.1	YES

Name: 181126M1_61, Date: 26-Nov-2018, Time: 22:13:30, ID: 1803647-01 MW-1 0.11071, Description: MW-1

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803647-01 MW-1 0.11071	1.20e4	140.5	NO
2	2	13C5-PFHxA	1803647-01 MW-1 0.11071	2.13e4	84.0	NO
3	3	13C3-PFHxS	1803647-01 MW-1 0.11071	2.99e3	89.9	NO
4	4	13C8-PFOA	1803647-01 MW-1 0.11071	2.30e4	75.6	NO
5	5	13C9-PFNA	1803647-01 MW-1 0.11071	1.52e4	69.5	NO
6	6	13C4-PFOS	1803647-01 MW-1 0.11071	2.54e3	75.2	NO
7	7	13C6-PFDA	1803647-01 MW-1 0.11071	1.36e4	57.9	NO
8	8	13C7-PFUdA	1803647-01 MW-1 0.11071	1.22e4	45.7	YES

Name: 181126M1_62, Date: 26-Nov-2018, Time: 22:24:08, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

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Name: 181126M1_63, Date: 26-Nov-2018, Time: 22:34:41, ID: ST181126M1-13 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M1-13 PFC CS3 18K1906	9.26e3	108.3	NO
2	2	13C5-PFHxA	ST181126M1-13 PFC CS3 18K1906	2.79e4	110.3	NO
3	3	13C3-PFHxS	ST181126M1-13 PFC CS3 18K1906	3.55e3	106.7	NO
4	4	13C8-PFOA	ST181126M1-13 PFC CS3 18K1906	3.20e4	105.3	NO
5	5	13C9-PFNA	ST181126M1-13 PFC CS3 18K1906	2.22e4	101.9	NO
6	6	13C4-PFOS	ST181126M1-13 PFC CS3 18K1906	3.76e3	111.4	NO
7	7	13C6-PFDA	ST181126M1-13 PFC CS3 18K1906	2.56e4	108.9	NO
8	8	13C7-PFUdA	ST181126M1-13 PFC CS3 18K1906	2.86e4	107.0	NO

Name: 181126M1_64, Date: 26-Nov-2018, Time: 22:45:19, ID: 1803647-02 MW-3 0.11209, Description: MW-3

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803647-02 MW-3 0.11209	1.25e4	145.8	NO
2	2	13C5-PFHxA	1803647-02 MW-3 0.11209	2.29e4	90.2	NO
3	3	13C3-PFHxS	1803647-02 MW-3 0.11209	3.09e3	92.8	NO
4	4	13C8-PFOA	1803647-02 MW-3 0.11209	2.64e4	86.8	NO
5	5	13C9-PFNA	1803647-02 MW-3 0.11209	1.71e4	78.2	NO
6	6	13C4-PFOS	1803647-02 MW-3 0.11209	2.50e3	74.2	NO
7	7	13C6-PFDA	1803647-02 MW-3 0.11209	1.54e4	65.6	NO
8	8	13C7-PFUdA	1803647-02 MW-3 0.11209	1.28e4	48.0	YES

Name: 181126M1_65, Date: 26-Nov-2018, Time: 22:55:52, ID: 1803651-01 MW-1 0.11903, Description: MW-1

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803651-01 MW-1 0.11903	1.40e4	163.9	YES
2	2	13C5-PFHxA	1803651-01 MW-1 0.11903	2.57e4	101.6	NO
3	3	13C3-PFHxS	1803651-01 MW-1 0.11903	3.30e3	99.1	NO
4	4	13C8-PFOA	1803651-01 MW-1 0.11903	2.80e4	92.2	NO
5	5	13C9-PFNA	1803651-01 MW-1 0.11903	1.72e4	78.7	NO
6	6	13C4-PFOS	1803651-01 MW-1 0.11903	2.21e3	65.5	NO
7	7	13C6-PFDA	1803651-01 MW-1 0.11903	1.17e4	49.6	YES
8	8	13C7-PFUdA	1803651-01 MW-1 0.11903	4.73e3	17.7	YES

Name: 181126M1_66, Date: 26-Nov-2018, Time: 23:06:31, ID: 1803651-02 MW-4 0.11498, Description: MW-4

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803651-02 MW-4 0.11498	1.08e4	126.2	NO
2	2	13C5-PFHxA	1803651-02 MW-4 0.11498	1.95e4	76.9	NO
3	3	13C3-PFHxS	1803651-02 MW-4 0.11498	2.61e3	78.5	NO
4	4	13C8-PFOA	1803651-02 MW-4 0.11498	2.18e4	71.8	NO
5	5	13C9-PFNA	1803651-02 MW-4 0.11498	1.47e4	67.2	NO
6	6	13C4-PFOS	1803651-02 MW-4 0.11498	1.91e3	56.7	NO
7	7	13C6-PFDA	1803651-02 MW-4 0.11498	1.15e4	49.0	YES
8	8	13C7-PFUdA	1803651-02 MW-4 0.11498	6.20e3	23.2	YES

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Name: 181126M1_67, Date: 26-Nov-2018, Time: 23:17:03, ID: 1803651-03 MW-3 0.11883, Description: MW-3

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803651-03 MW-3 0.11883	1.36e4	158.8	YES
2	2	13C5-PFHxA	1803651-03 MW-3 0.11883	2.37e4	93.4	NO
3	3	13C3-PFHxS	1803651-03 MW-3 0.11883	3.42e3	102.6	NO
4	4	13C8-PFOA	1803651-03 MW-3 0.11883	2.56e4	84.0	NO
5	5	13C9-PFNA	1803651-03 MW-3 0.11883	1.75e4	80.0	NO
6	6	13C4-PFOS	1803651-03 MW-3 0.11883	3.14e3	92.9	NO
7	7	13C6-PFDA	1803651-03 MW-3 0.11883	1.89e4	80.4	NO
8	8	13C7-PFUdA	1803651-03 MW-3 0.11883	1.90e4	71.4	NO

Name: 181126M1_68, Date: 26-Nov-2018, Time: 23:27:42, ID: 1803652-01 MW-1 0.11504, Description: MW-1

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803652-01 MW-1 0.11504	1.41e4	164.7	YES
2	2	13C5-PFHxA	1803652-01 MW-1 0.11504	2.61e4	103.2	NO
3	3	13C3-PFHxS	1803652-01 MW-1 0.11504	3.40e3	102.1	NO
4	4	13C8-PFOA	1803652-01 MW-1 0.11504	2.90e4	95.2	NO
5	5	13C9-PFNA	1803652-01 MW-1 0.11504	1.97e4	90.3	NO
6	6	13C4-PFOS	1803652-01 MW-1 0.11504	2.96e3	87.6	NO
7	7	13C6-PFDA	1803652-01 MW-1 0.11504	1.86e4	79.0	NO
8	8	13C7-PFUdA	1803652-01 MW-1 0.11504	1.30e4	48.7	YES

Name: 181126M1_69, Date: 26-Nov-2018, Time: 23:38:20, ID: 1803652-02 MW-2 0.11316, Description: MW-2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803652-02 MW-2 0.11316	1.46e4	170.7	YES
2	2	13C5-PFHxA	1803652-02 MW-2 0.11316	2.73e4	107.9	NO
3	3	13C3-PFHxS	1803652-02 MW-2 0.11316	3.51e3	105.4	NO
4	4	13C8-PFOA	1803652-02 MW-2 0.11316	3.03e4	99.7	NO
5	5	13C9-PFNA	1803652-02 MW-2 0.11316	2.04e4	93.4	NO
6	6	13C4-PFOS	1803652-02 MW-2 0.11316	2.95e3	87.5	NO
7	7	13C6-PFDA	1803652-02 MW-2 0.11316	1.94e4	82.5	NO
8	8	13C7-PFUdA	1803652-02 MW-2 0.11316	1.45e4	54.3	NO

Name: 181126M1_70, Date: 26-Nov-2018, Time: 23:48:53, ID: B8K0134-BS1 OPR 1, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0134-BS1 OPR 1	1.24e4	144.6	NO
2	2	13C5-PFHxA	B8K0134-BS1 OPR 1	2.20e4	87.0	NO
3	3	13C3-PFHxS	B8K0134-BS1 OPR 1	2.49e3	74.8	NO
4	4	13C8-PFOA	B8K0134-BS1 OPR 1	2.07e4	68.1	NO
5	5	13C9-PFNA	B8K0134-BS1 OPR 1	9.25e3	42.4	YES
6	6	13C4-PFOS	B8K0134-BS1 OPR 1	8.77e2	26.0	YES
7	7	13C6-PFDA	B8K0134-BS1 OPR 1	3.49e3	14.8	YES
8	8	13C7-PFUdA	B8K0134-BS1 OPR 1	9.60e2	3.6	YES

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Name: 181126M1_71, Date: 26-Nov-2018, Time: 23:59:32, ID: B8K0134-BLK1 Method Blank 1, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0134-BLK1 Method Blank 1	1.27e4	148.1	NO
2	2	13C5-PFHxA	B8K0134-BLK1 Method Blank 1	2.34e4	92.5	NO
3	3	13C3-PFHxS	B8K0134-BLK1 Method Blank 1	3.14e3	94.3	NO
4	4	13C8-PFOA	B8K0134-BLK1 Method Blank 1	2.76e4	90.6	NO
5	5	13C9-PFNA	B8K0134-BLK1 Method Blank 1	1.94e4	89.1	NO
6	6	13C4-PFOS	B8K0134-BLK1 Method Blank 1	3.13e3	92.7	NO
7	7	13C6-PFDA	B8K0134-BLK1 Method Blank 1	2.18e4	92.6	NO
8	8	13C7-PFUdA	B8K0134-BLK1 Method Blank 1	2.47e4	92.7	NO

Name: 181126M1_72, Date: 27-Nov-2018, Time: 00:10:06, ID: 1803552-01 BS1810291030GC 19.2, Description: BS1810291030GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803552-01 BS1810291030GC 19.2	1.14e4	133.3	NO
2	2	13C5-PFHxA	1803552-01 BS1810291030GC 19.2	1.71e4	67.6	NO
3	3	13C3-PFHxS	1803552-01 BS1810291030GC 19.2	2.64e3	79.4	NO
4	4	13C8-PFOA	1803552-01 BS1810291030GC 19.2	2.48e4	81.5	NO
5	5	13C9-PFNA	1803552-01 BS1810291030GC 19.2	1.49e4	68.4	NO
6	6	13C4-PFOS	1803552-01 BS1810291030GC 19.2	3.30e3	97.9	NO
7	7	13C6-PFDA	1803552-01 BS1810291030GC 19.2	1.84e4	78.4	NO
8	8	13C7-PFUdA	1803552-01 BS1810291030GC 19.2	1.80e4	67.5	NO

Name: 181126M1_73, Date: 27-Nov-2018, Time: 00:20:44, ID: 1803553-05 BS1810291600GC 21.65, Description: BS1810291600GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803553-05 BS1810291600GC 21.65	1.19e4	139.5	NO
2	2	13C5-PFHxA	1803553-05 BS1810291600GC 21.65	2.19e4	86.5	NO
3	3	13C3-PFHxS	1803553-05 BS1810291600GC 21.65	3.00e3	90.1	NO
4	4	13C8-PFOA	1803553-05 BS1810291600GC 21.65	2.70e4	88.8	NO
5	5	13C9-PFNA	1803553-05 BS1810291600GC 21.65	1.92e4	88.0	NO
6	6	13C4-PFOS	1803553-05 BS1810291600GC 21.65	3.22e3	95.5	NO
7	7	13C6-PFDA	1803553-05 BS1810291600GC 21.65	2.06e4	87.7	NO
8	8	13C7-PFUdA	1803553-05 BS1810291600GC 21.65	2.44e4	91.4	NO

Name: 181126M1_74, Date: 27-Nov-2018, Time: 00:31:22, ID: 1803553-06 SL1810291530GC 44.03, Description: SL1810291530GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803553-06 SL1810291530GC 44.03	1.31e4	153.5	YES
2	2	13C5-PFHxA	1803553-06 SL1810291530GC 44.03	2.31e4	91.2	NO
3	3	13C3-PFHxS	1803553-06 SL1810291530GC 44.03	3.22e3	96.8	NO
4	4	13C8-PFOA	1803553-06 SL1810291530GC 44.03	2.90e4	95.3	NO
5	5	13C9-PFNA	1803553-06 SL1810291530GC 44.03	1.88e4	86.1	NO
6	6	13C4-PFOS	1803553-06 SL1810291530GC 44.03	3.33e3	98.7	NO
7	7	13C6-PFDA	1803553-06 SL1810291530GC 44.03	2.07e4	87.9	NO
8	8	13C7-PFUdA	1803553-06 SL1810291530GC 44.03	1.99e4	74.5	NO

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Name: 181126M1_75, Date: 27-Nov-2018, Time: 00:41:55, ID: 1803576-03 BS1810311445GC 30.23, Description: BS1810311445GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803576-03 BS1810311445GC 30.23	1.23e4	143.3	NO
2	2	13C5-PFHxA	1803576-03 BS1810311445GC 30.23	2.13e4	83.9	NO
3	3	13C3-PFHxS	1803576-03 BS1810311445GC 30.23	2.89e3	86.8	NO
4	4	13C8-PFOA	1803576-03 BS1810311445GC 30.23	2.64e4	86.7	NO
5	5	13C9-PFNA	1803576-03 BS1810311445GC 30.23	1.89e4	86.8	NO
6	6	13C4-PFOS	1803576-03 BS1810311445GC 30.23	2.18e3	64.7	NO
7	7	13C6-PFDA	1803576-03 BS1810311445GC 30.23	2.07e4	88.2	NO
8	8	13C7-PFUdA	1803576-03 BS1810311445GC 30.23	2.32e4	87.0	NO

Name: 181126M1_76, Date: 27-Nov-2018, Time: 00:52:33, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181126M1_77, Date: 27-Nov-2018, Time: 01:03:06, ID: ST181126M1-14 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M1-14 PFC CS3 18K1906	9.46e3	110.7	NO
2	2	13C5-PFHxA	ST181126M1-14 PFC CS3 18K1906	2.77e4	109.2	NO
3	3	13C3-PFHxS	ST181126M1-14 PFC CS3 18K1906	3.62e3	108.8	NO
4	4	13C8-PFOA	ST181126M1-14 PFC CS3 18K1906	3.35e4	110.1	NO
5	5	13C9-PFNA	ST181126M1-14 PFC CS3 18K1906	2.35e4	107.8	NO
6	6	13C4-PFOS	ST181126M1-14 PFC CS3 18K1906	3.60e3	106.6	NO
7	7	13C6-PFDA	ST181126M1-14 PFC CS3 18K1906	2.47e4	105.1	NO
8	8	13C7-PFUdA	ST181126M1-14 PFC CS3 18K1906	2.94e4	110.3	NO

Name: 181126M1_78, Date: 27-Nov-2018, Time: 01:13:44, ID: 1803577-03 WW1810301640GC 29, Description: WW1810301640GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803577-03 WW1810301640GC 29	1.25e4	146.7	NO
2	2	13C5-PFHxA	1803577-03 WW1810301640GC 29	2.11e4	83.3	NO
3	3	13C3-PFHxS	1803577-03 WW1810301640GC 29	3.06e3	91.9	NO
4	4	13C8-PFOA	1803577-03 WW1810301640GC 29	2.50e4	82.2	NO
5	5	13C9-PFNA	1803577-03 WW1810301640GC 29	1.73e4	79.3	NO
6	6	13C4-PFOS	1803577-03 WW1810301640GC 29	2.81e3	83.3	NO
7	7	13C6-PFDA	1803577-03 WW1810301640GC 29	1.82e4	77.4	NO
8	8	13C7-PFUdA	1803577-03 WW1810301640GC 29	1.46e4	54.8	NO

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Name: 181126M1_79, Date: 27-Nov-2018, Time: 01:24:18, ID: 1803577-04 WW1810301650GC 27.95, Description: WW1810301650GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803577-04 WW1810301650GC 27.95	1.20e4	139.9	NO
2	2	13C5-PFHxA	1803577-04 WW1810301650GC 27.95	2.20e4	86.9	NO
3	3	13C3-PFHxS	1803577-04 WW1810301650GC 27.95	2.84e3	85.2	NO
4	4	13C8-PFOA	1803577-04 WW1810301650GC 27.95	2.70e4	88.7	NO
5	5	13C9-PFNA	1803577-04 WW1810301650GC 27.95	1.91e4	87.5	NO
6	6	13C4-PFOS	1803577-04 WW1810301650GC 27.95	3.12e3	92.4	NO
7	7	13C6-PFDA	1803577-04 WW1810301650GC 27.95	2.06e4	87.6	NO
8	8	13C7-PFUdA	1803577-04 WW1810301650GC 27.95	2.32e4	87.0	NO

Name: 181126M1_80, Date: 27-Nov-2018, Time: 01:34:57, ID: 1803578-04 BS1810301350GC 20.67, Description: BS1810301350GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803578-04 BS1810301350GC 20.67	1.28e4	149.6	NO
2	2	13C5-PFHxA	1803578-04 BS1810301350GC 20.67	2.13e4	84.0	NO
3	3	13C3-PFHxS	1803578-04 BS1810301350GC 20.67	3.03e3	90.9	NO
4	4	13C8-PFOA	1803578-04 BS1810301350GC 20.67	2.70e4	88.6	NO
5	5	13C9-PFNA	1803578-04 BS1810301350GC 20.67	1.74e4	79.6	NO
6	6	13C4-PFOS	1803578-04 BS1810301350GC 20.67	3.02e3	89.4	NO
7	7	13C6-PFDA	1803578-04 BS1810301350GC 20.67	2.00e4	85.2	NO
8	8	13C7-PFUdA	1803578-04 BS1810301350GC 20.67	2.18e4	81.8	NO

Name: 181126M1_81, Date: 27-Nov-2018, Time: 01:45:35, ID: B8K0120-BS1 OPR 0.25, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0120-BS1 OPR 0.25	1.17e4	137.1	NO
2	2	13C5-PFHxA	B8K0120-BS1 OPR 0.25	2.16e4	85.3	NO
3	3	13C3-PFHxS	B8K0120-BS1 OPR 0.25	2.98e3	89.7	NO
4	4	13C8-PFOA	B8K0120-BS1 OPR 0.25	2.60e4	85.4	NO
5	5	13C9-PFNA	B8K0120-BS1 OPR 0.25	1.87e4	85.5	NO
6	6	13C4-PFOS	B8K0120-BS1 OPR 0.25	3.04e3	90.2	NO
7	7	13C6-PFDA	B8K0120-BS1 OPR 0.25	1.97e4	83.9	NO
8	8	13C7-PFUdA	B8K0120-BS1 OPR 0.25	2.38e4	89.1	NO

Name: 181126M1_82, Date: 27-Nov-2018, Time: 01:56:08, ID: B8K0120-BLK1 Method Blank 0.25, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0120-BLK1 Method Blank 0.25	3.57e2	4.2	YES
2	2	13C5-PFHxA	B8K0120-BLK1 Method Blank 0.25	1.89e3	7.4	YES
3	3	13C3-PFHxS	B8K0120-BLK1 Method Blank 0.25	2.57e3	77.2	NO
4	4	13C8-PFOA	B8K0120-BLK1 Method Blank 0.25	4.01e3	13.2	YES
5	5	13C9-PFNA	B8K0120-BLK1 Method Blank 0.25	3.85e3	17.7	YES
6	6	13C4-PFOS	B8K0120-BLK1 Method Blank 0.25	2.82e3	83.5	NO
7	7	13C6-PFDA	B8K0120-BLK1 Method Blank 0.25	6.15e3	26.1	YES
8	8	13C7-PFUdA	B8K0120-BLK1 Method Blank 0.25	1.03e4	38.8	YES

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Name: 181126M1_83, Date: 27-Nov-2018, Time: 02:06:46, ID: 1803616-01 1811351-01A 0.24367, Description: 1811351-01A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803616-01 1811351-01A 0.24367	8.97e3	104.9	NO
2	2	13C5-PFHxA	1803616-01 1811351-01A 0.24367	1.73e4	68.4	NO
3	3	13C3-PFHxS	1803616-01 1811351-01A 0.24367	2.91e3	87.5	NO
4	4	13C8-PFOA	1803616-01 1811351-01A 0.24367	2.25e4	74.1	NO
5	5	13C9-PFNA	1803616-01 1811351-01A 0.24367	1.68e4	76.9	NO
6	6	13C4-PFOS	1803616-01 1811351-01A 0.24367	2.98e3	88.3	NO
7	7	13C6-PFDA	1803616-01 1811351-01A 0.24367	1.81e4	76.9	NO
8	8	13C7-PFUdA	1803616-01 1811351-01A 0.24367	2.19e4	82.2	NO

Name: 181126M1_84, Date: 27-Nov-2018, Time: 02:17:19, ID: 1803616-02 1811351-02A 0.24367, Description: 1811351-02A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803616-02 1811351-02A 0.24367	1.12e4	130.5	NO
2	2	13C5-PFHxA	1803616-02 1811351-02A 0.24367	2.03e4	80.0	NO
3	3	13C3-PFHxS	1803616-02 1811351-02A 0.24367	2.74e3	82.4	NO
4	4	13C8-PFOA	1803616-02 1811351-02A 0.24367	2.45e4	80.7	NO
5	5	13C9-PFNA	1803616-02 1811351-02A 0.24367	1.74e4	79.6	NO
6	6	13C4-PFOS	1803616-02 1811351-02A 0.24367	2.77e3	82.2	NO
7	7	13C6-PFDA	1803616-02 1811351-02A 0.24367	1.80e4	76.4	NO
8	8	13C7-PFUdA	1803616-02 1811351-02A 0.24367	2.25e4	84.3	NO

Name: 181126M1_85, Date: 27-Nov-2018, Time: 02:27:57, ID: 1803616-03 1811351-03A 0.23891, Description: 1811351-03A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803616-03 1811351-03A 0.23891	1.30e4	152.1	YES
2	2	13C5-PFHxA	1803616-03 1811351-03A 0.23891	2.29e4	90.4	NO
3	3	13C3-PFHxS	1803616-03 1811351-03A 0.23891	2.90e3	87.3	NO
4	4	13C8-PFOA	1803616-03 1811351-03A 0.23891	1.05e4	34.6	YES
5	5	13C9-PFNA	1803616-03 1811351-03A 0.23891	1.39e4	63.7	NO
6	6	13C4-PFOS	1803616-03 1811351-03A 0.23891	2.77e3	82.1	NO
7	7	13C6-PFDA	1803616-03 1811351-03A 0.23891	2.16e4	91.6	NO
8	8	13C7-PFUdA	1803616-03 1811351-03A 0.23891	2.36e4	88.3	NO

Name: 181126M1_86, Date: 27-Nov-2018, Time: 02:38:29, ID: 1803616-04 1811351-04A 0.23803, Description: 1811351-04A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803616-04 1811351-04A 0.23803	1.07e4	124.8	NO
2	2	13C5-PFHxA	1803616-04 1811351-04A 0.23803	1.71e4	67.7	NO
3	3	13C3-PFHxS	1803616-04 1811351-04A 0.23803	3.05e3	91.7	NO
4	4	13C8-PFOA	1803616-04 1811351-04A 0.23803	2.42e4	79.4	NO
5	5	13C9-PFNA	1803616-04 1811351-04A 0.23803	1.45e4	66.5	NO
6	6	13C4-PFOS	1803616-04 1811351-04A 0.23803	2.77e3	82.1	NO
7	7	13C6-PFDA	1803616-04 1811351-04A 0.23803	1.69e4	71.7	NO
8	8	13C7-PFUdA	1803616-04 1811351-04A 0.23803	1.57e4	58.9	NO

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Name: 181126M1_87, Date: 27-Nov-2018, Time: 02:49:08, ID: 1803616-05 1811351-05A 0.2442, Description: 1811351-05A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803616-05 1811351-05A 0.2442	1.17e4	137.1	NO
2	2	13C5-PFHxA	1803616-05 1811351-05A 0.2442	2.13e4	84.1	NO
3	3	13C3-PFHxS	1803616-05 1811351-05A 0.2442	2.86e3	86.0	NO
4	4	13C8-PFOA	1803616-05 1811351-05A 0.2442	2.53e4	83.0	NO
5	5	13C9-PFNA	1803616-05 1811351-05A 0.2442	1.84e4	84.2	NO
6	6	13C4-PFOS	1803616-05 1811351-05A 0.2442	2.95e3	87.6	NO
7	7	13C6-PFDA	1803616-05 1811351-05A 0.2442	1.95e4	82.9	NO
8	8	13C7-PFUdA	1803616-05 1811351-05A 0.2442	2.28e4	85.3	NO

Name: 181126M1_88, Date: 27-Nov-2018, Time: 02:59:40, ID: 1803617-01 1811352-01A 0.23776, Description: 1811352-01A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803617-01 1811352-01A 0.23776	7.66e2	9.0	YES
2	2	13C5-PFHxA	1803617-01 1811352-01A 0.23776	1.51e3	6.0	YES
3	3	13C3-PFHxS	1803617-01 1811352-01A 0.23776	1.82e2	5.5	YES
4	4	13C8-PFOA	1803617-01 1811352-01A 0.23776	1.68e3	5.5	YES
5	5	13C9-PFNA	1803617-01 1811352-01A 0.23776	1.34e3	6.1	YES
6	6	13C4-PFOS	1803617-01 1811352-01A 0.23776	1.76e2	5.2	YES
7	7	13C6-PFDA	1803617-01 1811352-01A 0.23776	1.39e3	5.9	YES
8	8	13C7-PFUdA	1803617-01 1811352-01A 0.23776	1.57e3	5.9	YES

Name: 181126M1_89, Date: 27-Nov-2018, Time: 03:10:19, ID: 1803617-02 1811352-02A 0.24714, Description: 1811352-02A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803617-02 1811352-02A 0.24714	1.23e4	144.2	NO
2	2	13C5-PFHxA	1803617-02 1811352-02A 0.24714	2.30e4	90.6	NO
3	3	13C3-PFHxS	1803617-02 1811352-02A 0.24714	3.01e3	90.4	NO
4	4	13C8-PFOA	1803617-02 1811352-02A 0.24714	2.53e4	83.2	NO
5	5	13C9-PFNA	1803617-02 1811352-02A 0.24714	1.92e4	88.0	NO
6	6	13C4-PFOS	1803617-02 1811352-02A 0.24714	3.10e3	92.0	NO
7	7	13C6-PFDA	1803617-02 1811352-02A 0.24714	2.04e4	86.6	NO
8	8	13C7-PFUdA	1803617-02 1811352-02A 0.24714	2.24e4	83.8	NO

Name: 181126M1_90, Date: 27-Nov-2018, Time: 03:20:52, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

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Name: 181126M1_91, Date: 27-Nov-2018, Time: 03:31:30, ID: ST181126M1-15 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M1-15 PFC CS3 18K1906	8.57e3	100.2	NO
2	2	13C5-PFHxA	ST181126M1-15 PFC CS3 18K1906	3.06e4	120.6	NO
3	3	13C3-PFHxS	ST181126M1-15 PFC CS3 18K1906	3.89e3	116.9	NO
4	4	13C8-PFOA	ST181126M1-15 PFC CS3 18K1906	3.59e4	118.0	NO
5	5	13C9-PFNA	ST181126M1-15 PFC CS3 18K1906	2.49e4	114.3	NO
6	6	13C4-PFOS	ST181126M1-15 PFC CS3 18K1906	4.12e3	122.0	NO
7	7	13C6-PFDA	ST181126M1-15 PFC CS3 18K1906	2.66e4	113.0	NO
8	8	13C7-PFUdA	ST181126M1-15 PFC CS3 18K1906	3.10e4	116.2	NO

Name: 181126M1_92, Date: 27-Nov-2018, Time: 03:42:04, ID: 1803618-01 1811353-01A 0.23448, Description: 1811353-01A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803618-01 1811353-01A 0.23448	3.42e3	39.9	YES
2	2	13C5-PFHxA	1803618-01 1811353-01A 0.23448	1.37e4	54.2	NO
3	3	13C3-PFHxS	1803618-01 1811353-01A 0.23448	2.71e3	81.5	NO
4	4	13C8-PFOA	1803618-01 1811353-01A 0.23448	2.15e4	70.7	NO
5	5	13C9-PFNA	1803618-01 1811353-01A 0.23448	1.79e4	81.8	NO
6	6	13C4-PFOS	1803618-01 1811353-01A 0.23448	3.00e3	88.9	NO
7	7	13C6-PFDA	1803618-01 1811353-01A 0.23448	1.93e4	82.0	NO
8	8	13C7-PFUdA	1803618-01 1811353-01A 0.23448	2.28e4	85.6	NO

Name: 181126M1_93, Date: 27-Nov-2018, Time: 03:52:42, ID: 1803618-02 1811353-02A 0.2386, Description: 1811353-02A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803618-02 1811353-02A 0.2386	1.02e4	119.5	NO
2	2	13C5-PFHxA	1803618-02 1811353-02A 0.2386	2.00e4	79.1	NO
3	3	13C3-PFHxS	1803618-02 1811353-02A 0.2386	2.75e3	82.7	NO
4	4	13C8-PFOA	1803618-02 1811353-02A 0.2386	2.42e4	79.6	NO
5	5	13C9-PFNA	1803618-02 1811353-02A 0.2386	1.66e4	76.0	NO
6	6	13C4-PFOS	1803618-02 1811353-02A 0.2386	2.98e3	88.4	NO
7	7	13C6-PFDA	1803618-02 1811353-02A 0.2386	1.85e4	78.7	NO
8	8	13C7-PFUdA	1803618-02 1811353-02A 0.2386	2.08e4	78.0	NO

Name: 181126M1_94, Date: 27-Nov-2018, Time: 04:03:16, ID: 1803618-03 1811353-03A 0.23967, Description: 1811353-03A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803618-03 1811353-03A 0.23967	7.23e3	84.6	NO
2	2	13C5-PFHxA	1803618-03 1811353-03A 0.23967	1.51e4	59.4	NO
3	3	13C3-PFHxS	1803618-03 1811353-03A 0.23967	2.26e3	67.9	NO
4	4	13C8-PFOA	1803618-03 1811353-03A 0.23967	1.93e4	63.3	NO
5	5	13C9-PFNA	1803618-03 1811353-03A 0.23967	1.41e4	64.8	NO
6	6	13C4-PFOS	1803618-03 1811353-03A 0.23967	2.39e3	70.7	NO
7	7	13C6-PFDA	1803618-03 1811353-03A 0.23967	1.54e4	65.4	NO
8	8	13C7-PFUdA	1803618-03 1811353-03A 0.23967	1.82e4	68.2	NO

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-IIS AREA.qld

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Name: 181126M1_95, Date: 27-Nov-2018, Time: 04:13:54, ID: 1803618-04 1811353-04A 0.24522, Description: 1811353-04A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803618-04 1811353-04A 0.24522	1.20e4	140.0	NO
2	2	13C5-PFHxA	1803618-04 1811353-04A 0.24522	2.21e4	87.3	NO
3	3	13C3-PFHxS	1803618-04 1811353-04A 0.24522	2.92e3	87.7	NO
4	4	13C8-PFOA	1803618-04 1811353-04A 0.24522	2.61e4	85.7	NO
5	5	13C9-PFNA	1803618-04 1811353-04A 0.24522	1.71e4	78.4	NO
6	6	13C4-PFOS	1803618-04 1811353-04A 0.24522	2.99e3	88.5	NO
7	7	13C6-PFDA	1803618-04 1811353-04A 0.24522	1.92e4	81.7	NO
8	8	13C7-PFUdA	1803618-04 1811353-04A 0.24522	2.33e4	87.5	NO

Name: 181126M1_96, Date: 27-Nov-2018, Time: 04:24:26, ID: 1803620-01 1811354-01A 0.23589, Description: 1811354-01A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803620-01 1811354-01A 0.23589	7.15e3	83.6	NO
2	2	13C5-PFHxA	1803620-01 1811354-01A 0.23589	1.26e4	49.7	YES
3	3	13C3-PFHxS	1803620-01 1811354-01A 0.23589	2.30e3	69.0	NO
4	4	13C8-PFOA	1803620-01 1811354-01A 0.23589	1.46e4	47.9	YES
5	5	13C9-PFNA	1803620-01 1811354-01A 0.23589	1.05e4	48.0	YES
6	6	13C4-PFOS	1803620-01 1811354-01A 0.23589	2.26e3	66.9	NO
7	7	13C6-PFDA	1803620-01 1811354-01A 0.23589	1.17e4	49.7	YES
8	8	13C7-PFUdA	1803620-01 1811354-01A 0.23589	1.42e4	53.3	NO

Name: 181126M1_97, Date: 27-Nov-2018, Time: 04:35:05, ID: 1803620-02 1811354-02A 0.22278, Description: 1811354-02A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803620-02 1811354-02A 0.22278	8.53e3	99.8	NO
2	2	13C5-PFHxA	1803620-02 1811354-02A 0.22278	1.61e4	63.4	NO
3	3	13C3-PFHxS	1803620-02 1811354-02A 0.22278	2.10e3	63.2	NO
4	4	13C8-PFOA	1803620-02 1811354-02A 0.22278	1.87e4	61.5	NO
5	5	13C9-PFNA	1803620-02 1811354-02A 0.22278	1.32e4	60.7	NO
6	6	13C4-PFOS	1803620-02 1811354-02A 0.22278	2.16e3	64.2	NO
7	7	13C6-PFDA	1803620-02 1811354-02A 0.22278	1.44e4	61.2	NO
8	8	13C7-PFUdA	1803620-02 1811354-02A 0.22278	1.53e4	57.4	NO

Name: 181126M1_98, Date: 27-Nov-2018, Time: 04:45:37, ID: 1803626-02 16-MW-06-SA2 0.1197, Description: 16-MW-06-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803626-02 16-MW-06-SA2 0.1197	1.45e4	169.9	YES
2	2	13C5-PFHxA	1803626-02 16-MW-06-SA2 0.1197	2.61e4	103.0	NO
3	3	13C3-PFHxS	1803626-02 16-MW-06-SA2 0.1197	3.36e3	101.1	NO
4	4	13C8-PFOA	1803626-02 16-MW-06-SA2 0.1197	2.80e4	92.0	NO
5	5	13C9-PFNA	1803626-02 16-MW-06-SA2 0.1197	2.01e4	92.3	NO
6	6	13C4-PFOS	1803626-02 16-MW-06-SA2 0.1197	3.78e3	111.9	NO
7	7	13C6-PFDA	1803626-02 16-MW-06-SA2 0.1197	2.19e4	92.9	NO
8	8	13C7-PFUdA	1803626-02 16-MW-06-SA2 0.1197	2.49e4	93.1	NO

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-IIS AREA.qld

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Name: 181126M1_99, Date: 27-Nov-2018, Time: 04:56:15, ID: 1803626-01@5X 16-HS-03-SA2 0.11792, Description: 16-HS-03-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803626-01@5X 16-HS-03-SA2 0.11792	2.60e3	30.4	YES
2	2	13C5-PFHxA	1803626-01@5X 16-HS-03-SA2 0.11792	4.19e3	16.5	YES
3	3	13C3-PFHxS	1803626-01@5X 16-HS-03-SA2 0.11792	6.78e2	20.4	YES
4	4	13C8-PFOA	1803626-01@5X 16-HS-03-SA2 0.11792	5.01e3	16.5	YES
5	5	13C9-PFNA	1803626-01@5X 16-HS-03-SA2 0.11792	3.39e3	15.5	YES
6	6	13C4-PFOS	1803626-01@5X 16-HS-03-SA2 0.11792	7.05e2	20.9	YES
7	7	13C6-PFDA	1803626-01@5X 16-HS-03-SA2 0.11792	3.73e3	15.9	YES
8	8	13C7-PFUdA	1803626-01@5X 16-HS-03-SA2 0.11792	4.35e3	16.3	YES

Name: 181126M1_100, Date: 27-Nov-2018, Time: 05:06:54, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181126M1_101, Date: 27-Nov-2018, Time: 05:17:27, ID: ST181126M1-16 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181126M1-16 PFC CS3 18K1906	7.87e3	92.1	NO
2	2	13C5-PFHxA	ST181126M1-16 PFC CS3 18K1906	2.37e4	93.6	NO
3	3	13C3-PFHxS	ST181126M1-16 PFC CS3 18K1906	2.89e3	87.0	NO
4	4	13C8-PFOA	ST181126M1-16 PFC CS3 18K1906	2.67e4	87.8	NO
5	5	13C9-PFNA	ST181126M1-16 PFC CS3 18K1906	1.99e4	91.2	NO
6	6	13C4-PFOS	ST181126M1-16 PFC CS3 18K1906	3.11e3	92.1	NO
7	7	13C6-PFDA	ST181126M1-16 PFC CS3 18K1906	2.15e4	91.2	NO
8	8	13C7-PFUdA	ST181126M1-16 PFC CS3 18K1906	2.56e4	96.1	NO

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Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_12, Date: 26-Nov-2018, Time: 13:32:01, ID: IPA, Description: IPA

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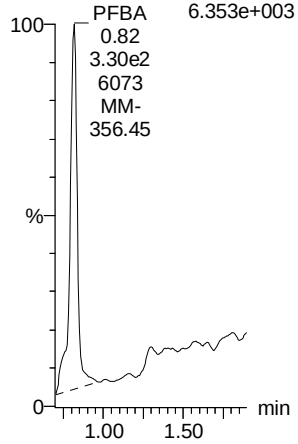
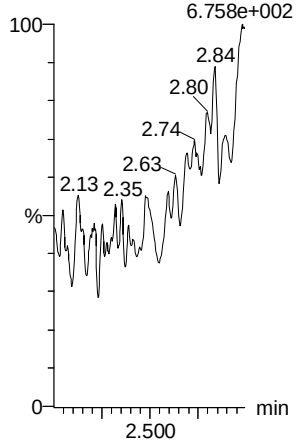
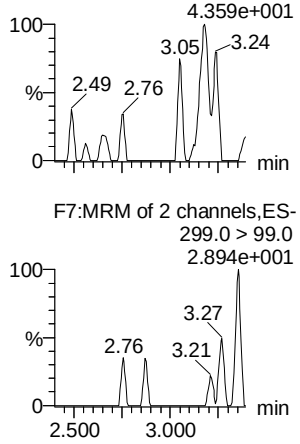


PFPeA



PFBS



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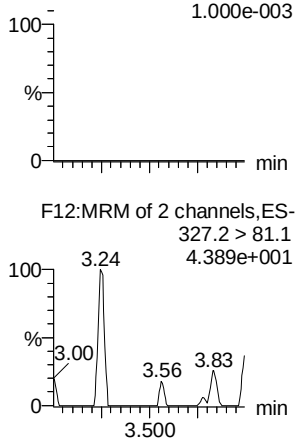
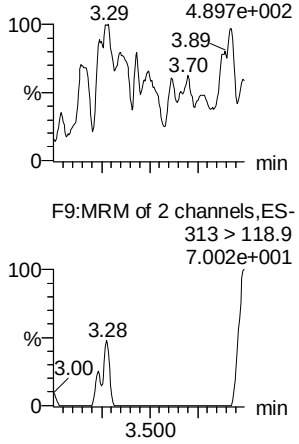
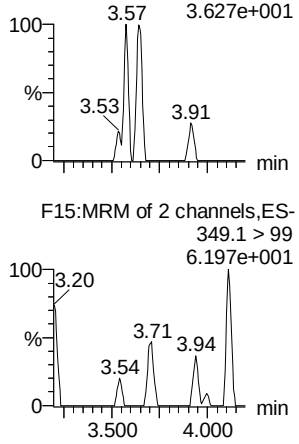


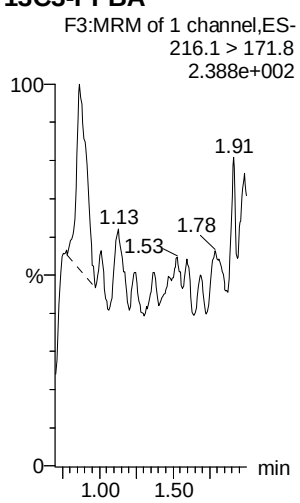
PFHxA



PFPeS



13C3-PFBA



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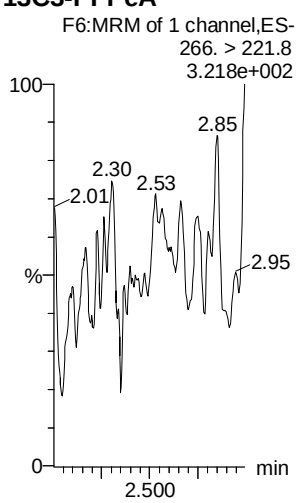

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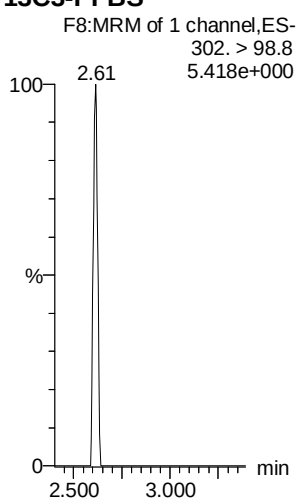
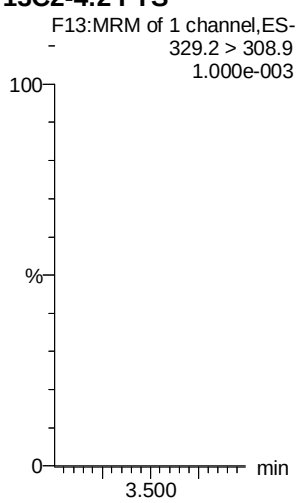


13C2-4:2 FTS



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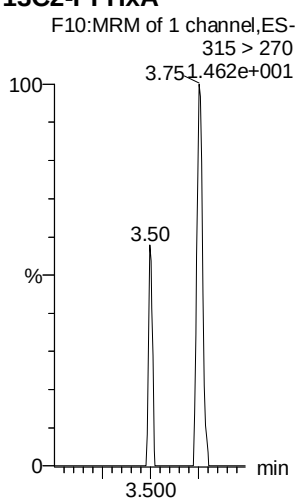

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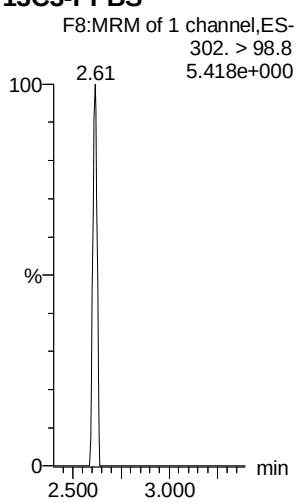

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-IB.qld

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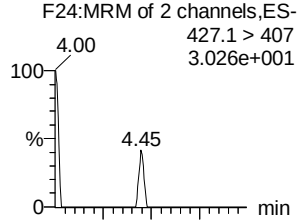
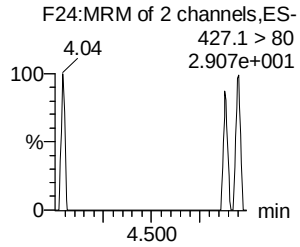
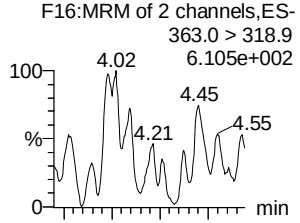
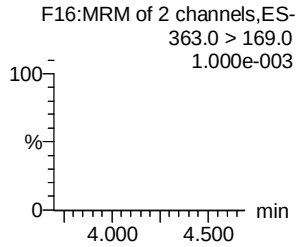
6:2 FTS



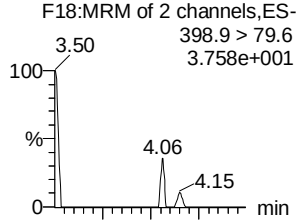


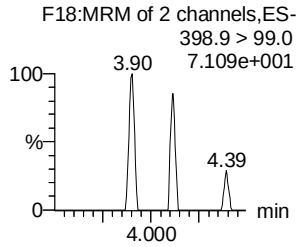
PFHpA



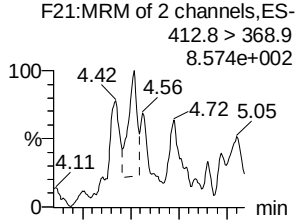


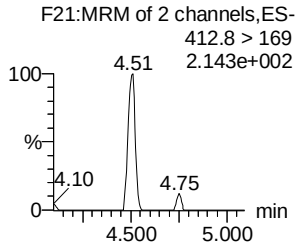
L-PFHxS



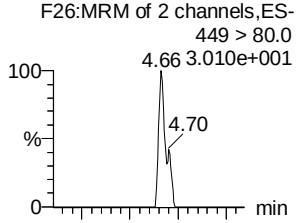


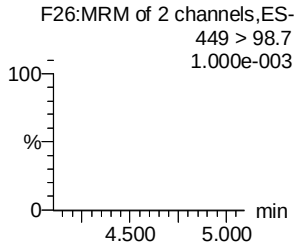
L-PFOA





PFHpS





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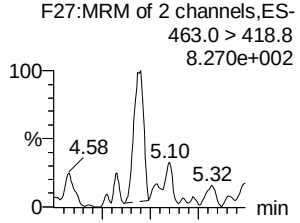
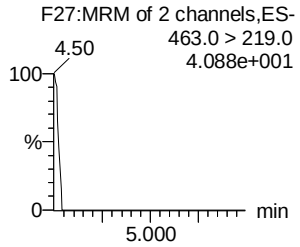
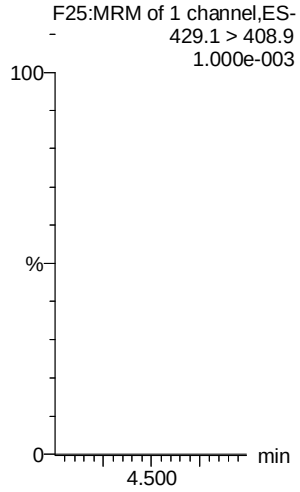




13C2-6:2 FTS



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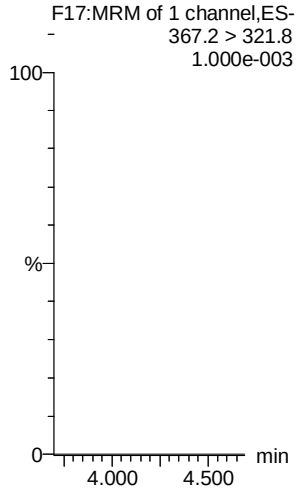
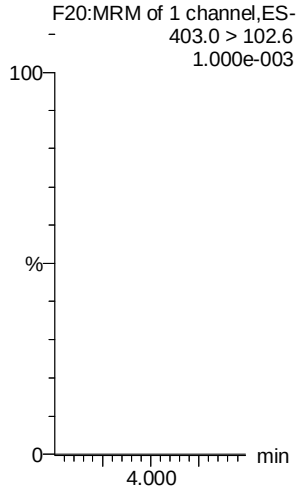
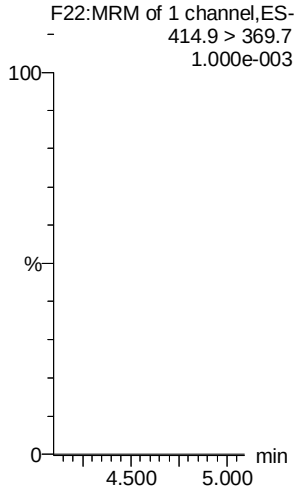


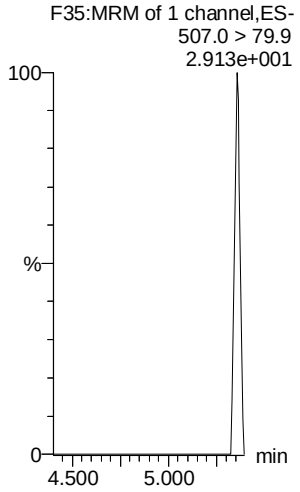
18O2-PFHxS



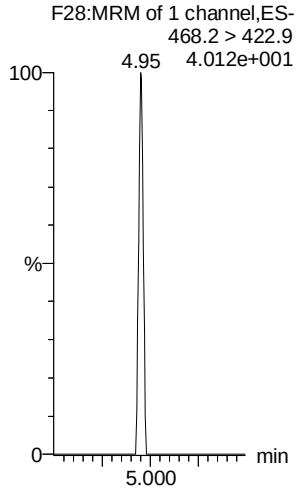
13C2-PFOA



13C8-PFOS



13C5-PFNA



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-IB.qld

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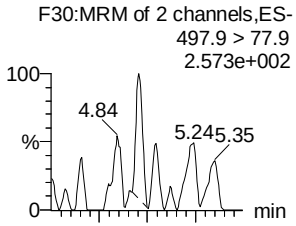
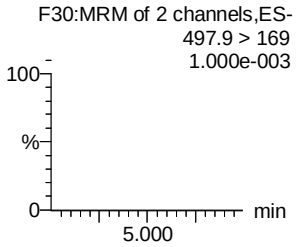
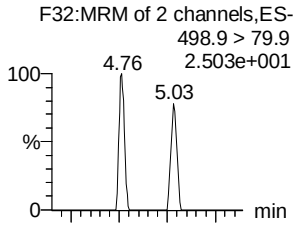
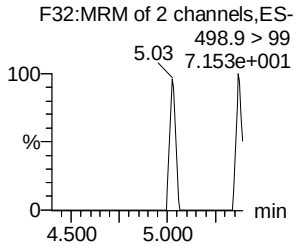
PFOSA



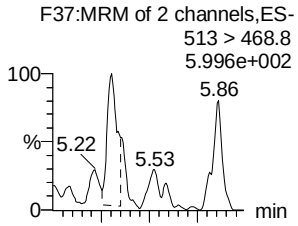


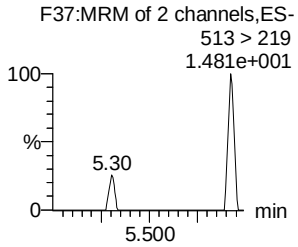
L-PFOS



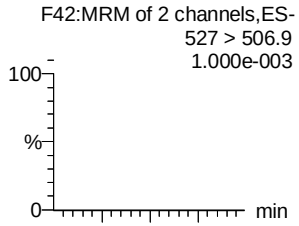


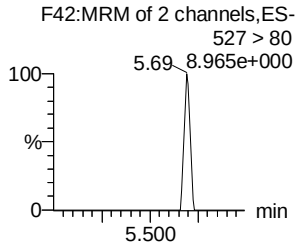
PFDA





8:2 FTS





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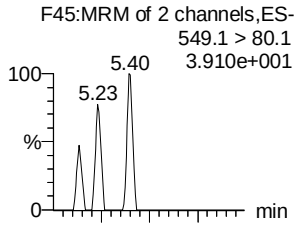

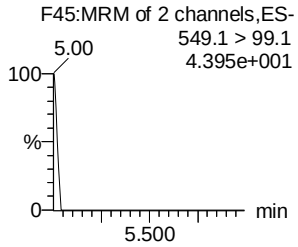

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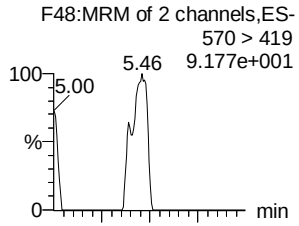
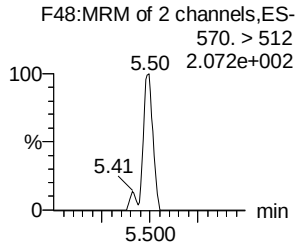
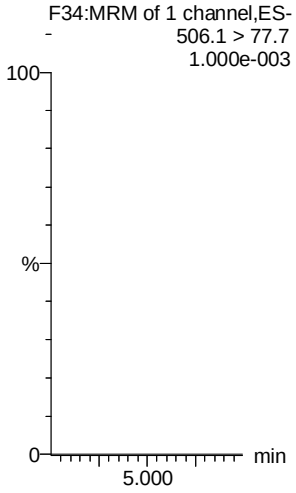




13C8-PFOSA



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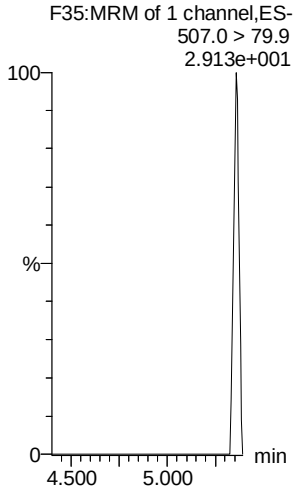

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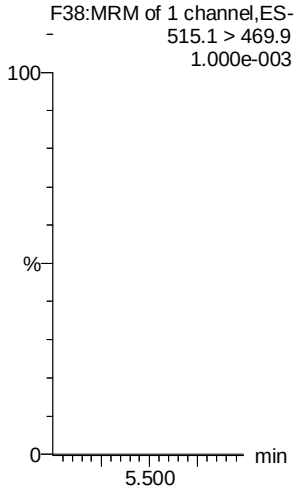

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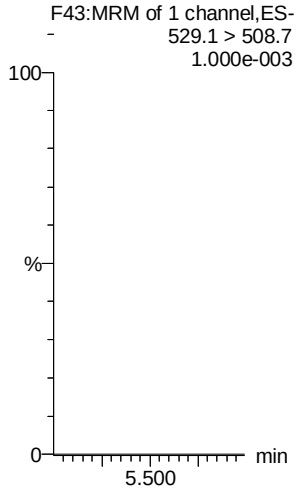

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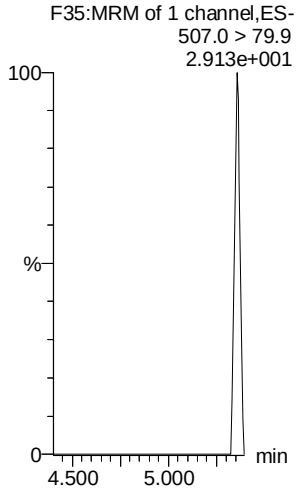

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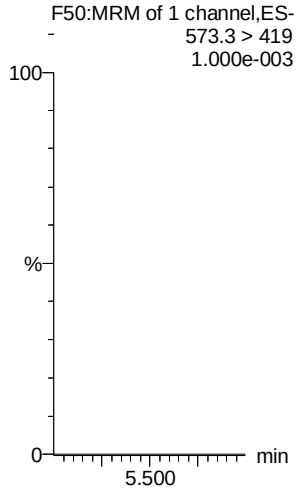

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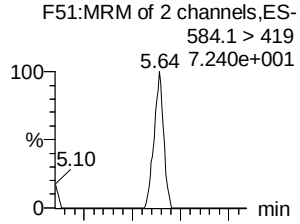
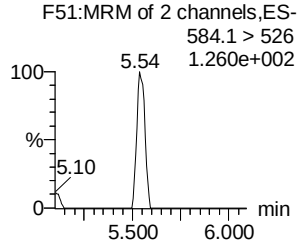
Printed: Monday, November 26, 2018 14:39:16 Pacific Standard Time

Name: 181126M1_12, Date: 26-Nov-2018, Time: 13:32:01, ID: IPA, Description: IPA

L-EtFOSAA





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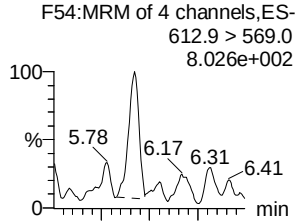

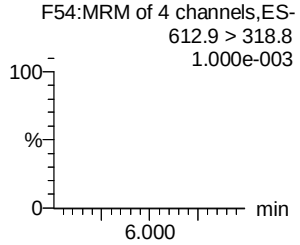

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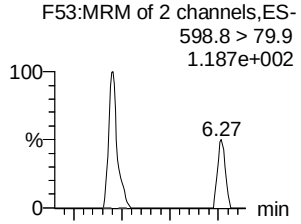

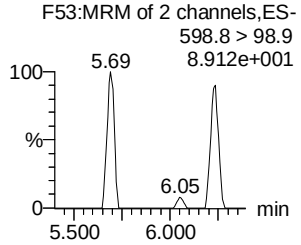

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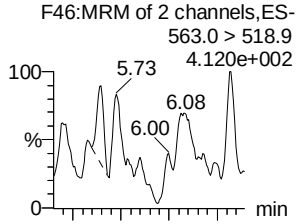
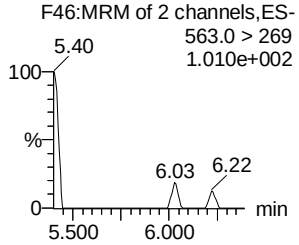
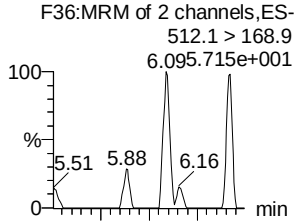
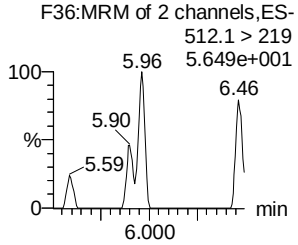




N-MeFOSA





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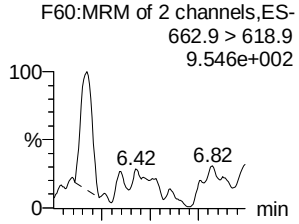

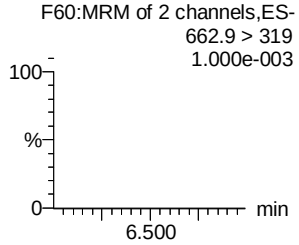

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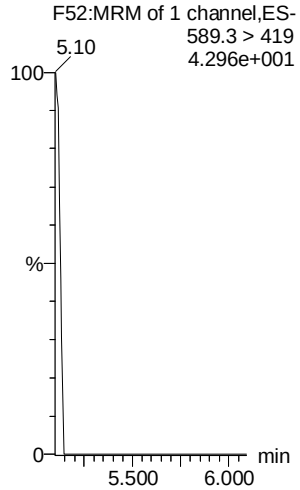

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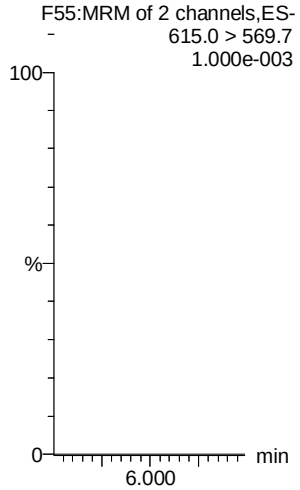

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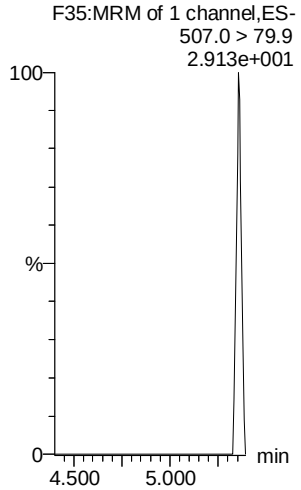

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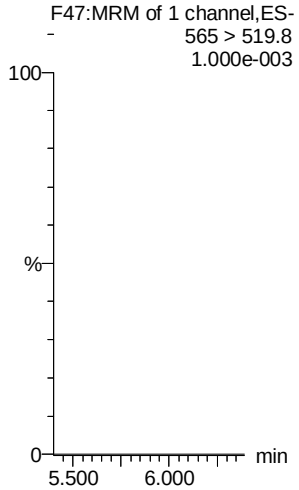

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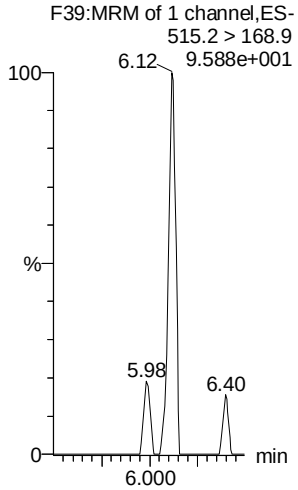

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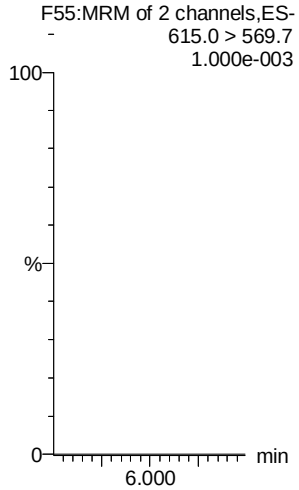

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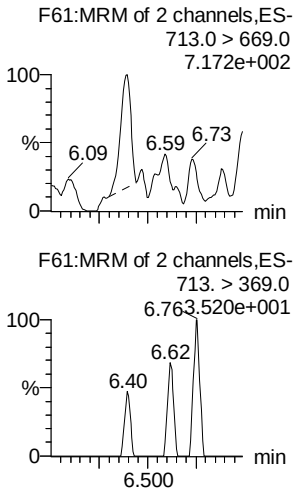

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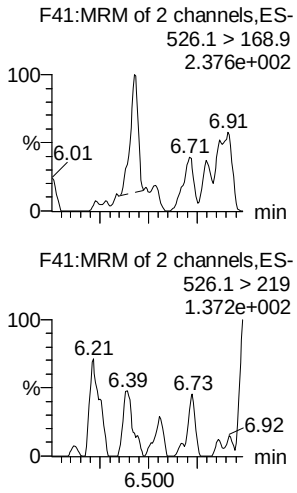

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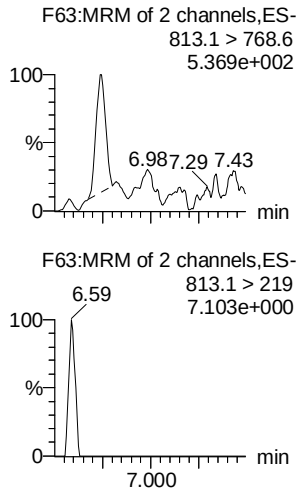

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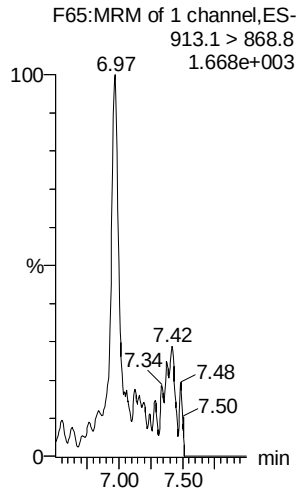

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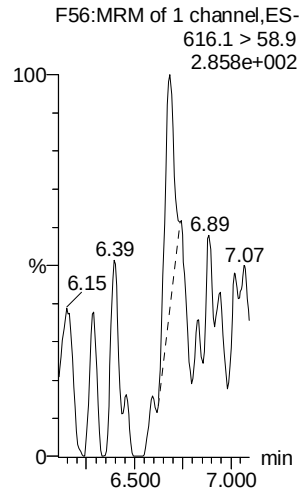

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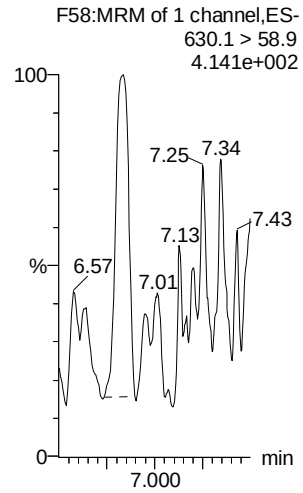

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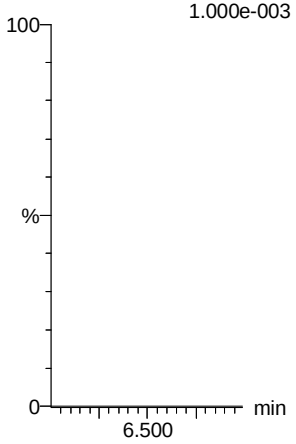

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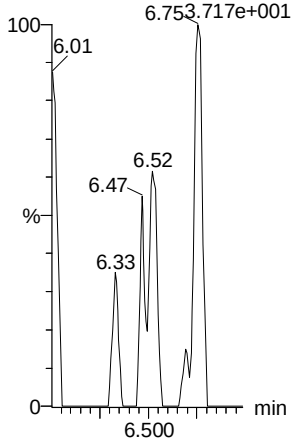

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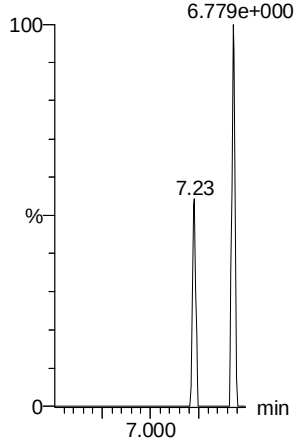

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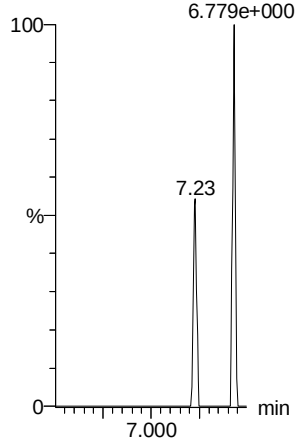

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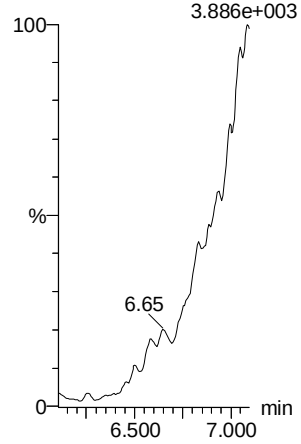

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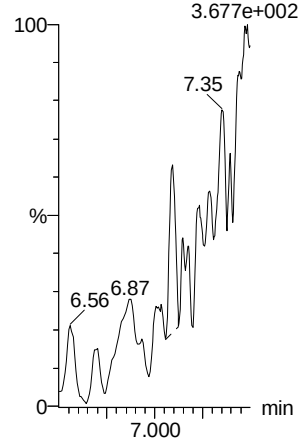

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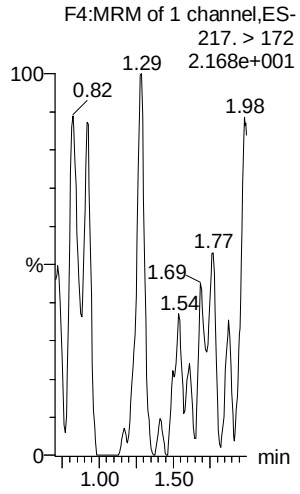

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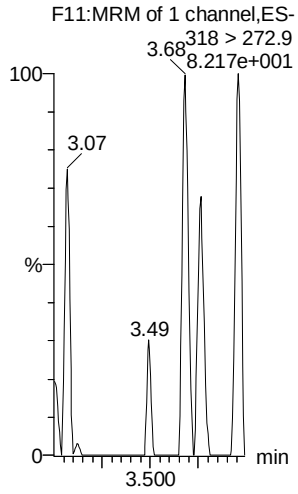

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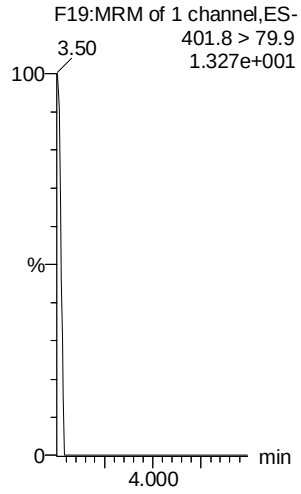

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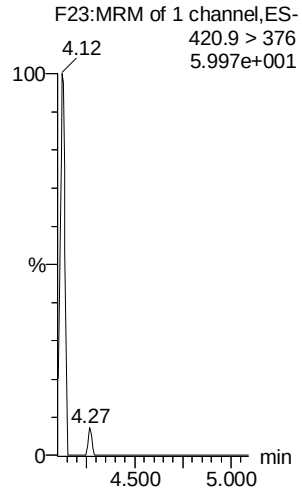

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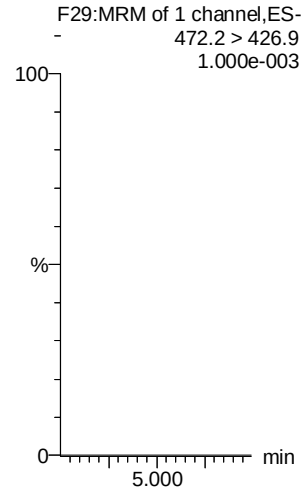

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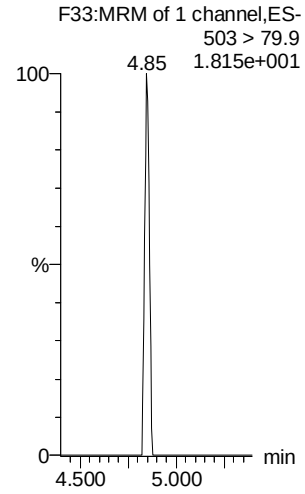

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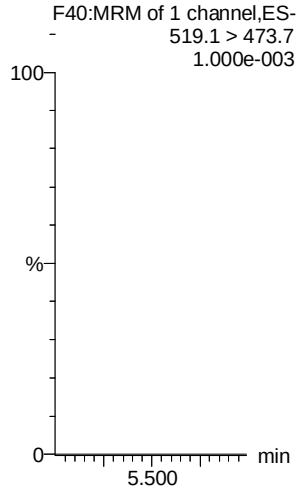

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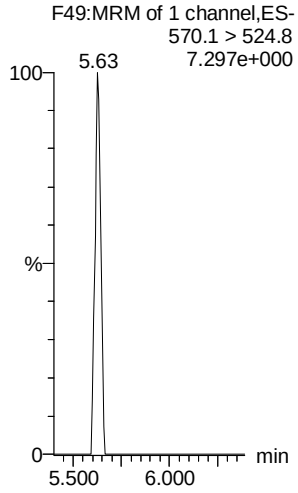

LC Calibration Standards Review Checklist Q4

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Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐

Full Mass Cal. Date: 11/26/18

Run Log Present: ☐

# of Samples per Sequence Checked: ☐ 9

Instrument Blank Saved ☑

IIS Area Saved ☑

Reviewed By: JM 11/28/18
Initials/Date

Comments:

ID: LR - LCSRC Rev. No.: 1 Rev. Date: 02/06/2018 Page: 1 of 1

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-32.qld

Last Altered: Tuesday, November 27, 2018 14:01:57 Pacific Standard Time
Printed: Tuesday, November 27, 2018 14:02:49 Pacific Standard Time

√ DM 11/27/18

Name: 181126M1_32, Date: 26-Nov-2018, Time: 17:06:06, ID: ST181126M1-11 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	6606.858	7049.748	1.00	1.20	11.715	10.0	100.0	NO		
2	2	PFPeA	263.1 > 218.9	10985.244	14740.899	1.00	2.41	9.315	9.8	97.8	NO		
3	3	PFBS	299.0 > 79.7	2888.723	1893.052	1.00	2.75	19.075	9.2	92.4	NO	2.655	NO
4	4	4:2 FTS	327.2>307.2	4060.376	4900.835	1.00	3.24	10.356	9.9	99.1	NO	1.641	NO
5	5	PFHxA	313 > 269	19501.162	10553.197	1.00	3.32	9.239	9.8	97.5	NO	14.778	NO
6	6	PFPeS	349.1>80.1	2387.928	1893.052	1.00	3.54	15.768	9.4	94.4	NO	1.547	NO
7	36	13C3-PFBA	216.1 > 171.8	7049.748	8809.497	1.00	1.19	10.003	12.7	101.6	NO		
8	37	13C3-PFPeA	266. > 221.8	14740.899	27131.221	1.00	2.41	6.791	12.2	97.7	NO		
9	38	13C3-PFBS	302. > 98.8	1893.052	3644.961	1.00	2.75	6.492	12.1	96.7	NO		
10	39	13C2-4:2 FTS	329.2>308.9	4900.835	3644.961	1.00	3.24	16.807	11.4	91.0	NO		
11	40	13C2-PFHxA	315 > 270	10553.197	27131.221	1.00	3.32	4.862	4.9	98.4	NO		
12	38	13C3-PFBS	302. > 98.8	1893.052	3644.961	1.00	2.75	6.492	12.1	96.7	NO		
13	-1												
14	10	6:2 FTS	427.1 > 407	4997.967	5060.272	1.00	4.43	12.346	9.9	99.2	NO	3.078	NO
15	7	PFHpA	363.0 > 318.9	13748.122	13302.933	1.00	3.99	12.918	9.8	98.0	NO	12.500	NO
16	8	L-PFHxS	398.9 > 79.6	2291.493	1573.380	1.00	4.14	18.205	9.4	93.6	NO	1.636	NO
17	11	L-PFOA	412.8 > 368.9	26320.563	24051.920	1.00	4.48	13.679	10.0	99.6	NO	3.362	NO
18	13	PFHpS	449 > 80.0	2802.643	3692.837	1.00	4.60	9.487	10.1	101.2	NO	1.786	NO
19	14	PFNA	463.0 > 418.8	22550.791	22563.053	1.00	4.91	12.493	10.0	99.7	NO	4.788	NO
20	43	13C2-6:2 FTS	429.1 > 408.9	5060.272	3506.858	1.00	4.43	18.037	11.5	92.3	NO		
21	41	13C4-PFHpA	367.2 > 321.8	13302.933	27131.221	1.00	3.99	6.129	11.4	91.4	NO		
22	42	18O2-PFHxS	403.0 > 102.6	1573.380	3644.961	1.00	4.13	5.396	12.0	96.3	NO		
23	44	13C2-PFOA	414.9 > 369.7	24051.920	32606.566	1.00	4.48	9.221	12.2	97.7	NO		
24	47	13C8-PFOS	507.0 > 79.9	3692.837	3506.858	1.00	5.00	13.163	12.6	101.1	NO		
25	45	13C5-PFNA	468.2 > 422.9	22563.053	22385.721	1.00	4.91	12.599	12.7	101.7	NO		
26	-1												
27	15	PFOSA	497.9 > 77.9	2839.476	3108.852	1.00	4.96	11.417	10.0	100.3	NO	28.488	NO
28	16	L-PFOS	498.9 > 79.9	3101.389	3692.837	1.00	5.00	10.498	9.5	95.5	NO	2.035	NO
29	18	PFDA	513 > 468.8	23474.510	21359.041	1.00	5.30	13.738	10.4	104.5	NO	5.844	NO
30	19	8:2 FTS	527 > 506.9	4582.216	3731.945	1.00	5.27	15.348	10.1	101.5	NO	2.486	NO
31	20	PFNS	549.1 > 80.1	2154.288	3692.837	1.00	5.36	7.292	9.5	95.0	NO	1.641	NO
32	21	L-MeFOSAA	570 > 419	8526.330	3698.784	1.00	5.45	28.815	9.9	99.1	NO	2.519	NO
33	46	13C8-PFOSA	506.1 > 77.7	3108.852	28556.748	1.00	4.96	1.361	14.0	112.1	NO		
34	47	13C8-PFOS	507.0 > 79.9	3692.837	3506.858	1.00	5.00	13.163	12.6	101.1	NO		
35	48	13C2-PFDA	515.1 > 469.9	21359.041	25260.830	1.00	5.30	10.569	11.7	93.7	NO		
36	49	13C2-8:2 FTS	529.1 > 508.7	3731.945	3506.858	1.00	5.27	13.302	11.3	90.4	NO		

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Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-32.qld

Last Altered: Tuesday, November 27, 2018 14:01:57 Pacific Standard Time
Printed: Tuesday, November 27, 2018 14:02:49 Pacific Standard Time

Name: 181126M1_32, Date: 26-Nov-2018, Time: 17:06:06, ID: ST181126M1-11 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	47	13C8-PFOS	507.0 > 79.9	3692.837	3506.858	1.00	5.00	13.163	12.6	101.1	NO		
38	50	d3-N-MeFOSAA	573.3 > 419	3698.784	28556.748	1.00	5.45	1.619	12.0	96.2	NO		
39	-1												
40	23	L-EtFOSAA	584.1 > 419	7404.324	5280.511	1.00	5.61	17.527	10.8	108.2	NO	1.432	NO
41	27	PFDoA	612.9 > 569.0	23449.475	25779.438	1.00	5.91	11.370	9.7	97.4	NO	8.241	NO
42	26	PFDS	598.8 > 79.9	2844.874	3692.837	1.00	5.67	9.630	9.2	91.8	NO	1.700	NO
43	25	PFUdA	563.0 > 518.9	20633.477	27061.512	1.00	5.62	9.531	9.8	97.7	NO	9.235	NO
44	28	N-MeFOSA	512.1 > 168.9	4122.458	12424.194	1.00	5.89	49.771	51.8	103.6	NO	1.437	NO
45	29	PFTrDA	662.9 > 618.9	24281.201	25779.438	1.00	6.16	11.774	10.1	101.3	NO	25.389	NO
46	52	d5-N-EtFOSAA	589.3 > 419	5280.511	28556.748	1.00	5.61	2.311	12.5	99.8	NO		
47	53	13C2-PFDoA	615.0 > 569.7	25779.438	25260.830	1.00	5.91	12.757	12.2	97.5	NO		
48	47	13C8-PFOS	507.0 > 79.9	3692.837	3506.858	1.00	5.00	13.163	12.6	101.1	NO		
49	51	13C2-PFUdA	565 > 519.8	27061.512	28556.748	1.00	5.63	11.845	12.4	99.0	NO		
50	54	d3-N-MeFOSA	515.2 > 168.9	12424.194	28556.748	1.00	5.92	5.438	148.2	98.8	NO		
51	53	13C2-PFDoA	615.0 > 569.7	25779.438	25260.830	1.00	5.91	12.757	12.2	97.5	NO		
52	-1												
53	30	PFTeDA	713.0 > 669.0	20583.383	15845.762	1.00	6.38	16.237	9.9	99.3	NO	12.770	NO
54	31	N-EtFOSA	526.1 > 168.9	6015.029	21639.605	1.00	6.39	41.695	47.5	94.9	NO	1.631	NO
55	32	PFHxDA	813.1 > 768.6	7486.576	8629.297	1.00	6.72	4.338	10.8	108.2	NO	17.427	NO
56	33	PFODA	913.1 > 868.8	12776.631	8629.297	1.00	6.96	7.403	10.5	104.9	NO		
57	34	N-MeFOSE	616.1 > 58.9	3104.770	10626.706	1.00	6.69	43.825	48.3	96.7	NO		
58	35	N-EtFOSE	630.1 > 58.9	3914.298	10263.792	1.00	6.84	57.205	49.8	99.6	NO		
59	55	13C2-PFTeDA	715.1 > 669.7	15845.762	28556.748	1.00	6.38	6.936	12.2	97.9	NO		
60	56	d5-N-ETFOSA	531.1 > 168.9	21639.605	28556.748	1.00	6.42	9.472	162.4	108.3	NO		
61	57	13C2-PFHxDA	815 > 769.7	8629.297	28556.748	1.00	6.72	3.777	5.1	101.3	NO		
62	57	13C2-PFHxDA	815 > 769.7	8629.297	28556.748	1.00	6.72	3.777	5.1	101.3	NO		
63	58	d7-N-MeFOSE	623.1 > 58.9	10626.706	28556.748	1.00	6.68	4.652	147.0	98.0	NO		
64	59	d9-N-EtFOSE	639.2 > 58.8	10263.792	28556.748	1.00	6.83	4.493	150.6	100.4	NO		
65	-1												
66	60	13C4-PFBA	217. > 172	8809.497	8809.497	1.00	1.19	12.500	12.5	100.0	NO		
67	61	13C5-PFHxA	318 > 272.9	27131.221	27131.221	1.00	3.32	12.500	12.5	100.0	NO		
68	62	13C3-PFHxS	401.8 > 79.9	3644.961	3644.961	1.00	4.13	12.500	12.5	100.0	NO		
69	63	13C8-PFOA	420.9 > 376	32606.566	32606.566	1.00	4.48	12.500	12.5	100.0	NO		
70	64	13C9-PFNA	472.2 > 426.9	22385.721	22385.721	1.00	4.91	12.500	12.5	100.0	NO		
71	65	13C4-PFOS	503 > 79.9	3506.858	3506.858	1.00	5.00	12.500	12.5	100.0	NO		
72	66	13C6-PFDA	519.1 > 473.7	25260.830	25260.830	1.00	5.30	12.500	12.5	100.0	NO		

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-32.qld

Last Altered: Tuesday, November 27, 2018 14:01:57 Pacific Standard Time
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Name: 181126M1_32, Date: 26-Nov-2018, Time: 17:06:06, ID: ST181126M1-11 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	67	13C7-PFUdA	570.1 > 524.8	28556.748	28556.748	1.00	5.63	12.500	12.5	100.0	NO		

Quantity Compound Summary Report **MassLynx MassLynx V4.1 SCN945 SCN960**
Vista Analytical Laboratory

Dataset: Untitled

Last Altered: Tuesday, November 27, 2018 08:29:26 Pacific Standard Time
Printed: Tuesday, November 27, 2018 08:29:38 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
1	1	181126M1_1	IPA	26-Nov-18	11:35:18
2	2	181126M1_2	ST181126M1-1 PFC CS-2 18K1901	26-Nov-18	11:45:59
3	3	181126M1_3	ST181126M1-2 PFC CS-1 18K1902	26-Nov-18	11:56:32
4	4	181126M1_4	ST181126M1-3 PFC CS0 18K1903	26-Nov-18	12:07:10
5	5	181126M1_5	ST181126M1-4 PFC CS1 18K1904	26-Nov-18	12:17:48
6	6	181126M1_6	ST181126M1-5 PFC CS2 18K1905	26-Nov-18	12:28:21
7	7	181126M1_7	ST181126M1-6 PFC CS3 18K1906	26-Nov-18	12:38:59
8	8	181126M1_8	ST181126M1-7 PFC CS4 1810907	26-Nov-18	12:49:38
9	9	181126M1_9	ST181126M1-8 PFC CS5 18K1908	26-Nov-18	13:00:11
10	10	181126M1_10	ST181126M1-9 PFC CS6 18K1909	26-Nov-18	13:10:49
11	11	181126M1_11	ST181126M1-10 PFC CS7 18K1910	26-Nov-18	13:21:23
12	12	181126M1_12	IPA	26-Nov-18	13:32:01
13	13	181126M1_13	ICV181126M1-1 PFC ICV 18K1911	26-Nov-18	13:42:34
14	14	181126M1_14	IPA	26-Nov-18	13:53:12
15	15	181126M1_15	B8K0097-BSD1 LCSD 0.125	26-Nov-18	14:03:48
16	16	181126M1_16	1803629-06 REEPDW585 0.11471	26-Nov-18	14:14:24
17	17	181126M1_17	B8K0152-BS1 OPR 0.25	26-Nov-18	14:25:02
18	18	181126M1_18	B8K0152-BLK1 Method Blank 0.25	26-Nov-18	14:35:34
19	19	181126M1_19	1803729-01 WMP1811191026JSJ 0.23788	26-Nov-18	14:46:12
20	20	181126M1_20	1803729-02 WMP1811191035JSJ 0.23637	26-Nov-18	14:56:45
21	21	181126M1_21	1803729-03 WMP1811191043JSJ 0.23365	26-Nov-18	15:07:48
22	22	181126M1_22	1803730-01 WEF1811191106JSJ 0.24116	26-Nov-18	15:18:26
23	23	181126M1_23	B8K0144-BS1 OPR 0.125	26-Nov-18	15:29:49
24	24	181126M1_24	B8K0144-BSD1 LCSD 0.125	26-Nov-18	15:41:20
25	25	181126M1_25	B8K0144-BLK1 Method Blank 0.125	26-Nov-18	15:51:53
26	26	181126M1_26	1803659-01 A1-MW-07-SA2 0.11704	26-Nov-18	16:02:31
27	27	181126M1_27	1803659-02 A1-MW-23-SA2 0.1178	26-Nov-18	16:13:04
28	28	181126M1_28	1803659-03 A1-MW-25-SA2 0.11426	26-Nov-18	16:23:43
29	29	181126M1_29	1803659-04 A1-MW-27-SA2 0.11731	26-Nov-18	16:34:21
30	30	181126M1_30	1803659-05 A1-MW-55-SA2 0.11846	26-Nov-18	16:44:53
31	31	181126M1_31	IPA	26-Nov-18	16:55:32
32	32	181126M1_32	ST181126M1-11 PFC CS3 18K1906	26-Nov-18	17:06:06

(K) dm 11/27/18

Dataset: Untitled

Last Altered: Tuesday, November 27, 2018 08:29:26 Pacific Standard Time
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Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
33	33	181126M1_33	1803659-06 A1-MW-54-SA2 0.11683	26-Nov-18	17:16:44
34	34	181126M1_34	1803659-07 FRB-20181114 0.11549	26-Nov-18	17:27:17
35	35	181126M1_35	B8K0135-BS1 OPR 1	26-Nov-18	17:37:55
36	36	181126M1_36	B8K0135-BLK1 Method Blank 1	26-Nov-18	17:48:34
37	37	181126M1_37	1803551-03 BS1810290940GC 5	26-Nov-18	17:59:07
38	38	181126M1_38	1803581-03 BS1810311220GC 5.1	26-Nov-18	18:09:45
39	39	181126M1_39	1803581-04 BS1810311230GC 5.08	26-Nov-18	18:20:24
40	40	181126M1_40	B8K0049-BS1 OPR 1	26-Nov-18	18:30:57
41	41	181126M1_41	B8K0049-BLK1 Method Blank 1	26-Nov-18	18:41:36
42	42	181126M1_42	1803520-01 HS-SB-939 (3-5)-EPA 1.51	26-Nov-18	18:52:09
43	43	181126M1_43	1803553-04 BS1810291445GC 3.51	26-Nov-18	19:02:47
44	44	181126M1_44	1803575-06 BS1810301040GC 1.48	26-Nov-18	19:13:20
45	45	181126M1_45	1803577-05 BS1810301620GC 5.94	26-Nov-18	19:23:58
46	46	181126M1_46	B8K0118-BS1 OPR 0.125	26-Nov-18	19:34:37
47	47	181126M1_47	B8K0118-BLK1 Method Blank 0.125	26-Nov-18	19:45:09
48	48	181126M1_48	1803640-01 MW-2A 0.11056	26-Nov-18	19:55:48
49	49	181126M1_49	1803640-02 MW-3 0.1163	26-Nov-18	20:06:21
50	50	181126M1_50	IPA	26-Nov-18	20:16:59
51	51	181126M1_51	ST181126M1-12 PFC CS3 18K1906	26-Nov-18	20:27:33
52	52	181126M1_52	1803640-03 MW-4 0.11182	26-Nov-18	20:38:11
53	53	181126M1_53	1803640-04 TS Well 0.11479	26-Nov-18	20:48:44
54	54	181126M1_54	1803641-01 MW3S 0.11429	26-Nov-18	20:59:22
55	55	181126M1_55	1803641-02 MW6 0.11494	26-Nov-18	21:09:56
56	56	181126M1_56	1803641-03 MW7 0.11164	26-Nov-18	21:20:34
57	57	181126M1_57	1803641-04 SW2 0.11314	26-Nov-18	21:31:07
58	58	181126M1_58	1803646-01 MW-1 0.11872	26-Nov-18	21:41:46
59	59	181126M1_59	1803646-02 MW-4S 0.11549	26-Nov-18	21:52:19
60	60	181126M1_60	1803646-03 Thorne 0.11815	26-Nov-18	22:02:57
61	61	181126M1_61	1803647-01 MW-1 0.11071	26-Nov-18	22:13:30
62	62	181126M1_62	IPA	26-Nov-18	22:24:08
63	63	181126M1_63	ST181126M1-13 PFC CS3 18K1906	26-Nov-18	22:34:41
64	64	181126M1_64	1803647-02 MW-3 0.11209	26-Nov-18	22:45:19
65	65	181126M1_65	1803651-01 MW-1 0.11903	26-Nov-18	22:55:52
66	66	181126M1_66	1803651-02 MW-4 0.11498	26-Nov-18	23:06:31
67	67	181126M1_67	1803651-03 MW-3 0.11883	26-Nov-18	23:17:03
68	68	181126M1_68	1803652-01 MW-1 0.11504	26-Nov-18	23:27:42

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Dataset: Untitled

Last Altered: Tuesday, November 27, 2018 08:29:26 Pacific Standard Time
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Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
69	69	181126M1_69	1803652-02 MW-2 0.11316	26-Nov-18	23:38:20
70	70	181126M1_70	B8K0134-BS1 OPR 1	26-Nov-18	23:48:53
71	71	181126M1_71	B8K0134-BLK1 Method Blank 1	26-Nov-18	23:59:32
72	72	181126M1_72	1803552-01 BS1810291030GC 19.2	27-Nov-18	00:10:06
73	73	181126M1_73	1803553-05 BS1810291600GC 21.65	27-Nov-18	00:20:44
74	74	181126M1_74	1803553-06 SL1810291530GC 44.03	27-Nov-18	00:31:22
75	75	181126M1_75	1803576-03 BS1810311445GC 30.23	27-Nov-18	00:41:55
76	76	181126M1_76	IPA	27-Nov-18	00:52:33
77	77	181126M1_77	ST181126M1-14 PFC CS3 18K1906	27-Nov-18	01:03:06
78	78	181126M1_78	1803577-03 WW1810301640GC 29	27-Nov-18	01:13:44
79	79	181126M1_79	1803577-04 WW1810301650GC 27.95	27-Nov-18	01:24:18
80	80	181126M1_80	1803578-04 BS1810301350GC 20.67	27-Nov-18	01:34:57
81	81	181126M1_81	B8K0120-BS1 OPR 0.25	27-Nov-18	01:45:35
82	82	181126M1_82	B8K0120-BLK1 Method Blank 0.25	27-Nov-18	01:56:08
83	83	181126M1_83	1803616-01 1811351-01A 0.24367	27-Nov-18	02:06:46
84	84	181126M1_84	1803616-02 1811351-02A 0.24367	27-Nov-18	02:17:19
85	85	181126M1_85	1803616-03 1811351-03A 0.23891	27-Nov-18	02:27:57
86	86	181126M1_86	1803616-04 1811351-04A 0.23803	27-Nov-18	02:38:29
87	87	181126M1_87	1803616-05 1811351-05A 0.2442	27-Nov-18	02:49:08
88	88	181126M1_88	1803617-01 1811352-01A 0.23776	27-Nov-18	02:59:40
89	89	181126M1_89	1803617-02 1811352-02A 0.24714	27-Nov-18	03:10:19
90	90	181126M1_90	IPA	27-Nov-18	03:20:52
91	91	181126M1_91	ST181126M1-15 PFC CS3 18K1906	27-Nov-18	03:31:30
92	92	181126M1_92	1803618-01 1811353-01A 0.23448	27-Nov-18	03:42:04
93	93	181126M1_93	1803618-02 1811353-02A 0.2386	27-Nov-18	03:52:42
94	94	181126M1_94	1803618-03 1811353-03A 0.23967	27-Nov-18	04:03:16
95	95	181126M1_95	1803618-04 1811353-04A 0.24522	27-Nov-18	04:13:54
96	96	181126M1_96	1803620-01 1811354-01A 0.23589	27-Nov-18	04:24:26
97	97	181126M1_97	1803620-02 1811354-02A 0.22278	27-Nov-18	04:35:05
98	98	181126M1_98	1803626-02 16-MW-06-SA2 0.1197	27-Nov-18	04:45:37
99	99	181126M1_99	1803626-01@5X 16-HS-03-SA2 0.11792	27-Nov-18	04:56:15
100	1...	181126M1_100	IPA	27-Nov-18	05:06:54
101	1...	181126M1_101	ST181126M1-16 PFC CS3 18K1906	27-Nov-18	05:17:27

Vista Analytical Laboratory

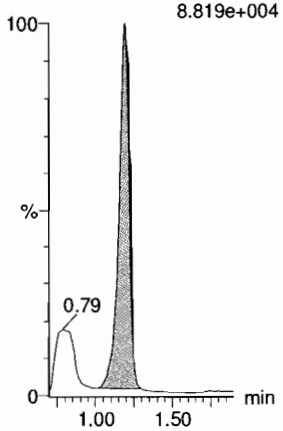
Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-32.qld

Last Altered: Tuesday, November 27, 2018 14:01:57 Pacific Standard Time
Printed: Tuesday, November 27, 2018 14:02:49 Pacific Standard Time

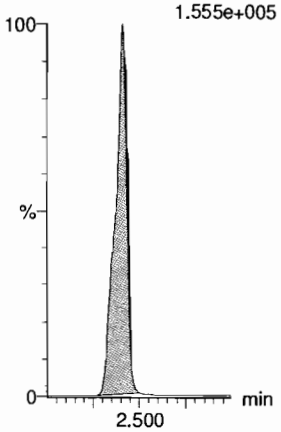
Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_32, Date: 26-Nov-2018, Time: 17:06:06, ID: ST181126M1-11 PFC CS3 18K1906, Description: PFC CS3 18K1906

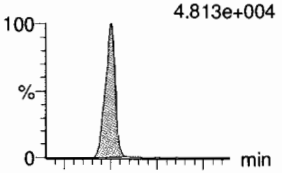
PFBA
F2:MRM of 1 channel,ES-
213.0 > 168.8
8.819e+004



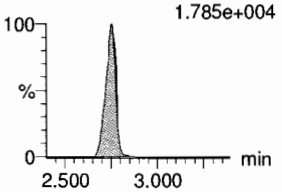
PFPeA
F5:MRM of 1 channel,ES-
263.1 > 218.9
1.555e+005



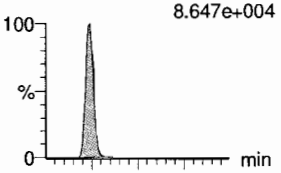
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
4.813e+004



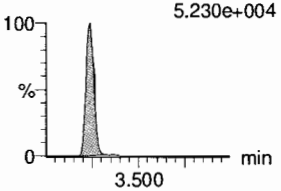
F7:MRM of 2 channels,ES-
299.0 > 99.0
1.785e+004



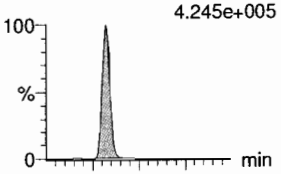
4:2 FTS
F12:MRM of 2 channels,ES-
327.2 > 307.2
8.647e+004



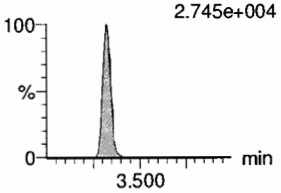
F12:MRM of 2 channels,ES-
327.2 > 81.1
5.230e+004



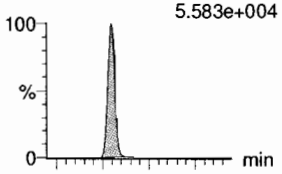
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
4.245e+005



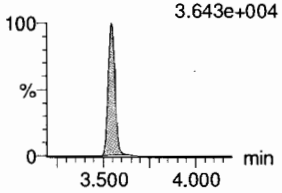
F9:MRM of 2 channels,ES-
313 > 118.9
2.745e+004



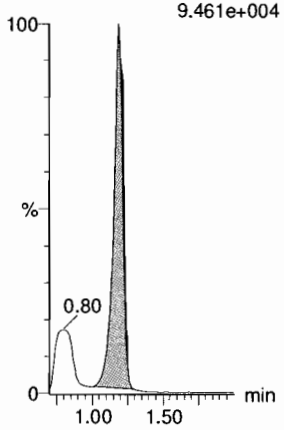
PFPeS
F15:MRM of 2 channels,ES-
349.1 > 80.1
5.583e+004



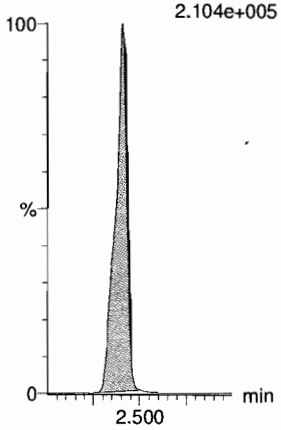
F15:MRM of 2 channels,ES-
349.1 > 99
3.643e+004



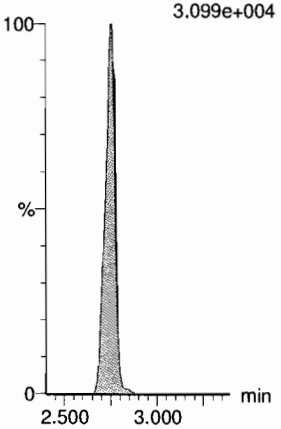
13C3-PFBA
F3:MRM of 1 channel,ES-
216.1 > 171.8
9.461e+004



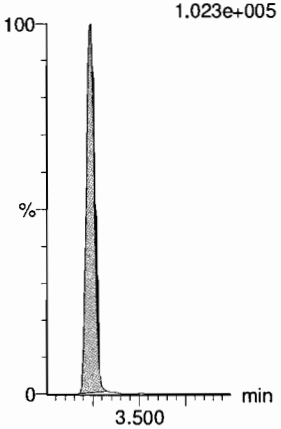
13C3-PFPeA
F6:MRM of 1 channel,ES-
266. > 221.8
2.104e+005



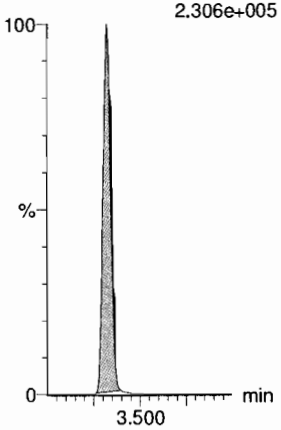
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.099e+004



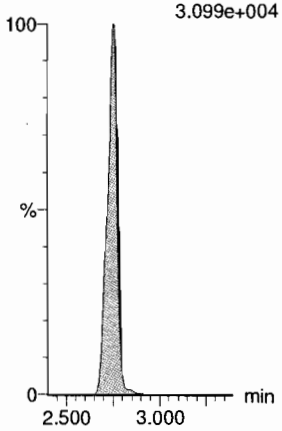
13C2-4:2 FTS
F13:MRM of 1 channel,ES-
329.2 > 308.9
1.023e+005



13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
2.306e+005



13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.099e+004



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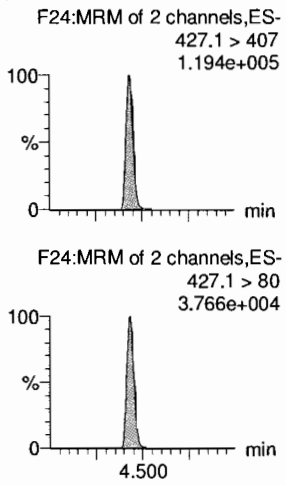
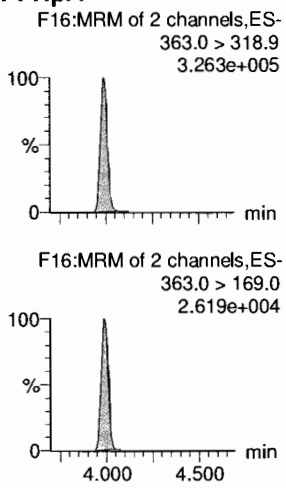
Last Altered: Tuesday, November 27, 2018 14:01:57 Pacific Standard Time
Printed: Tuesday, November 27, 2018 14:02:49 Pacific Standard Time

Name: 181126M1_32, Date: 26-Nov-2018, Time: 17:06:06, ID: ST181126M1-11 PFC CS3 18K1906, Description: PFC CS3 18K1906

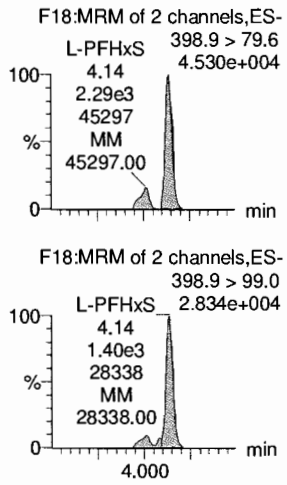
6:2 FTS



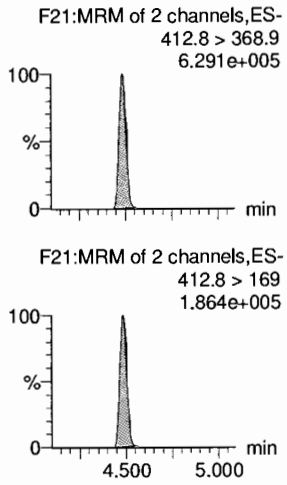
PFHpA



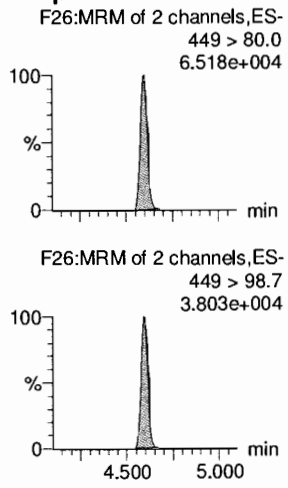
L-PFHxS



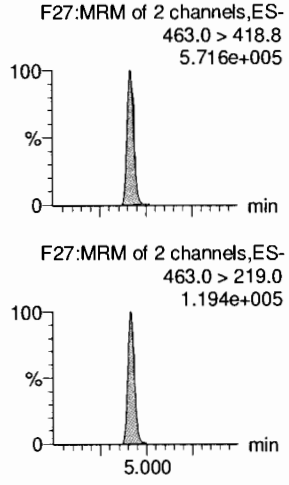
L-PFOA



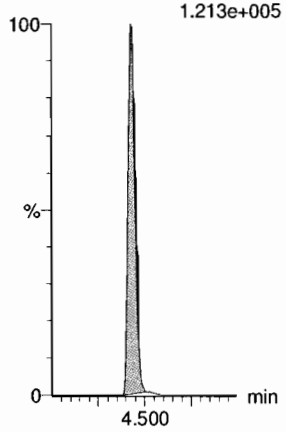
PFHpS



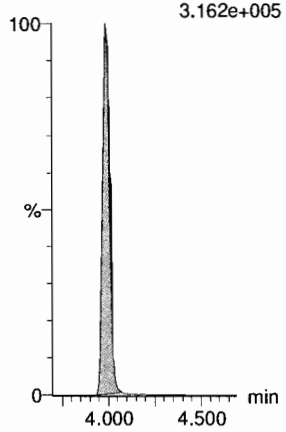
PFNA



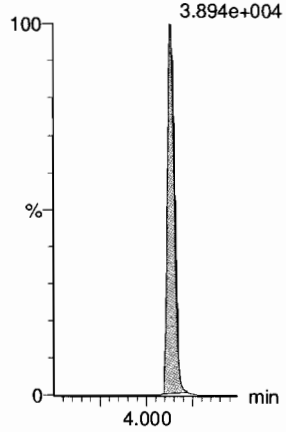
13C2-6:2 FTS



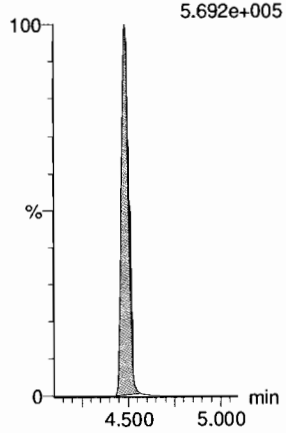
13C4-PFHpA



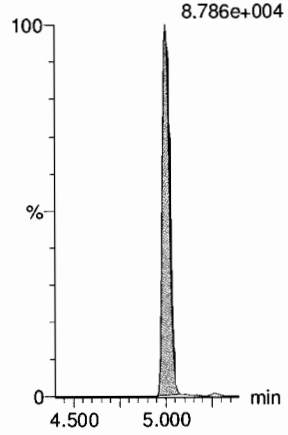
18O2-PFHxS



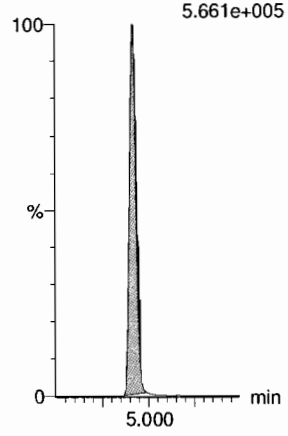
13C2-PFOA



13C8-PFOS



13C5-PFNA



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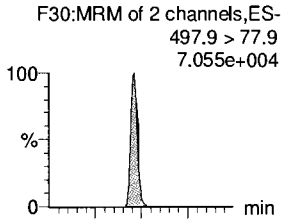
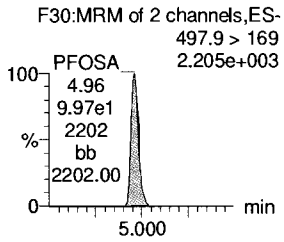
Last Altered: Tuesday, November 27, 2018 14:01:57 Pacific Standard Time
Printed: Tuesday, November 27, 2018 14:02:49 Pacific Standard Time

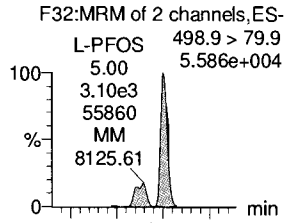
Name: 181126M1_32, Date: 26-Nov-2018, Time: 17:06:06, ID: ST181126M1-11 PFC CS3 18K1906, Description: PFC CS3 18K1906

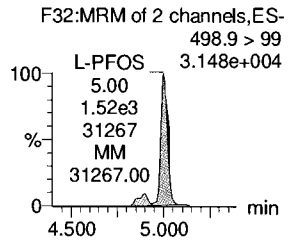
PFOSA





L-PFOS





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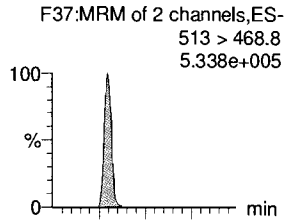
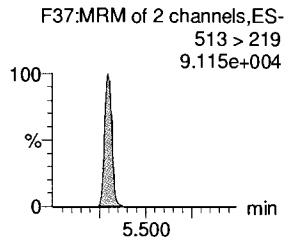
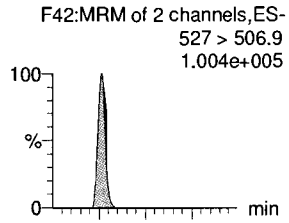
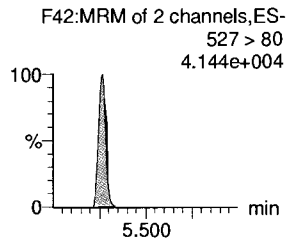


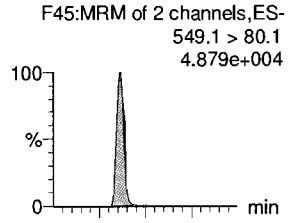


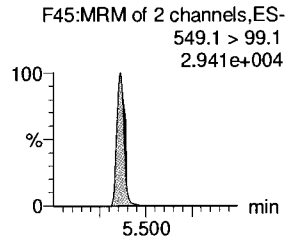
8:2 FTS



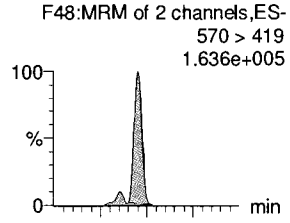


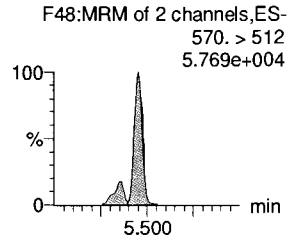
PFNS



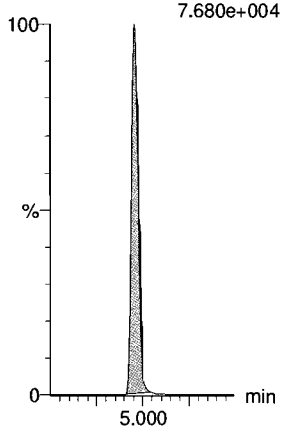


L-MeFOSAA

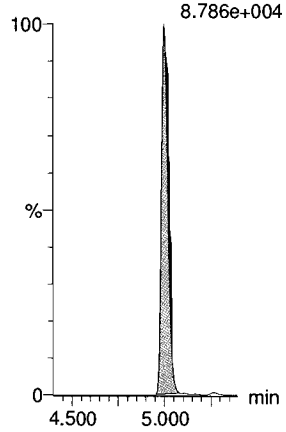




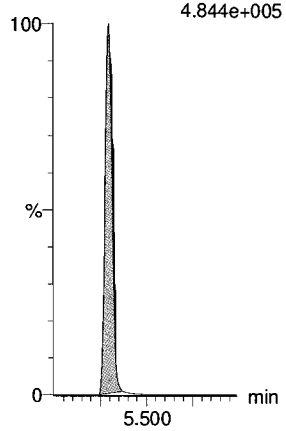
13C8-PFOSA



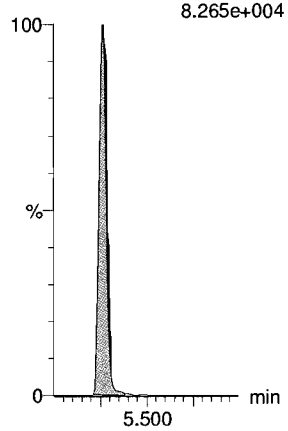
13C8-PFOS



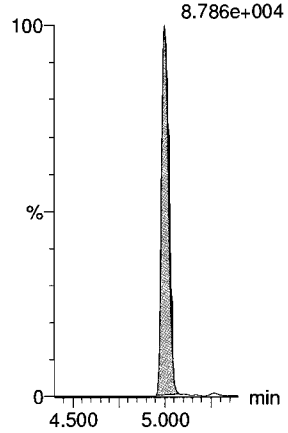
13C2-PFDA



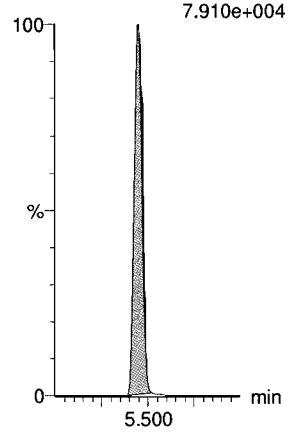
13C2-8:2 FTS



13C8-PFOS



d3-N-MeFOSAA



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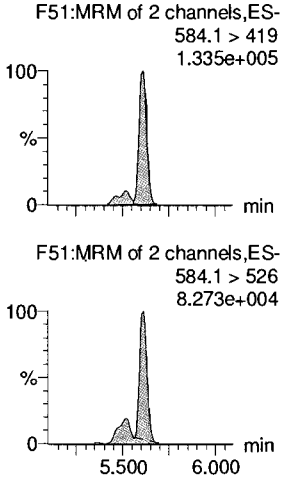
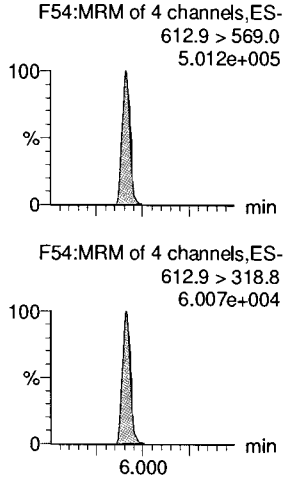
Last Altered: Tuesday, November 27, 2018 14:01:57 Pacific Standard Time
Printed: Tuesday, November 27, 2018 14:02:49 Pacific Standard Time

Name: 181126M1_32, Date: 26-Nov-2018, Time: 17:06:06, ID: ST181126M1-11 PFC CS3 18K1906, Description: PFC CS3 18K1906

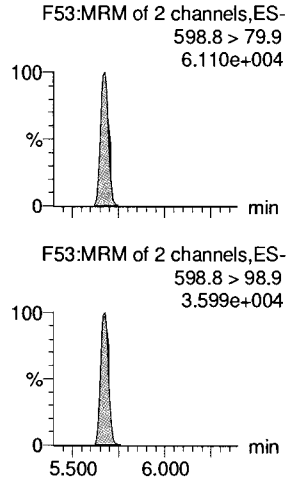
L-EtFOSAA



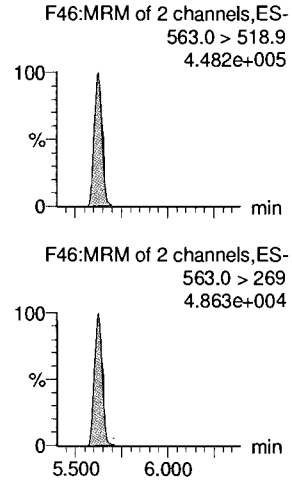
PFDoA



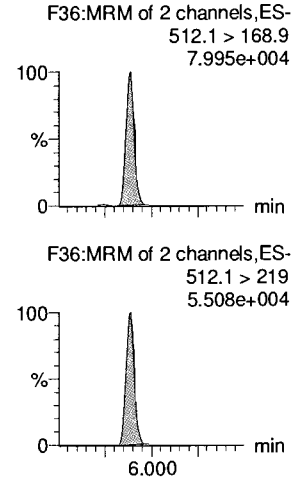
PFDS



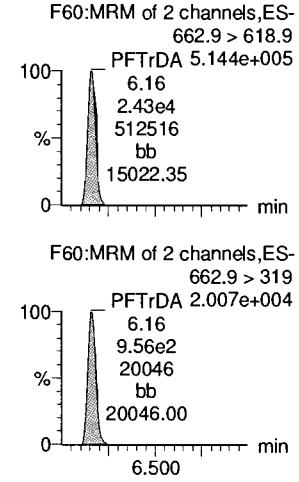
PFUdA



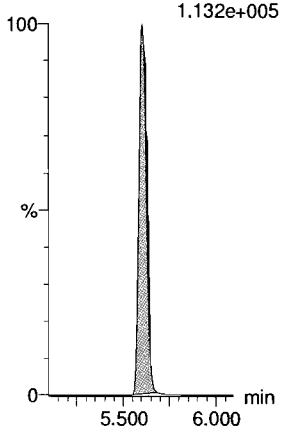
N-MeFOSA



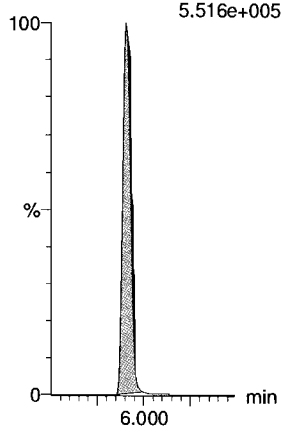
PFTrDA



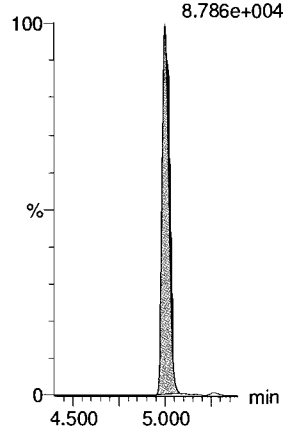
d5-N-EtFOSAA



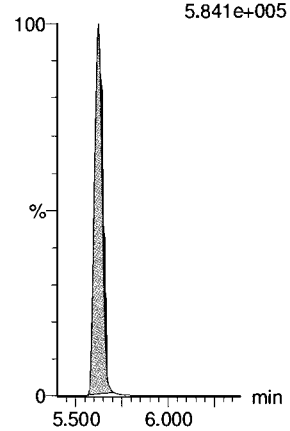
13C2-PFDoA



13C8-PFOS



13C2-PFUdA



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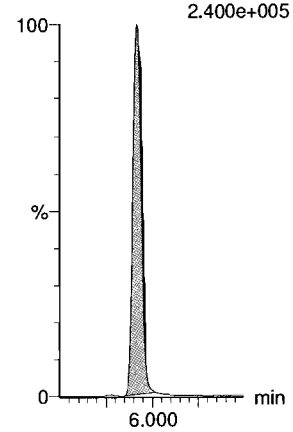

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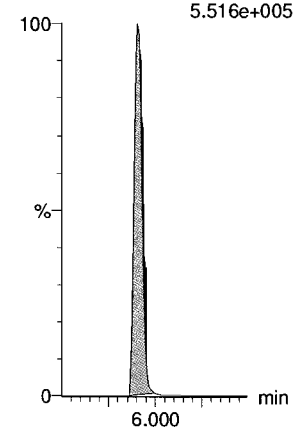

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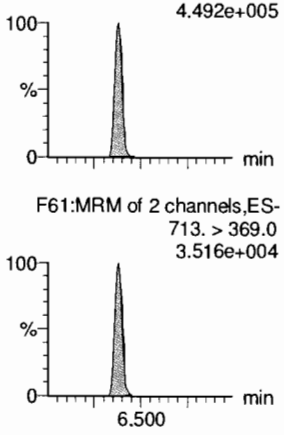
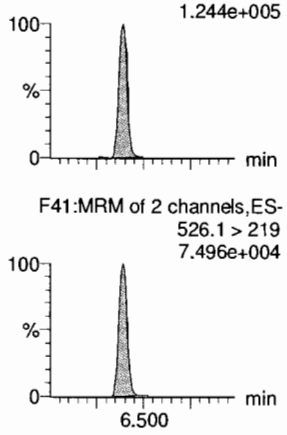
Last Altered: Tuesday, November 27, 2018 14:01:57 Pacific Standard Time
Printed: Tuesday, November 27, 2018 14:02:49 Pacific Standard Time

Name: 181126M1_32, Date: 26-Nov-2018, Time: 17:06:06, ID: ST181126M1-11 PFC CS3 18K1906, Description: PFC CS3 18K1906

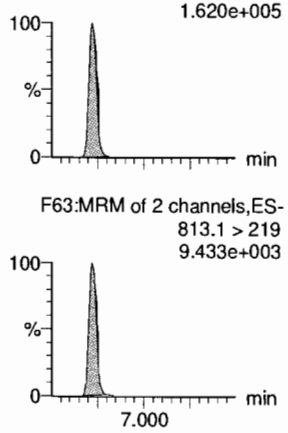
PFTeDA



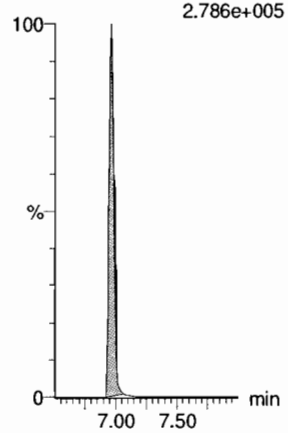
N-EtFOSA



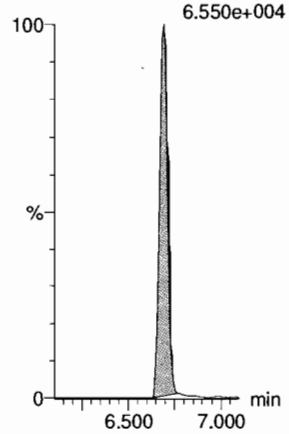
PFHxDA



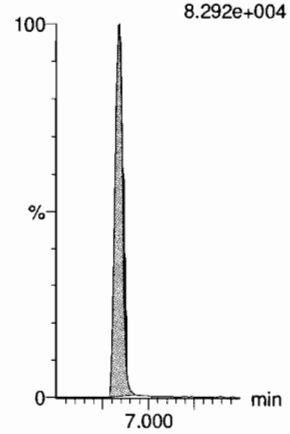
PFODA



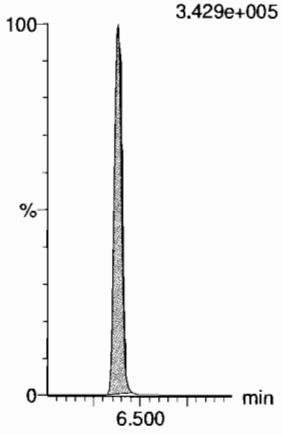
N-MeFOSE



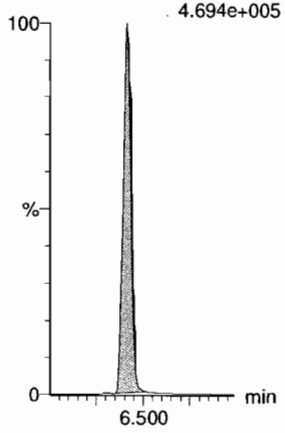
N-EtFOSE



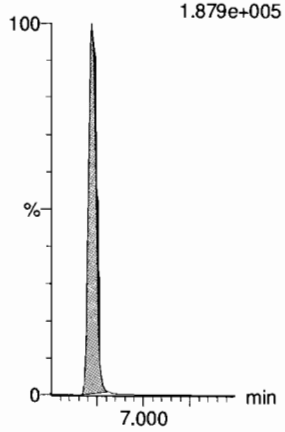
13C2-PFTeDA



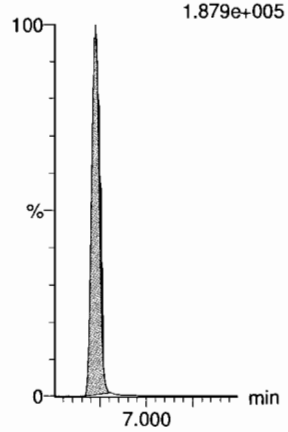
d5-N-ETFOSA



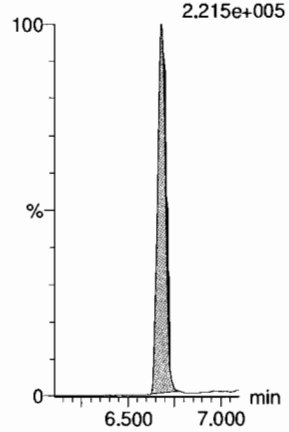
13C2-PFHxDA



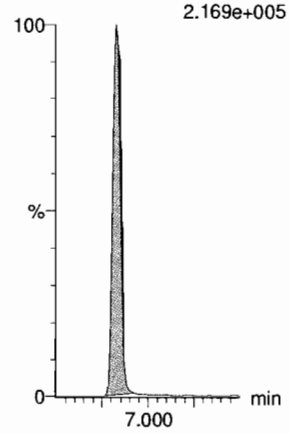
13C2-PFHxDA



d7-N-MeFOSE



d9-N-EtFOSE



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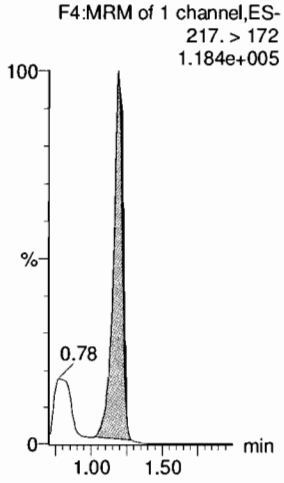
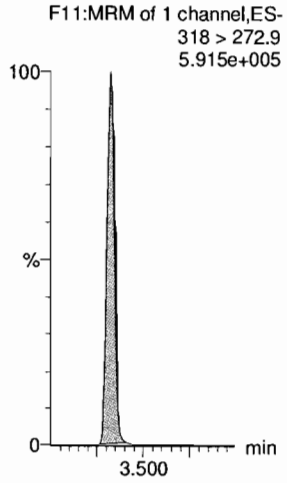
Last Altered: Tuesday, November 27, 2018 14:01:57 Pacific Standard Time
Printed: Tuesday, November 27, 2018 14:02:49 Pacific Standard Time

Name: 181126M1_32, Date: 26-Nov-2018, Time: 17:06:06, ID: ST181126M1-11 PFC CS3 18K1906, Description: PFC CS3 18K1906

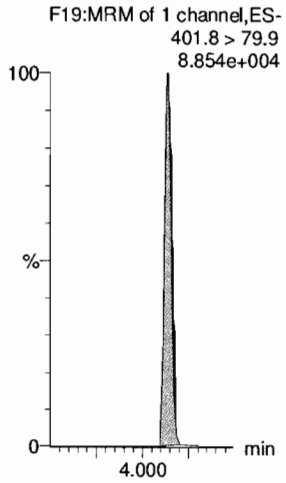
13C4-PFBA



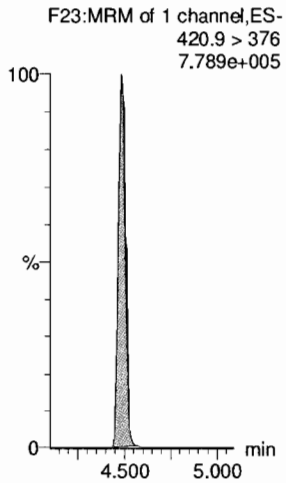
13C5-PFHxA



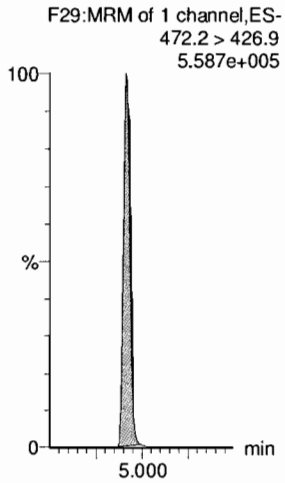
13C3-PFHxS



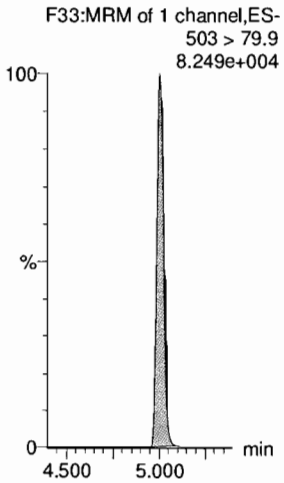
13C8-PFOA



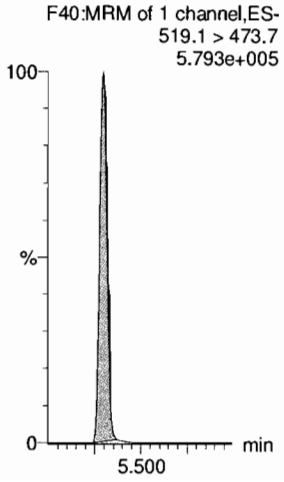
13C9-PFNA



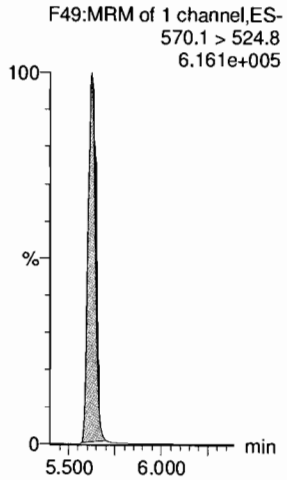
13C4-PFOS



13C6-PFDA



13C7-PFUdA



LC Calibration Standards Review Checklist Q4

			ION Ratio	Concentration	C-Cals Name	Sign Date	Correct I-Cal	Manual Integrations	N/A
Calibration ID:	ST181126M1-12	L (M) H	☑	☑	☐	☐	☐	☑	☐
Calibration ID:	-13	L (M) H	☑	☑	☑	☐	☐	☑	☐
Calibration ID:	-14	L (M) H	☑	☑	☑	☐	☐	☑	☐
Calibration ID:	-15	L (M) H	☑	☑	☑	☐	☐	☑	☐
Calibration ID:	-16	L (M) H	☑	☑	☑	☐	☐	☑	☑
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:		L M H	☐	☐	☐	☐	☐	☐	☐

Full Mass Cal. Date: 11/26/18

Run Log Present: ☑

# of Samples per Sequence Checked: ☑

Instrument Blank Saved ☑

IIS Area Saved ☑

Reviewed By: [signature] 11/27/18
Initials/Date

Comments:

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-51.qld

Last Altered: Tuesday, November 27, 2018 07:47:21 Pacific Standard Time
Printed: Tuesday, November 27, 2018 07:49:52 Pacific Standard Time

JAM 11/27/18

Name: 181126M1_51, Date: 26-Nov-2018, Time: 20:27:33, ID: ST181126M1-12 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	6588.289	7309.560	1.00	1.20	11.267	9.6	96.1	NO		
2	2	PFPeA	263.1 > 218.9	11336.866	15137.450	1.00	2.41	9.362	9.8	98.3	NO		
3	3	PFBS	299.0 > 79.7	2984.553	2002.295	1.00	2.76	18.632	9.0	90.3	NO	2.625	NO
4	4	4:2 FTS	327.2>307.2	4112.123	5036.154	1.00	3.24	10.207	9.8	97.6	NO	1.652	NO
5	5	PFHxA	313 > 269	20376.381	10763.384	1.00	3.33	9.466	10.0	99.9	NO	14.789	NO
6	6	PFPeS	349.1>80.1	2437.552	2002.295	1.00	3.55	15.217	9.1	91.1	NO	1.490	NO
7	36	13C3-PFBA	216.1 > 171.8	7309.560	9004.345	1.00	1.19	10.147	12.9	103.1	NO		
8	37	13C3-PFPeA	266. > 221.8	15137.450	27727.666	1.00	2.41	6.824	12.3	98.2	NO		
9	38	13C3-PFBS	302. > 98.8	2002.295	3520.348	1.00	2.76	7.110	13.2	105.9	NO		
10	39	13C2-4:2 FTS	329.2>308.9	5036.154	3520.348	1.00	3.24	17.882	12.1	96.8	NO		
11	40	13C2-PFHxA	315 > 270	10763.384	27727.666	1.00	3.33	4.852	4.9	98.2	NO		
12	38	13C3-PFBS	302. > 98.8	2002.295	3520.348	1.00	2.76	7.110	13.2	105.9	NO		
13	-1												
14	10	6:2 FTS	427.1 > 407	5083.969	5189.335	1.00	4.43	12.246	9.8	98.3	NO	2.903	NO
15	7	PFHpA	363.0 > 318.9	14493.083	13615.053	1.00	4.00	13.306	10.1	101.0	NO	12.715	NO
16	8	L-PFHxS	398.9 > 79.6	2329.029	1656.171	1.00	4.14	17.578	9.0	90.4	NO	1.583	NO
17	11	L-PFOA	412.8 > 368.9	27449.291	24339.395	1.00	4.49	14.097	10.3	102.7	NO	3.377	NO
18	13	PFHpS	449 > 80.0	2811.122	3724.375	1.00	4.60	9.435	10.1	100.6	NO	1.729	NO
19	14	PFNA	463.0 > 418.8	22649.625	23128.396	1.00	4.92	12.241	9.8	97.6	NO	4.374	NO
20	43	13C2-6:2 FTS	429.1 > 408.9	5189.335	3594.123	1.00	4.43	18.048	11.5	92.4	NO		
21	41	13C4-PFHpA	367.2 > 321.8	13615.053	27727.666	1.00	4.00	6.138	11.4	91.5	NO		
22	42	18O2-PFHxS	403.0 > 102.6	1656.171	3520.348	1.00	4.14	5.881	13.1	105.0	NO		
23	44	13C2-PFOA	414.9 > 369.7	24339.395	32930.648	1.00	4.49	9.239	12.2	97.9	NO		
24	47	13C8-PFOS	507.0 > 79.9	3724.375	3594.123	1.00	5.01	12.953	12.4	99.5	NO		
25	45	13C5-PFNA	468.2 > 422.9	23128.396	22734.143	1.00	4.92	12.717	12.8	102.7	NO		
26	-1												
27	15	PFOSA	497.9 > 77.9	2876.130	3197.235	1.00	4.96	11.245	9.9	98.8	NO	32.409	NO
28	16	L-PFOS	498.9 > 79.9	3128.094	3724.375	1.00	5.01	10.499	9.5	95.5	NO	1.903	NO
29	18	PFDA	513 > 468.8	23836.016	22119.607	1.00	5.30	13.470	10.2	102.5	NO	5.709	NO
30	19	8:2 FTS	527 > 506.9	4477.387	3725.844	1.00	5.27	15.021	9.9	99.3	NO	2.451	NO
31	20	PFNS	549.1 > 80.1	2133.369	3724.375	1.00	5.36	7.160	9.3	93.3	NO	1.637	NO
32	21	L-MeFOSAA	570 > 419	9014.925	3699.045	1.00	5.46	30.464	10.5	104.8	NO	2.588	NO
33	46	13C8-PFOSA	506.1 > 77.7	3197.235	29270.285	1.00	4.96	1.365	14.1	112.5	NO		
34	47	13C8-PFOS	507.0 > 79.9	3724.375	3594.123	1.00	5.01	12.953	12.4	99.5	NO		
35	48	13C2-PFDA	515.1 > 469.9	22119.607	24999.756	1.00	5.30	11.060	12.3	98.1	NO		
36	49	13C2-8:2 FTS	529.1 > 508.7	3725.844	3594.123	1.00	5.27	12.958	11.0	88.0	NO		

CAH 11/27/18

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-51.qld

Last Altered: Tuesday, November 27, 2018 07:47:21 Pacific Standard Time
Printed: Tuesday, November 27, 2018 07:49:52 Pacific Standard Time

Name: 181126M1_51, Date: 26-Nov-2018, Time: 20:27:33, ID: ST181126M1-12 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	47	13C8-PFOS	507.0 > 79.9	3724.375	3594.123	1.00	5.01	12.953	12.4	99.5	NO		
38	50	d3-N-MeFOSAA	573.3 > 419	3699.045	29270.285	1.00	5.45	1.580	11.7	93.9	NO		
39	-1												
40	23	L-EtFOSAA	584.1 > 419	7682.282	5511.399	1.00	5.61	17.424	10.8	107.5	NO	1.443	NO
41	27	PFDoA	612.9 > 569.0	23497.086	25750.277	1.00	5.91	11.406	9.8	97.7	NO	8.235	NO
42	26	PFDS	598.8 > 79.9	2940.808	3724.375	1.00	5.67	9.870	9.4	94.1	NO	1.775	NO
43	25	PFUdA	563.0 > 518.9	20870.963	27582.633	1.00	5.62	9.458	9.7	97.0	NO	9.056	NO
44	28	N-MeFOSA	512.1 > 168.9	4295.403	12300.665	1.00	5.89	52.380	54.6	109.1	NO	1.461	NO
45	29	PFTrDA	662.9 > 618.9	24165.801	25750.277	1.00	6.16	11.731	10.1	101.0	NO	22.929	NO
46	52	d5-N-EtFOSAA	589.3 > 419	5511.399	29270.285	1.00	5.61	2.354	12.7	101.6	NO		
47	53	13C2-PFDoA	615.0 > 569.7	25750.277	24999.756	1.00	5.91	12.875	12.3	98.4	NO		
48	47	13C8-PFOS	507.0 > 79.9	3724.375	3594.123	1.00	5.01	12.953	12.4	99.5	NO		
49	51	13C2-PFUdA	565 > 519.8	27582.633	29270.285	1.00	5.63	11.779	12.3	98.4	NO		
50	54	d3-N-MeFOSA	515.2 > 168.9	12300.665	29270.285	1.00	5.92	5.253	143.1	95.4	NO		
51	53	13C2-PFDoA	615.0 > 569.7	25750.277	24999.756	1.00	5.91	12.875	12.3	98.4	NO		
52	-1												
53	30	PFTeDA	713.0 > 669.0	20618.123	16666.953	1.00	6.38	15.463	9.5	94.6	NO	13.051	NO
54	31	N-EtFOSA	526.1 > 168.9	5890.388	21892.029	1.00	6.40	40.360	45.9	91.9	NO	1.543	NO
55	32	PFHxDA	813.1 > 768.6	6980.713	8686.820	1.00	6.72	4.018	10.0	100.1	NO	15.499	NO
56	33	PFODA	913.1 > 868.8	13274.853	8686.820	1.00	6.97	7.641	10.8	108.3	NO		
57	34	N-MeFOSE	616.1 > 58.9	3285.835	10662.976	1.00	6.69	46.223	51.0	102.0	NO		
58	35	N-EtFOSE	630.1 > 58.9	3843.752	10159.459	1.00	6.84	56.751	49.4	98.8	NO		
59	55	13C2-PFTeDA	715.1 > 669.7	16666.953	29270.285	1.00	6.38	7.118	12.6	100.4	NO		
60	56	d5-N-ETFOSA	531.1 > 168.9	21892.029	29270.285	1.00	6.42	9.349	160.3	106.9	NO		
61	57	13C2-PFHxDA	815 > 769.7	8686.820	29270.285	1.00	6.72	3.710	5.0	99.5	NO		
62	57	13C2-PFHxDA	815 > 769.7	8686.820	29270.285	1.00	6.72	3.710	5.0	99.5	NO		
63	58	d7-N-MeFOSE	623.1 > 58.9	10662.976	29270.285	1.00	6.68	4.554	143.9	95.9	NO		
64	59	d9-N-EtFOSE	639.2 > 58.8	10159.459	29270.285	1.00	6.83	4.339	145.5	97.0	NO		
65	-1												
66	60	13C4-PFBA	217. > 172	9004.345	9004.345	1.00	1.19	12.500	12.5	100.0	NO		
67	61	13C5-PFHxA	318 > 272.9	27727.666	27727.666	1.00	3.33	12.500	12.5	100.0	NO		
68	62	13C3-PFHxS	401.8 > 79.9	3520.348	3520.348	1.00	4.14	12.500	12.5	100.0	NO		
69	63	13C8-PFOA	420.9 > 376	32930.648	32930.648	1.00	4.49	12.500	12.5	100.0	NO		
70	64	13C9-PFNA	472.2 > 426.9	22734.143	22734.143	1.00	4.92	12.500	12.5	100.0	NO		
71	65	13C4-PFOS	503 > 79.9	3594.123	3594.123	1.00	5.01	12.500	12.5	100.0	NO		
72	66	13C6-PFDA	519.1 > 473.7	24999.756	24999.756	1.00	5.30	12.500	12.5	100.0	NO		

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-51.qld

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Name: 181126M1_51, Date: 26-Nov-2018, Time: 20:27:33, ID: ST181126M1-12 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	67	13C7-PFUdA	570.1 > 524.8	29270.285	29270.285	1.00	5.63	12.500	12.5	100.0	NO		

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Dataset: Untitled

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Printed: Tuesday, November 27, 2018 08:29:38 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
1	1	181126M1_1	IPA	26-Nov-18	11:35:18
2	2	181126M1_2	ST181126M1-1 PFC CS-2 18K1901	26-Nov-18	11:45:59
3	3	181126M1_3	ST181126M1-2 PFC CS-1 18K1902	26-Nov-18	11:56:32
4	4	181126M1_4	ST181126M1-3 PFC CS0 18K1903	26-Nov-18	12:07:10
5	5	181126M1_5	ST181126M1-4 PFC CS1 18K1904	26-Nov-18	12:17:48
6	6	181126M1_6	ST181126M1-5 PFC CS2 18K1905	26-Nov-18	12:28:21
7	7	181126M1_7	ST181126M1-6 PFC CS3 18K1906	26-Nov-18	12:38:59
8	8	181126M1_8	ST181126M1-7 PFC CS4 1810907	26-Nov-18	12:49:38
9	9	181126M1_9	ST181126M1-8 PFC CS5 18K1908	26-Nov-18	13:00:11
10	10	181126M1_10	ST181126M1-9 PFC CS6 18K1909	26-Nov-18	13:10:49
11	11	181126M1_11	ST181126M1-10 PFC CS7 18K1910	26-Nov-18	13:21:23
12	12	181126M1_12	IPA	26-Nov-18	13:32:01
13	13	181126M1_13	ICV181126M1-1 PFC ICV 18K1911	26-Nov-18	13:42:34
14	14	181126M1_14	IPA	26-Nov-18	13:53:12
15	15	181126M1_15	B8K0097-BSD1 LCSD 0.125	26-Nov-18	14:03:48
16	16	181126M1_16	1803629-06 REEPDW585 0.11471	26-Nov-18	14:14:24
17	17	181126M1_17	B8K0152-BS1 OPR 0.25	26-Nov-18	14:25:02
18	18	181126M1_18	B8K0152-BLK1 Method Blank 0.25	26-Nov-18	14:35:34
19	19	181126M1_19	1803729-01 WMP1811191026JSJ 0.23788	26-Nov-18	14:46:12
20	20	181126M1_20	1803729-02 WMP1811191035JSJ 0.23637	26-Nov-18	14:56:45
21	21	181126M1_21	1803729-03 WMP1811191043JSJ 0.23365	26-Nov-18	15:07:48
22	22	181126M1_22	1803730-01 WEF1811191106JSJ 0.24116	26-Nov-18	15:18:26
23	23	181126M1_23	B8K0144-BS1 OPR 0.125	26-Nov-18	15:29:49
24	24	181126M1_24	B8K0144-BSD1 LCSD 0.125	26-Nov-18	15:41:20
25	25	181126M1_25	B8K0144-BLK1 Method Blank 0.125	26-Nov-18	15:51:53
26	26	181126M1_26	1803659-01 A1-MW-07-SA2 0.11704	26-Nov-18	16:02:31
27	27	181126M1_27	1803659-02 A1-MW-23-SA2 0.1178	26-Nov-18	16:13:04
28	28	181126M1_28	1803659-03 A1-MW-25-SA2 0.11426	26-Nov-18	16:23:43
29	29	181126M1_29	1803659-04 A1-MW-27-SA2 0.11731	26-Nov-18	16:34:21
30	30	181126M1_30	1803659-05 A1-MW-55-SA2 0.11846	26-Nov-18	16:44:53
31	31	181126M1_31	IPA	26-Nov-18	16:55:32
32	32	181126M1_32	ST181126M1-11 PFC CS3 18K1906	26-Nov-18	17:06:06

Dataset: Untitled

Last Altered: Tuesday, November 27, 2018 08:29:26 Pacific Standard Time
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Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
33	33	181126M1_33	1803659-06 A1-MW-54-SA2 0.11683	26-Nov-18	17:16:44
34	34	181126M1_34	1803659-07 FRB-20181114 0.11549	26-Nov-18	17:27:17
35	35	181126M1_35	B8K0135-BS1 OPR 1	26-Nov-18	17:37:55
36	36	181126M1_36	B8K0135-BLK1 Method Blank 1	26-Nov-18	17:48:34
37	37	181126M1_37	1803551-03 BS1810290940GC 5	26-Nov-18	17:59:07
38	38	181126M1_38	1803581-03 BS1810311220GC 5.1	26-Nov-18	18:09:45
39	39	181126M1_39	1803581-04 BS1810311230GC 5.08	26-Nov-18	18:20:24
40	40	181126M1_40	B8K0049-BS1 OPR 1	26-Nov-18	18:30:57
41	41	181126M1_41	B8K0049-BLK1 Method Blank 1	26-Nov-18	18:41:36
42	42	181126M1_42	1803520-01 HS-SB-939 (3-5)-EPA 1.51	26-Nov-18	18:52:09
43	43	181126M1_43	1803553-04 BS1810291445GC 3.51	26-Nov-18	19:02:47
44	44	181126M1_44	1803575-06 BS1810301040GC 1.48	26-Nov-18	19:13:20
45	45	181126M1_45	1803577-05 BS1810301620GC 5.94	26-Nov-18	19:23:58
46	46	181126M1_46	B8K0118-BS1 OPR 0.125	26-Nov-18	19:34:37
47	47	181126M1_47	B8K0118-BLK1 Method Blank 0.125	26-Nov-18	19:45:09
48	48	181126M1_48	1803640-01 MW-2A 0.11056	26-Nov-18	19:55:48
49	49	181126M1_49	1803640-02 MW-3 0.1163	26-Nov-18	20:06:21
50	50	181126M1_50	IPA	26-Nov-18	20:16:59
51	51	181126M1_51	ST181126M1-12 PFC CS3 18K1906	26-Nov-18	20:27:33
52	52	181126M1_52	1803640-03 MW-4 0.11182	26-Nov-18	20:38:11
53	53	181126M1_53	1803640-04 TS Well 0.11479	26-Nov-18	20:48:44
54	54	181126M1_54	1803641-01 MW3S 0.11429	26-Nov-18	20:59:22
55	55	181126M1_55	1803641-02 MW6 0.11494	26-Nov-18	21:09:56
56	56	181126M1_56	1803641-03 MW7 0.11164	26-Nov-18	21:20:34
57	57	181126M1_57	1803641-04 SW2 0.11314	26-Nov-18	21:31:07
58	58	181126M1_58	1803646-01 MW-1 0.11872	26-Nov-18	21:41:46
59	59	181126M1_59	1803646-02 MW-4S 0.11549	26-Nov-18	21:52:19
60	60	181126M1_60	1803646-03 Thorne 0.11815	26-Nov-18	22:02:57
61	61	181126M1_61	1803647-01 MW-1 0.11071	26-Nov-18	22:13:30
62	62	181126M1_62	IPA	26-Nov-18	22:24:08
63	63	181126M1_63	ST181126M1-13 PFC CS3 18K1906	26-Nov-18	22:34:41
64	64	181126M1_64	1803647-02 MW-3 0.11209	26-Nov-18	22:45:19
65	65	181126M1_65	1803651-01 MW-1 0.11903	26-Nov-18	22:55:52
66	66	181126M1_66	1803651-02 MW-4 0.11498	26-Nov-18	23:06:31
67	67	181126M1_67	1803651-03 MW-3 0.11883	26-Nov-18	23:17:03
68	68	181126M1_68	1803652-01 MW-1 0.11504	26-Nov-18	23:27:42

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Dataset: Untitled

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Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
69	69	181126M1_69	1803652-02 MW-2 0.11316	26-Nov-18	23:38:20
70	70	181126M1_70	B8K0134-BS1 OPR 1	26-Nov-18	23:48:53
71	71	181126M1_71	B8K0134-BLK1 Method Blank 1	26-Nov-18	23:59:32
72	72	181126M1_72	1803552-01 BS1810291030GC 19.2	27-Nov-18	00:10:06
73	73	181126M1_73	1803553-05 BS1810291600GC 21.65	27-Nov-18	00:20:44
74	74	181126M1_74	1803553-06 SL1810291530GC 44.03	27-Nov-18	00:31:22
75	75	181126M1_75	1803576-03 BS1810311445GC 30.23	27-Nov-18	00:41:55
76	76	181126M1_76	IPA	27-Nov-18	00:52:33
77	77	181126M1_77	ST181126M1-14 PFC CS3 18K1906	27-Nov-18	01:03:06
78	78	181126M1_78	1803577-03 WW1810301640GC 29	27-Nov-18	01:13:44
79	79	181126M1_79	1803577-04 WW1810301650GC 27.95	27-Nov-18	01:24:18
80	80	181126M1_80	1803578-04 BS1810301350GC 20.67	27-Nov-18	01:34:57
81	81	181126M1_81	B8K0120-BS1 OPR 0.25	27-Nov-18	01:45:35
82	82	181126M1_82	B8K0120-BLK1 Method Blank 0.25	27-Nov-18	01:56:08
83	83	181126M1_83	1803616-01 1811351-01A 0.24367	27-Nov-18	02:06:46
84	84	181126M1_84	1803616-02 1811351-02A 0.24367	27-Nov-18	02:17:19
85	85	181126M1_85	1803616-03 1811351-03A 0.23891	27-Nov-18	02:27:57
86	86	181126M1_86	1803616-04 1811351-04A 0.23803	27-Nov-18	02:38:29
87	87	181126M1_87	1803616-05 1811351-05A 0.2442	27-Nov-18	02:49:08
88	88	181126M1_88	1803617-01 1811352-01A 0.23776	27-Nov-18	02:59:40
89	89	181126M1_89	1803617-02 1811352-02A 0.24714	27-Nov-18	03:10:19
90	90	181126M1_90	IPA	27-Nov-18	03:20:52
91	91	181126M1_91	ST181126M1-15 PFC CS3 18K1906	27-Nov-18	03:31:30
92	92	181126M1_92	1803618-01 1811353-01A 0.23448	27-Nov-18	03:42:04
93	93	181126M1_93	1803618-02 1811353-02A 0.2386	27-Nov-18	03:52:42
94	94	181126M1_94	1803618-03 1811353-03A 0.23967	27-Nov-18	04:03:16
95	95	181126M1_95	1803618-04 1811353-04A 0.24522	27-Nov-18	04:13:54
96	96	181126M1_96	1803620-01 1811354-01A 0.23589	27-Nov-18	04:24:26
97	97	181126M1_97	1803620-02 1811354-02A 0.22278	27-Nov-18	04:35:05
98	98	181126M1_98	1803626-02 16-MW-06-SA2 0.1197	27-Nov-18	04:45:37
99	99	181126M1_99	1803626-01@5X 16-HS-03-SA2 0.11792	27-Nov-18	04:56:15
100	1...	181126M1_100	IPA	27-Nov-18	05:06:54
101	1...	181126M1_101	ST181126M1-16 PFC CS3 18K1906	27-Nov-18	05:17:27

Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-51.qld

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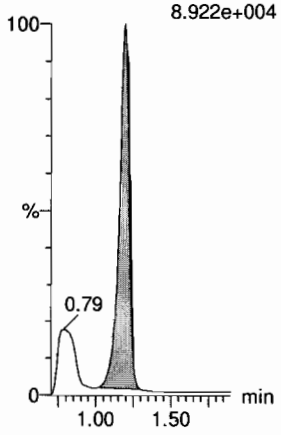
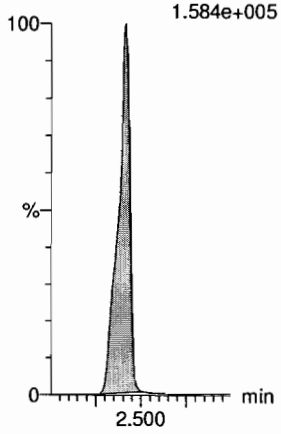
Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_51, Date: 26-Nov-2018, Time: 20:27:33, ID: ST181126M1-12 PFC CS3 18K1906, Description: PFC CS3 18K1906

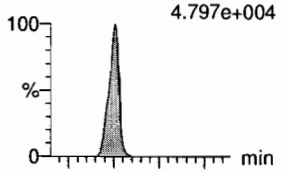
PFBA
F2:MRM of 1 channel,ES-
213.0 > 168.8
8.922e+004



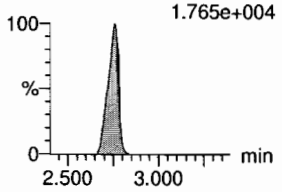
PFPeA
F5:MRM of 1 channel,ES-
263.1 > 218.9
1.584e+005



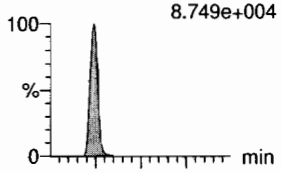
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
4.797e+004



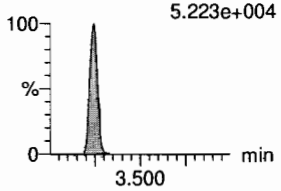
F7:MRM of 2 channels,ES-
299.0 > 99.0
1.765e+004



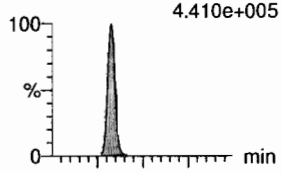
4:2 FTS
F12:MRM of 2 channels,ES-
327.2 > 307.2
8.749e+004



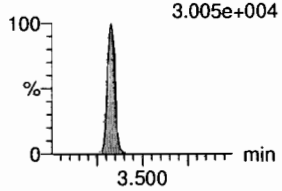
F12:MRM of 2 channels,ES-
327.2 > 81.1
5.223e+004



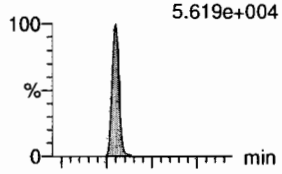
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
4.410e+005



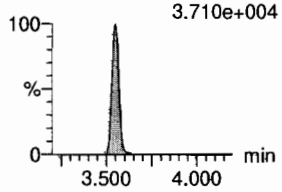
F9:MRM of 2 channels,ES-
313 > 118.9
3.005e+004



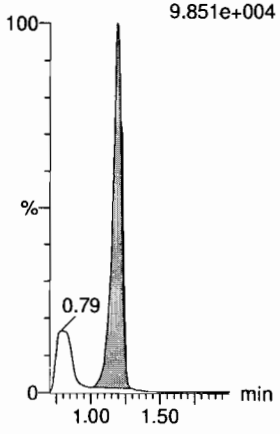
PFPeS
F15:MRM of 2 channels,ES-
349.1 > 80.1
5.619e+004



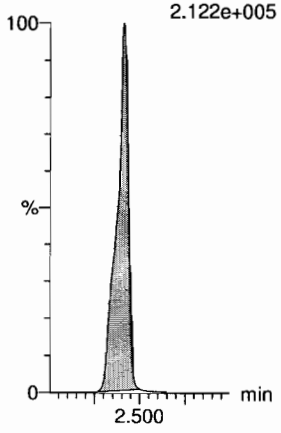
F15:MRM of 2 channels,ES-
349.1 > 99
3.710e+004



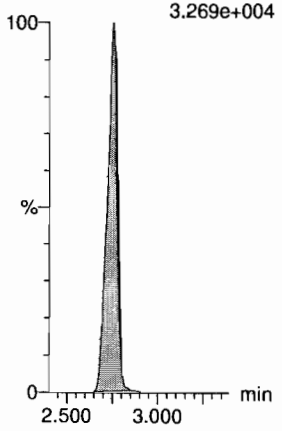
13C3-PFBA
F3:MRM of 1 channel,ES-
216.1 > 171.8
9.851e+004



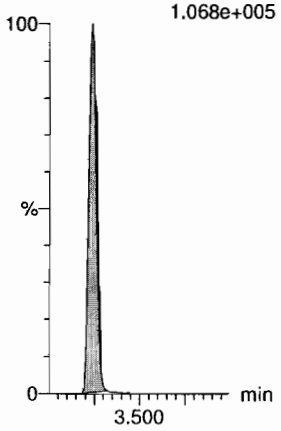
13C3-PFPeA
F6:MRM of 1 channel,ES-
266. > 221.8
2.122e+005



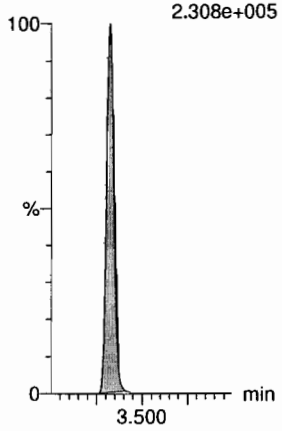
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.269e+004



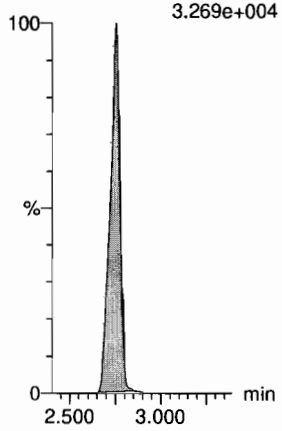
13C2-4:2 FTS
F13:MRM of 1 channel,ES-
329.2 > 308.9
1.068e+005



13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
2.308e+005



13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.269e+004



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Last Altered: Tuesday, November 27, 2018 07:47:21 Pacific Standard Time
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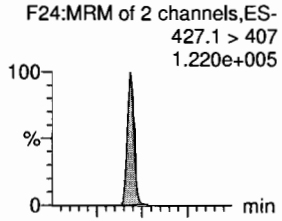
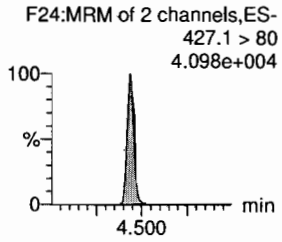
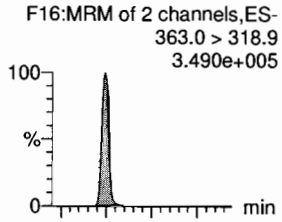
Name: 181126M1_51, Date: 26-Nov-2018, Time: 20:27:33, ID: ST181126M1-12 PFC CS3 18K1906, Description: PFC CS3 18K1906

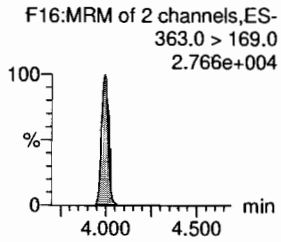
6:2 FTS



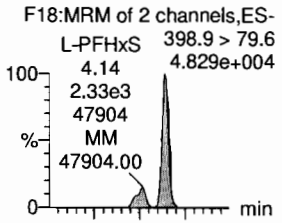


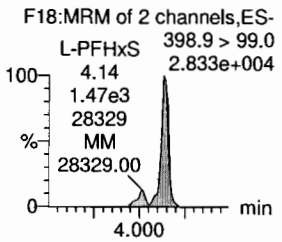
PFHpA



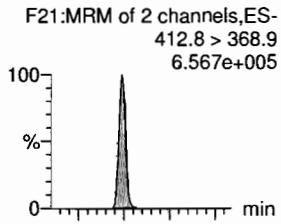


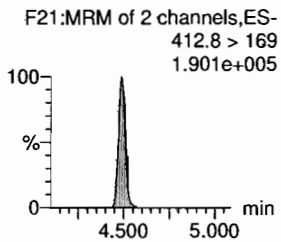
L-PFHxS





L-PFOA





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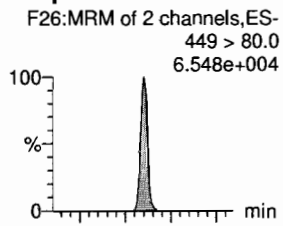

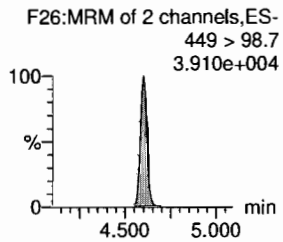

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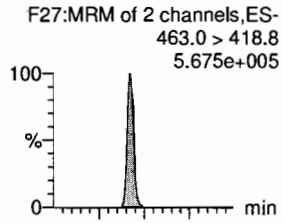
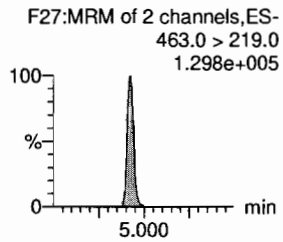
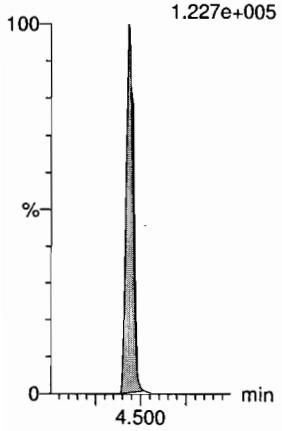
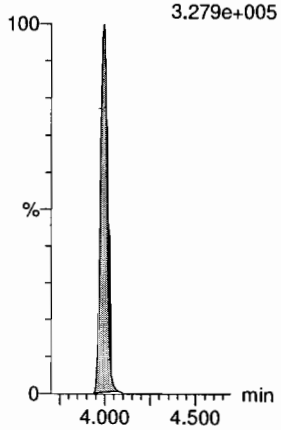




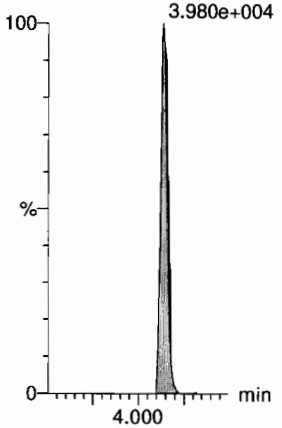
13C2-6:2 FTS



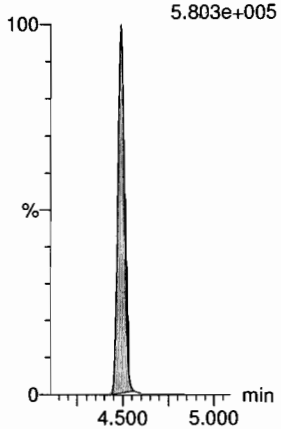
13C4-PFHpA



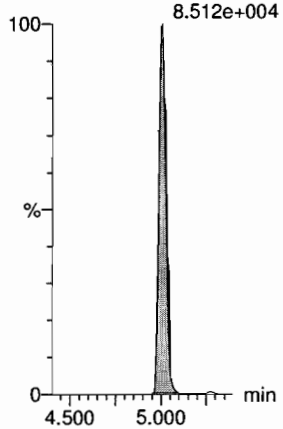
18O2-PFHxS



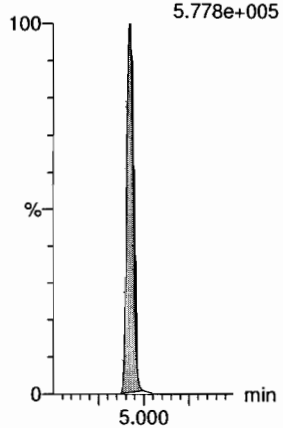
13C2-PFOA



13C8-PFOS



13C5-PFNA



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Last Altered: Tuesday, November 27, 2018 07:47:21 Pacific Standard Time
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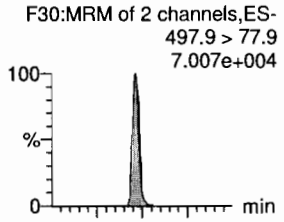
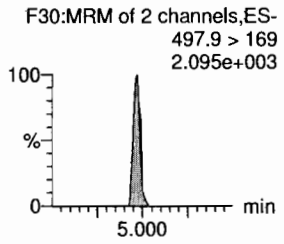
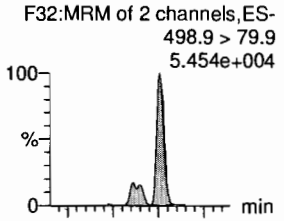
Name: 181126M1_51, Date: 26-Nov-2018, Time: 20:27:33, ID: ST181126M1-12 PFC CS3 18K1906, Description: PFC CS3 18K1906

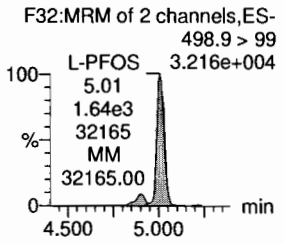
PFOSA





L-PFOS





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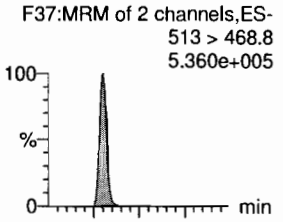
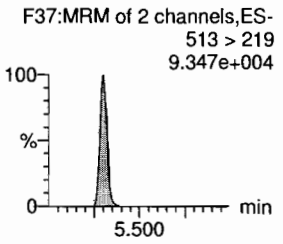
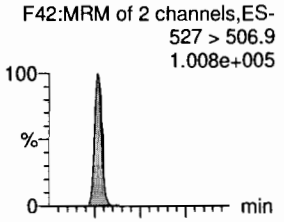
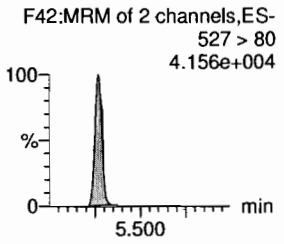


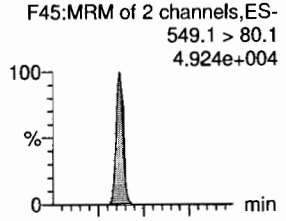


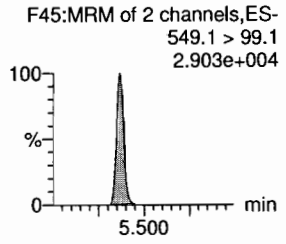
8:2 FTS



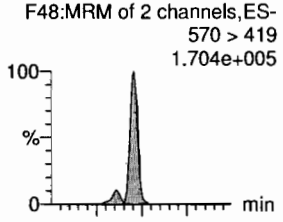


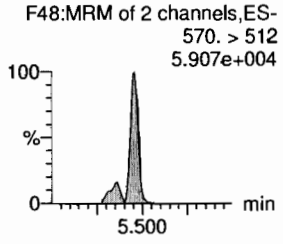
PFNS



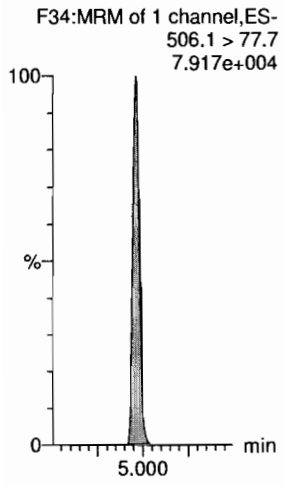


L-MeFOSAA

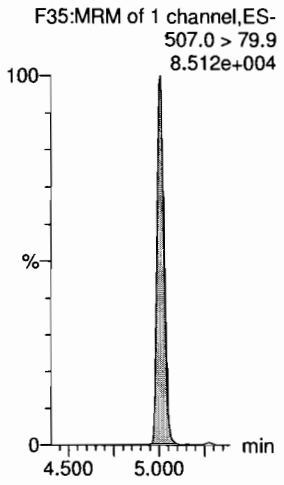




13C8-PFOSA



13C8-PFOS



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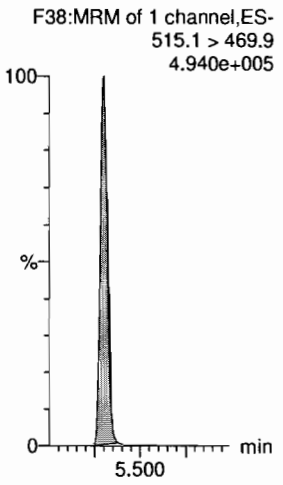
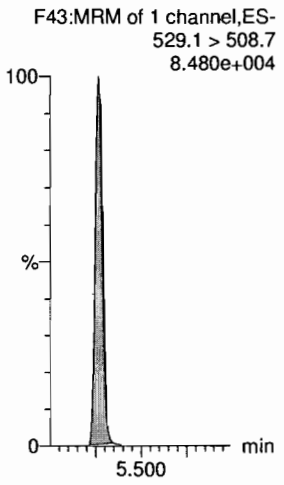
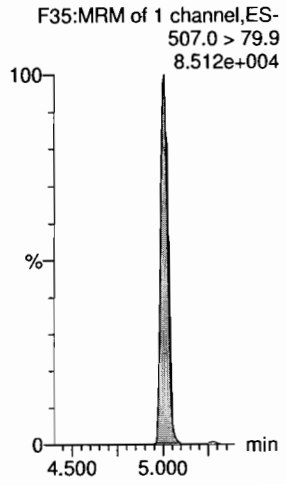


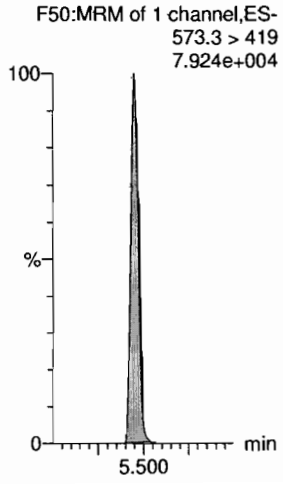
13C2-8:2 FTS



13C8-PFOS



d3-N-MeFOSAA



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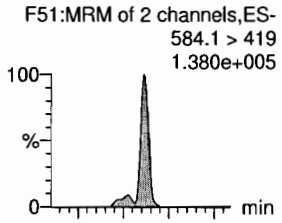
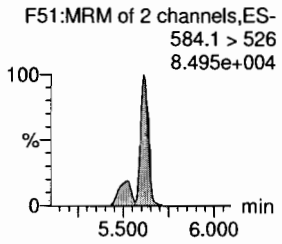
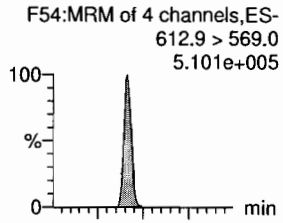
Name: 181126M1_51, Date: 26-Nov-2018, Time: 20:27:33, ID: ST181126M1-12 PFC CS3 18K1906, Description: PFC CS3 18K1906

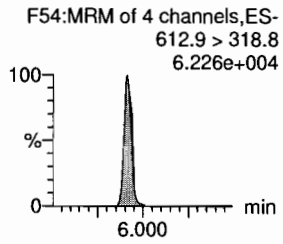
L-EtFOSAA



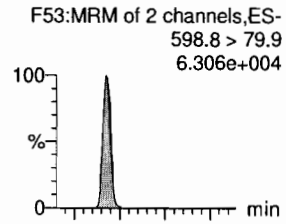


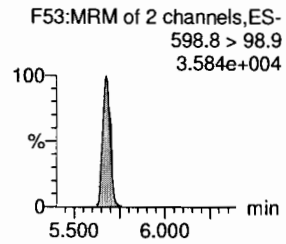
PFDoA





PFDS





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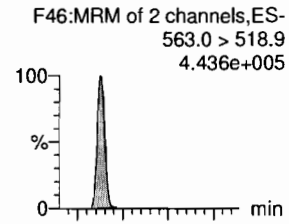
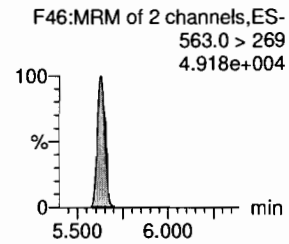
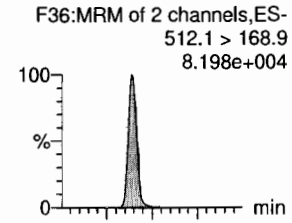
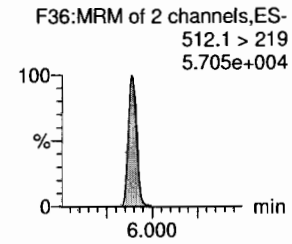


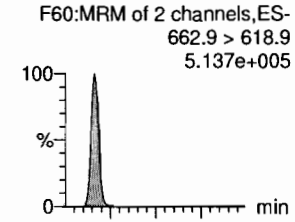


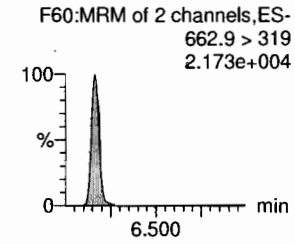
N-MeFOSA



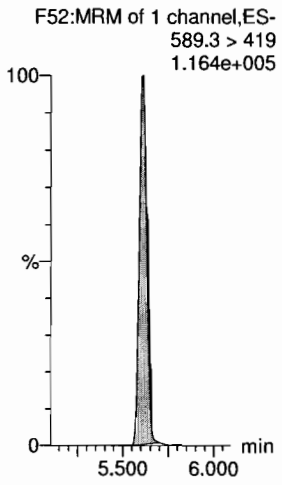


PFTrDA

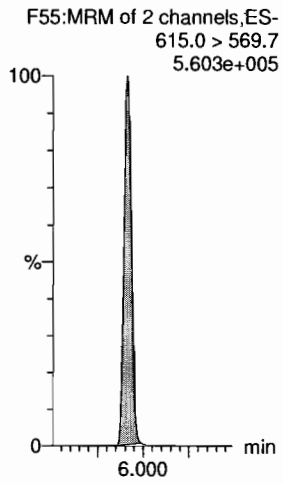




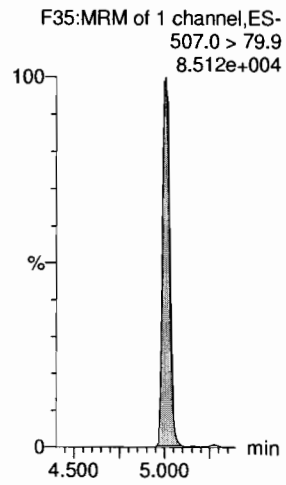
d5-N-EtFOSAA



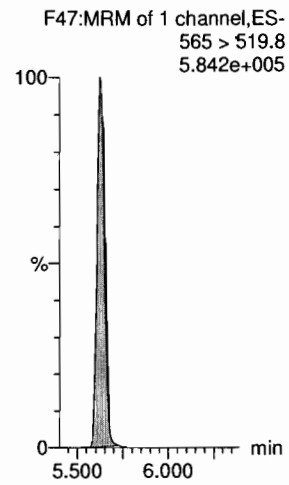
13C2-PFDoA



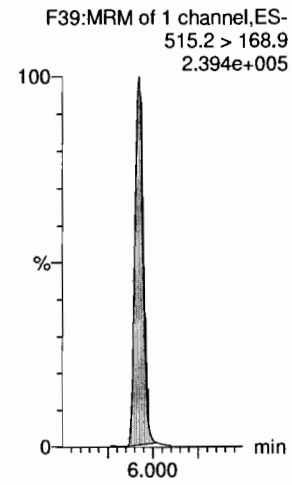
13C8-PFOS



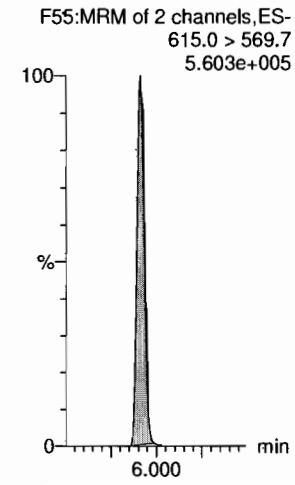
13C2-PFUdA



d3-N-MeFOSA



13C2-PFDoA

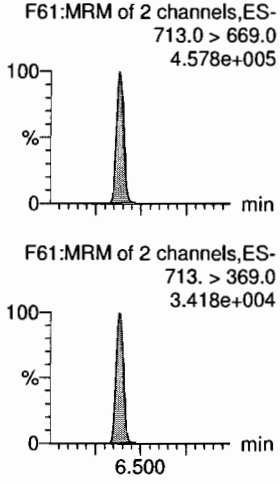


Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-51.qld

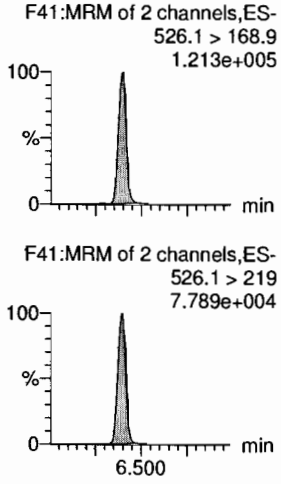
Last Altered: Tuesday, November 27, 2018 07:47:21 Pacific Standard Time
Printed: Tuesday, November 27, 2018 07:49:52 Pacific Standard Time

Name: 181126M1_51, Date: 26-Nov-2018, Time: 20:27:33, ID: ST181126M1-12 PFC CS3 18K1906, Description: PFC CS3 18K1906

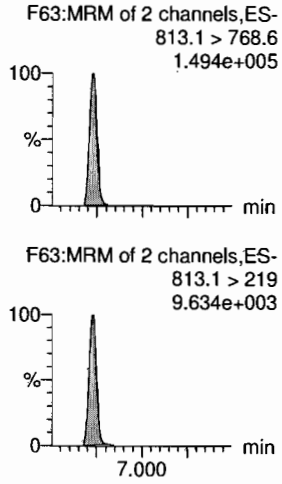
PFTeDA



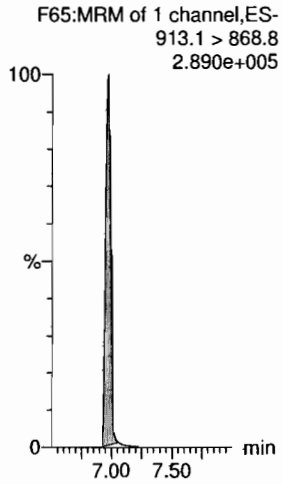
N-EtFOSA



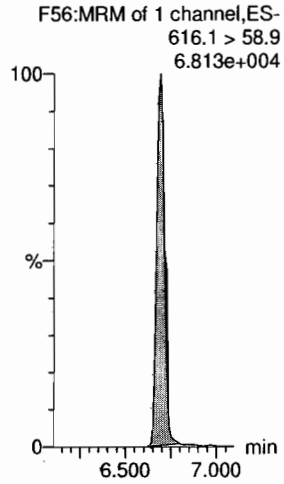
PFHxDA



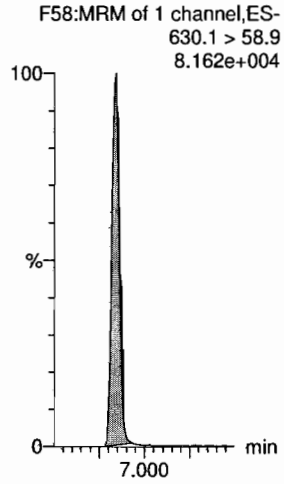
PFODA



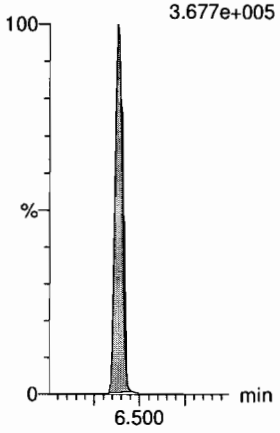
N-MeFOSE



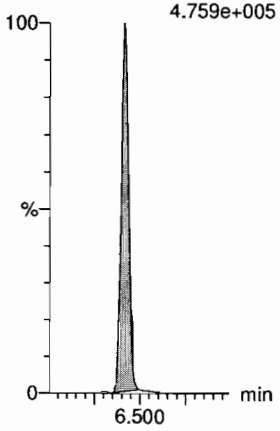
N-EtFOSE



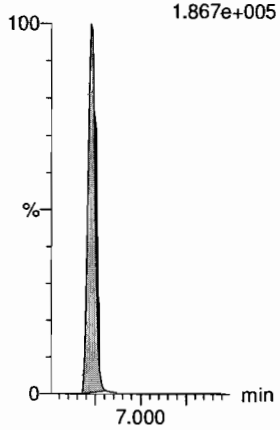
13C2-PFTeDA



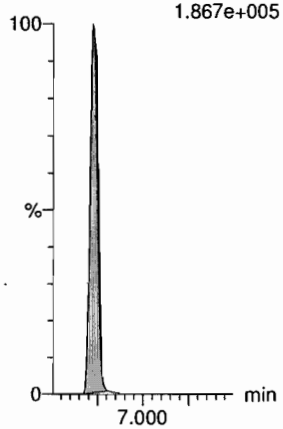
d5-N-ETFOSA



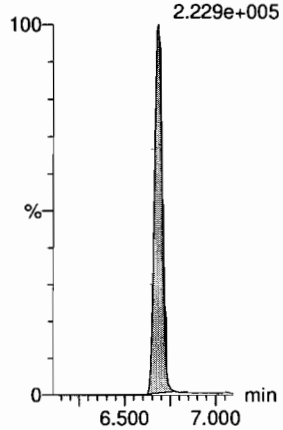
13C2-PFHxDA



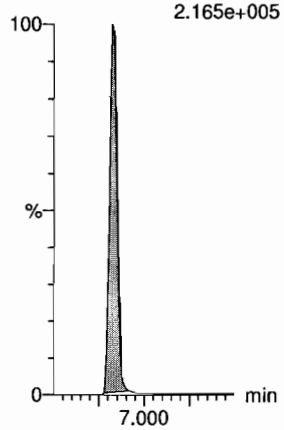
13C2-PFHxDA



d7-N-MeFOSE



d9-N-EtFOSE

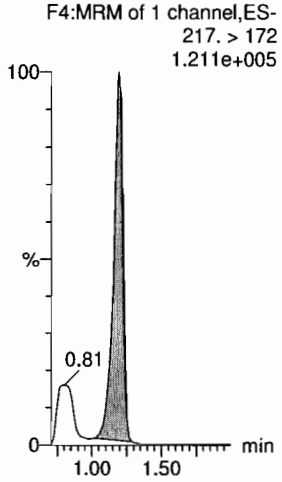


Dataset: Z:\Projects\PFAS.PRO\Results\181126M1\181126M1-51.qld

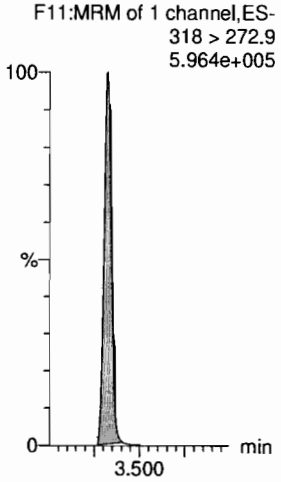
Last Altered: Tuesday, November 27, 2018 07:47:21 Pacific Standard Time
Printed: Tuesday, November 27, 2018 07:49:52 Pacific Standard Time

Name: 181126M1_51, Date: 26-Nov-2018, Time: 20:27:33, ID: ST181126M1-12 PFC CS3 18K1906, Description: PFC CS3 18K1906

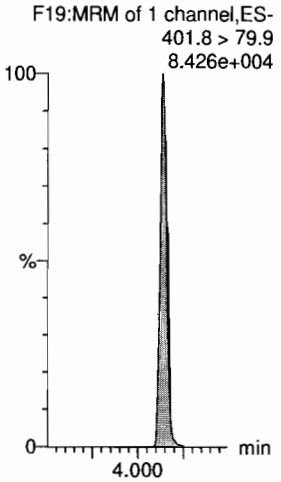
13C4-PFBA



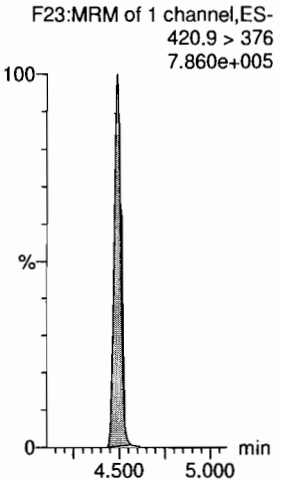
13C5-PFHxA



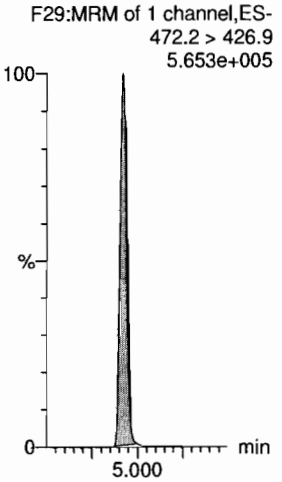
13C3-PFHxS



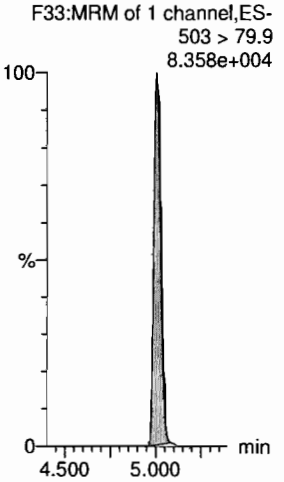
13C8-PFOA



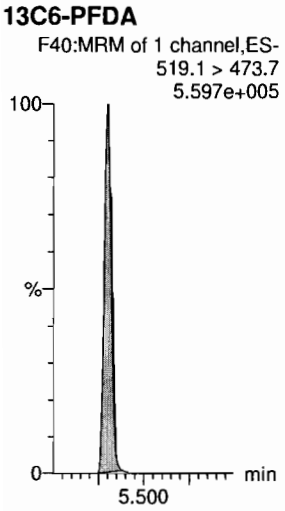
13C9-PFNA



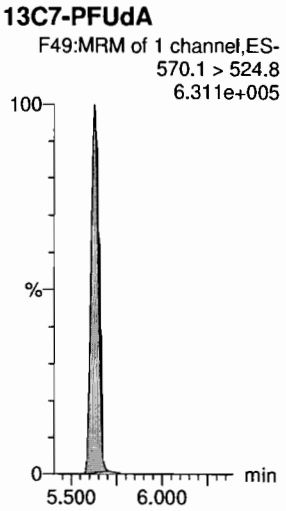
13C4-PFOS



13C6-PFDA



13C7-PFUdA



Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-IIS AREA.qld

Last Altered: Wednesday, November 28, 2018 08:10:24 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:10:42 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_RS-11-14-18.mdb 28 Nov 2018 08:08:38
Calibration: 28 Nov 2018 08:08:10

Name: 181127M1_2, Date: 27-Nov-2018, Time: 12:22:15, ID: ST181127M1-1 PFC CS0 18K1903, Description: PFC CS0 18K1903

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181127M1-1 PFC CS0 18K1903	7.26e3	100.0	NO
2	2	13C5-PFHxA	ST181127M1-1 PFC CS0 18K1903	2.24e4	100.0	NO
3	3	13C3-PFHxS	ST181127M1-1 PFC CS0 18K1903	2.73e3	100.0	NO
4	4	13C8-PFOA	ST181127M1-1 PFC CS0 18K1903	2.68e4	100.0	NO
5	5	13C9-PFNA	ST181127M1-1 PFC CS0 18K1903	1.85e4	100.0	NO
6	6	13C4-PFOS	ST181127M1-1 PFC CS0 18K1903	2.94e3	100.0	NO
7	7	13C6-PFDA	ST181127M1-1 PFC CS0 18K1903	2.12e4	100.0	NO
8	8	13C7-PFUdA	ST181127M1-1 PFC CS0 18K1903	2.27e4	100.0	NO

Name: 181127M1_3, Date: 27-Nov-2018, Time: 12:32:54, ID: QC MEOH LOT JB072509, Description: QC MEOH LOT JB072509

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	QC MEOH LOT JB072509	5.63e1	0.8	YES
2	2	13C5-PFHxA	QC MEOH LOT JB072509			NO
3	3	13C3-PFHxS	QC MEOH LOT JB072509			NO
4	4	13C8-PFOA	QC MEOH LOT JB072509	1.08e1	0.0	YES
5	5	13C9-PFNA	QC MEOH LOT JB072509			NO
6	6	13C4-PFOS	QC MEOH LOT JB072509	2.82e1	1.0	YES
7	7	13C6-PFDA	QC MEOH LOT JB072509			NO
8	8	13C7-PFUdA	QC MEOH LOT JB072509			NO

Name: 181127M1_4, Date: 27-Nov-2018, Time: 12:43:32, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_5, Date: 27-Nov-2018, Time: 12:54:05, ID: 1803659-01 A1-MW-07-SA2 0.11704, Description: A1-MW-07-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803659-01 A1-MW-07-SA2 0.11704	5.41e3	74.5	NO
2	2	13C5-PFHxA	1803659-01 A1-MW-07-SA2 0.11704	1.02e4	45.6	YES
3	3	13C3-PFHxS	1803659-01 A1-MW-07-SA2 0.11704	1.74e3	63.9	NO
4	4	13C8-PFOA	1803659-01 A1-MW-07-SA2 0.11704	1.11e4	41.4	YES
5	5	13C9-PFNA	1803659-01 A1-MW-07-SA2 0.11704	7.15e3	38.6	YES
6	6	13C4-PFOS	1803659-01 A1-MW-07-SA2 0.11704	1.80e3	61.2	NO
7	7	13C6-PFDA	1803659-01 A1-MW-07-SA2 0.11704	7.84e3	37.0	YES
8	8	13C7-PFUdA	1803659-01 A1-MW-07-SA2 0.11704	9.15e3	40.3	YES

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-IIS AREA.qld

Last Altered: Wednesday, November 28, 2018 08:10:24 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:10:42 Pacific Standard Time

Name: 181127M1_6, Date: 27-Nov-2018, Time: 13:04:43, ID: 1803659-02 A1-MW-23-SA2 0.1178, Description: A1-MW-23-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803659-02 A1-MW-23-SA2 0.1178	7.35e3	101.3	NO
2	2	13C5-PFHxA	1803659-02 A1-MW-23-SA2 0.1178	1.41e4	63.1	NO
3	3	13C3-PFHxS	1803659-02 A1-MW-23-SA2 0.1178	2.38e3	87.3	NO
4	4	13C8-PFOA	1803659-02 A1-MW-23-SA2 0.1178	1.70e4	63.5	NO
5	5	13C9-PFNA	1803659-02 A1-MW-23-SA2 0.1178	1.10e4	59.5	NO
6	6	13C4-PFOS	1803659-02 A1-MW-23-SA2 0.1178	2.29e3	77.9	NO
7	7	13C6-PFDA	1803659-02 A1-MW-23-SA2 0.1178	1.18e4	55.7	NO
8	8	13C7-PFUdA	1803659-02 A1-MW-23-SA2 0.1178	1.51e4	66.6	NO

Name: 181127M1_7, Date: 27-Nov-2018, Time: 13:15:22, ID: 1803659-03 A1-MW-25-SA2 0.11426, Description: A1-MW-25-SA2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803659-03 A1-MW-25-SA2 0.11426	7.13e3	98.2	NO
2	2	13C5-PFHxA	1803659-03 A1-MW-25-SA2 0.11426	1.24e4	55.2	NO
3	3	13C3-PFHxS	1803659-03 A1-MW-25-SA2 0.11426	2.55e3	93.5	NO
4	4	13C8-PFOA	1803659-03 A1-MW-25-SA2 0.11426	1.30e4	48.6	YES
5	5	13C9-PFNA	1803659-03 A1-MW-25-SA2 0.11426	8.83e3	47.6	YES
6	6	13C4-PFOS	1803659-03 A1-MW-25-SA2 0.11426	2.68e3	91.1	NO
7	7	13C6-PFDA	1803659-03 A1-MW-25-SA2 0.11426	1.05e4	49.6	YES
8	8	13C7-PFUdA	1803659-03 A1-MW-25-SA2 0.11426	1.42e4	62.4	NO

Name: 181127M1_8, Date: 27-Nov-2018, Time: 13:25:54, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181127M1-2 PFC CS3 18K1906	7.53e3	103.8	NO
2	2	13C5-PFHxA	ST181127M1-2 PFC CS3 18K1906	2.65e4	118.4	NO
3	3	13C3-PFHxS	ST181127M1-2 PFC CS3 18K1906	3.19e3	117.0	NO
4	4	13C8-PFOA	ST181127M1-2 PFC CS3 18K1906	3.02e4	112.7	NO
5	5	13C9-PFNA	ST181127M1-2 PFC CS3 18K1906	2.10e4	113.4	NO
6	6	13C4-PFOS	ST181127M1-2 PFC CS3 18K1906	3.20e3	108.8	NO
7	7	13C6-PFDA	ST181127M1-2 PFC CS3 18K1906	2.35e4	111.0	NO
8	8	13C7-PFUdA	ST181127M1-2 PFC CS3 18K1906	2.75e4	120.9	NO

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-IIS AREA.qld

Last Altered: Wednesday, November 28, 2018 08:10:24 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:10:42 Pacific Standard Time

Name: 181127M1_10, Date: 27-Nov-2018, Time: 13:47:11, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_11, Date: 27-Nov-2018, Time: 15:12:40, ID: 1803553-04 BS1810291445GC 3.51, Description: BS1810291445GC

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803553-04 BS1810291445GC 3.51	1.37e4	189.0	YES
2	2	13C5-PFHxA	1803553-04 BS1810291445GC 3.51	2.61e4	116.4	NO
3	3	13C3-PFHxS	1803553-04 BS1810291445GC 3.51	3.87e3	141.6	NO
4	4	13C8-PFOA	1803553-04 BS1810291445GC 3.51	3.19e4	119.0	NO
5	5	13C9-PFNA	1803553-04 BS1810291445GC 3.51	2.10e4	113.3	NO
6	6	13C4-PFOS	1803553-04 BS1810291445GC 3.51	6.68e3	227.5	YES
7	7	13C6-PFDA	1803553-04 BS1810291445GC 3.51	2.17e4	102.6	NO
8	8	13C7-PFUdA	1803553-04 BS1810291445GC 3.51	1.83e4	80.4	NO

Name: 181127M1_12, Date: 27-Nov-2018, Time: 15:23:15, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_13, Date: 27-Nov-2018, Time: 15:33:53, ID: B8K0162-MS1 Matrix Spike 0.11696, Description: Matrix Spike

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0162-MS1 Matrix Spike 0.11696	1.39e4	191.0	YES
2	2	13C5-PFHxA	B8K0162-MS1 Matrix Spike 0.11696	2.55e4	114.0	NO
3	3	13C3-PFHxS	B8K0162-MS1 Matrix Spike 0.11696	3.22e3	118.1	NO
4	4	13C8-PFOA	B8K0162-MS1 Matrix Spike 0.11696	3.04e4	113.3	NO
5	5	13C9-PFNA	B8K0162-MS1 Matrix Spike 0.11696	1.96e4	105.9	NO
6	6	13C4-PFOS	B8K0162-MS1 Matrix Spike 0.11696	2.77e3	94.4	NO
7	7	13C6-PFDA	B8K0162-MS1 Matrix Spike 0.11696	1.65e4	77.7	NO
8	8	13C7-PFUdA	B8K0162-MS1 Matrix Spike 0.11696	9.80e3	43.1	YES

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Name: 181127M1_14, Date: 27-Nov-2018, Time: 15:44:27, ID: B8K0162-MSD1 Matrix Spike Dup 0.11463, Description: Matrix Spike Dup

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0162-MSD1 Matrix Spike Dup 0.114...	1.54e4	211.7	YES
2	2	13C5-PFHxA	B8K0162-MSD1 Matrix Spike Dup 0.114...	2.84e4	126.6	NO
3	3	13C3-PFHxS	B8K0162-MSD1 Matrix Spike Dup 0.114...	3.61e3	132.1	NO
4	4	13C8-PFOA	B8K0162-MSD1 Matrix Spike Dup 0.114...	3.23e4	120.4	NO
5	5	13C9-PFNA	B8K0162-MSD1 Matrix Spike Dup 0.114...	2.04e4	110.1	NO
6	6	13C4-PFOS	B8K0162-MSD1 Matrix Spike Dup 0.114...	3.04e3	103.6	NO
7	7	13C6-PFDA	B8K0162-MSD1 Matrix Spike Dup 0.114...	1.60e4	75.6	NO
8	8	13C7-PFUdA	B8K0162-MSD1 Matrix Spike Dup 0.114...	8.85e3	39.0	YES

Name: 181127M1_15, Date: 27-Nov-2018, Time: 15:55:05, ID: B8K0162-BS1 OPR 0.125, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0162-BS1 OPR 0.125	1.31e4	181.2	YES
2	2	13C5-PFHxA	B8K0162-BS1 OPR 0.125	2.47e4	110.2	NO
3	3	13C3-PFHxS	B8K0162-BS1 OPR 0.125	3.03e3	110.9	NO
4	4	13C8-PFOA	B8K0162-BS1 OPR 0.125	2.61e4	97.4	NO
5	5	13C9-PFNA	B8K0162-BS1 OPR 0.125	1.42e4	76.4	NO
6	6	13C4-PFOS	B8K0162-BS1 OPR 0.125	1.77e3	60.4	NO
7	7	13C6-PFDA	B8K0162-BS1 OPR 0.125	7.53e3	35.6	YES
8	8	13C7-PFUdA	B8K0162-BS1 OPR 0.125	2.79e3	12.3	YES

Name: 181127M1_16, Date: 27-Nov-2018, Time: 16:05:38, ID: B8K0162-BLK1 Method Blank 0.125, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0162-BLK1 Method Blank 0.125	1.36e4	187.2	YES
2	2	13C5-PFHxA	B8K0162-BLK1 Method Blank 0.125	2.54e4	113.5	NO
3	3	13C3-PFHxS	B8K0162-BLK1 Method Blank 0.125	3.19e3	117.1	NO
4	4	13C8-PFOA	B8K0162-BLK1 Method Blank 0.125	2.83e4	105.7	NO
5	5	13C9-PFNA	B8K0162-BLK1 Method Blank 0.125	1.55e4	83.7	NO
6	6	13C4-PFOS	B8K0162-BLK1 Method Blank 0.125	1.72e3	58.4	NO
7	7	13C6-PFDA	B8K0162-BLK1 Method Blank 0.125	8.15e3	38.5	YES
8	8	13C7-PFUdA	B8K0162-BLK1 Method Blank 0.125	2.75e3	12.1	YES

Name: 181127M1_17, Date: 27-Nov-2018, Time: 16:16:16, ID: 1803677-01 OC-RW05-1118 0.1159, Description: OC-RW05-1118

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803677-01 OC-RW05-1118 0.1159	1.41e4	194.1	YES
2	2	13C5-PFHxA	1803677-01 OC-RW05-1118 0.1159	2.62e4	117.1	NO
3	3	13C3-PFHxS	1803677-01 OC-RW05-1118 0.1159	3.05e3	111.8	NO
4	4	13C8-PFOA	1803677-01 OC-RW05-1118 0.1159	2.81e4	104.8	NO
5	5	13C9-PFNA	1803677-01 OC-RW05-1118 0.1159	1.48e4	80.1	NO
6	6	13C4-PFOS	1803677-01 OC-RW05-1118 0.1159	1.52e3	51.9	NO
7	7	13C6-PFDA	1803677-01 OC-RW05-1118 0.1159	7.74e3	36.5	YES
8	8	13C7-PFUdA	1803677-01 OC-RW05-1118 0.1159	3.18e3	14.0	YES

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Name: 181127M1_18, Date: 27-Nov-2018, Time: 16:26:49, ID: 1803677-02 OC-RW05P-1118 0.11752, Description: OC-RW05P-1118

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803677-02 OC-RW05P-1118 0.11752	1.40e4	193.5	YES
2	2	13C5-PFHxA	1803677-02 OC-RW05P-1118 0.11752	2.61e4	116.7	NO
3	3	13C3-PFHxS	1803677-02 OC-RW05P-1118 0.11752	3.16e3	115.9	NO
4	4	13C8-PFOA	1803677-02 OC-RW05P-1118 0.11752	3.04e4	113.3	NO
5	5	13C9-PFNA	1803677-02 OC-RW05P-1118 0.11752	1.84e4	99.2	NO
6	6	13C4-PFOS	1803677-02 OC-RW05P-1118 0.11752	2.06e3	70.1	NO
7	7	13C6-PFDA	1803677-02 OC-RW05P-1118 0.11752	1.34e4	63.2	NO
8	8	13C7-PFUdA	1803677-02 OC-RW05P-1118 0.11752	6.05e3	26.6	YES

Name: 181127M1_19, Date: 27-Nov-2018, Time: 16:37:27, ID: 1803677-03 OC-FB05-1118 0.12187, Description: OC-FB05-1118

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803677-03 OC-FB05-1118 0.12187	1.53e4	210.4	YES
2	2	13C5-PFHxA	1803677-03 OC-FB05-1118 0.12187	2.86e4	127.5	NO
3	3	13C3-PFHxS	1803677-03 OC-FB05-1118 0.12187	3.33e3	121.9	NO
4	4	13C8-PFOA	1803677-03 OC-FB05-1118 0.12187	3.10e4	115.5	NO
5	5	13C9-PFNA	1803677-03 OC-FB05-1118 0.12187	1.99e4	107.5	NO
6	6	13C4-PFOS	1803677-03 OC-FB05-1118 0.12187	2.48e3	84.4	NO
7	7	13C6-PFDA	1803677-03 OC-FB05-1118 0.12187	1.49e4	70.4	NO
8	8	13C7-PFUdA	1803677-03 OC-FB05-1118 0.12187	7.06e3	31.0	YES

Name: 181127M1_20, Date: 27-Nov-2018, Time: 16:48:00, ID: B8K0098-BS1 OPR 0.125, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0098-BS1 OPR 0.125	1.02e4	140.1	NO
2	2	13C5-PFHxA	B8K0098-BS1 OPR 0.125	1.97e4	87.8	NO
3	3	13C3-PFHxS	B8K0098-BS1 OPR 0.125	2.65e3	96.9	NO
4	4	13C8-PFOA	B8K0098-BS1 OPR 0.125	2.27e4	84.7	NO
5	5	13C9-PFNA	B8K0098-BS1 OPR 0.125	1.70e4	91.6	NO
6	6	13C4-PFOS	B8K0098-BS1 OPR 0.125	2.58e3	87.9	NO
7	7	13C6-PFDA	B8K0098-BS1 OPR 0.125	1.94e4	91.5	NO
8	8	13C7-PFUdA	B8K0098-BS1 OPR 0.125	2.22e4	97.8	NO

Name: 181127M1_21, Date: 27-Nov-2018, Time: 16:58:38, ID: B8K0098-BLK1 Method Blank 0.125, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0098-BLK1 Method Blank 0.125	9.79e3	135.0	NO
2	2	13C5-PFHxA	B8K0098-BLK1 Method Blank 0.125	1.87e4	83.3	NO
3	3	13C3-PFHxS	B8K0098-BLK1 Method Blank 0.125	2.44e3	89.5	NO
4	4	13C8-PFOA	B8K0098-BLK1 Method Blank 0.125	2.27e4	84.6	NO
5	5	13C9-PFNA	B8K0098-BLK1 Method Blank 0.125	1.57e4	84.7	NO
6	6	13C4-PFOS	B8K0098-BLK1 Method Blank 0.125	2.50e3	85.1	NO
7	7	13C6-PFDA	B8K0098-BLK1 Method Blank 0.125	1.84e4	87.0	NO
8	8	13C7-PFUdA	B8K0098-BLK1 Method Blank 0.125	2.08e4	91.4	NO

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Name: 181127M1_22, Date: 27-Nov-2018, Time: 17:09:12, ID: 1803630-01 277 Bond Rd 0.10443, Description: 277 Bond Rd

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803630-01 277 Bond Rd 0.10443	7.43e3	102.4	NO
2	2	13C5-PFHxA	1803630-01 277 Bond Rd 0.10443	1.44e4	64.1	NO
3	3	13C3-PFHxS	1803630-01 277 Bond Rd 0.10443	2.01e3	73.7	NO
4	4	13C8-PFOA	1803630-01 277 Bond Rd 0.10443	1.75e4	65.3	NO
5	5	13C9-PFNA	1803630-01 277 Bond Rd 0.10443	1.26e4	67.9	NO
6	6	13C4-PFOS	1803630-01 277 Bond Rd 0.10443	2.04e3	69.6	NO
7	7	13C6-PFDA	1803630-01 277 Bond Rd 0.10443	1.40e4	66.1	NO
8	8	13C7-PFUdA	1803630-01 277 Bond Rd 0.10443	1.67e4	73.7	NO

Name: 181127M1_23, Date: 27-Nov-2018, Time: 17:19:51, ID: 1803630-02 292 Bond Rd 0.11197, Description: 292 Bond Rd

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803630-02 292 Bond Rd 0.11197	7.13e3	98.2	NO
2	2	13C5-PFHxA	1803630-02 292 Bond Rd 0.11197	1.34e4	59.9	NO
3	3	13C3-PFHxS	1803630-02 292 Bond Rd 0.11197	1.89e3	69.3	NO
4	4	13C8-PFOA	1803630-02 292 Bond Rd 0.11197	1.58e4	59.1	NO
5	5	13C9-PFNA	1803630-02 292 Bond Rd 0.11197	1.13e4	61.2	NO
6	6	13C4-PFOS	1803630-02 292 Bond Rd 0.11197	1.80e3	61.2	NO
7	7	13C6-PFDA	1803630-02 292 Bond Rd 0.11197	1.30e4	61.5	NO
8	8	13C7-PFUdA	1803630-02 292 Bond Rd 0.11197	1.52e4	66.8	NO

Name: 181127M1_24, Date: 27-Nov-2018, Time: 17:30:29, ID: 1803630-03 110 Phinney Rd 0.10702, Description: 110 Phinney Rd

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803630-03 110 Phinney Rd 0.10702	6.46e3	89.0	NO
2	2	13C5-PFHxA	1803630-03 110 Phinney Rd 0.10702	1.28e4	57.2	NO
3	3	13C3-PFHxS	1803630-03 110 Phinney Rd 0.10702	1.67e3	61.3	NO
4	4	13C8-PFOA	1803630-03 110 Phinney Rd 0.10702	1.58e4	58.7	NO
5	5	13C9-PFNA	1803630-03 110 Phinney Rd 0.10702	1.14e4	61.7	NO
6	6	13C4-PFOS	1803630-03 110 Phinney Rd 0.10702	1.82e3	62.1	NO
7	7	13C6-PFDA	1803630-03 110 Phinney Rd 0.10702	1.23e4	57.9	NO
8	8	13C7-PFUdA	1803630-03 110 Phinney Rd 0.10702	1.46e4	64.3	NO

Name: 181127M1_25, Date: 27-Nov-2018, Time: 17:41:02, ID: 1803630-04 305 Bond Rd 0.10908, Description: 305 Bond Rd

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803630-04 305 Bond Rd 0.10908	6.75e3	93.1	NO
2	2	13C5-PFHxA	1803630-04 305 Bond Rd 0.10908	1.30e4	58.1	NO
3	3	13C3-PFHxS	1803630-04 305 Bond Rd 0.10908	1.68e3	61.6	NO
4	4	13C8-PFOA	1803630-04 305 Bond Rd 0.10908	1.52e4	56.8	NO
5	5	13C9-PFNA	1803630-04 305 Bond Rd 0.10908	1.09e4	58.8	NO
6	6	13C4-PFOS	1803630-04 305 Bond Rd 0.10908	1.76e3	60.0	NO
7	7	13C6-PFDA	1803630-04 305 Bond Rd 0.10908	1.25e4	59.1	NO
8	8	13C7-PFUdA	1803630-04 305 Bond Rd 0.10908	1.48e4	65.0	NO

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Name: 181127M1_26, Date: 27-Nov-2018, Time: 17:51:40, ID: 1803630-05 122 Phinney Rd 0.11013, Description: 122 Phinney Rd

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803630-05 122 Phinney Rd 0.11013	7.18e3	98.9	NO
2	2	13C5-PFHxA	1803630-05 122 Phinney Rd 0.11013	1.33e4	59.5	NO
3	3	13C3-PFHxS	1803630-05 122 Phinney Rd 0.11013	1.81e3	66.2	NO
4	4	13C8-PFOA	1803630-05 122 Phinney Rd 0.11013	1.66e4	62.0	NO
5	5	13C9-PFNA	1803630-05 122 Phinney Rd 0.11013	1.10e4	59.1	NO
6	6	13C4-PFOS	1803630-05 122 Phinney Rd 0.11013	1.90e3	64.7	NO
7	7	13C6-PFDA	1803630-05 122 Phinney Rd 0.11013	1.25e4	59.2	NO
8	8	13C7-PFUdA	1803630-05 122 Phinney Rd 0.11013	1.51e4	66.4	NO

Name: 181127M1_27, Date: 27-Nov-2018, Time: 18:02:13, ID: 1803630-06 123 Phinney Rd 0.09851, Description: 123 Phinney Rd

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803630-06 123 Phinney Rd 0.09851	8.58e3	118.3	NO
2	2	13C5-PFHxA	1803630-06 123 Phinney Rd 0.09851	1.69e4	75.4	NO
3	3	13C3-PFHxS	1803630-06 123 Phinney Rd 0.09851	2.25e3	82.5	NO
4	4	13C8-PFOA	1803630-06 123 Phinney Rd 0.09851	2.03e4	75.7	NO
5	5	13C9-PFNA	1803630-06 123 Phinney Rd 0.09851	1.44e4	77.9	NO
6	6	13C4-PFOS	1803630-06 123 Phinney Rd 0.09851	2.35e3	79.9	NO
7	7	13C6-PFDA	1803630-06 123 Phinney Rd 0.09851	1.48e4	70.0	NO
8	8	13C7-PFUdA	1803630-06 123 Phinney Rd 0.09851	1.83e4	80.5	NO

Name: 181127M1_28, Date: 27-Nov-2018, Time: 18:12:52, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA	1.04e1	0.0	YES

Name: 181127M1_29, Date: 27-Nov-2018, Time: 18:23:26, ID: ST181127M1-3 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181127M1-3 PFC CS3 18K1906	8.69e3	119.8	NO
2	2	13C5-PFHxA	ST181127M1-3 PFC CS3 18K1906	2.86e4	127.8	NO
3	3	13C3-PFHxS	ST181127M1-3 PFC CS3 18K1906	3.47e3	127.0	NO
4	4	13C8-PFOA	ST181127M1-3 PFC CS3 18K1906	3.25e4	121.3	NO
5	5	13C9-PFNA	ST181127M1-3 PFC CS3 18K1906	2.32e4	125.1	NO
6	6	13C4-PFOS	ST181127M1-3 PFC CS3 18K1906	3.58e3	121.8	NO
7	7	13C6-PFDA	ST181127M1-3 PFC CS3 18K1906	2.70e4	127.5	NO
8	8	13C7-PFUdA	ST181127M1-3 PFC CS3 18K1906	3.06e4	134.6	NO

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Name: 181127M1_30, Date: 27-Nov-2018, Time: 18:34:04, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_31, Date: 27-Nov-2018, Time: 18:44:37, ID: 1803630-07 277 Bond Rd FRB 0.11327, Description: 277 Bond Rd FRB

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803630-07 277 Bond Rd FRB 0.11327	9.13e3	125.9	NO
2	2	13C5-PFHxA	1803630-07 277 Bond Rd FRB 0.11327	1.77e4	79.2	NO
3	3	13C3-PFHxS	1803630-07 277 Bond Rd FRB 0.11327	2.34e3	85.8	NO
4	4	13C8-PFOA	1803630-07 277 Bond Rd FRB 0.11327	2.11e4	78.5	NO
5	5	13C9-PFNA	1803630-07 277 Bond Rd FRB 0.11327	1.46e4	78.7	NO
6	6	13C4-PFOS	1803630-07 277 Bond Rd FRB 0.11327	2.28e3	77.6	NO
7	7	13C6-PFDA	1803630-07 277 Bond Rd FRB 0.11327	1.70e4	80.2	NO
8	8	13C7-PFUdA	1803630-07 277 Bond Rd FRB 0.11327	1.99e4	87.6	NO

Name: 181127M1_32, Date: 27-Nov-2018, Time: 18:55:15, ID: B8K0105-BS1 OPR 0.125, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0105-BS1 OPR 0.125	1.03e4	142.2	NO
2	2	13C5-PFHxA	B8K0105-BS1 OPR 0.125	1.96e4	87.4	NO
3	3	13C3-PFHxS	B8K0105-BS1 OPR 0.125	2.48e3	91.0	NO
4	4	13C8-PFOA	B8K0105-BS1 OPR 0.125	2.32e4	86.4	NO
5	5	13C9-PFNA	B8K0105-BS1 OPR 0.125	1.63e4	88.2	NO
6	6	13C4-PFOS	B8K0105-BS1 OPR 0.125	2.46e3	83.7	NO
7	7	13C6-PFDA	B8K0105-BS1 OPR 0.125	1.84e4	86.7	NO
8	8	13C7-PFUdA	B8K0105-BS1 OPR 0.125	2.20e4	96.6	NO

Name: 181127M1_33, Date: 27-Nov-2018, Time: 19:05:49, ID: B8K0105-BLK1 Method Blank 0.125, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0105-BLK1 Method Blank 0.125	9.95e3	137.1	NO
2	2	13C5-PFHxA	B8K0105-BLK1 Method Blank 0.125	1.91e4	85.5	NO
3	3	13C3-PFHxS	B8K0105-BLK1 Method Blank 0.125	2.35e3	86.0	NO
4	4	13C8-PFOA	B8K0105-BLK1 Method Blank 0.125	2.32e4	86.5	NO
5	5	13C9-PFNA	B8K0105-BLK1 Method Blank 0.125	1.66e4	89.4	NO
6	6	13C4-PFOS	B8K0105-BLK1 Method Blank 0.125	2.49e3	84.6	NO
7	7	13C6-PFDA	B8K0105-BLK1 Method Blank 0.125	1.89e4	89.4	NO
8	8	13C7-PFUdA	B8K0105-BLK1 Method Blank 0.125	2.10e4	92.3	NO

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Name: 181127M1_34, Date: 27-Nov-2018, Time: 19:16:27, ID: 1803643-01 DPH-MW10-17 0.11455, Description: DPH-MW10-17

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803643-01 DPH-MW10-17 0.11455	1.09e4	150.6	YES
2	2	13C5-PFHxA	1803643-01 DPH-MW10-17 0.11455	2.13e4	95.0	NO
3	3	13C3-PFHxS	1803643-01 DPH-MW10-17 0.11455	2.76e3	101.0	NO
4	4	13C8-PFOA	1803643-01 DPH-MW10-17 0.11455	2.57e4	96.0	NO
5	5	13C9-PFNA	1803643-01 DPH-MW10-17 0.11455	1.94e4	104.6	NO
6	6	13C4-PFOS	1803643-01 DPH-MW10-17 0.11455	2.97e3	101.0	NO
7	7	13C6-PFDA	1803643-01 DPH-MW10-17 0.11455	2.13e4	100.8	NO
8	8	13C7-PFUdA	1803643-01 DPH-MW10-17 0.11455	2.46e4	108.4	NO

Name: 181127M1_35, Date: 27-Nov-2018, Time: 19:27:05, ID: 1803643-02 DPH-MW8-17 0.11432, Description: DPH-MW8-17

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803643-02 DPH-MW8-17 0.11432	1.01e4	139.1	NO
2	2	13C5-PFHxA	1803643-02 DPH-MW8-17 0.11432	2.00e4	89.1	NO
3	3	13C3-PFHxS	1803643-02 DPH-MW8-17 0.11432	2.59e3	94.8	NO
4	4	13C8-PFOA	1803643-02 DPH-MW8-17 0.11432	2.49e4	92.7	NO
5	5	13C9-PFNA	1803643-02 DPH-MW8-17 0.11432	1.80e4	97.4	NO
6	6	13C4-PFOS	1803643-02 DPH-MW8-17 0.11432	2.60e3	88.4	NO
7	7	13C6-PFDA	1803643-02 DPH-MW8-17 0.11432	2.03e4	95.9	NO
8	8	13C7-PFUdA	1803643-02 DPH-MW8-17 0.11432	2.35e4	103.3	NO

Name: 181127M1_36, Date: 27-Nov-2018, Time: 19:37:44, ID: 1803643-03 DPH-MW5-17 0.11778, Description: DPH-MW5-17

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803643-03 DPH-MW5-17 0.11778	1.05e4	145.3	NO
2	2	13C5-PFHxA	1803643-03 DPH-MW5-17 0.11778	2.04e4	91.0	NO
3	3	13C3-PFHxS	1803643-03 DPH-MW5-17 0.11778	2.62e3	95.8	NO
4	4	13C8-PFOA	1803643-03 DPH-MW5-17 0.11778	2.39e4	89.2	NO
5	5	13C9-PFNA	1803643-03 DPH-MW5-17 0.11778	1.69e4	91.3	NO
6	6	13C4-PFOS	1803643-03 DPH-MW5-17 0.11778	2.61e3	88.9	NO
7	7	13C6-PFDA	1803643-03 DPH-MW5-17 0.11778	1.92e4	90.9	NO
8	8	13C7-PFUdA	1803643-03 DPH-MW5-17 0.11778	2.22e4	97.5	NO

Name: 181127M1_37, Date: 27-Nov-2018, Time: 19:48:16, ID: 1803643-04 DPH-MW9-17 0.11197, Description: DPH-MW9-17

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803643-04 DPH-MW9-17 0.11197	9.78e3	134.8	NO
2	2	13C5-PFHxA	1803643-04 DPH-MW9-17 0.11197	1.82e4	81.5	NO
3	3	13C3-PFHxS	1803643-04 DPH-MW9-17 0.11197	2.38e3	87.4	NO
4	4	13C8-PFOA	1803643-04 DPH-MW9-17 0.11197	2.20e4	82.1	NO
5	5	13C9-PFNA	1803643-04 DPH-MW9-17 0.11197	1.53e4	82.6	NO
6	6	13C4-PFOS	1803643-04 DPH-MW9-17 0.11197	2.30e3	78.2	NO
7	7	13C6-PFDA	1803643-04 DPH-MW9-17 0.11197	1.74e4	82.3	NO
8	8	13C7-PFUdA	1803643-04 DPH-MW9-17 0.11197	2.03e4	89.5	NO

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Name: 181127M1_38, Date: 27-Nov-2018, Time: 19:58:55, ID: 1803643-05 DPH-MW4-17 0.11305, Description: DPH-MW4-17

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803643-05 DPH-MW4-17 0.11305	1.00e4	138.0	NO
2	2	13C5-PFHxA	1803643-05 DPH-MW4-17 0.11305	1.97e4	88.0	NO
3	3	13C3-PFHxS	1803643-05 DPH-MW4-17 0.11305	2.54e3	93.0	NO
4	4	13C8-PFOA	1803643-05 DPH-MW4-17 0.11305	2.42e4	90.2	NO
5	5	13C9-PFNA	1803643-05 DPH-MW4-17 0.11305	1.76e4	94.8	NO
6	6	13C4-PFOS	1803643-05 DPH-MW4-17 0.11305	2.73e3	92.8	NO
7	7	13C6-PFDA	1803643-05 DPH-MW4-17 0.11305	2.01e4	94.9	NO
8	8	13C7-PFUdA	1803643-05 DPH-MW4-17 0.11305	2.25e4	99.2	NO

Name: 181127M1_39, Date: 27-Nov-2018, Time: 20:09:28, ID: 1803643-06 DPH-MW2-17 0.11423, Description: DPH-MW2-17

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803643-06 DPH-MW2-17 0.11423	1.03e4	142.3	NO
2	2	13C5-PFHxA	1803643-06 DPH-MW2-17 0.11423	2.03e4	90.8	NO
3	3	13C3-PFHxS	1803643-06 DPH-MW2-17 0.11423	2.76e3	101.1	NO
4	4	13C8-PFOA	1803643-06 DPH-MW2-17 0.11423	2.43e4	90.8	NO
5	5	13C9-PFNA	1803643-06 DPH-MW2-17 0.11423	1.84e4	99.1	NO
6	6	13C4-PFOS	1803643-06 DPH-MW2-17 0.11423	2.92e3	99.5	NO
7	7	13C6-PFDA	1803643-06 DPH-MW2-17 0.11423	2.06e4	97.1	NO
8	8	13C7-PFUdA	1803643-06 DPH-MW2-17 0.11423	2.47e4	108.8	NO

Name: 181127M1_40, Date: 27-Nov-2018, Time: 20:20:06, ID: 1803643-07 DPH-B5 0.11397, Description: DPH-B5

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803643-07 DPH-B5 0.11397	9.50e3	130.9	NO
2	2	13C5-PFHxA	1803643-07 DPH-B5 0.11397	1.90e4	84.6	NO
3	3	13C3-PFHxS	1803643-07 DPH-B5 0.11397	2.42e3	88.6	NO
4	4	13C8-PFOA	1803643-07 DPH-B5 0.11397	2.29e4	85.5	NO
5	5	13C9-PFNA	1803643-07 DPH-B5 0.11397	1.59e4	85.7	NO
6	6	13C4-PFOS	1803643-07 DPH-B5 0.11397	2.46e3	83.6	NO
7	7	13C6-PFDA	1803643-07 DPH-B5 0.11397	1.84e4	86.8	NO
8	8	13C7-PFUdA	1803643-07 DPH-B5 0.11397	2.15e4	94.5	NO

Name: 181127M1_41, Date: 27-Nov-2018, Time: 20:30:44, ID: 1803643-08 DPH-MW1-17 0.1163, Description: DPH-MW1-17

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803643-08 DPH-MW1-17 0.1163	1.05e4	144.6	NO
2	2	13C5-PFHxA	1803643-08 DPH-MW1-17 0.1163	2.05e4	91.3	NO
3	3	13C3-PFHxS	1803643-08 DPH-MW1-17 0.1163	2.57e3	94.2	NO
4	4	13C8-PFOA	1803643-08 DPH-MW1-17 0.1163	2.47e4	92.1	NO
5	5	13C9-PFNA	1803643-08 DPH-MW1-17 0.1163	1.73e4	93.1	NO
6	6	13C4-PFOS	1803643-08 DPH-MW1-17 0.1163	2.62e3	89.1	NO
7	7	13C6-PFDA	1803643-08 DPH-MW1-17 0.1163	1.99e4	93.9	NO
8	8	13C7-PFUdA	1803643-08 DPH-MW1-17 0.1163	2.25e4	99.1	NO

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Name: 181127M1_42, Date: 27-Nov-2018, Time: 20:41:18, ID: 1803643-09 DPH-EX4 0.11442, Description: DPH-EX4

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803643-09 DPH-EX4 0.11442	9.80e3	135.0	NO
2	2	13C5-PFHxA	1803643-09 DPH-EX4 0.11442	1.88e4	83.9	NO
3	3	13C3-PFHxS	1803643-09 DPH-EX4 0.11442	2.44e3	89.5	NO
4	4	13C8-PFOA	1803643-09 DPH-EX4 0.11442	2.25e4	83.7	NO
5	5	13C9-PFNA	1803643-09 DPH-EX4 0.11442	1.58e4	85.3	NO
6	6	13C4-PFOS	1803643-09 DPH-EX4 0.11442	2.48e3	84.5	NO
7	7	13C6-PFDA	1803643-09 DPH-EX4 0.11442	1.87e4	88.5	NO
8	8	13C7-PFUdA	1803643-09 DPH-EX4 0.11442	2.12e4	93.5	NO

Name: 181127M1_43, Date: 27-Nov-2018, Time: 20:51:56, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_44, Date: 27-Nov-2018, Time: 21:02:28, ID: ST181127M1-4 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181127M1-4 PFC CS3 18K1906	8.73e3	120.2	NO
2	2	13C5-PFHxA	ST181127M1-4 PFC CS3 18K1906	2.86e4	127.8	NO
3	3	13C3-PFHxS	ST181127M1-4 PFC CS3 18K1906	3.55e3	130.2	NO
4	4	13C8-PFOA	ST181127M1-4 PFC CS3 18K1906	3.37e4	125.8	NO
5	5	13C9-PFNA	ST181127M1-4 PFC CS3 18K1906	2.36e4	127.1	NO
6	6	13C4-PFOS	ST181127M1-4 PFC CS3 18K1906	3.67e3	124.9	NO
7	7	13C6-PFDA	ST181127M1-4 PFC CS3 18K1906	2.73e4	129.2	NO
8	8	13C7-PFUdA	ST181127M1-4 PFC CS3 18K1906	3.10e4	136.6	NO

Name: 181127M1_45, Date: 27-Nov-2018, Time: 21:13:06, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA	6.03e0	0.0	YES
8	8	13C7-PFUdA	IPA			NO

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Name: 181127M1_46, Date: 27-Nov-2018, Time: 21:23:39, ID: 1803645-01 DPH-MW6 0.11548, Description: DPH-MW6

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803645-01 DPH-MW6 0.11548	1.07e4	147.1	NO
2	2	13C5-PFHxA	1803645-01 DPH-MW6 0.11548	2.03e4	90.4	NO
3	3	13C3-PFHxS	1803645-01 DPH-MW6 0.11548	2.54e3	93.2	NO
4	4	13C8-PFOA	1803645-01 DPH-MW6 0.11548	2.49e4	92.8	NO
5	5	13C9-PFNA	1803645-01 DPH-MW6 0.11548	1.71e4	92.2	NO
6	6	13C4-PFOS	1803645-01 DPH-MW6 0.11548	2.63e3	89.5	NO
7	7	13C6-PFDA	1803645-01 DPH-MW6 0.11548	2.00e4	94.6	NO
8	8	13C7-PFUdA	1803645-01 DPH-MW6 0.11548	2.29e4	100.7	NO

Name: 181127M1_47, Date: 27-Nov-2018, Time: 21:34:18, ID: 1803645-02 DPH-MW21 0.11562, Description: DPH-MW21

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803645-02 DPH-MW21 0.11562	1.01e4	139.8	NO
2	2	13C5-PFHxA	1803645-02 DPH-MW21 0.11562	1.99e4	88.7	NO
3	3	13C3-PFHxS	1803645-02 DPH-MW21 0.11562	2.56e3	93.7	NO
4	4	13C8-PFOA	1803645-02 DPH-MW21 0.11562	2.43e4	90.5	NO
5	5	13C9-PFNA	1803645-02 DPH-MW21 0.11562	1.66e4	89.3	NO
6	6	13C4-PFOS	1803645-02 DPH-MW21 0.11562	2.62e3	89.1	NO
7	7	13C6-PFDA	1803645-02 DPH-MW21 0.11562	1.93e4	91.1	NO
8	8	13C7-PFUdA	1803645-02 DPH-MW21 0.11562	2.23e4	98.3	NO

Name: 181127M1_48, Date: 27-Nov-2018, Time: 21:44:56, ID: 1803645-03 DPH-MW15D 0.11807, Description: DPH-MW15D

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803645-03 DPH-MW15D 0.11807	9.26e3	127.7	NO
2	2	13C5-PFHxA	1803645-03 DPH-MW15D 0.11807	1.81e4	80.8	NO
3	3	13C3-PFHxS	1803645-03 DPH-MW15D 0.11807	2.55e3	93.5	NO
4	4	13C8-PFOA	1803645-03 DPH-MW15D 0.11807	2.21e4	82.2	NO
5	5	13C9-PFNA	1803645-03 DPH-MW15D 0.11807	1.59e4	85.7	NO
6	6	13C4-PFOS	1803645-03 DPH-MW15D 0.11807	2.62e3	89.3	NO
7	7	13C6-PFDA	1803645-03 DPH-MW15D 0.11807	1.91e4	90.4	NO
8	8	13C7-PFUdA	1803645-03 DPH-MW15D 0.11807	2.24e4	98.6	NO

Name: 181127M1_49, Date: 27-Nov-2018, Time: 21:55:28, ID: 1803645-04 DPH-MW22 0.11748, Description: DPH-MW22

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803645-04 DPH-MW22 0.11748	9.76e3	134.5	NO
2	2	13C5-PFHxA	1803645-04 DPH-MW22 0.11748	1.89e4	84.5	NO
3	3	13C3-PFHxS	1803645-04 DPH-MW22 0.11748	2.55e3	93.6	NO
4	4	13C8-PFOA	1803645-04 DPH-MW22 0.11748	2.25e4	84.0	NO
5	5	13C9-PFNA	1803645-04 DPH-MW22 0.11748	1.64e4	88.6	NO
6	6	13C4-PFOS	1803645-04 DPH-MW22 0.11748	2.70e3	91.8	NO
7	7	13C6-PFDA	1803645-04 DPH-MW22 0.11748	1.81e4	85.4	NO
8	8	13C7-PFUdA	1803645-04 DPH-MW22 0.11748	2.13e4	93.6	NO

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Name: 181127M1_50, Date: 27-Nov-2018, Time: 22:06:07, ID: 1803649-01 DPH-MW18 0.11992, Description: DPH-MW18

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803649-01 DPH-MW18 0.11992	9.76e3	134.6	NO
2	2	13C5-PFHxA	1803649-01 DPH-MW18 0.11992	1.92e4	85.5	NO
3	3	13C3-PFHxS	1803649-01 DPH-MW18 0.11992	2.59e3	95.0	NO
4	4	13C8-PFOA	1803649-01 DPH-MW18 0.11992	2.28e4	84.9	NO
5	5	13C9-PFNA	1803649-01 DPH-MW18 0.11992	1.60e4	86.2	NO
6	6	13C4-PFOS	1803649-01 DPH-MW18 0.11992	2.44e3	82.9	NO
7	7	13C6-PFDA	1803649-01 DPH-MW18 0.11992	1.82e4	85.8	NO
8	8	13C7-PFUdA	1803649-01 DPH-MW18 0.11992	2.13e4	93.7	NO

Name: 181127M1_51, Date: 27-Nov-2018, Time: 22:16:45, ID: 1803649-02 DPH-MW19 0.11728, Description: DPH-MW19

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803649-02 DPH-MW19 0.11728	1.03e4	142.4	NO
2	2	13C5-PFHxA	1803649-02 DPH-MW19 0.11728	2.03e4	90.8	NO
3	3	13C3-PFHxS	1803649-02 DPH-MW19 0.11728	2.81e3	102.8	NO
4	4	13C8-PFOA	1803649-02 DPH-MW19 0.11728	2.50e4	93.4	NO
5	5	13C9-PFNA	1803649-02 DPH-MW19 0.11728	1.82e4	98.2	NO
6	6	13C4-PFOS	1803649-02 DPH-MW19 0.11728	2.86e3	97.4	NO
7	7	13C6-PFDA	1803649-02 DPH-MW19 0.11728	2.04e4	96.3	NO
8	8	13C7-PFUdA	1803649-02 DPH-MW19 0.11728	2.36e4	103.8	NO

Name: 181127M1_52, Date: 27-Nov-2018, Time: 22:27:18, ID: 1803649-03 DPH-SW1 0.1142, Description: DPH-SW1

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803649-03 DPH-SW1 0.1142	9.68e3	133.4	NO
2	2	13C5-PFHxA	1803649-03 DPH-SW1 0.1142	1.88e4	84.1	NO
3	3	13C3-PFHxS	1803649-03 DPH-SW1 0.1142	2.22e3	81.4	NO
4	4	13C8-PFOA	1803649-03 DPH-SW1 0.1142	2.24e4	83.4	NO
5	5	13C9-PFNA	1803649-03 DPH-SW1 0.1142	1.45e4	78.1	NO
6	6	13C4-PFOS	1803649-03 DPH-SW1 0.1142	2.37e3	80.7	NO
7	7	13C6-PFDA	1803649-03 DPH-SW1 0.1142	1.76e4	82.9	NO
8	8	13C7-PFUdA	1803649-03 DPH-SW1 0.1142	1.99e4	87.7	NO

Name: 181127M1_53, Date: 27-Nov-2018, Time: 22:37:57, ID: 1803649-04 DPH-SW3 0.11432, Description: DPH-SW3

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803649-04 DPH-SW3 0.11432	1.07e4	147.6	NO
2	2	13C5-PFHxA	1803649-04 DPH-SW3 0.11432	2.06e4	91.9	NO
3	3	13C3-PFHxS	1803649-04 DPH-SW3 0.11432	2.58e3	94.6	NO
4	4	13C8-PFOA	1803649-04 DPH-SW3 0.11432	2.41e4	89.8	NO
5	5	13C9-PFNA	1803649-04 DPH-SW3 0.11432	1.73e4	93.1	NO
6	6	13C4-PFOS	1803649-04 DPH-SW3 0.11432	2.64e3	89.9	NO
7	7	13C6-PFDA	1803649-04 DPH-SW3 0.11432	1.93e4	91.3	NO
8	8	13C7-PFUdA	1803649-04 DPH-SW3 0.11432	2.20e4	96.7	NO

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Name: 181127M1_54, Date: 27-Nov-2018, Time: 22:48:35, ID: 1803649-05 DPH-SW4 0.11082, Description: DPH-SW4

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803649-05 DPH-SW4 0.11082	9.73e3	134.0	NO
2	2	13C5-PFHxA	1803649-05 DPH-SW4 0.11082	1.86e4	83.1	NO
3	3	13C3-PFHxS	1803649-05 DPH-SW4 0.11082	2.32e3	85.1	NO
4	4	13C8-PFOA	1803649-05 DPH-SW4 0.11082	2.28e4	84.9	NO
5	5	13C9-PFNA	1803649-05 DPH-SW4 0.11082	1.51e4	81.7	NO
6	6	13C4-PFOS	1803649-05 DPH-SW4 0.11082	2.47e3	84.0	NO
7	7	13C6-PFDA	1803649-05 DPH-SW4 0.11082	1.84e4	86.7	NO
8	8	13C7-PFUdA	1803649-05 DPH-SW4 0.11082	2.12e4	93.2	NO

Name: 181127M1_55, Date: 27-Nov-2018, Time: 22:59:07, ID: B8K0133-BS1 OPR 0.125, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0133-BS1 OPR 0.125	1.03e4	141.9	NO
2	2	13C5-PFHxA	B8K0133-BS1 OPR 0.125	1.98e4	88.3	NO
3	3	13C3-PFHxS	B8K0133-BS1 OPR 0.125	2.82e3	103.4	NO
4	4	13C8-PFOA	B8K0133-BS1 OPR 0.125	2.47e4	92.1	NO
5	5	13C9-PFNA	B8K0133-BS1 OPR 0.125	1.84e4	99.1	NO
6	6	13C4-PFOS	B8K0133-BS1 OPR 0.125	2.91e3	98.9	NO
7	7	13C6-PFDA	B8K0133-BS1 OPR 0.125	2.16e4	102.0	NO
8	8	13C7-PFUdA	B8K0133-BS1 OPR 0.125	2.53e4	111.2	NO

Name: 181127M1_56, Date: 27-Nov-2018, Time: 23:09:45, ID: B8K0133-BLK1 Method Blank 0.125, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0133-BLK1 Method Blank 0.125	1.19e4	164.0	YES
2	2	13C5-PFHxA	B8K0133-BLK1 Method Blank 0.125	2.25e4	100.6	NO
3	3	13C3-PFHxS	B8K0133-BLK1 Method Blank 0.125	2.80e3	102.7	NO
4	4	13C8-PFOA	B8K0133-BLK1 Method Blank 0.125	2.69e4	100.4	NO
5	5	13C9-PFNA	B8K0133-BLK1 Method Blank 0.125	1.88e4	101.5	NO
6	6	13C4-PFOS	B8K0133-BLK1 Method Blank 0.125	2.85e3	97.0	NO
7	7	13C6-PFDA	B8K0133-BLK1 Method Blank 0.125	2.17e4	102.4	NO
8	8	13C7-PFUdA	B8K0133-BLK1 Method Blank 0.125	2.42e4	106.6	NO

Name: 181127M1_57, Date: 27-Nov-2018, Time: 23:20:24, ID: 1803638-01 Ireland 0.11664, Description: Ireland

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803638-01 Ireland 0.11664	9.13e3	125.8	NO
2	2	13C5-PFHxA	1803638-01 Ireland 0.11664	1.75e4	78.0	NO
3	3	13C3-PFHxS	1803638-01 Ireland 0.11664	2.88e3	105.6	NO
4	4	13C8-PFOA	1803638-01 Ireland 0.11664	2.02e4	75.3	NO
5	5	13C9-PFNA	1803638-01 Ireland 0.11664	1.44e4	77.6	NO
6	6	13C4-PFOS	1803638-01 Ireland 0.11664	2.90e3	98.8	NO
7	7	13C6-PFDA	1803638-01 Ireland 0.11664	1.74e4	82.4	NO
8	8	13C7-PFUdA	1803638-01 Ireland 0.11664	2.07e4	90.9	NO

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Name: 181127M1_58, Date: 27-Nov-2018, Time: 23:30:57, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_59, Date: 27-Nov-2018, Time: 23:41:36, ID: ST181127M1-5 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181127M1-5 PFC CS3 18K1906	8.82e3	121.5	NO
2	2	13C5-PFHxA	ST181127M1-5 PFC CS3 18K1906	2.92e4	130.4	NO
3	3	13C3-PFHxS	ST181127M1-5 PFC CS3 18K1906	3.60e3	132.0	NO
4	4	13C8-PFOA	ST181127M1-5 PFC CS3 18K1906	3.31e4	123.3	NO
5	5	13C9-PFNA	ST181127M1-5 PFC CS3 18K1906	2.36e4	127.3	NO
6	6	13C4-PFOS	ST181127M1-5 PFC CS3 18K1906	3.55e3	121.0	NO
7	7	13C6-PFDA	ST181127M1-5 PFC CS3 18K1906	2.70e4	127.6	NO
8	8	13C7-PFUdA	ST181127M1-5 PFC CS3 18K1906	3.03e4	133.2	NO

Name: 181127M1_60, Date: 27-Nov-2018, Time: 23:52:09, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_61, Date: 28-Nov-2018, Time: 00:02:47, ID: 1803639-01 MW-1 0.11477, Description: MW-1

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803639-01 MW-1 0.11477	1.03e4	141.7	NO
2	2	13C5-PFHxA	1803639-01 MW-1 0.11477	1.90e4	84.8	NO
3	3	13C3-PFHxS	1803639-01 MW-1 0.11477	2.77e3	101.5	NO
4	4	13C8-PFOA	1803639-01 MW-1 0.11477	2.20e4	82.1	NO
5	5	13C9-PFNA	1803639-01 MW-1 0.11477	1.57e4	84.6	NO
6	6	13C4-PFOS	1803639-01 MW-1 0.11477	2.85e3	97.1	NO
7	7	13C6-PFDA	1803639-01 MW-1 0.11477	1.80e4	84.9	NO
8	8	13C7-PFUdA	1803639-01 MW-1 0.11477	2.14e4	94.3	NO

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Name: 181127M1_62, Date: 28-Nov-2018, Time: 00:13:20, ID: 1803639-02 MW-3 0.11437, Description: MW-3

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803639-02 MW-3 0.11437	1.02e4	140.8	NO
2	2	13C5-PFHxA	1803639-02 MW-3 0.11437	2.00e4	89.3	NO
3	3	13C3-PFHxS	1803639-02 MW-3 0.11437	2.59e3	94.8	NO
4	4	13C8-PFOA	1803639-02 MW-3 0.11437	2.23e4	83.2	NO
5	5	13C9-PFNA	1803639-02 MW-3 0.11437	1.60e4	86.4	NO
6	6	13C4-PFOS	1803639-02 MW-3 0.11437	2.67e3	90.8	NO
7	7	13C6-PFDA	1803639-02 MW-3 0.11437	1.90e4	89.6	NO
8	8	13C7-PFUdA	1803639-02 MW-3 0.11437	2.25e4	98.9	NO

Name: 181127M1_63, Date: 28-Nov-2018, Time: 00:23:58, ID: 1803650-01 RFW-3 0.113, Description: RFW-3

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803650-01 RFW-3 0.113	1.11e4	152.4	YES
2	2	13C5-PFHxA	1803650-01 RFW-3 0.113	2.15e4	96.0	NO
3	3	13C3-PFHxS	1803650-01 RFW-3 0.113	2.85e3	104.4	NO
4	4	13C8-PFOA	1803650-01 RFW-3 0.113	2.32e4	86.7	NO
5	5	13C9-PFNA	1803650-01 RFW-3 0.113	1.65e4	88.9	NO
6	6	13C4-PFOS	1803650-01 RFW-3 0.113	3.12e3	106.1	NO
7	7	13C6-PFDA	1803650-01 RFW-3 0.113	2.01e4	94.9	NO
8	8	13C7-PFUdA	1803650-01 RFW-3 0.113	2.41e4	106.0	NO

Name: 181127M1_64, Date: 28-Nov-2018, Time: 00:34:30, ID: 1803650-02 RFW-4 0.11224, Description: RFW-4

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803650-02 RFW-4 0.11224	1.20e4	165.2	YES
2	2	13C5-PFHxA	1803650-02 RFW-4 0.11224	2.25e4	100.4	NO
3	3	13C3-PFHxS	1803650-02 RFW-4 0.11224	2.99e3	109.7	NO
4	4	13C8-PFOA	1803650-02 RFW-4 0.11224	2.74e4	102.1	NO
5	5	13C9-PFNA	1803650-02 RFW-4 0.11224	1.97e4	106.0	NO
6	6	13C4-PFOS	1803650-02 RFW-4 0.11224	3.19e3	108.7	NO
7	7	13C6-PFDA	1803650-02 RFW-4 0.11224	2.26e4	106.8	NO
8	8	13C7-PFUdA	1803650-02 RFW-4 0.11224	2.50e4	109.9	NO

Name: 181127M1_65, Date: 28-Nov-2018, Time: 00:45:09, ID: 1803650-03 GZ-202A 0.11317, Description: GZ-202A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803650-03 GZ-202A 0.11317	1.10e4	151.0	YES
2	2	13C5-PFHxA	1803650-03 GZ-202A 0.11317	2.13e4	94.9	NO
3	3	13C3-PFHxS	1803650-03 GZ-202A 0.11317	2.77e3	101.4	NO
4	4	13C8-PFOA	1803650-03 GZ-202A 0.11317	2.66e4	99.3	NO
5	5	13C9-PFNA	1803650-03 GZ-202A 0.11317	1.83e4	98.7	NO
6	6	13C4-PFOS	1803650-03 GZ-202A 0.11317	2.64e3	89.8	NO
7	7	13C6-PFDA	1803650-03 GZ-202A 0.11317	2.09e4	98.7	NO
8	8	13C7-PFUdA	1803650-03 GZ-202A 0.11317	2.41e4	106.0	NO

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Name: 181127M1_66, Date: 28-Nov-2018, Time: 00:55:47, ID: 1803650-04 P-2R (South Spring) 0.11552, Description: P-2R (South Spring)

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803650-04 P-2R (South Spring) 0.11552	9.07e3	124.9	NO
2	2	13C5-PFHxA	1803650-04 P-2R (South Spring) 0.11552	1.82e4	81.2	NO
3	3	13C3-PFHxS	1803650-04 P-2R (South Spring) 0.11552	2.39e3	87.5	NO
4	4	13C8-PFOA	1803650-04 P-2R (South Spring) 0.11552	2.13e4	79.5	NO
5	5	13C9-PFNA	1803650-04 P-2R (South Spring) 0.11552	1.53e4	82.4	NO
6	6	13C4-PFOS	1803650-04 P-2R (South Spring) 0.11552	2.50e3	85.1	NO
7	7	13C6-PFDA	1803650-04 P-2R (South Spring) 0.11552	1.86e4	87.7	NO
8	8	13C7-PFUdA	1803650-04 P-2R (South Spring) 0.11552	2.10e4	92.5	NO

Name: 181127M1_67, Date: 28-Nov-2018, Time: 01:06:20, ID: 1803653-01 SEA-1 0.11267, Description: SEA-1

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803653-01 SEA-1 0.11267	1.14e4	157.7	YES
2	2	13C5-PFHxA	1803653-01 SEA-1 0.11267	2.21e4	98.5	NO
3	3	13C3-PFHxS	1803653-01 SEA-1 0.11267	2.96e3	108.5	NO
4	4	13C8-PFOA	1803653-01 SEA-1 0.11267	2.68e4	99.8	NO
5	5	13C9-PFNA	1803653-01 SEA-1 0.11267	1.91e4	103.0	NO
6	6	13C4-PFOS	1803653-01 SEA-1 0.11267	3.04e3	103.3	NO
7	7	13C6-PFDA	1803653-01 SEA-1 0.11267	2.19e4	103.6	NO
8	8	13C7-PFUdA	1803653-01 SEA-1 0.11267	2.57e4	113.0	NO

Name: 181127M1_68, Date: 28-Nov-2018, Time: 01:16:59, ID: 1803653-02 SEA-2 0.1142, Description: SEA-2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803653-02 SEA-2 0.1142	1.03e4	141.9	NO
2	2	13C5-PFHxA	1803653-02 SEA-2 0.1142	2.03e4	90.5	NO
3	3	13C3-PFHxS	1803653-02 SEA-2 0.1142	2.86e3	104.7	NO
4	4	13C8-PFOA	1803653-02 SEA-2 0.1142	2.42e4	90.1	NO
5	5	13C9-PFNA	1803653-02 SEA-2 0.1142	1.79e4	96.6	NO
6	6	13C4-PFOS	1803653-02 SEA-2 0.1142	2.83e3	96.3	NO
7	7	13C6-PFDA	1803653-02 SEA-2 0.1142	2.04e4	96.3	NO
8	8	13C7-PFUdA	1803653-02 SEA-2 0.1142	2.34e4	103.1	NO

Name: 181127M1_69, Date: 28-Nov-2018, Time: 01:27:32, ID: 1803653-03 DH-1A 0.11294, Description: DH-1A

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803653-03 DH-1A 0.11294	1.12e4	154.5	YES
2	2	13C5-PFHxA	1803653-03 DH-1A 0.11294	2.15e4	96.0	NO
3	3	13C3-PFHxS	1803653-03 DH-1A 0.11294	3.00e3	110.0	NO
4	4	13C8-PFOA	1803653-03 DH-1A 0.11294	2.65e4	98.6	NO
5	5	13C9-PFNA	1803653-03 DH-1A 0.11294	1.88e4	101.6	NO
6	6	13C4-PFOS	1803653-03 DH-1A 0.11294	2.94e3	100.1	NO
7	7	13C6-PFDA	1803653-03 DH-1A 0.11294	2.16e4	101.8	NO
8	8	13C7-PFUdA	1803653-03 DH-1A 0.11294	2.59e4	114.0	NO

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Name: 181127M1_70, Date: 28-Nov-2018, Time: 01:38:10, ID: 1803653-04 SW-2 0.11723, Description: SW-2

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803653-04 SW-2 0.11723	1.19e4	163.8	YES
2	2	13C5-PFHxA	1803653-04 SW-2 0.11723	2.30e4	102.8	NO
3	3	13C3-PFHxS	1803653-04 SW-2 0.11723	2.97e3	108.8	NO
4	4	13C8-PFOA	1803653-04 SW-2 0.11723	2.73e4	101.7	NO
5	5	13C9-PFNA	1803653-04 SW-2 0.11723	1.92e4	103.6	NO
6	6	13C4-PFOS	1803653-04 SW-2 0.11723	2.99e3	101.6	NO
7	7	13C6-PFDA	1803653-04 SW-2 0.11723	2.22e4	104.8	NO
8	8	13C7-PFUdA	1803653-04 SW-2 0.11723	2.59e4	113.8	NO

Name: 181127M1_71, Date: 28-Nov-2018, Time: 01:48:43, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_72, Date: 28-Nov-2018, Time: 01:59:21, ID: ST181127M1-6 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181127M1-6 PFC CS3 18K1906	8.91e3	122.7	NO
2	2	13C5-PFHxA	ST181127M1-6 PFC CS3 18K1906	2.98e4	133.0	NO
3	3	13C3-PFHxS	ST181127M1-6 PFC CS3 18K1906	3.60e3	131.8	NO
4	4	13C8-PFOA	ST181127M1-6 PFC CS3 18K1906	3.49e4	130.2	NO
5	5	13C9-PFNA	ST181127M1-6 PFC CS3 18K1906	2.41e4	130.3	NO
6	6	13C4-PFOS	ST181127M1-6 PFC CS3 18K1906	3.45e3	117.5	NO
7	7	13C6-PFDA	ST181127M1-6 PFC CS3 18K1906	2.73e4	128.8	NO
8	8	13C7-PFUdA	ST181127M1-6 PFC CS3 18K1906	3.20e4	140.6	NO

Name: 181127M1_73, Date: 28-Nov-2018, Time: 02:10:00, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

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Name: 181127M1_74, Date: 28-Nov-2018, Time: 02:20:31, ID: 1803653-05 Seep 0.11658, Description: Seep

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803653-05 Seep 0.11658	1.04e4	143.9	NO
2	2	13C5-PFHxA	1803653-05 Seep 0.11658	2.03e4	90.5	NO
3	3	13C3-PFHxS	1803653-05 Seep 0.11658	3.05e3	111.6	NO
4	4	13C8-PFOA	1803653-05 Seep 0.11658	2.37e4	88.4	NO
5	5	13C9-PFNA	1803653-05 Seep 0.11658	1.72e4	92.9	NO
6	6	13C4-PFOS	1803653-05 Seep 0.11658	3.14e3	107.0	NO
7	7	13C6-PFDA	1803653-05 Seep 0.11658	2.00e4	94.3	NO
8	8	13C7-PFUdA	1803653-05 Seep 0.11658	2.45e4	107.7	NO

Name: 181127M1_75, Date: 28-Nov-2018, Time: 02:31:10, ID: B8K0146-BS1 OPR 0.25, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0146-BS1 OPR 0.25	1.08e4	148.6	NO
2	2	13C5-PFHxA	B8K0146-BS1 OPR 0.25	2.06e4	91.9	NO
3	3	13C3-PFHxS	B8K0146-BS1 OPR 0.25	2.65e3	96.9	NO
4	4	13C8-PFOA	B8K0146-BS1 OPR 0.25	2.39e4	89.0	NO
5	5	13C9-PFNA	B8K0146-BS1 OPR 0.25	1.64e4	88.5	NO
6	6	13C4-PFOS	B8K0146-BS1 OPR 0.25	2.79e3	95.0	NO
7	7	13C6-PFDA	B8K0146-BS1 OPR 0.25	1.85e4	87.4	NO
8	8	13C7-PFUdA	B8K0146-BS1 OPR 0.25	2.07e4	90.9	NO

Name: 181127M1_76, Date: 28-Nov-2018, Time: 02:41:43, ID: B8K0146-BLK1 Method Blank 0.25, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0146-BLK1 Method Blank 0.25	1.19e4	163.8	YES
2	2	13C5-PFHxA	B8K0146-BLK1 Method Blank 0.25	2.27e4	101.5	NO
3	3	13C3-PFHxS	B8K0146-BLK1 Method Blank 0.25	2.68e3	98.4	NO
4	4	13C8-PFOA	B8K0146-BLK1 Method Blank 0.25	2.56e4	95.5	NO
5	5	13C9-PFNA	B8K0146-BLK1 Method Blank 0.25	1.74e4	94.0	NO
6	6	13C4-PFOS	B8K0146-BLK1 Method Blank 0.25	2.63e3	89.6	NO
7	7	13C6-PFDA	B8K0146-BLK1 Method Blank 0.25	1.89e4	89.4	NO
8	8	13C7-PFUdA	B8K0146-BLK1 Method Blank 0.25	1.91e4	84.1	NO

Name: 181127M1_77, Date: 28-Nov-2018, Time: 02:52:22, ID: 1803692-01 SWIN1811071400GGA 0.22883, Description: SWIN1811071400GGA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803692-01 SWIN1811071400GGA 0.2...	1.10e4	151.5	YES
2	2	13C5-PFHxA	1803692-01 SWIN1811071400GGA 0.2...	2.15e4	96.1	NO
3	3	13C3-PFHxS	1803692-01 SWIN1811071400GGA 0.2...	3.04e3	111.5	NO
4	4	13C8-PFOA	1803692-01 SWIN1811071400GGA 0.2...	2.52e4	94.0	NO
5	5	13C9-PFNA	1803692-01 SWIN1811071400GGA 0.2...	1.76e4	95.0	NO
6	6	13C4-PFOS	1803692-01 SWIN1811071400GGA 0.2...	2.99e3	101.7	NO
7	7	13C6-PFDA	1803692-01 SWIN1811071400GGA 0.2...	2.00e4	94.6	NO
8	8	13C7-PFUdA	1803692-01 SWIN1811071400GGA 0.2...	2.36e4	103.7	NO

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Name: 181127M1_78, Date: 28-Nov-2018, Time: 03:02:54, ID: 1803692-02 SWEF1811071430GGA 0.24623, Description: SWEF1811071430GGA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803692-02 SWEF1811071430GGA 0....	1.05e4	145.0	NO
2	2	13C5-PFHxA	1803692-02 SWEF1811071430GGA 0....	2.03e4	90.5	NO
3	3	13C3-PFHxS	1803692-02 SWEF1811071430GGA 0....	2.62e3	96.1	NO
4	4	13C8-PFOA	1803692-02 SWEF1811071430GGA 0....	2.40e4	89.7	NO
5	5	13C9-PFNA	1803692-02 SWEF1811071430GGA 0....	1.61e4	87.1	NO
6	6	13C4-PFOS	1803692-02 SWEF1811071430GGA 0....	2.59e3	88.3	NO
7	7	13C6-PFDA	1803692-02 SWEF1811071430GGA 0....	1.80e4	85.0	NO
8	8	13C7-PFUdA	1803692-02 SWEF1811071430GGA 0....	1.85e4	81.4	NO

Name: 181127M1_79, Date: 28-Nov-2018, Time: 03:13:33, ID: B8K0140-BS1 OPR 0.25, Description: OPR

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0140-BS1 OPR 0.25	9.00e3	124.1	NO
2	2	13C5-PFHxA	B8K0140-BS1 OPR 0.25	1.73e4	77.4	NO
3	3	13C3-PFHxS	B8K0140-BS1 OPR 0.25	2.56e3	93.7	NO
4	4	13C8-PFOA	B8K0140-BS1 OPR 0.25	1.97e4	73.4	NO
5	5	13C9-PFNA	B8K0140-BS1 OPR 0.25	1.37e4	73.8	NO
6	6	13C4-PFOS	B8K0140-BS1 OPR 0.25	2.59e3	88.2	NO
7	7	13C6-PFDA	B8K0140-BS1 OPR 0.25	1.65e4	78.1	NO
8	8	13C7-PFUdA	B8K0140-BS1 OPR 0.25	1.94e4	85.2	NO

Name: 181127M1_80, Date: 28-Nov-2018, Time: 03:24:11, ID: B8K0140-BLK1 Method Blank 0.25, Description: Method Blank

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	B8K0140-BLK1 Method Blank 0.25	8.62e3	118.7	NO
2	2	13C5-PFHxA	B8K0140-BLK1 Method Blank 0.25	1.61e4	72.1	NO
3	3	13C3-PFHxS	B8K0140-BLK1 Method Blank 0.25	2.40e3	88.0	NO
4	4	13C8-PFOA	B8K0140-BLK1 Method Blank 0.25	1.87e4	69.7	NO
5	5	13C9-PFNA	B8K0140-BLK1 Method Blank 0.25	1.32e4	71.3	NO
6	6	13C4-PFOS	B8K0140-BLK1 Method Blank 0.25	2.45e3	83.6	NO
7	7	13C6-PFDA	B8K0140-BLK1 Method Blank 0.25	1.56e4	73.7	NO
8	8	13C7-PFUdA	B8K0140-BLK1 Method Blank 0.25	1.86e4	81.8	NO

Name: 181127M1_81, Date: 28-Nov-2018, Time: 03:34:45, ID: 1803675-01 GW0110161811150925KER 0.2531, Description: GW0110161811150925KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-01 GW0110161811150925KE...	9.70e3	133.7	NO
2	2	13C5-PFHxA	1803675-01 GW0110161811150925KE...	1.90e4	84.7	NO
3	3	13C3-PFHxS	1803675-01 GW0110161811150925KE...	2.52e3	92.3	NO
4	4	13C8-PFOA	1803675-01 GW0110161811150925KE...	2.20e4	81.9	NO
5	5	13C9-PFNA	1803675-01 GW0110161811150925KE...	1.59e4	85.8	NO
6	6	13C4-PFOS	1803675-01 GW0110161811150925KE...	2.53e3	86.1	NO
7	7	13C6-PFDA	1803675-01 GW0110161811150925KE...	1.84e4	86.7	NO
8	8	13C7-PFUdA	1803675-01 GW0110161811150925KE...	2.06e4	90.6	NO

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Name: 181127M1_82, Date: 28-Nov-2018, Time: 03:45:23, ID: 1803675-02 GW0480531811151025KER 0.25333, Description: GW0480531811151025KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-02 GW0480531811151025KE...	8.32e3	114.7	NO
2	2	13C5-PFHxA	1803675-02 GW0480531811151025KE...	1.62e4	72.1	NO
3	3	13C3-PFHxS	1803675-02 GW0480531811151025KE...	2.37e3	86.8	NO
4	4	13C8-PFOA	1803675-02 GW0480531811151025KE...	1.99e4	74.4	NO
5	5	13C9-PFNA	1803675-02 GW0480531811151025KE...	1.42e4	76.8	NO
6	6	13C4-PFOS	1803675-02 GW0480531811151025KE...	2.30e3	78.2	NO
7	7	13C6-PFDA	1803675-02 GW0480531811151025KE...	1.62e4	76.4	NO
8	8	13C7-PFUdA	1803675-02 GW0480531811151025KE...	1.90e4	83.7	NO

Name: 181127M1_83, Date: 28-Nov-2018, Time: 03:56:01, ID: 1803675-03 EB11811151030MK 0.2493, Description: EB11811151030MK

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-03 EB11811151030MK 0.2493	9.28e3	127.9	NO
2	2	13C5-PFHxA	1803675-03 EB11811151030MK 0.2493	1.73e4	77.4	NO
3	3	13C3-PFHxS	1803675-03 EB11811151030MK 0.2493	2.64e3	96.6	NO
4	4	13C8-PFOA	1803675-03 EB11811151030MK 0.2493	2.06e4	76.6	NO
5	5	13C9-PFNA	1803675-03 EB11811151030MK 0.2493	1.44e4	77.9	NO
6	6	13C4-PFOS	1803675-03 EB11811151030MK 0.2493	2.77e3	94.2	NO
7	7	13C6-PFDA	1803675-03 EB11811151030MK 0.2493	1.80e4	85.2	NO
8	8	13C7-PFUdA	1803675-03 EB11811151030MK 0.2493	2.10e4	92.6	NO

Name: 181127M1_84, Date: 28-Nov-2018, Time: 04:06:34, ID: 1803675-04 GW0750801811151140KER 0.25044, Description: GW0750801811151140KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-04 GW0750801811151140KE...	8.86e3	122.1	NO
2	2	13C5-PFHxA	1803675-04 GW0750801811151140KE...	1.75e4	78.0	NO
3	3	13C3-PFHxS	1803675-04 GW0750801811151140KE...	2.43e3	88.9	NO
4	4	13C8-PFOA	1803675-04 GW0750801811151140KE...	2.04e4	75.9	NO
5	5	13C9-PFNA	1803675-04 GW0750801811151140KE...	1.46e4	78.6	NO
6	6	13C4-PFOS	1803675-04 GW0750801811151140KE...	2.62e3	89.3	NO
7	7	13C6-PFDA	1803675-04 GW0750801811151140KE...	1.72e4	81.4	NO
8	8	13C7-PFUdA	1803675-04 GW0750801811151140KE...	2.02e4	89.1	NO

Name: 181127M1_85, Date: 28-Nov-2018, Time: 04:17:12, ID: 1803675-05 GW0800851811151255KER 0.25087, Description: GW0800851811151255KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-05 GW0800851811151255KE...	9.60e3	132.3	NO
2	2	13C5-PFHxA	1803675-05 GW0800851811151255KE...	1.91e4	85.1	NO
3	3	13C3-PFHxS	1803675-05 GW0800851811151255KE...	2.63e3	96.5	NO
4	4	13C8-PFOA	1803675-05 GW0800851811151255KE...	2.13e4	79.6	NO
5	5	13C9-PFNA	1803675-05 GW0800851811151255KE...	1.57e4	84.9	NO
6	6	13C4-PFOS	1803675-05 GW0800851811151255KE...	2.63e3	89.4	NO
7	7	13C6-PFDA	1803675-05 GW0800851811151255KE...	1.85e4	87.4	NO
8	8	13C7-PFUdA	1803675-05 GW0800851811151255KE...	2.13e4	93.6	NO

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Name: 181127M1_86, Date: 28-Nov-2018, Time: 04:27:51, ID: 1803675-06 GW0850901811151405KER 0.24759, Description: GW0850901811151405KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-06 GW0850901811151405KE...	1.03e4	141.3	NO
2	2	13C5-PFHxA	1803675-06 GW0850901811151405KE...	1.95e4	86.9	NO
3	3	13C3-PFHxS	1803675-06 GW0850901811151405KE...	2.80e3	102.5	NO
4	4	13C8-PFOA	1803675-06 GW0850901811151405KE...	2.36e4	87.8	NO
5	5	13C9-PFNA	1803675-06 GW0850901811151405KE...	1.61e4	86.9	NO
6	6	13C4-PFOS	1803675-06 GW0850901811151405KE...	2.72e3	92.6	NO
7	7	13C6-PFDA	1803675-06 GW0850901811151405KE...	2.00e4	94.4	NO
8	8	13C7-PFUdA	1803675-06 GW0850901811151405KE...	2.21e4	97.2	NO

Name: 181127M1_87, Date: 28-Nov-2018, Time: 04:38:24, ID: 1803675-07 GW0920971811151535KER 0.24638, Description: GW0920971811151535KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-07 GW0920971811151535KE...	7.79e3	107.4	NO
2	2	13C5-PFHxA	1803675-07 GW0920971811151535KE...	1.57e4	69.9	NO
3	3	13C3-PFHxS	1803675-07 GW0920971811151535KE...	2.30e3	84.1	NO
4	4	13C8-PFOA	1803675-07 GW0920971811151535KE...	1.91e4	71.3	NO
5	5	13C9-PFNA	1803675-07 GW0920971811151535KE...	1.31e4	70.9	NO
6	6	13C4-PFOS	1803675-07 GW0920971811151535KE...	2.36e3	80.4	NO
7	7	13C6-PFDA	1803675-07 GW0920971811151535KE...	1.63e4	77.1	NO
8	8	13C7-PFUdA	1803675-07 GW0920971811151535KE...	1.81e4	79.8	NO

Name: 181127M1_88, Date: 28-Nov-2018, Time: 04:49:03, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA	7.14e0	0.0	YES
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_89, Date: 28-Nov-2018, Time: 04:59:41, ID: ST181127M1-7 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181127M1-7 PFC CS3 18K1906	8.96e3	123.5	NO
2	2	13C5-PFHxA	ST181127M1-7 PFC CS3 18K1906	2.87e4	128.3	NO
3	3	13C3-PFHxS	ST181127M1-7 PFC CS3 18K1906	3.46e3	126.7	NO
4	4	13C8-PFOA	ST181127M1-7 PFC CS3 18K1906	3.24e4	120.7	NO
5	5	13C9-PFNA	ST181127M1-7 PFC CS3 18K1906	2.37e4	127.6	NO
6	6	13C4-PFOS	ST181127M1-7 PFC CS3 18K1906	3.67e3	124.8	NO
7	7	13C6-PFDA	ST181127M1-7 PFC CS3 18K1906	2.66e4	125.5	NO
8	8	13C7-PFUdA	ST181127M1-7 PFC CS3 18K1906	3.16e4	138.8	NO

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Name: 181127M1_90, Date: 28-Nov-2018, Time: 05:10:15, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_91, Date: 28-Nov-2018, Time: 05:20:53, ID: 1803675-08 GW0971021811151650KER 0.24641, Description: GW0971021811151650KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-08 GW0971021811151650KE...	8.99e3	123.9	NO
2	2	13C5-PFHxA	1803675-08 GW0971021811151650KE...	1.74e4	77.9	NO
3	3	13C3-PFHxS	1803675-08 GW0971021811151650KE...	2.52e3	92.3	NO
4	4	13C8-PFOA	1803675-08 GW0971021811151650KE...	2.13e4	79.3	NO
5	5	13C9-PFNA	1803675-08 GW0971021811151650KE...	1.51e4	81.3	NO
6	6	13C4-PFOS	1803675-08 GW0971021811151650KE...	2.75e3	93.5	NO
7	7	13C6-PFDA	1803675-08 GW0971021811151650KE...	1.78e4	84.3	NO
8	8	13C7-PFUdA	1803675-08 GW0971021811151650KE...	2.03e4	89.4	NO

Name: 181127M1_92, Date: 28-Nov-2018, Time: 05:31:26, ID: 1803675-09 GW0230281811121610MK 0.25313, Description: GW0230281811121610MK

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-09 GW0230281811121610MK...	9.73e3	134.1	NO
2	2	13C5-PFHxA	1803675-09 GW0230281811121610MK...	1.91e4	85.3	NO
3	3	13C3-PFHxS	1803675-09 GW0230281811121610MK...	2.53e3	92.7	NO
4	4	13C8-PFOA	1803675-09 GW0230281811121610MK...	2.26e4	84.3	NO
5	5	13C9-PFNA	1803675-09 GW0230281811121610MK...	1.60e4	86.2	NO
6	6	13C4-PFOS	1803675-09 GW0230281811121610MK...	2.55e3	86.9	NO
7	7	13C6-PFDA	1803675-09 GW0230281811121610MK...	1.90e4	89.5	NO
8	8	13C7-PFUdA	1803675-09 GW0230281811121610MK...	2.11e4	92.7	NO

Name: 181127M1_93, Date: 28-Nov-2018, Time: 05:42:04, ID: 1803675-10 GW0280331811131655KER 0.24856, Description: GW0280331811131655KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-10 GW0280331811131655KE...	9.36e3	129.0	NO
2	2	13C5-PFHxA	1803675-10 GW0280331811131655KE...	1.86e4	83.1	NO
3	3	13C3-PFHxS	1803675-10 GW0280331811131655KE...	2.66e3	97.6	NO
4	4	13C8-PFOA	1803675-10 GW0280331811131655KE...	2.26e4	84.4	NO
5	5	13C9-PFNA	1803675-10 GW0280331811131655KE...	1.54e4	82.9	NO
6	6	13C4-PFOS	1803675-10 GW0280331811131655KE...	2.78e3	94.5	NO
7	7	13C6-PFDA	1803675-10 GW0280331811131655KE...	1.84e4	86.7	NO
8	8	13C7-PFUdA	1803675-10 GW0280331811131655KE...	2.23e4	98.0	NO

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Name: 181127M1_94, Date: 28-Nov-2018, Time: 05:52:42, ID: 1803675-11 GW0820871811141045KER 0.24842, Description: GW0820871811141045KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-11 GW0820871811141045KE...	8.58e3	118.3	NO
2	2	13C5-PFHxA	1803675-11 GW0820871811141045KE...	1.68e4	75.2	NO
3	3	13C3-PFHxS	1803675-11 GW0820871811141045KE...	2.47e3	90.5	NO
4	4	13C8-PFOA	1803675-11 GW0820871811141045KE...	2.06e4	77.0	NO
5	5	13C9-PFNA	1803675-11 GW0820871811141045KE...	1.52e4	82.3	NO
6	6	13C4-PFOS	1803675-11 GW0820871811141045KE...	2.50e3	84.9	NO
7	7	13C6-PFDA	1803675-11 GW0820871811141045KE...	1.72e4	81.0	NO
8	8	13C7-PFUdA	1803675-11 GW0820871811141045KE...	1.99e4	87.7	NO

Name: 181127M1_95, Date: 28-Nov-2018, Time: 06:03:15, ID: 1803675-12 FB1811141050KER 0.24655, Description: FB1811141050KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-12 FB1811141050KER 0.24655	9.89e3	136.2	NO
2	2	13C5-PFHxA	1803675-12 FB1811141050KER 0.24655	1.88e4	83.8	NO
3	3	13C3-PFHxS	1803675-12 FB1811141050KER 0.24655	2.67e3	97.7	NO
4	4	13C8-PFOA	1803675-12 FB1811141050KER 0.24655	2.22e4	82.7	NO
5	5	13C9-PFNA	1803675-12 FB1811141050KER 0.24655	1.57e4	84.9	NO
6	6	13C4-PFOS	1803675-12 FB1811141050KER 0.24655	2.76e3	94.0	NO
7	7	13C6-PFDA	1803675-12 FB1811141050KER 0.24655	1.88e4	88.9	NO
8	8	13C7-PFUdA	1803675-12 FB1811141050KER 0.24655	2.22e4	97.7	NO

Name: 181127M1_96, Date: 28-Nov-2018, Time: 06:13:53, ID: 1803675-13 GW0971021811141145KER 0.2461, Description: GW0971021811141145KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-13 GW0971021811141145KE...	8.07e3	111.2	NO
2	2	13C5-PFHxA	1803675-13 GW0971021811141145KE...	1.56e4	69.8	NO
3	3	13C3-PFHxS	1803675-13 GW0971021811141145KE...	2.36e3	86.4	NO
4	4	13C8-PFOA	1803675-13 GW0971021811141145KE...	1.93e4	71.9	NO
5	5	13C9-PFNA	1803675-13 GW0971021811141145KE...	1.37e4	74.2	NO
6	6	13C4-PFOS	1803675-13 GW0971021811141145KE...	2.40e3	81.8	NO
7	7	13C6-PFDA	1803675-13 GW0971021811141145KE...	1.65e4	77.7	NO
8	8	13C7-PFUdA	1803675-13 GW0971021811141145KE...	1.84e4	81.0	NO

Name: 181127M1_97, Date: 28-Nov-2018, Time: 06:24:32, ID: 1803675-14 GW0280331811141310KER 0.24685, Description: GW0280331811141310KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-14 GW0280331811141310KE...	8.58e3	118.2	NO
2	2	13C5-PFHxA	1803675-14 GW0280331811141310KE...	1.69e4	75.4	NO
3	3	13C3-PFHxS	1803675-14 GW0280331811141310KE...	2.24e3	82.2	NO
4	4	13C8-PFOA	1803675-14 GW0280331811141310KE...	1.97e4	73.6	NO
5	5	13C9-PFNA	1803675-14 GW0280331811141310KE...	1.42e4	76.7	NO
6	6	13C4-PFOS	1803675-14 GW0280331811141310KE...	2.37e3	80.7	NO
7	7	13C6-PFDA	1803675-14 GW0280331811141310KE...	1.66e4	78.5	NO
8	8	13C7-PFUdA	1803675-14 GW0280331811141310KE...	1.91e4	84.1	NO

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-IIS AREA.qld

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Name: 181127M1_98, Date: 28-Nov-2018, Time: 06:35:05, ID: 1803675-15 GW0890941811141415KER 0.24549, Description: GW0890941811141415KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-15 GW0890941811141415KE...	8.55e3	117.8	NO
2	2	13C5-PFHxA	1803675-15 GW0890941811141415KE...	1.69e4	75.5	NO
3	3	13C3-PFHxS	1803675-15 GW0890941811141415KE...	2.43e3	88.9	NO
4	4	13C8-PFOA	1803675-15 GW0890941811141415KE...	1.99e4	74.3	NO
5	5	13C9-PFNA	1803675-15 GW0890941811141415KE...	1.29e4	69.8	NO
6	6	13C4-PFOS	1803675-15 GW0890941811141415KE...	2.33e3	79.3	NO
7	7	13C6-PFDA	1803675-15 GW0890941811141415KE...	1.52e4	71.8	NO
8	8	13C7-PFUdA	1803675-15 GW0890941811141415KE...	1.73e4	76.2	NO

Name: 181127M1_99, Date: 28-Nov-2018, Time: 06:45:43, ID: 1803675-16 GW0991041811141615KER 0.24811, Description: GW0991041811141615KER

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-16 GW0991041811141615KE...	8.86e3	122.1	NO
2	2	13C5-PFHxA	1803675-16 GW0991041811141615KE...	1.73e4	77.1	NO
3	3	13C3-PFHxS	1803675-16 GW0991041811141615KE...	2.33e3	85.2	NO
4	4	13C8-PFOA	1803675-16 GW0991041811141615KE...	2.14e4	79.9	NO
5	5	13C9-PFNA	1803675-16 GW0991041811141615KE...	1.42e4	76.7	NO
6	6	13C4-PFOS	1803675-16 GW0991041811141615KE...	2.25e3	76.7	NO
7	7	13C6-PFDA	1803675-16 GW0991041811141615KE...	1.65e4	77.9	NO
8	8	13C7-PFUdA	1803675-16 GW0991041811141615KE...	1.93e4	85.1	NO

Name: 181127M1_100, Date: 28-Nov-2018, Time: 06:56:16, ID: 1803675-17 GW0991041811141620KER-FD 0.24325, Description: GW0991041811141620KER-FD

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	1803675-17 GW0991041811141620KE...	9.76e3	134.5	NO
2	2	13C5-PFHxA	1803675-17 GW0991041811141620KE...	1.92e4	85.9	NO
3	3	13C3-PFHxS	1803675-17 GW0991041811141620KE...	2.57e3	94.3	NO
4	4	13C8-PFOA	1803675-17 GW0991041811141620KE...	2.31e4	86.1	NO
5	5	13C9-PFNA	1803675-17 GW0991041811141620KE...	1.61e4	87.1	NO
6	6	13C4-PFOS	1803675-17 GW0991041811141620KE...	2.49e3	84.9	NO
7	7	13C6-PFDA	1803675-17 GW0991041811141620KE...	1.85e4	87.4	NO
8	8	13C7-PFUdA	1803675-17 GW0991041811141620KE...	2.06e4	90.8	NO

Name: 181127M1_101, Date: 28-Nov-2018, Time: 07:06:55, ID: QC MEOH LOT JB072509, Description: QC MEOH LOT JB072509

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	QC MEOH LOT JB072509	5.10e3	70.3	NO
2	2	13C5-PFHxA	QC MEOH LOT JB072509	2.34e4	104.5	NO
3	3	13C3-PFHxS	QC MEOH LOT JB072509	2.87e3	105.3	NO
4	4	13C8-PFOA	QC MEOH LOT JB072509	2.74e4	102.2	NO
5	5	13C9-PFNA	QC MEOH LOT JB072509	1.95e4	105.4	NO
6	6	13C4-PFOS	QC MEOH LOT JB072509	3.04e3	103.4	NO
7	7	13C6-PFDA	QC MEOH LOT JB072509	2.26e4	106.8	NO
8	8	13C7-PFUdA	QC MEOH LOT JB072509	2.46e4	108.4	NO

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-IIS AREA.qld

Last Altered: Wednesday, November 28, 2018 08:10:24 Pacific Standard Time
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Name: 181127M1_102, Date: 28-Nov-2018, Time: 07:17:28, ID: IPA, Description: IPA

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1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Name: 181127M1_103, Date: 28-Nov-2018, Time: 07:28:06, ID: ST181127M1-8 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	ST181127M1-8 PFC CS3 18K1906	8.73e3	120.2	NO
2	2	13C5-PFHxA	ST181127M1-8 PFC CS3 18K1906	2.97e4	132.4	NO
3	3	13C3-PFHxS	ST181127M1-8 PFC CS3 18K1906	3.65e3	133.8	NO
4	4	13C8-PFOA	ST181127M1-8 PFC CS3 18K1906	3.39e4	126.2	NO
5	5	13C9-PFNA	ST181127M1-8 PFC CS3 18K1906	2.32e4	125.2	NO
6	6	13C4-PFOS	ST181127M1-8 PFC CS3 18K1906	3.61e3	122.8	NO
7	7	13C6-PFDA	ST181127M1-8 PFC CS3 18K1906	2.84e4	134.0	NO
8	8	13C7-PFUdA	ST181127M1-8 PFC CS3 18K1906	2.99e4	131.6	NO

Name: 181127M1_104, Date: 28-Nov-2018, Time: 07:38:39, ID: IPA, Description: IPA

	#	Name	ID	Area	%Rec	Area Out
1	1	13C4-PFBA	IPA			NO
2	2	13C5-PFHxA	IPA			NO
3	3	13C3-PFHxS	IPA			NO
4	4	13C8-PFOA	IPA			NO
5	5	13C9-PFNA	IPA			NO
6	6	13C4-PFOS	IPA			NO
7	7	13C6-PFDA	IPA			NO
8	8	13C7-PFUdA	IPA			NO

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-4.qld

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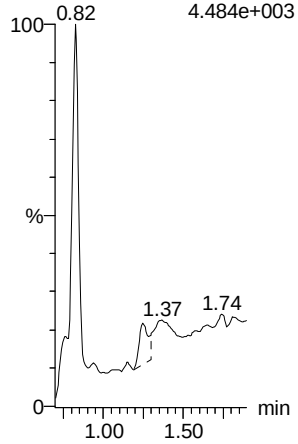
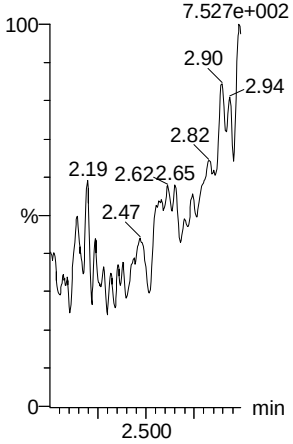
Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112718.mdb 28 Nov 2018 07:06:35
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181127M1_4, Date: 27-Nov-2018, Time: 12:43:32, ID: IPA, Description: IPA

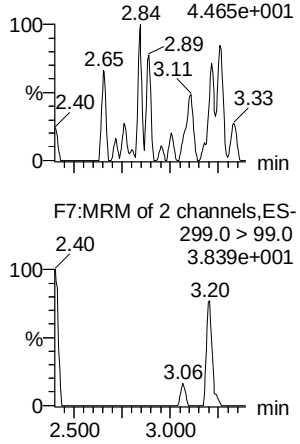
PFBA



PFPeA



PFBS



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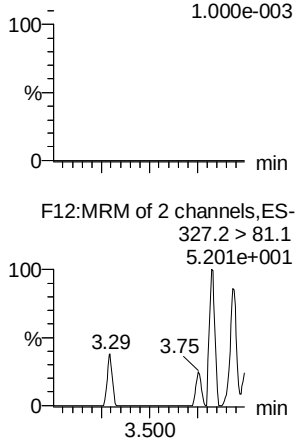
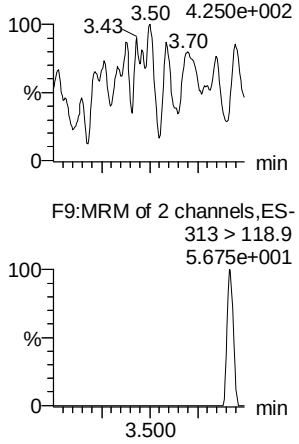
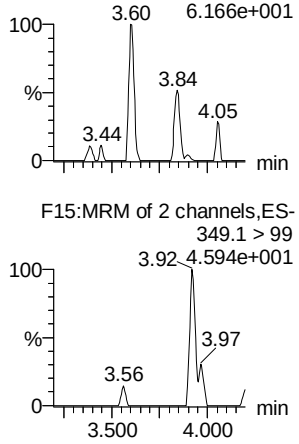


PFHxA



PFPeS



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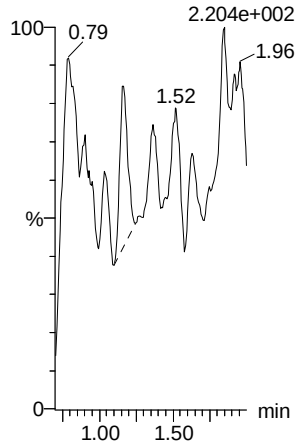
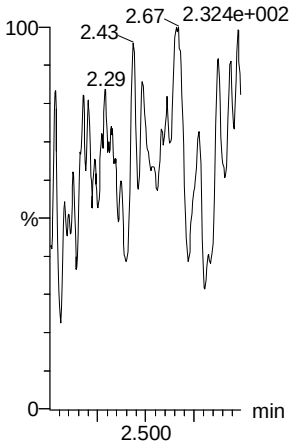


13C3-PFPeA



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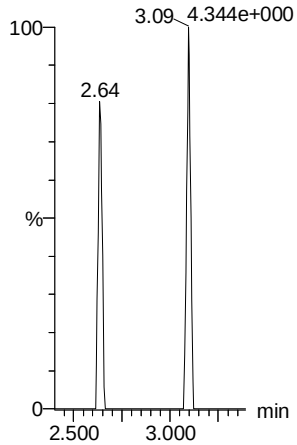
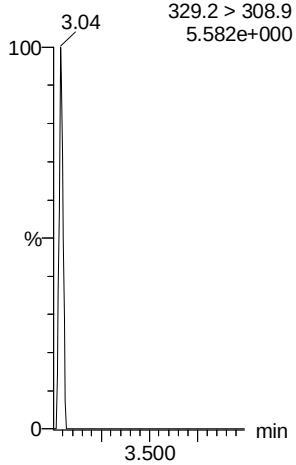


13C2-4:2 FTS



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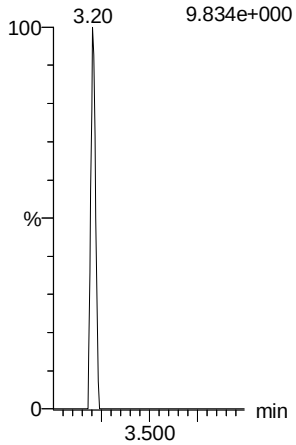

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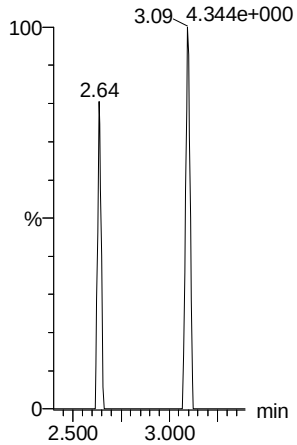

MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-4.qld

Last Altered: Wednesday, November 28, 2018 08:04:22 Pacific Standard Time
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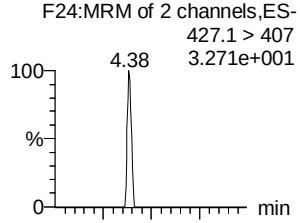
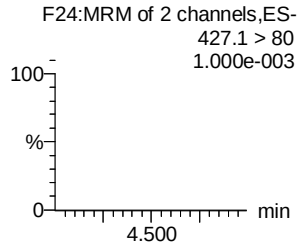
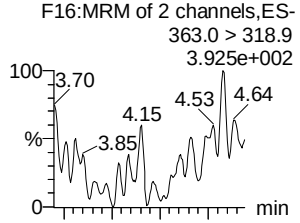
Name: 181127M1_4, Date: 27-Nov-2018, Time: 12:43:32, ID: IPA, Description: IPA

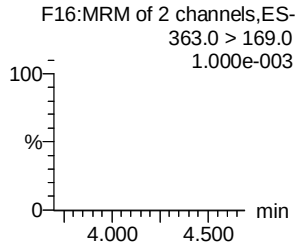
6:2 FTS



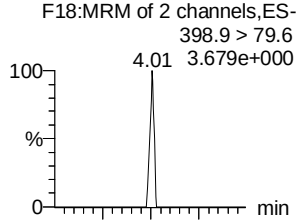


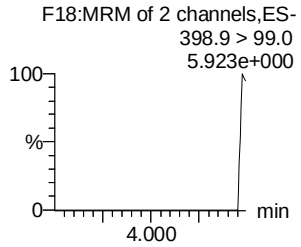
PFHpA



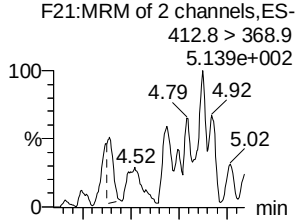


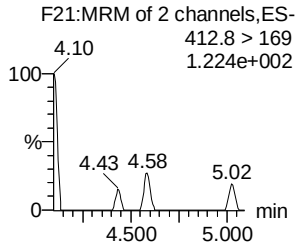
L-PFHxS





L-PFOA





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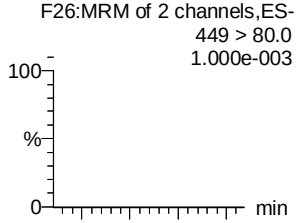
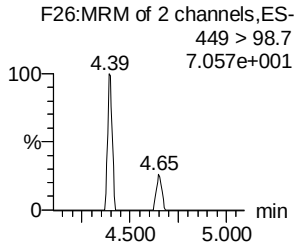
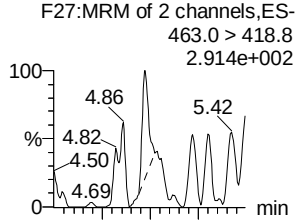
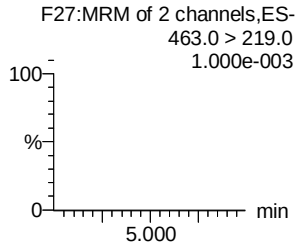


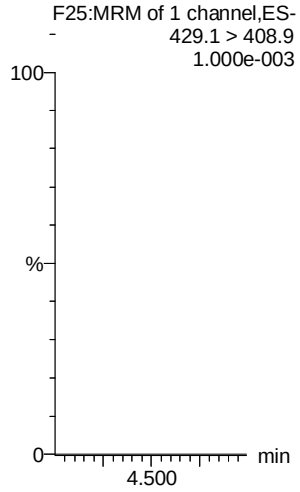


PFNA





13C2-6:2 FTS



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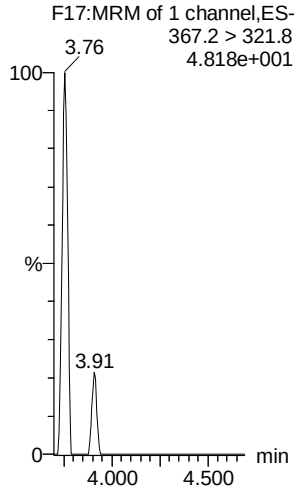
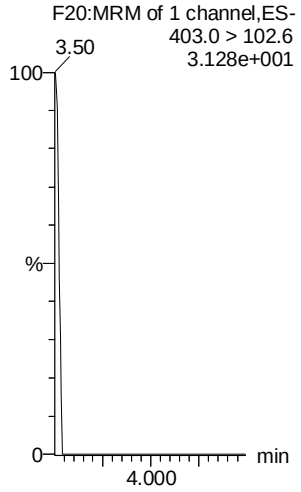
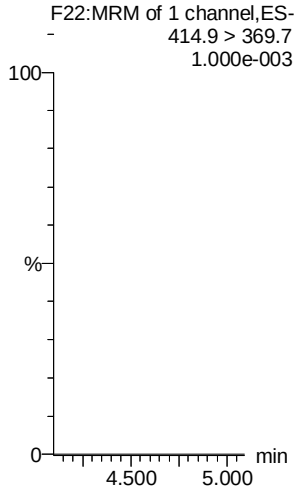


18O2-PFHxS



13C2-PFOA



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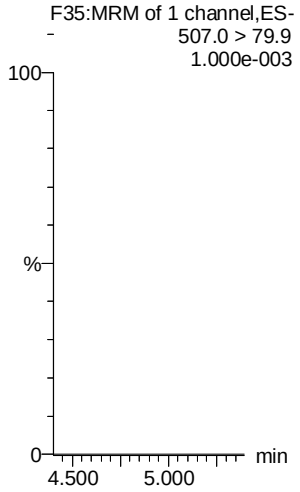
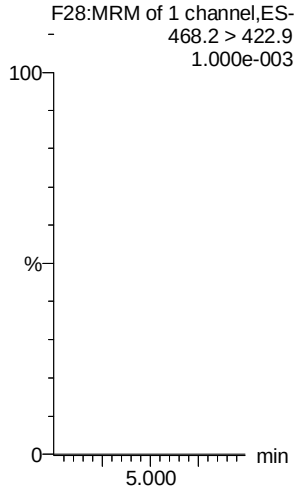


13C5-PFNA



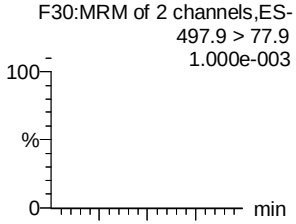
MJT 11/28/2018

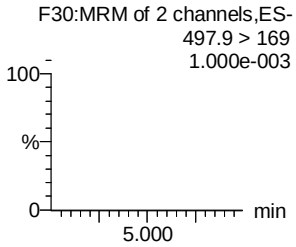
Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-4.qld

Last Altered: Wednesday, November 28, 2018 08:04:22 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:04:51 Pacific Standard Time

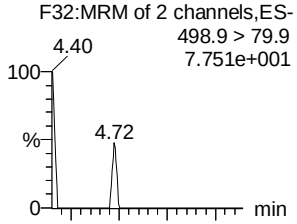
Name: 181127M1_4, Date: 27-Nov-2018, Time: 12:43:32, ID: IPA, Description: IPA

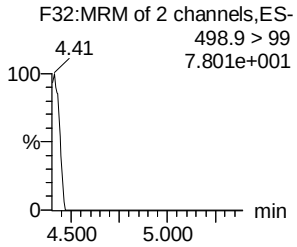
PFOSA





L-PFOS





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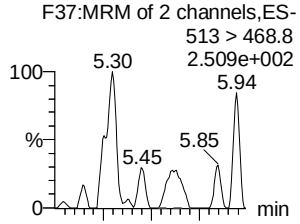
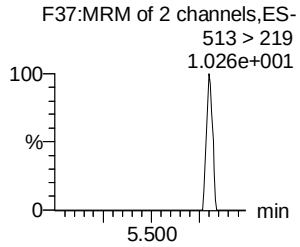
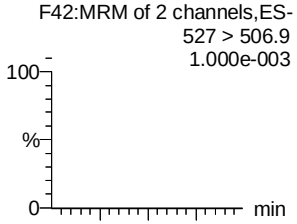
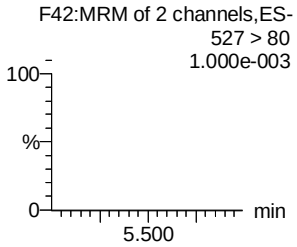




8:2 FTS





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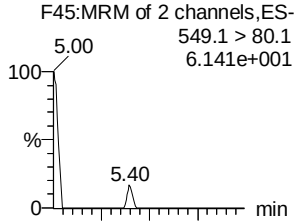

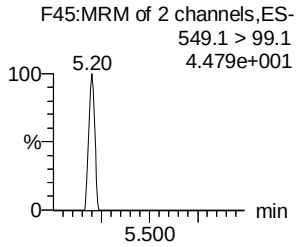

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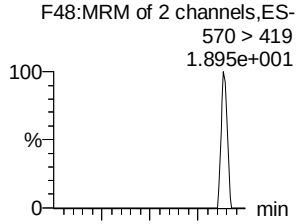
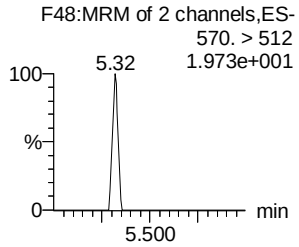
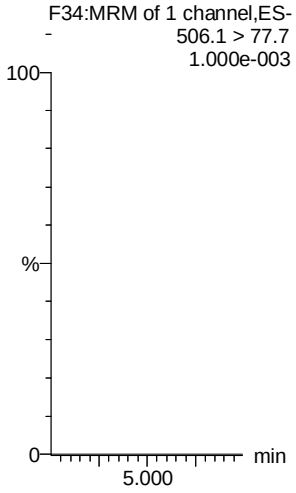
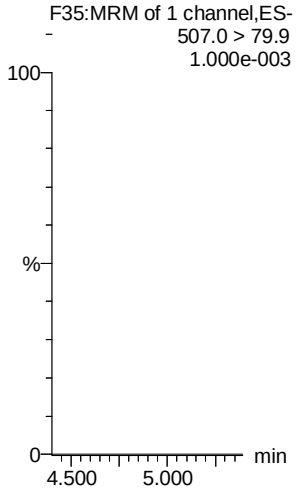




13C8-PFOSA



13C8-PFOS



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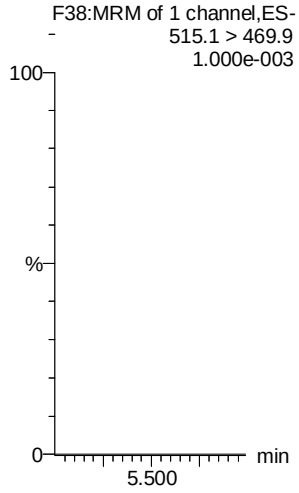

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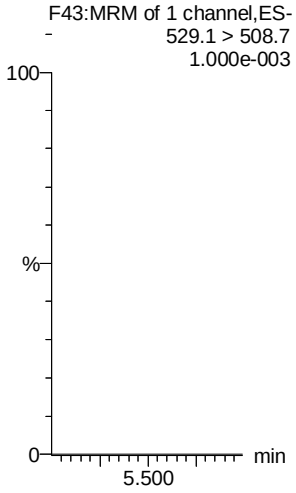

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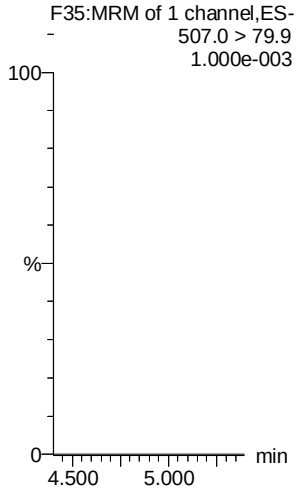
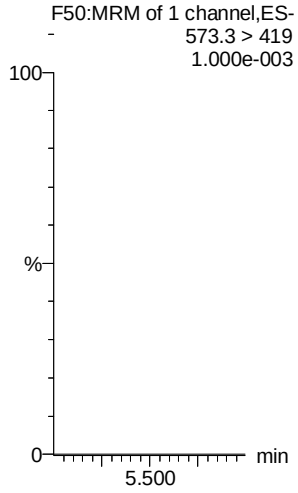


d3-N-MeFOSAA



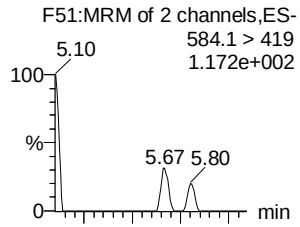
MJT 11/28/2018

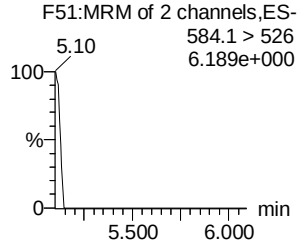
Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-4.qld

Last Altered: Wednesday, November 28, 2018 08:04:22 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:04:51 Pacific Standard Time

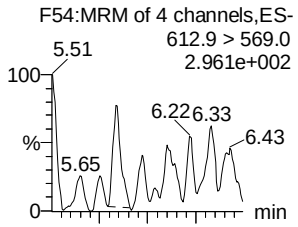
Name: 181127M1_4, Date: 27-Nov-2018, Time: 12:43:32, ID: IPA, Description: IPA

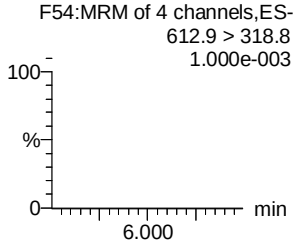
L-EtFOSAA





PFDoA





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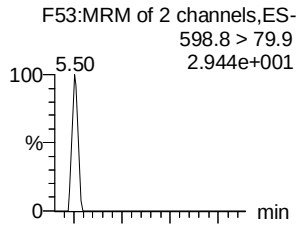

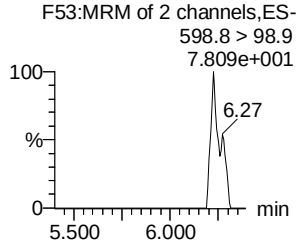

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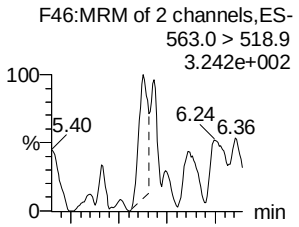

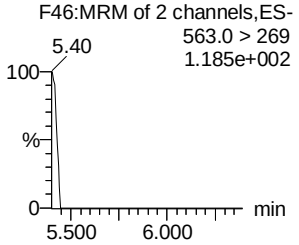

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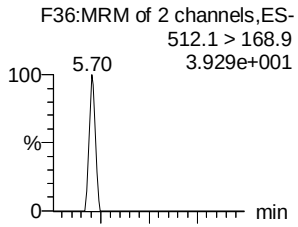

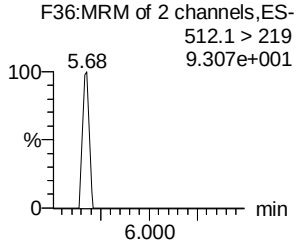

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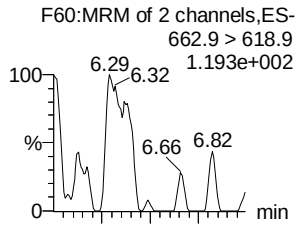
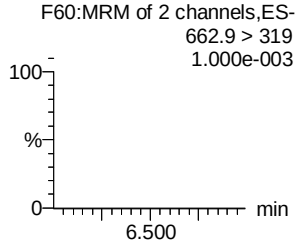
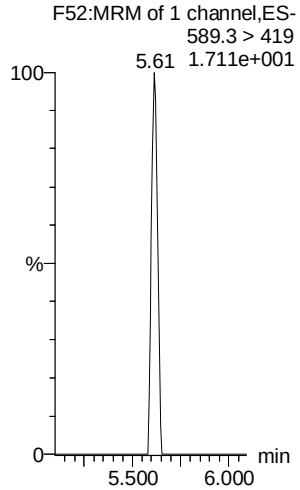




d5-N-EtFOSAA



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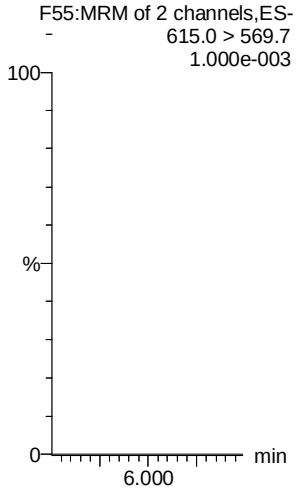

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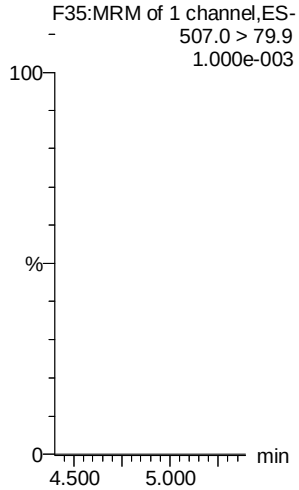
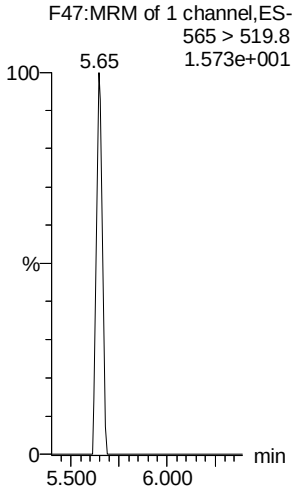


13C2-PFUdA



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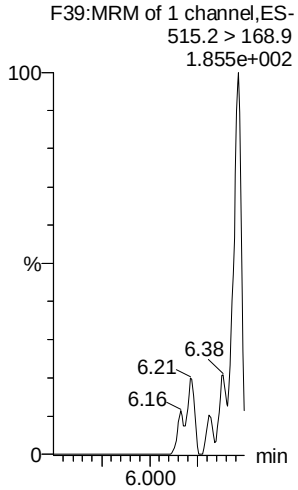

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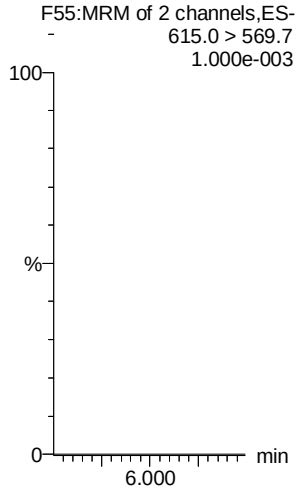

MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-4.qld

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Printed: Wednesday, November 28, 2018 08:04:51 Pacific Standard Time

Name: 181127M1_4, Date: 27-Nov-2018, Time: 12:43:32, ID: IPA, Description: IPA

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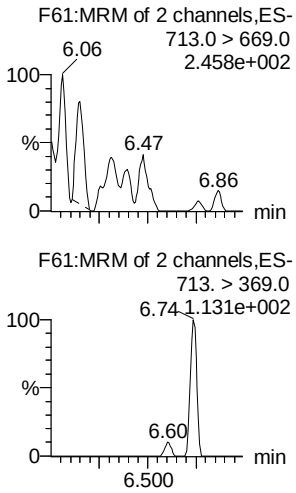
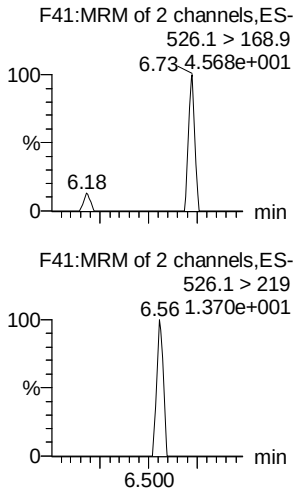


N-EtFOSA



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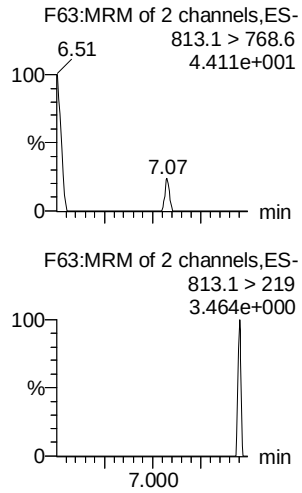

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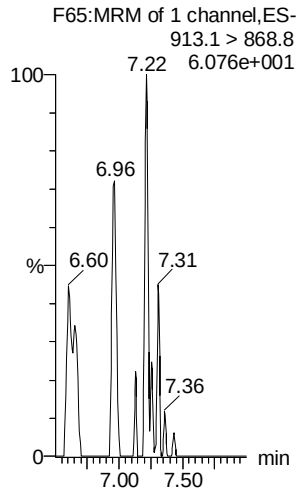

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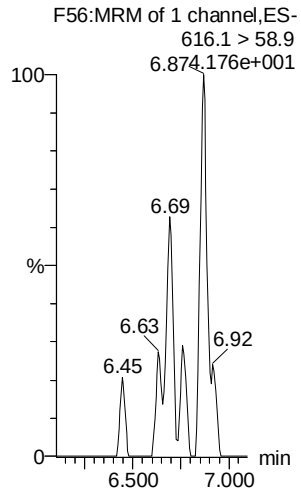

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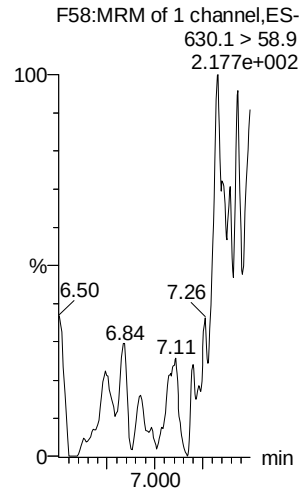

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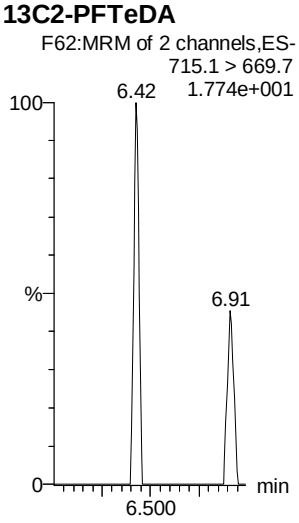
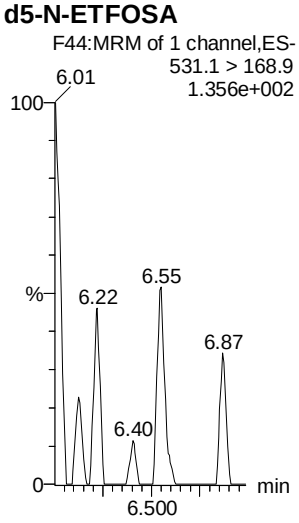


d5-N-ETFOSA



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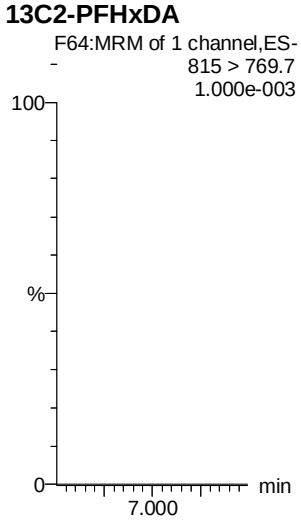

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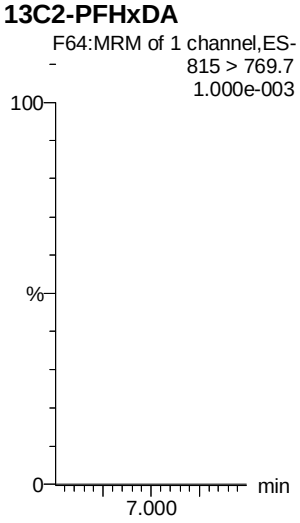

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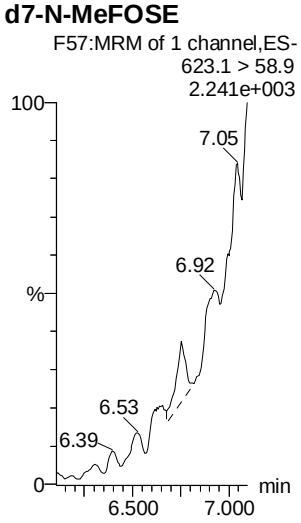

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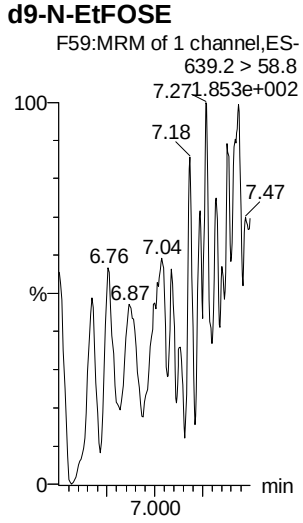

MJT 11/28/2018

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-4.qld

Last Altered: Wednesday, November 28, 2018 08:04:22 Pacific Standard Time
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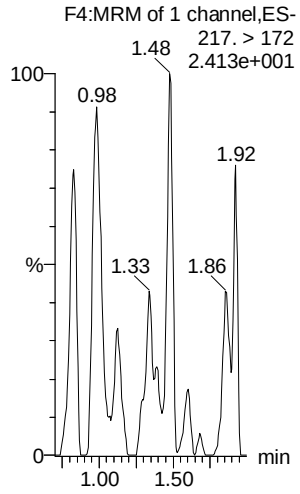
Name: 181127M1_4, Date: 27-Nov-2018, Time: 12:43:32, ID: IPA, Description: IPA

13C4-PFBA



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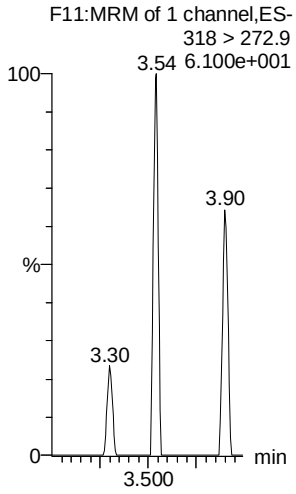

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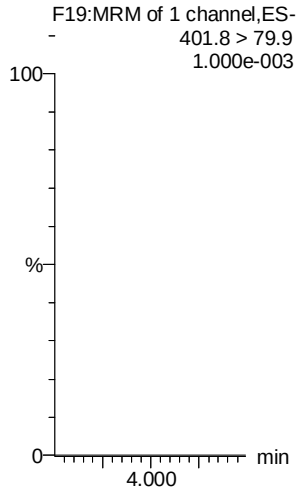
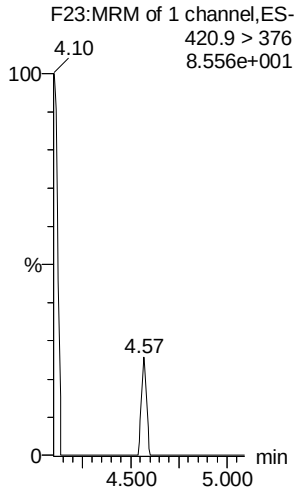
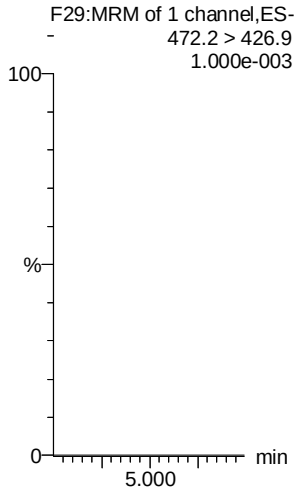


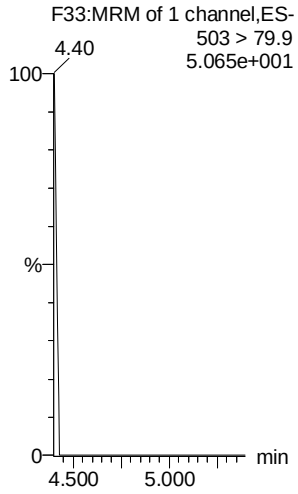
13C8-PFOA



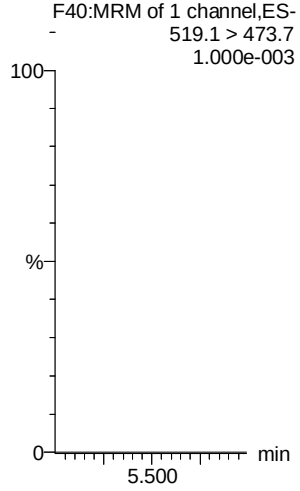
13C9-PFNA



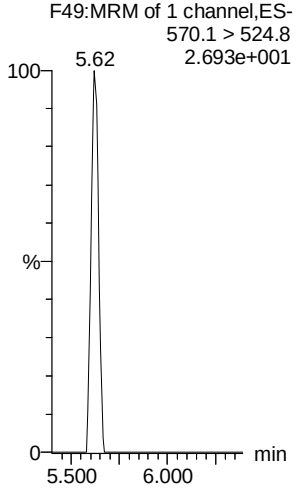
13C4-PFOS



13C6-PFDA



13C7-PFUdA



MJT 11/28/2018

LC Calibration Standards Review Checklist Q4

		ION Ratio	Concentration	C-Cals Name	Sign Date	Correct I-Cal	Manual Integrations	NA
Calibration ID: ST181127MI-1	L M H	☑	☑	☑	☑	☑	☑	☐
Calibration ID: -2	L M H	☑	☑	☑	☑	☑	☑	☐
Calibration ID: -3	L M H	☑	☑	☑	☑	☑	☑	☐
Calibration ID: -4	L M H	☑	☑	☑	☑	☑	☐	☐
Calibration ID: -5	L M H	☑	☑	☑	☑	☑	☑	☐
Calibration ID: -6	L M H	☑	☑	☑	☑	☑	☑	☐
Calibration ID: -7	L M H	☑	☑	☑	☑	☑	☑	☐
Calibration ID: -8	L M H	☑	☑	☑	☑	☑	☑	☐
Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐
Calibration ID:	L M H	☐	☐	☐	☐	☐	☐	☐

Full Mass Cal. Date: ~~20181126~~ 11-26-18 MJT 11/28/18

Run Log Present: ☑

# of Samples per Sequence Checked: ☑

Instrument Blank Saved ☑

IIS Area Saved ☑

Reviewed By: AD 11/28/18
Initials/Date

Comments:

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-2.qld

Last Altered: Wednesday, November 28, 2018 07:31:25 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:32:02 Pacific Standard Time

JAD 11/28/18

Name: 181127M1_2, Date: 27-Nov-2018, Time: 12:22:15, ID: ST181127M1-1 PFC CS0 18K1903, Description: PFC CS0 18K1903

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	577.334	5788.080	1.00	1.20	1.247	1.0	101.2	NO		
2	2	PFPeA	263.1 > 218.9	978.693	12099.848	1.00	2.41	1.011	1.0	100.0	NO		
3	3	PFBS	299.0 > 79.7	242.985	1498.232	1.00	2.76	2.027	1.0	96.9	NO	2.465	NO
4	4	4:2 FTS	327.2>307.2	341.344	4049.204	1.00	3.24	1.054	1.0	95.5	NO	1.501	NO
5	5	PFHxA	313 > 269	1703.856	8806.086	1.00	3.32	0.967	1.0	97.3	NO	14.041	NO
6	6	PFPeS	349.1>80.1	169.081	1498.232	1.00	3.55	1.411	0.8	82.6	NO	1.400	NO
7	36	13C3-PFBA	216.1 > 171.8	5788.080	7256.258	1.00	1.20	9.971	12.7	101.3	NO		
8	37	13C3-PFPeA	266. > 221.8	12099.848	22400.566	1.00	2.41	6.752	12.1	97.2	NO		
9	38	13C3-PFBS	302. > 98.8	1498.232	2729.253	1.00	2.76	6.862	12.8	102.2	NO		
10	39	13C2-4:2 FTS	329.2>308.9	4049.204	2729.253	1.00	3.24	18.545	12.5	100.4	NO		
11	40	13C2-PFHxA	315 > 270	8806.086	22400.566	1.00	3.32	4.914	5.0	99.4	NO		
12	38	13C3-PFBS	302. > 98.8	1498.232	2729.253	1.00	2.76	6.862	12.8	102.2	NO		
13	-1												
14	10	6:2 FTS	427.1 > 407	439.597	4411.112	1.00	4.43	1.246	0.9	94.4	NO	2.966	NO
15	7	PFHpA	363.0 > 318.9	1270.390	11376.847	1.00	4.00	1.396	1.0	99.9	NO	14.880	NO
16	8	L-PFHxS	398.9 > 79.6	178.184	1197.294	1.00	4.13	1.860	1.0	95.7	NO	2.034	NO
17	11	L-PFOA	412.8 > 368.9	2294.727	20417.268	1.00	4.48	1.405	0.9	91.9	NO	3.184	NO
18	13	PFHpS	449 > 80.0	220.475	3007.491	1.00	4.59	0.916	0.9	91.9	NO	1.865	NO
19	14	PFNA	463.0 > 418.8	1992.297	18353.252	1.00	4.91	1.357	1.1	105.0	NO	5.316	NO
20	43	13C2-6:2 FTS	429.1 > 408.9	4411.112	2937.737	1.00	4.43	18.769	12.0	96.1	NO		
21	41	13C4-PFHpA	367.2 > 321.8	11376.847	22400.566	1.00	3.99	6.349	11.8	94.7	NO		
22	42	18O2-PFHxS	403.0 > 102.6	1197.294	2729.253	1.00	4.13	5.484	12.2	97.9	NO		
23	44	13C2-PFOA	414.9 > 369.7	20417.268	26824.303	1.00	4.48	9.514	12.6	100.8	NO		
24	47	13C8-PFOS	507.0 > 79.9	3007.491	2937.737	1.00	5.00	12.797	12.3	98.3	NO		
25	45	13C5-PFNA	468.2 > 422.9	18353.252	18532.588	1.00	4.91	12.379	12.5	100.0	NO		
26	-1												
27	15	PFOSA	497.9 > 77.9	197.764	2245.646	1.00	4.96	1.101	1.0	98.7	NO	32.304	NO
28	16	L-PFOS	498.9 > 79.9	286.087	3007.491	1.00	5.00	1.189	1.0	104.4	NO	2.556	NO
29	18	PFDA	513 > 468.8	2062.660	18489.143	1.00	5.30	1.395	1.0	104.1	NO	7.395	NO
30	19	8:2 FTS	527 > 506.9	432.934	3574.510	1.00	5.26	1.514	0.9	93.6	NO	2.559	NO
31	20	PFNS	549.1 > 80.1	195.700	3007.491	1.00	5.36	0.813	1.0	99.7	NO	1.755	NO
32	21	L-MeFOSAA	570 > 419	704.380	2988.858	1.00	5.45	2.946	1.0	98.4	NO	2.879	NO
33	46	13C8-PFOSA	506.1 > 77.7	2245.646	22725.342	1.00	4.96	1.235	12.7	101.7	NO		
34	47	13C8-PFOS	507.0 > 79.9	3007.491	2937.737	1.00	5.00	12.797	12.3	98.3	NO		
35	48	13C2-PFDA	515.1 > 469.9	18489.143	21171.957	1.00	5.30	10.916	12.1	96.8	NO		
36	49	13C2-8:2 FTS	529.1 > 508.7	3574.510	2937.737	1.00	5.26	15.209	12.9	103.3	NO		

MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-2.qld

Last Altered: Wednesday, November 28, 2018 07:31:25 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:32:02 Pacific Standard Time

Name: 181127M1_2, Date: 27-Nov-2018, Time: 12:22:15, ID: ST181127M1-1 PFC CS0 18K1903, Description: PFC CS0 18K1903

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	47	13C8-PFOS	507.0 > 79.9	3007.491	2937.737	1.00	5.00	12.797	12.3	98.3	NO		
38	50	d3-N-MeFOSAA	573.3 > 419	2988.858	22725.342	1.00	5.44	1.644	12.2	97.7	NO		
39	-1												
40	23	L-EtFOSAA	584.1 > 419	557.745	3895.362	1.00	5.61	1.790	1.1	107.3	NO	1.470	NO
41	27	PFDoA	612.9 > 569.0	1993.174	21987.939	1.00	5.91	1.133	0.9	91.8	NO	10.778	NO
42	26	PFDS	598.8 > 79.9	217.631	3007.491	1.00	5.67	0.905	0.9	85.1	NO	1.679	NO
43	25	PFUdA	563.0 > 518.9	1860.542	22463.137	1.00	5.62	1.035	1.0	99.4	NO	9.736	NO
44	28	N-MeFOSA	512.1 > 168.9	388.099	9998.881	1.00	5.90	5.822	5.6	112.3	NO	1.390	NO
45	29	PFTrDA	662.9 > 618.9	2169.976	21987.939	1.00	6.16	1.234	1.0	100.8	NO	25.184	NO
46	52	d5-N-EtFOSAA	589.3 > 419	3895.362	22725.342	1.00	5.61	2.143	11.6	92.5	NO		
47	53	13C2-PFDoA	615.0 > 569.7	21987.939	21171.957	1.00	5.91	12.982	12.4	99.2	NO		
48	47	13C8-PFOS	507.0 > 79.9	3007.491	2937.737	1.00	5.00	12.797	12.3	98.3	NO		
49	51	13C2-PFUdA	565 > 519.8	22463.137	22725.342	1.00	5.63	12.356	12.9	103.3	NO		
50	54	d3-N-MeFOSA	515.2 > 168.9	9998.881	22725.342	1.00	5.94	5.500	149.8	99.9	NO		
51	53	13C2-PFDoA	615.0 > 569.7	21987.939	21171.957	1.00	5.91	12.982	12.4	99.2	NO		
52	-1												
53	30	PFTeDA	713.0 > 669.0	1849.566	13371.332	1.00	6.37	1.729	1.0	100.7	NO	12.706	NO
54	31	N-EtFOSA	526.1 > 168.9	488.829	15986.600	1.00	6.40	4.587	4.9	98.8	NO	1.589	NO
55	32	PFHxDA	813.1 > 768.6	728.777	6915.183	1.00	6.72	0.527	1.2	116.2	NO	28.768	YES
56	33	PFODA	913.1 > 868.8	1105.133	6915.183	1.00	6.96	0.799	1.1	109.6	NO		
57	34	N-MeFOSE	616.1 > 58.9	267.748	8512.178	1.00	6.69	4.718	4.7	94.6	NO		
58	35	N-EtFOSE	630.1 > 58.9	319.139	7766.781	1.00	6.84	6.164	5.1	101.8	NO		
59	55	13C2-PFTeDA	715.1 > 669.7	13371.332	22725.342	1.00	6.37	7.355	13.0	103.8	NO		
60	56	d5-N-ETFOSA	531.1 > 168.9	15986.600	22725.342	1.00	6.43	8.793	150.8	100.5	NO		
61	57	13C2-PFHxDA	815 > 769.7	6915.183	22725.342	1.00	6.72	3.804	5.1	102.0	NO		
62	57	13C2-PFHxDA	815 > 769.7	6915.183	22725.342	1.00	6.72	3.804	5.1	102.0	NO		
63	58	d7-N-MeFOSE	623.1 > 58.9	8512.178	22725.342	1.00	6.68	4.682	148.0	98.7	NO		
64	59	d9-N-EtFOSE	639.2 > 58.8	7766.781	22725.342	1.00	6.83	4.272	143.2	95.5	NO		
65	-1												
66	60	13C4-PFBA	217. > 172	7256.258	7256.258	1.00	1.19	12.500	12.5	100.0	NO		
67	61	13C5-PFHxA	318 > 272.9	22400.566	22400.566	1.00	3.32	12.500	12.5	100.0	NO		
68	62	13C3-PFHxS	401.8 > 79.9	2729.253	2729.253	1.00	4.13	12.500	12.5	100.0	NO		
69	63	13C8-PFOA	420.9 > 376	26824.303	26824.303	1.00	4.48	12.500	12.5	100.0	NO		
70	64	13C9-PFNA	472.2 > 426.9	18532.588	18532.588	1.00	4.91	12.500	12.5	100.0	NO		
71	65	13C4-PFOS	503 > 79.9	2937.737	2937.737	1.00	5.00	12.500	12.5	100.0	NO		
72	66	13C6-PFDA	519.1 > 473.7	21171.957	21171.957	1.00	5.30	12.500	12.5	100.0	NO		

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Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-2.qld

Last Altered: Wednesday, November 28, 2018 07:31:25 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:32:02 Pacific Standard Time

Name: 181127M1_2, Date: 27-Nov-2018, Time: 12:22:15, ID: ST181127M1-1 PFC CS0 18K1903, Description: PFC CS0 18K1903

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	67	13C7-PFUdA	570.1 > 524.8	22725.342	22725.342	1.00	5.62	12.500	12.5	100.0	NO		

MJT 11/28/2018

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Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:07:59 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112718.mdb 28 Nov 2018 07:06:35
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

	Name	Ion Ratio	Ratio out?
1	PFBA		
2	PFPeA		
3	PFBS	2.653	NO
4	4:2 FTS	1.678	NO
5	PFHxA	15.387	NO
6	PFPeS	1.569	NO
7	PFHpA	13.798	NO
8	L-PFHxS	1.572	NO
9	6:2 FTS	2.980	NO
10	L-PFOA	3.389	NO
11	PFHpS	1.758	NO
12	PFNA	4.593	NO
13	PFOSA	36.760	NO
14	L-PFOS	1.857	NO
15	PFDA	5.620	NO
16	8:2 FTS	2.416	NO
17	PFNS	1.633	NO
18	L-MeFOSAA	2.648	NO
19	L-EtFOSAA	1.441	NO

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Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:08:14 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112718.mdb 28 Nov 2018 07:06:35
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

	Name	Ion Ratio	Ratio out?
1	PFUdA	10.122	NO
2	PFDS	1.608	NO
3	PFDoA	8.212	NO
4	N-MeFOSA	1.547	NO
5	PFTrDA	22.771	NO
6	PFTeDA	12.587	NO
7	N-EtFOSA	1.616	NO
8	PFHxDA	17.774	NO
9	PFODA		
10	N-MeFOSE		
11	N-EtFOSE		

MT 11/28/18

Vista Analytical Laboratory

Dataset: Untitled

Last Altered: Wednesday, November 28, 2018 08:06:15 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:06:22 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112718.mdb 28 Nov 2018 07:06:35
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
1	1	181127M1_1	IPA	27-Nov-18	12:11:38
2	2	181127M1_2	ST181127M1-1 PFC CS0 18K1903	27-Nov-18	12:22:15
3	3	181127M1_3	QC MEOH LOT JB072509	27-Nov-18	12:32:54
4	4	181127M1_4	IPA	27-Nov-18	12:43:32
5	5	181127M1_5	1803659-01 A1-MW-07-SA2 0.11704	27-Nov-18	12:54:05
6	6	181127M1_6	1803659-02 A1-MW-23-SA2 0.1178	27-Nov-18	13:04:43
7	7	181127M1_7	1803659-03 A1-MW-25-SA2 0.11426	27-Nov-18	13:15:22
8	8	181127M1_8	IPA	27-Nov-18	13:25:54
9	9	181127M1_9	ST181127M1-2 PFC CS3 18K1906	27-Nov-18	13:36:33
10	10	181127M1_10	IPA	27-Nov-18	13:47:11
11	11	181127M1_11	1803553-04 BS1810291445GC 3.51	27-Nov-18	15:12:40
12	12	181127M1_12	IPA	27-Nov-18	15:23:15
13	13	181127M1_13	B8K0162-MS1 Matrix Spike 0.11696	27-Nov-18	15:33:53
14	14	181127M1_14	B8K0162-MSD1 Matrix Spike Dup 0.11463	27-Nov-18	15:44:27
15	15	181127M1_15	B8K0162-BS1 OPR 0.125	27-Nov-18	15:55:05
16	16	181127M1_16	B8K0162-BLK1 Method Blank 0.125	27-Nov-18	16:05:38
17	17	181127M1_17	1803677-01 OC-RW05-1118 0.1159	27-Nov-18	16:16:16
18	18	181127M1_18	1803677-02 OC-RW05P-1118 0.11752	27-Nov-18	16:26:49
19	19	181127M1_19	1803677-03 OC-FB05-1118 0.12187	27-Nov-18	16:37:27
20	20	181127M1_20	B8K0098-BS1 OPR 0.125	27-Nov-18	16:48:00
21	21	181127M1_21	B8K0098-BLK1 Method Blank 0.125	27-Nov-18	16:58:38
22	22	181127M1_22	1803630-01 277 Bond Rd 0.10443	27-Nov-18	17:09:12
23	23	181127M1_23	1803630-02 292 Bond Rd 0.11197	27-Nov-18	17:19:51
24	24	181127M1_24	1803630-03 110 Phinney Rd 0.10702	27-Nov-18	17:30:29
25	25	181127M1_25	1803630-04 305 Bond Rd 0.10908	27-Nov-18	17:41:02
26	26	181127M1_26	1803630-05 122 Phinney Rd 0.11013	27-Nov-18	17:51:40
27	27	181127M1_27	1803630-06 123 Phinney Rd 0.09851	27-Nov-18	18:02:13
28	28	181127M1_28	IPA	27-Nov-18	18:12:52
29	29	181127M1_29	ST181127M1-3 PFC CS3 18K1906	27-Nov-18	18:23:26
30	30	181127M1_30	IPA	27-Nov-18	18:34:04
31	31	181127M1_31	1803630-07 277 Bond Rd FRB 0.11327	27-Nov-18	18:44:37
32	32	181127M1_32	B8K0105-BS1 OPR 0.125	27-Nov-18	18:55:15

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Dataset: Untitled

Last Altered: Wednesday, November 28, 2018 08:06:15 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:06:22 Pacific Standard Time

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
33	33	181127M1_33	B8K0105-BLK1 Method Blank 0.125	27-Nov-18	19:05:49
34	34	181127M1_34	1803643-01 DPH-MW10-17 0.11455	27-Nov-18	19:16:27
35	35	181127M1_35	1803643-02 DPH-MW8-17 0.11432	27-Nov-18	19:27:05
36	36	181127M1_36	1803643-03 DPH-MW5-17 0.11778	27-Nov-18	19:37:44
37	37	181127M1_37	1803643-04 DPH-MW9-17 0.11197	27-Nov-18	19:48:16
38	38	181127M1_38	1803643-05 DPH-MW4-17 0.11305	27-Nov-18	19:58:55
39	39	181127M1_39	1803643-06 DPH-MW2-17 0.11423	27-Nov-18	20:09:28
40	40	181127M1_40	1803643-07 DPH-B5 0.11397	27-Nov-18	20:20:06
41	41	181127M1_41	1803643-08 DPH-MW1-17 0.1163	27-Nov-18	20:30:44
42	42	181127M1_42	1803643-09 DPH-EX4 0.11442	27-Nov-18	20:41:18
43	43	181127M1_43	IPA	27-Nov-18	20:51:56
44	44	181127M1_44	ST181127M1-4 PFC CS3 18K1906	27-Nov-18	21:02:28
45	45	181127M1_45	IPA	27-Nov-18	21:13:06
46	46	181127M1_46	1803645-01 DPH-MW6 0.11548	27-Nov-18	21:23:39
47	47	181127M1_47	1803645-02 DPH-MW21 0.11562	27-Nov-18	21:34:18
48	48	181127M1_48	1803645-03 DPH-MW15D 0.11807	27-Nov-18	21:44:56
49	49	181127M1_49	1803645-04 DPH-MW22 0.11748	27-Nov-18	21:55:28
50	50	181127M1_50	1803649-01 DPH-MW18 0.11992	27-Nov-18	22:06:07
51	51	181127M1_51	1803649-02 DPH-MW19 0.11728	27-Nov-18	22:16:45
52	52	181127M1_52	1803649-03 DPH-SW1 0.1142	27-Nov-18	22:27:18
53	53	181127M1_53	1803649-04 DPH-SW3 0.11432	27-Nov-18	22:37:57
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58	58	181127M1_58	IPA	27-Nov-18	23:30:57
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62	62	181127M1_62	1803639-02 MW-3 0.11437	28-Nov-18	00:13:20
63	63	181127M1_63	1803650-01 RFW-3 0.113	28-Nov-18	00:23:58
64	64	181127M1_64	1803650-02 RFW-4 0.11224	28-Nov-18	00:34:30
65	65	181127M1_65	1803650-03 GZ-202A 0.11317	28-Nov-18	00:45:09
66	66	181127M1_66	1803650-04 P-2R (South Spring) 0.11552	28-Nov-18	00:55:47
67	67	181127M1_67	1803653-01 SEA-1 0.11267	28-Nov-18	01:06:20
68	68	181127M1_68	1803653-02 SEA-2 0.1142	28-Nov-18	01:16:59

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Dataset: Untitled

Last Altered: Wednesday, November 28, 2018 08:06:15 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:06:22 Pacific Standard Time

Compound name: PFBA

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71	71	181127M1_71	IPA	28-Nov-18	01:48:43
72	72	181127M1_72	ST181127M1-6 PFC CS3 18K1906	28-Nov-18	01:59:21
73	73	181127M1_73	IPA	28-Nov-18	02:10:00
74	74	181127M1_74	1803653-05 Seep 0.11658	28-Nov-18	02:20:31
75	75	181127M1_75	B8K0146-BS1 OPR 0.25	28-Nov-18	02:31:10
76	76	181127M1_76	B8K0146-BLK1 Method Blank 0.25	28-Nov-18	02:41:43
77	77	181127M1_77	1803692-01 SWIN1811071400GGA 0.22883	28-Nov-18	02:52:22
78	78	181127M1_78	1803692-02 SWEF1811071430GGA 0.24623	28-Nov-18	03:02:54
79	79	181127M1_79	B8K0140-BS1 OPR 0.25	28-Nov-18	03:13:33
80	80	181127M1_80	B8K0140-BLK1 Method Blank 0.25	28-Nov-18	03:24:11
81	81	181127M1_81	1803675-01 GW0110161811150925KER 0.2531	28-Nov-18	03:34:45
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83	83	181127M1_83	1803675-03 EB11811151030MK 0.2493	28-Nov-18	03:56:01
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85	85	181127M1_85	1803675-05 GW0800851811151255KER 0.25087	28-Nov-18	04:17:12
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87	87	181127M1_87	1803675-07 GW0920971811151535KER 0.24638	28-Nov-18	04:38:24
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93	93	181127M1_93	1803675-10 GW0280331811131655KER 0.24856	28-Nov-18	05:42:04
94	94	181127M1_94	1803675-11 GW0820871811141045KER 0.24842	28-Nov-18	05:52:42
95	95	181127M1_95	1803675-12 FB1811141050KER 0.24655	28-Nov-18	06:03:15
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97	97	181127M1_97	1803675-14 GW0280331811141310KER 0.24685	28-Nov-18	06:24:32
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101	1...	181127M1_101	QC MEOH LOT JB072509	28-Nov-18	07:06:55
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103	1...	181127M1_103	ST181127M1-8 PFC CS3 18K1906	28-Nov-18	07:28:06
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Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-2.qld

Last Altered: Wednesday, November 28, 2018 07:31:25 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:32:02 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112718.mdb 28 Nov 2018 07:06:35
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181127M1_2, Date: 27-Nov-2018, Time: 12:22:15, ID: ST181127M1-1 PFC CS0 18K1903, Description: PFC CS0 18K1903

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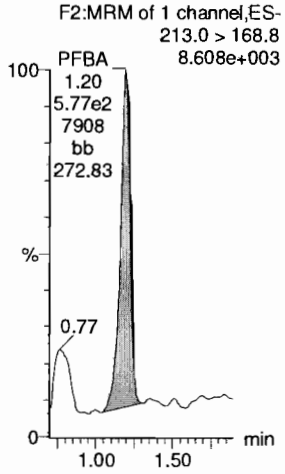

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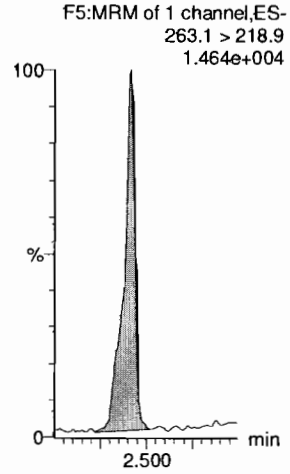

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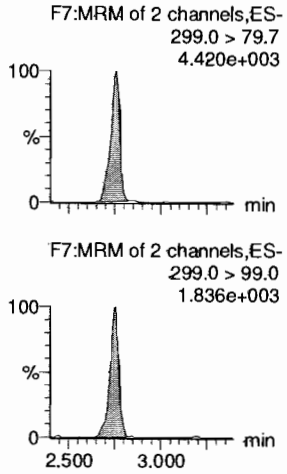

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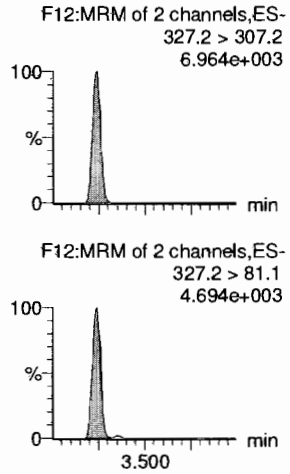

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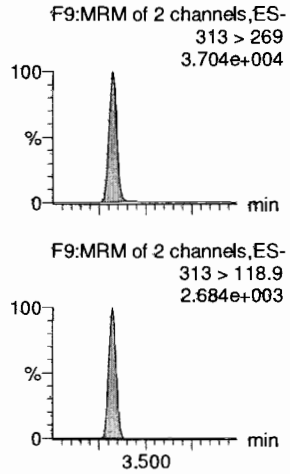

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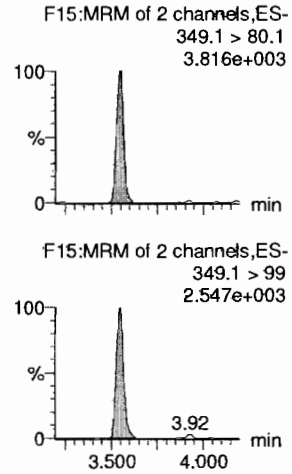
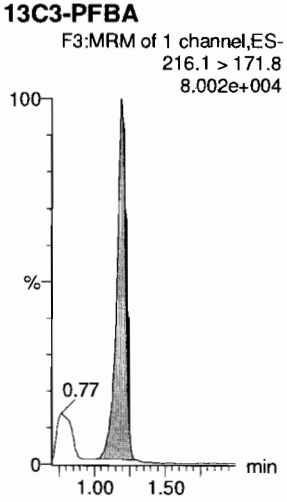


13C3-PFBA



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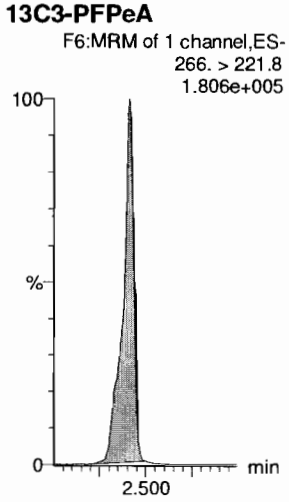

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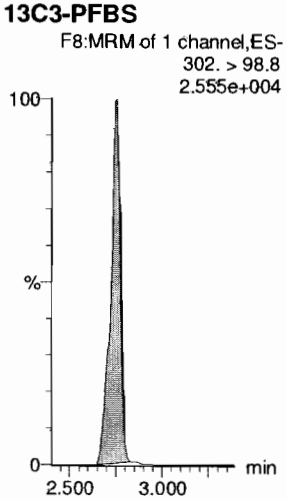

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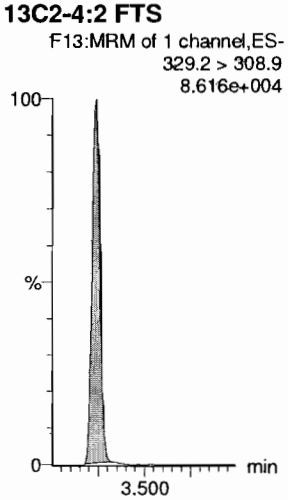

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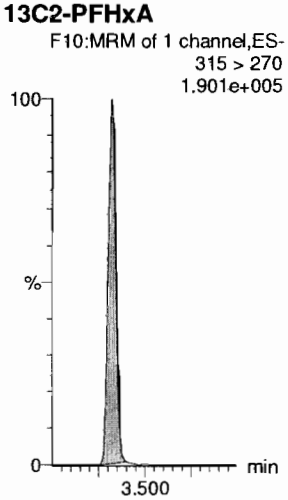

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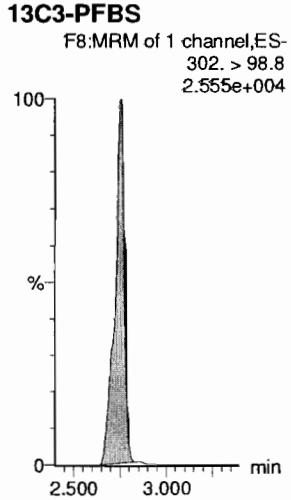

MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-2.qld

Last Altered: Wednesday, November 28, 2018 07:31:25 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:32:02 Pacific Standard Time

Name: 181127M1_2, Date: 27-Nov-2018, Time: 12:22:15, ID: ST181127M1-1 PFC CS0 18K1903, Description: PFC CS0 18K1903

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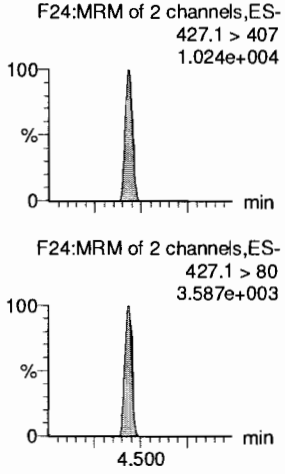

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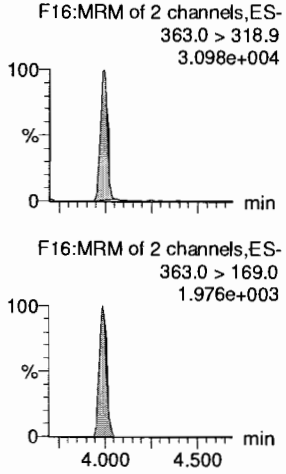

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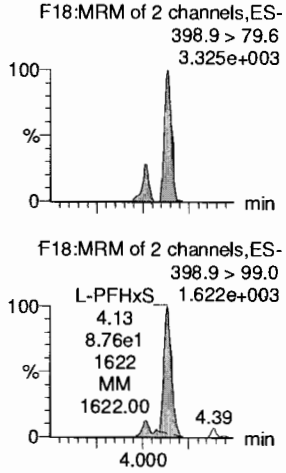

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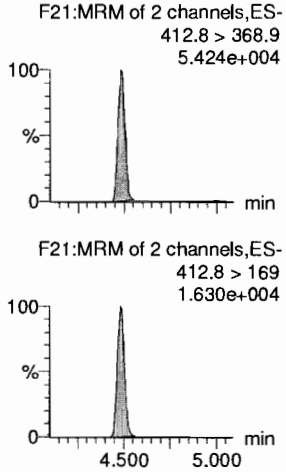

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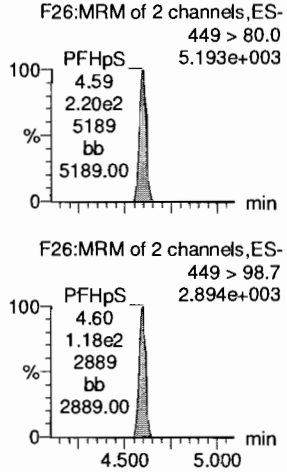

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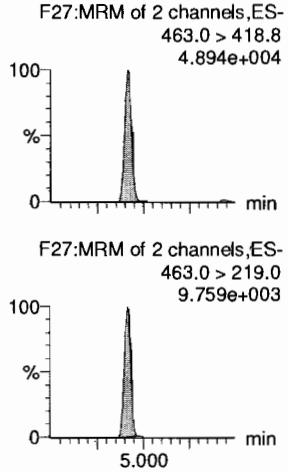

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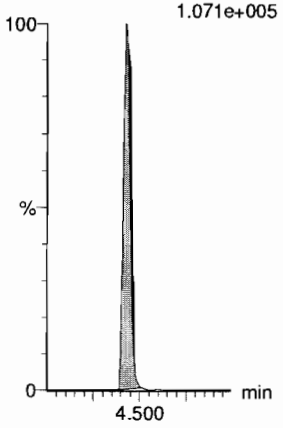

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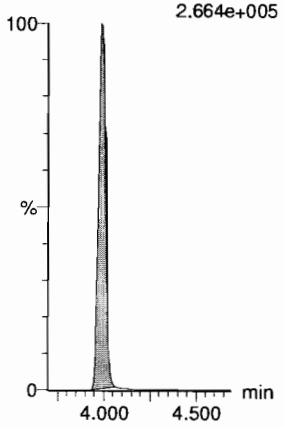

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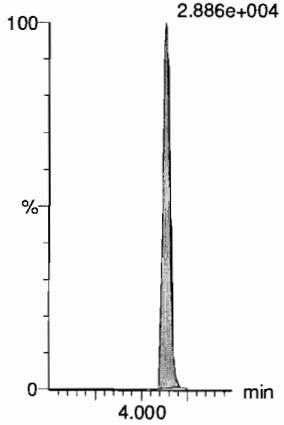

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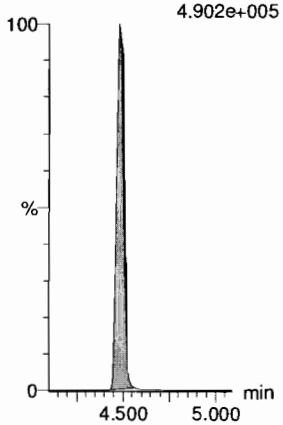

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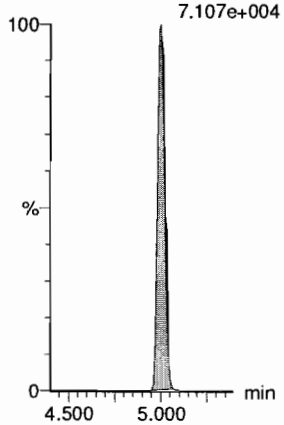

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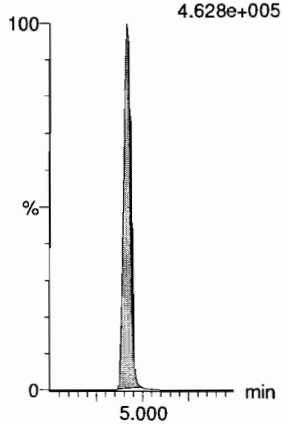

MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-2.qld

Last Altered: Wednesday, November 28, 2018 07:31:25 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:32:02 Pacific Standard Time

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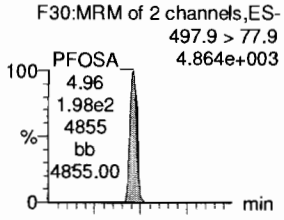

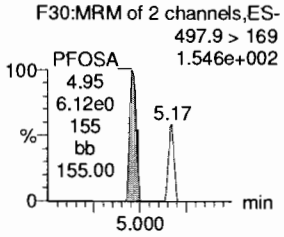

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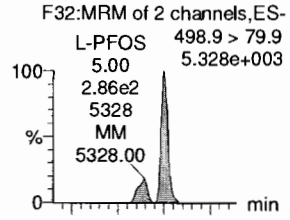

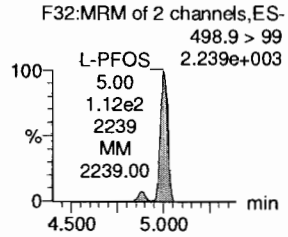

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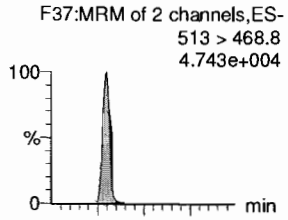

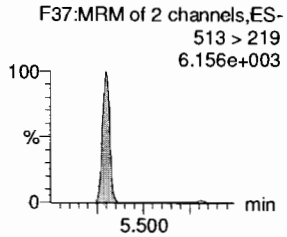

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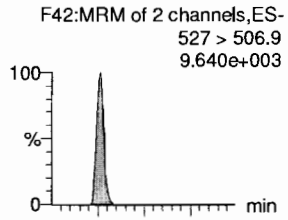
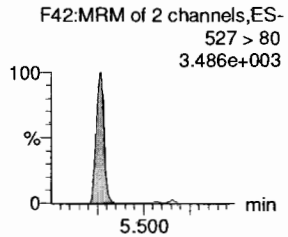
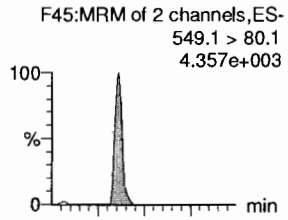
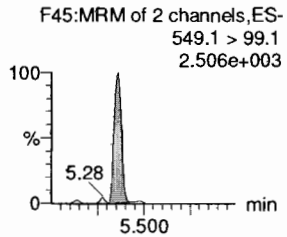


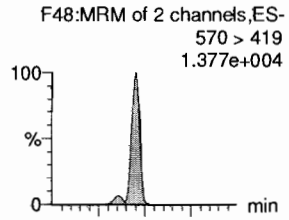


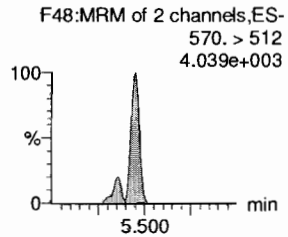
PFNS



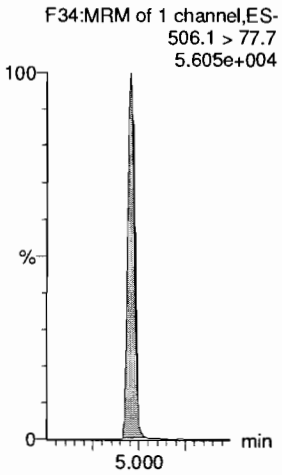


L-MeFOSAA

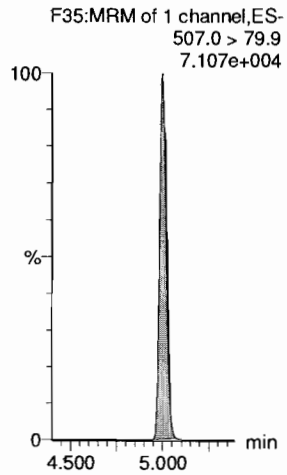




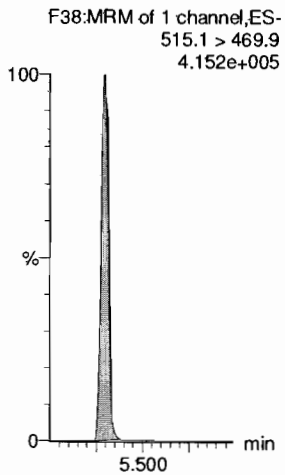
13C8-PFOSA



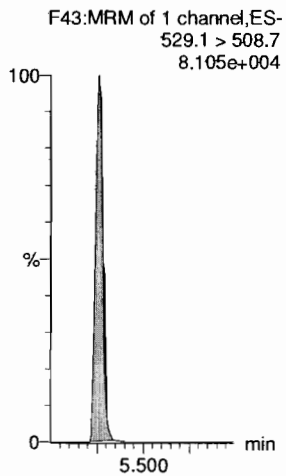
13C8-PFOS



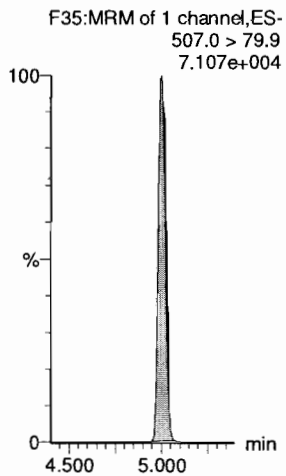
13C2-PFDA



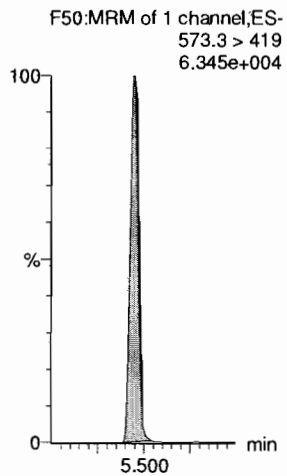
13C2-8:2 FTS



13C8-PFOS



d3-N-MeFOSAA



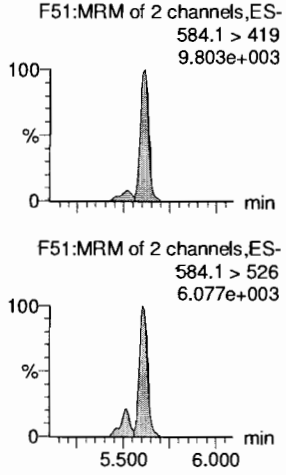
MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-2.qld

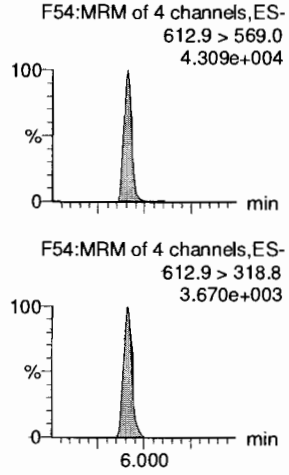
Last Altered: Wednesday, November 28, 2018 07:31:25 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:32:02 Pacific Standard Time

Name: 181127M1_2, Date: 27-Nov-2018, Time: 12:22:15, ID: ST181127M1-1 PFC CS0 18K1903, Description: PFC CS0 18K1903

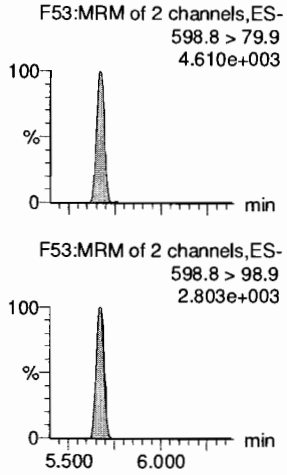
L-EtFOSAA



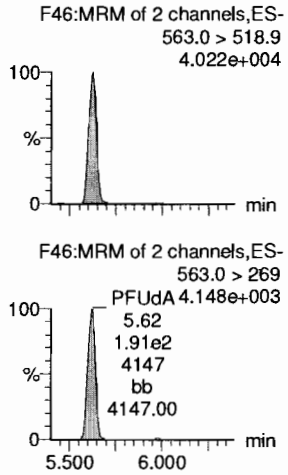
PFDoA



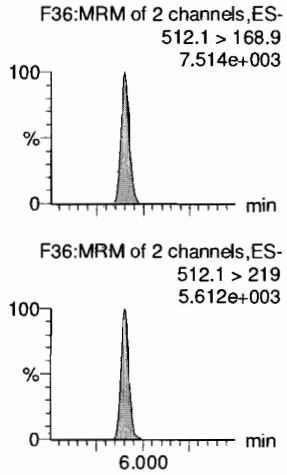
PFDS



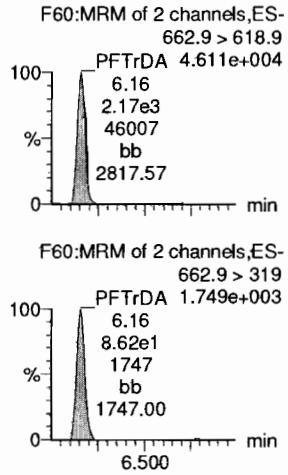
PFUdA



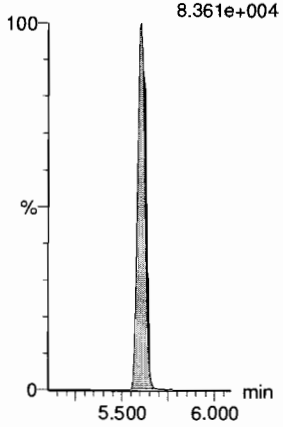
N-MeFOSA



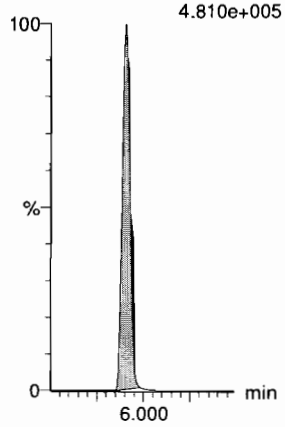
PFTrDA



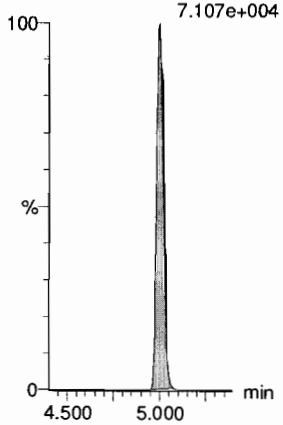
d5-N-EtFOSAA



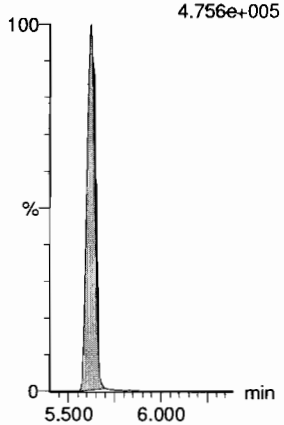
13C2-PFDoA



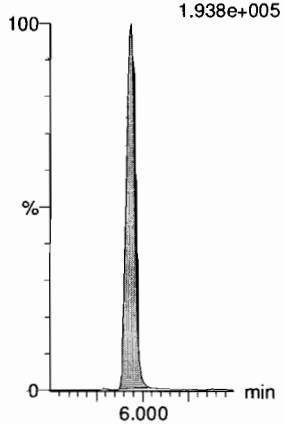
13C8-PFOS



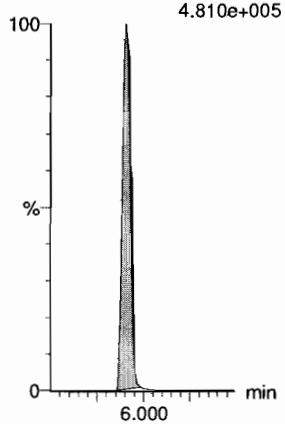
13C2-PFUdA



d3-N-MeFOSA



13C2-PFDoA



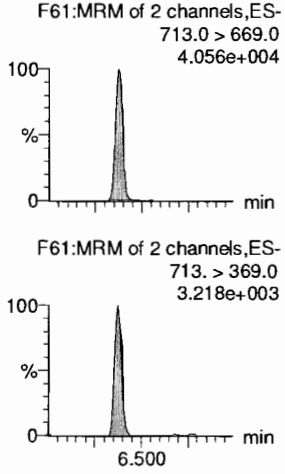
MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-2.qld

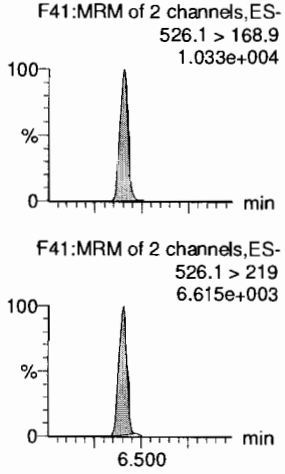
Last Altered: Wednesday, November 28, 2018 07:31:25 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:32:02 Pacific Standard Time

Name: 181127M1_2, Date: 27-Nov-2018, Time: 12:22:15, ID: ST181127M1-1 PFC CS0 18K1903, Description: PFC CS0 18K1903

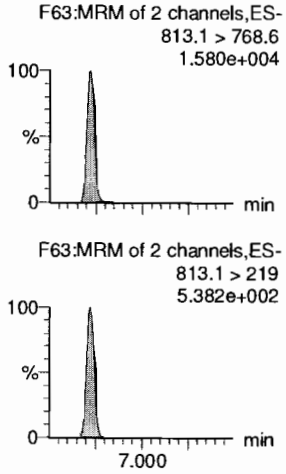
PFTeDA



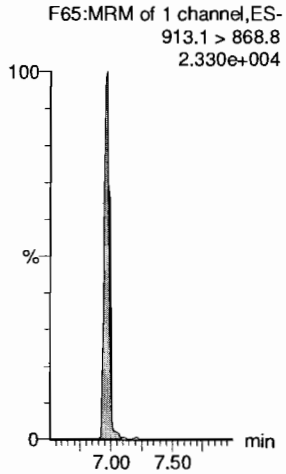
N-EtFOSA



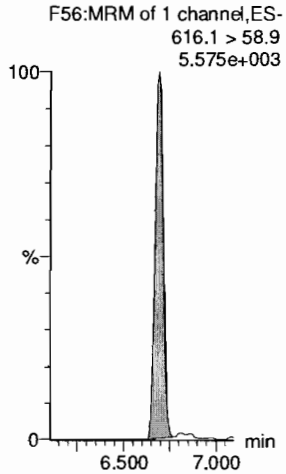
PFHxDA



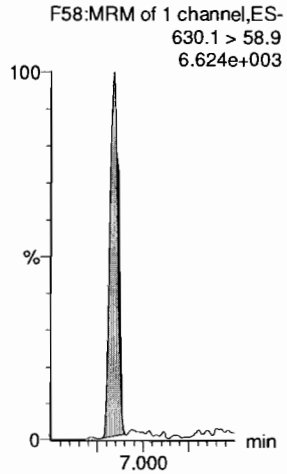
PFODA



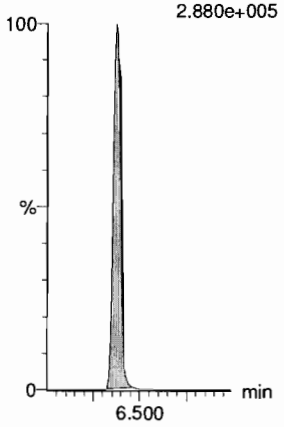
N-MeFOSE



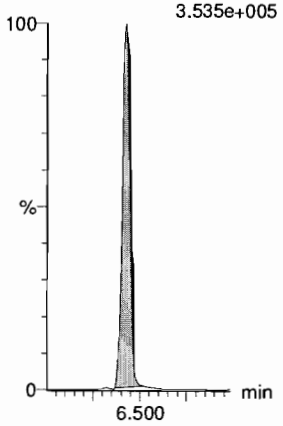
N-EtFOSE



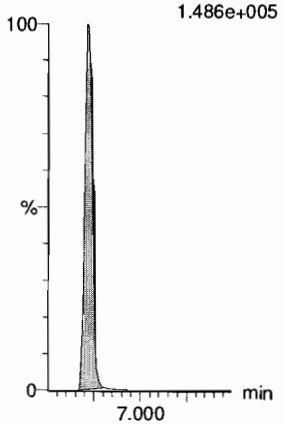
13C2-PFTeDA



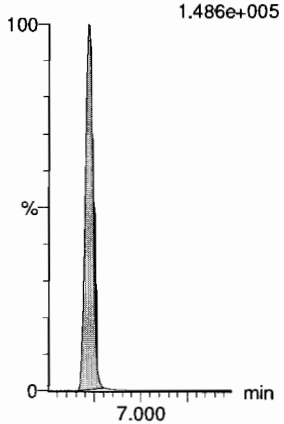
d5-N-ETFOSA



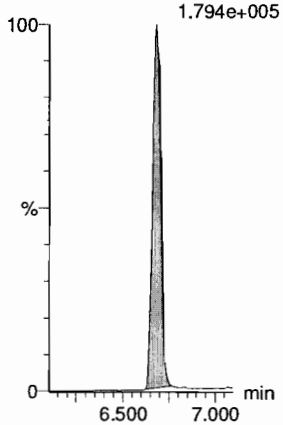
13C2-PFHxDA



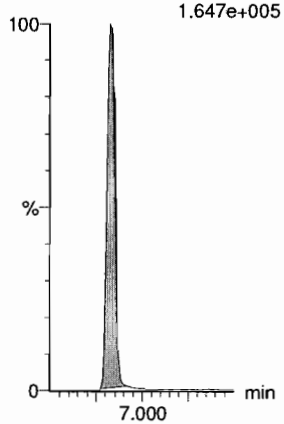
13C2-PFHxDA



d7-N-MeFOSE



d9-N-EtFOSE



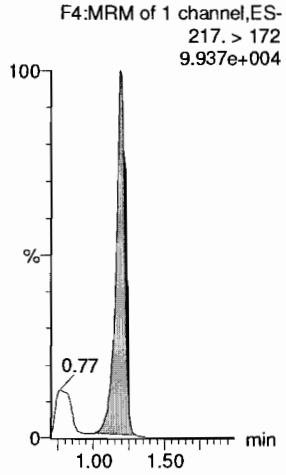
MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-2.qld

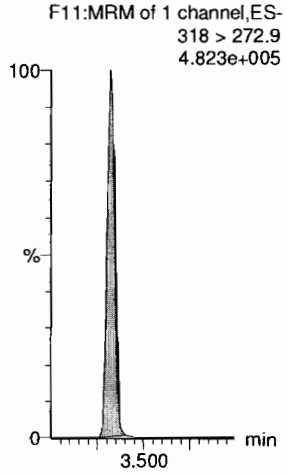
Last Altered: Wednesday, November 28, 2018 07:31:25 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:32:02 Pacific Standard Time

Name: 181127M1_2, Date: 27-Nov-2018, Time: 12:22:15, ID: ST181127M1-1 PFC CS0 18K1903, Description: PFC CS0 18K1903

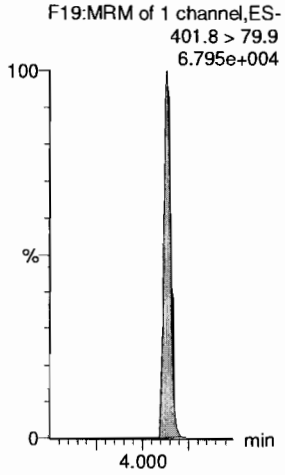
13C4-PFBA



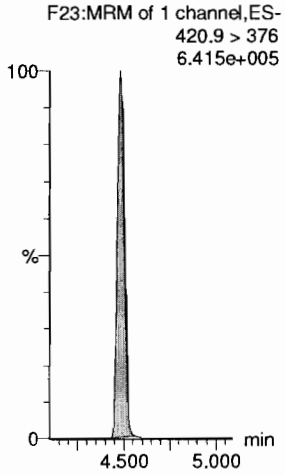
13C5-PFHxA



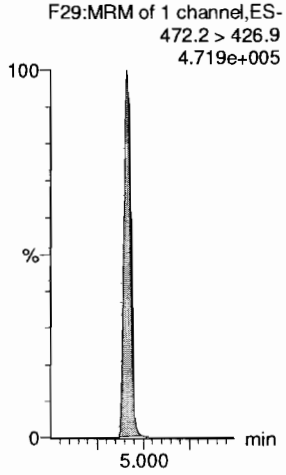
13C3-PFHxS



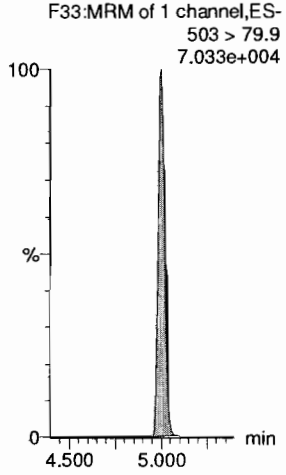
13C8-PFOA



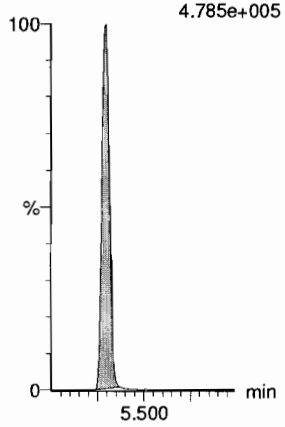
13C9-PFNA



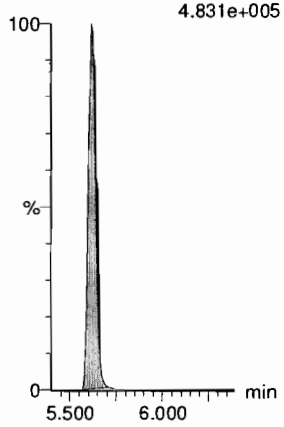
13C4-PFOS



13C6-PFDA



13C7-PFUdA



MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

VAD 11/28/18

Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:09:49 Pacific Standard Time

Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	5564.242	6044.539	1.00	1.20	11.507	9.8	98.2	NO		
2	2	PFPeA	263.1 > 218.9	9437.526	12552.300	1.00	2.42	9.398	9.9	98.7	NO		
3	3	PFBS	299.0 > 79.7	2744.029	1770.857	1.00	2.76	19.369	9.4	93.9	NO	2.653	NO
4	4	4:2 FTS	327.2>307.2	3878.139	4684.055	1.00	3.24	10.349	9.9	99.0	NO	1.678	NO
5	5	PFHxA	313 > 269	19324.664	10028.589	1.00	3.33	9.635	10.2	101.7	NO	15.387	NO
6	6	PFPeS	349.1>80.1	2235.374	1770.857	1.00	3.55	15.779	9.4	94.5	NO	1.569	NO
7	36	13C3-PFBA	216.1 > 171.8	6044.539	7529.786	1.00	1.21	10.034	12.7	101.9	NO		
8	37	13C3-PFPeA	266. > 221.8	12552.300	26517.391	1.00	2.42	5.917	10.6	85.2	NO		
9	38	13C3-PFBS	302. > 98.8	1770.857	3194.410	1.00	2.77	6.930	12.9	103.2	NO		
10	39	13C2-4:2 FTS	329.2>308.9	4684.055	3194.410	1.00	3.24	18.329	12.4	99.2	NO		
11	40	13C2-PFHxA	315 > 270	10028.589	26517.391	1.00	3.33	4.727	4.8	95.7	NO		
12	38	13C3-PFBS	302. > 98.8	1770.857	3194.410	1.00	2.77	6.930	12.9	103.2	NO		
13	-1												
14	10	6:2 FTS	427.1 > 407	4773.198	5023.632	1.00	4.43	11.877	9.5	95.3	NO	2.980	NO
15	7	PFHpA	363.0 > 318.9	13695.012	13520.427	1.00	4.00	12.661	9.6	96.1	NO	13.798	NO
16	8	L-PFHxS	398.9 > 79.6	2138.740	1378.069	1.00	4.14	19.400	10.0	99.7	NO	1.572	NO
17	11	L-PFOA	412.8 > 368.9	25305.109	23463.607	1.00	4.49	13.481	9.8	98.2	NO	3.389	NO
18	13	PFHpS	449 > 80.0	2673.484	3358.318	1.00	4.60	9.951	10.6	106.1	NO	1.758	NO
19	14	PFNA	463.0 > 418.8	21073.703	21311.506	1.00	4.92	12.361	9.9	98.6	NO	4.593	NO
20	43	13C2-6:2 FTS	429.1 > 408.9	5023.632	3196.477	1.00	4.43	19.645	12.6	100.6	NO		
21	41	13C4-PFHpA	367.2 > 321.8	13520.427	26517.391	1.00	4.00	6.373	11.9	95.0	NO		
22	42	18O2-PFHxS	403.0 > 102.6	1378.069	3194.410	1.00	4.14	5.393	12.0	96.3	NO		
23	44	13C2-PFOA	414.9 > 369.7	23463.607	30220.549	1.00	4.49	9.705	12.9	102.9	NO		
24	47	13C8-PFOS	507.0 > 79.9	3358.318	3196.477	1.00	5.01	13.133	12.6	100.9	NO		
25	45	13C5-PFNA	468.2 > 422.9	21311.506	21023.799	1.00	4.92	12.671	12.8	102.3	NO		
26	-1												
27	15	PFOSA	497.9 > 77.9	2579.209	2802.614	1.00	4.96	11.504	10.1	101.1	NO	36.760	NO
28	16	L-PFOS	498.9 > 79.9	2965.089	3358.318	1.00	5.01	11.036	10.0	100.4	NO	1.857	NO
29	18	PFDA	513 > 468.8	22081.447	20196.289	1.00	5.30	13.667	10.4	104.0	NO	5.620	NO
30	19	8:2 FTS	527 > 506.9	4252.868	3453.842	1.00	5.27	15.392	10.2	101.8	NO	2.416	NO
31	20	PFNS	549.1 > 80.1	2112.453	3358.318	1.00	5.36	7.863	10.3	102.5	NO	1.633	NO
32	21	L-MeFOSAA	570 > 419	8254.508	3445.453	1.00	5.46	29.947	10.3	103.0	NO	2.648	NO
33	46	13C8-PFOSA	506.1 > 77.7	2802.614	27465.320	1.00	4.96	1.276	13.1	105.1	NO		
34	47	13C8-PFOS	507.0 > 79.9	3358.318	3196.477	1.00	5.01	13.133	12.6	100.9	NO		
35	48	13C2-PFDA	515.1 > 469.9	20196.289	23510.281	1.00	5.30	10.738	11.9	95.2	NO		
36	49	13C2-8:2 FTS	529.1 > 508.7	3453.842	3196.477	1.00	5.27	13.506	11.5	91.8	NO		

MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:09:49 Pacific Standard Time

Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	47	13C8-PFOS	507.0 > 79.9	3358.318	3196.477	1.00	5.01	13.133	12.6	100.9	NO		
38	50	d3-N-MeFOSAA	573.3 > 419	3445.453	27465.320	1.00	5.45	1.568	11.7	93.2	NO		
39	-1												
40	23	L-EtFOSAA	584.1 > 419	7009.348	5071.883	1.00	5.61	17.275	10.7	106.6	NO	1.441	NO
41	27	PFDoA	612.9 > 569.0	22119.477	24419.674	1.00	5.91	11.323	9.7	97.0	NO	8.212	NO
42	26	PFDS	598.8 > 79.9	2640.579	3358.318	1.00	5.67	9.829	9.4	93.7	NO	1.608	NO
43	25	PFUdA	563.0 > 518.9	20501.998	26709.641	1.00	5.62	9.595	9.8	98.4	NO	10.122	NO
44	28	N-MeFOSA	512.1 > 168.9	3891.354	11224.262	1.00	5.91	52.004	54.2	108.3	NO	1.547	NO
45	29	PFTrDA	662.9 > 618.9	22619.566	24419.674	1.00	6.16	11.579	10.0	99.7	NO	22.771	NO
46	52	d5-N-EtFOSAA	589.3 > 419	5071.883	27465.320	1.00	5.61	2.308	12.5	99.7	NO		
47	53	13C2-PFDoA	615.0 > 569.7	24419.674	23510.281	1.00	5.91	12.984	12.4	99.2	NO		
48	47	13C8-PFOS	507.0 > 79.9	3358.318	3196.477	1.00	5.01	13.133	12.6	100.9	NO		
49	51	13C2-PFUdA	565 > 519.8	26709.641	27465.320	1.00	5.63	12.156	12.7	101.6	NO		
50	54	d3-N-MeFOSA	515.2 > 168.9	11224.262	27465.320	1.00	5.94	5.108	139.2	92.8	NO		
51	53	13C2-PFDoA	615.0 > 569.7	24419.674	23510.281	1.00	5.91	12.984	12.4	99.2	NO		
52	-1												
53	30	PFTeDA	713.0 > 669.0	19949.881	15599.024	1.00	6.38	15.986	9.8	97.8	NO	12.587	NO
54	31	N-EtFOSA	526.1 > 168.9	5702.125	19797.959	1.00	6.41	43.202	49.2	98.4	NO	1.616	NO
55	32	PFHxDA	813.1 > 768.6	7260.882	8234.222	1.00	6.72	4.409	11.0	110.0	NO	17.774	NO
56	33	PFODA	913.1 > 868.8	12578.619	8234.222	1.00	6.96	7.638	10.8	108.3	NO		
57	34	N-MeFOSE	616.1 > 58.9	3011.901	9716.585	1.00	6.69	46.496	51.3	102.6	NO		
58	35	N-EtFOSE	630.1 > 58.9	3571.052	9169.272	1.00	6.84	58.419	50.8	101.7	NO		
59	55	13C2-PFTeDA	715.1 > 669.7	15599.024	27465.320	1.00	6.38	7.099	12.5	100.2	NO		
60	56	d5-N-ETFOSA	531.1 > 168.9	19797.959	27465.320	1.00	6.43	9.010	154.5	103.0	NO		
61	57	13C2-PFHxDA	815 > 769.7	8234.222	27465.320	1.00	6.72	3.748	5.0	100.5	NO		
62	57	13C2-PFHxDA	815 > 769.7	8234.222	27465.320	1.00	6.72	3.748	5.0	100.5	NO		
63	58	d7-N-MeFOSE	623.1 > 58.9	9716.585	27465.320	1.00	6.68	4.422	139.8	93.2	NO		
64	59	d9-N-EtFOSE	639.2 > 58.8	9169.272	27465.320	1.00	6.83	4.173	139.9	93.3	NO		
65	-1												
66	60	13C4-PFBA	217. > 172	7529.786	7529.786	1.00	1.20	12.500	12.5	100.0	NO		
67	61	13C5-PFHxA	318 > 272.9	26517.391	26517.391	1.00	3.33	12.500	12.5	100.0	NO		
68	62	13C3-PFHxS	401.8 > 79.9	3194.410	3194.410	1.00	4.14	12.500	12.5	100.0	NO		
69	63	13C8-PFOA	420.9 > 376	30220.549	30220.549	1.00	4.49	12.500	12.5	100.0	NO		
70	64	13C9-PFNA	472.2 > 426.9	21023.799	21023.799	1.00	4.92	12.500	12.5	100.0	NO		
71	65	13C4-PFOS	503 > 79.9	3196.477	3196.477	1.00	5.01	12.500	12.5	100.0	NO		
72	66	13C6-PFDA	519.1 > 473.7	23510.281	23510.281	1.00	5.30	12.500	12.5	100.0	NO		

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Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:09:49 Pacific Standard Time

Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	67	13C7-PFUdA	570.1 > 524.8	27465.320	27465.320	1.00	5.63	12.500	12.5	100.0	NO		

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Dataset: Untitled

Last Altered: Wednesday, November 28, 2018 08:06:15 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:06:22 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112718.mdb 28 Nov 2018 07:06:35
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
1	1	181127M1_1	IPA	27-Nov-18	12:11:38
2	2	181127M1_2	ST181127M1-1 PFC CS0 18K1903	27-Nov-18	12:22:15
3	3	181127M1_3	QC MEOH LOT JB072509	27-Nov-18	12:32:54
4	4	181127M1_4	IPA	27-Nov-18	12:43:32
5	5	181127M1_5	1803659-01 A1-MW-07-SA2 0.11704	27-Nov-18	12:54:05
6	6	181127M1_6	1803659-02 A1-MW-23-SA2 0.1178	27-Nov-18	13:04:43
7	7	181127M1_7	1803659-03 A1-MW-25-SA2 0.11426	27-Nov-18	13:15:22
8	8	181127M1_8	IPA	27-Nov-18	13:25:54
9	9	181127M1_9	ST181127M1-2 PFC CS3 18K1906	27-Nov-18	13:36:33
10	10	181127M1_10	IPA	27-Nov-18	13:47:11
11	11	181127M1_11	1803553-04 BS1810291445GC 3.51	27-Nov-18	15:12:40
12	12	181127M1_12	IPA	27-Nov-18	15:23:15
13	13	181127M1_13	B8K0162-MS1 Matrix Spike 0.11696	27-Nov-18	15:33:53
14	14	181127M1_14	B8K0162-MSD1 Matrix Spike Dup 0.11463	27-Nov-18	15:44:27
15	15	181127M1_15	B8K0162-BS1 OPR 0.125	27-Nov-18	15:55:05
16	16	181127M1_16	B8K0162-BLK1 Method Blank 0.125	27-Nov-18	16:05:38
17	17	181127M1_17	1803677-01 OC-RW05-1118 0.1159	27-Nov-18	16:16:16
18	18	181127M1_18	1803677-02 OC-RW05P-1118 0.11752	27-Nov-18	16:26:49
19	19	181127M1_19	1803677-03 OC-FB05-1118 0.12187	27-Nov-18	16:37:27
20	20	181127M1_20	B8K0098-BS1 OPR 0.125	27-Nov-18	16:48:00
21	21	181127M1_21	B8K0098-BLK1 Method Blank 0.125	27-Nov-18	16:58:38
22	22	181127M1_22	1803630-01 277 Bond Rd 0.10443	27-Nov-18	17:09:12
23	23	181127M1_23	1803630-02 292 Bond Rd 0.11197	27-Nov-18	17:19:51
24	24	181127M1_24	1803630-03 110 Phinney Rd 0.10702	27-Nov-18	17:30:29
25	25	181127M1_25	1803630-04 305 Bond Rd 0.10908	27-Nov-18	17:41:02
26	26	181127M1_26	1803630-05 122 Phinney Rd 0.11013	27-Nov-18	17:51:40
27	27	181127M1_27	1803630-06 123 Phinney Rd 0.09851	27-Nov-18	18:02:13
28	28	181127M1_28	IPA	27-Nov-18	18:12:52
29	29	181127M1_29	ST181127M1-3 PFC CS3 18K1906	27-Nov-18	18:23:26
30	30	181127M1_30	IPA	27-Nov-18	18:34:04
31	31	181127M1_31	1803630-07 277 Bond Rd FRB 0.11327	27-Nov-18	18:44:37
32	32	181127M1_32	B8K0105-BS1 OPR 0.125	27-Nov-18	18:55:15

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Dataset: Untitled

Last Altered: Wednesday, November 28, 2018 08:06:15 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:06:22 Pacific Standard Time

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
33	33	181127M1_33	B8K0105-BLK1 Method Blank 0.125	27-Nov-18	19:05:49
34	34	181127M1_34	1803643-01 DPH-MW10-17 0.11455	27-Nov-18	19:16:27
35	35	181127M1_35	1803643-02 DPH-MW8-17 0.11432	27-Nov-18	19:27:05
36	36	181127M1_36	1803643-03 DPH-MW5-17 0.11778	27-Nov-18	19:37:44
37	37	181127M1_37	1803643-04 DPH-MW9-17 0.11197	27-Nov-18	19:48:16
38	38	181127M1_38	1803643-05 DPH-MW4-17 0.11305	27-Nov-18	19:58:55
39	39	181127M1_39	1803643-06 DPH-MW2-17 0.11423	27-Nov-18	20:09:28
40	40	181127M1_40	1803643-07 DPH-B5 0.11397	27-Nov-18	20:20:06
41	41	181127M1_41	1803643-08 DPH-MW1-17 0.1163	27-Nov-18	20:30:44
42	42	181127M1_42	1803643-09 DPH-EX4 0.11442	27-Nov-18	20:41:18
43	43	181127M1_43	IPA	27-Nov-18	20:51:56
44	44	181127M1_44	ST181127M1-4 PFC CS3 18K1906	27-Nov-18	21:02:28
45	45	181127M1_45	IPA	27-Nov-18	21:13:06
46	46	181127M1_46	1803645-01 DPH-MW6 0.11548	27-Nov-18	21:23:39
47	47	181127M1_47	1803645-02 DPH-MW21 0.11562	27-Nov-18	21:34:18
48	48	181127M1_48	1803645-03 DPH-MW15D 0.11807	27-Nov-18	21:44:56
49	49	181127M1_49	1803645-04 DPH-MW22 0.11748	27-Nov-18	21:55:28
50	50	181127M1_50	1803649-01 DPH-MW18 0.11992	27-Nov-18	22:06:07
51	51	181127M1_51	1803649-02 DPH-MW19 0.11728	27-Nov-18	22:16:45
52	52	181127M1_52	1803649-03 DPH-SW1 0.1142	27-Nov-18	22:27:18
53	53	181127M1_53	1803649-04 DPH-SW3 0.11432	27-Nov-18	22:37:57
54	54	181127M1_54	1803649-05 DPH-SW4 0.11082	27-Nov-18	22:48:35
55	55	181127M1_55	B8K0133-BS1 OPR 0.125	27-Nov-18	22:59:07
56	56	181127M1_56	B8K0133-BLK1 Method Blank 0.125	27-Nov-18	23:09:45
57	57	181127M1_57	1803638-01 Ireland 0.11664	27-Nov-18	23:20:24
58	58	181127M1_58	IPA	27-Nov-18	23:30:57
59	59	181127M1_59	ST181127M1-5 PFC CS3 18K1906	27-Nov-18	23:41:36
60	60	181127M1_60	IPA	27-Nov-18	23:52:09
61	61	181127M1_61	1803639-01 MW-1 0.11477	28-Nov-18	00:02:47
62	62	181127M1_62	1803639-02 MW-3 0.11437	28-Nov-18	00:13:20
63	63	181127M1_63	1803650-01 RFW-3 0.113	28-Nov-18	00:23:58
64	64	181127M1_64	1803650-02 RFW-4 0.11224	28-Nov-18	00:34:30
65	65	181127M1_65	1803650-03 GZ-202A 0.11317	28-Nov-18	00:45:09
66	66	181127M1_66	1803650-04 P-2R (South Spring) 0.11552	28-Nov-18	00:55:47
67	67	181127M1_67	1803653-01 SEA-1 0.11267	28-Nov-18	01:06:20
68	68	181127M1_68	1803653-02 SEA-2 0.1142	28-Nov-18	01:16:59

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Dataset: Untitled

Last Altered: Wednesday, November 28, 2018 08:06:15 Pacific Standard Time
Printed: Wednesday, November 28, 2018 08:06:22 Pacific Standard Time

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
69	69	181127M1_69	1803653-03 DH-1A 0.11294	28-Nov-18	01:27:32
70	70	181127M1_70	1803653-04 SW-2 0.11723	28-Nov-18	01:38:10
71	71	181127M1_71	IPA	28-Nov-18	01:48:43
72	72	181127M1_72	ST181127M1-6 PFC CS3 18K1906	28-Nov-18	01:59:21
73	73	181127M1_73	IPA	28-Nov-18	02:10:00
74	74	181127M1_74	1803653-05 Seep 0.11658	28-Nov-18	02:20:31
75	75	181127M1_75	B8K0146-BS1 OPR 0.25	28-Nov-18	02:31:10
76	76	181127M1_76	B8K0146-BLK1 Method Blank 0.25	28-Nov-18	02:41:43
77	77	181127M1_77	1803692-01 SWIN1811071400GGA 0.22883	28-Nov-18	02:52:22
78	78	181127M1_78	1803692-02 SWEF1811071430GGA 0.24623	28-Nov-18	03:02:54
79	79	181127M1_79	B8K0140-BS1 OPR 0.25	28-Nov-18	03:13:33
80	80	181127M1_80	B8K0140-BLK1 Method Blank 0.25	28-Nov-18	03:24:11
81	81	181127M1_81	1803675-01 GW0110161811150925KER 0.2531	28-Nov-18	03:34:45
82	82	181127M1_82	1803675-02 GW0480531811151025KER 0.25333	28-Nov-18	03:45:23
83	83	181127M1_83	1803675-03 EB11811151030MK 0.2493	28-Nov-18	03:56:01
84	84	181127M1_84	1803675-04 GW0750801811151140KER 0.25044	28-Nov-18	04:06:34
85	85	181127M1_85	1803675-05 GW0800851811151255KER 0.25087	28-Nov-18	04:17:12
86	86	181127M1_86	1803675-06 GW0850901811151405KER 0.24759	28-Nov-18	04:27:51
87	87	181127M1_87	1803675-07 GW0920971811151535KER 0.24638	28-Nov-18	04:38:24
88	88	181127M1_88	IPA	28-Nov-18	04:49:03
89	89	181127M1_89	ST181127M1-7 PFC CS3 18K1906	28-Nov-18	04:59:41
90	90	181127M1_90	IPA	28-Nov-18	05:10:15
91	91	181127M1_91	1803675-08 GW0971021811151650KER 0.24641	28-Nov-18	05:20:53
92	92	181127M1_92	1803675-09 GW0230281811121610MK 0.25313	28-Nov-18	05:31:26
93	93	181127M1_93	1803675-10 GW0280331811131655KER 0.24856	28-Nov-18	05:42:04
94	94	181127M1_94	1803675-11 GW0820871811141045KER 0.24842	28-Nov-18	05:52:42
95	95	181127M1_95	1803675-12 FB1811141050KER 0.24655	28-Nov-18	06:03:15
96	96	181127M1_96	1803675-13 GW0971021811141145KER 0.2461	28-Nov-18	06:13:53
97	97	181127M1_97	1803675-14 GW0280331811141310KER 0.24685	28-Nov-18	06:24:32
98	98	181127M1_98	1803675-15 GW0890941811141415KER 0.24549	28-Nov-18	06:35:05
99	99	181127M1_99	1803675-16 GW0991041811141615KER 0.24811	28-Nov-18	06:45:43
100	1...	181127M1_100	1803675-17 GW0991041811141620KER-FD 0.24325	28-Nov-18	06:56:16
101	1...	181127M1_101	QC MEOH LOT JB072509	28-Nov-18	07:06:55
102	1...	181127M1_102	IPA	28-Nov-18	07:17:28
103	1...	181127M1_103	ST181127M1-8 PFC CS3 18K1906	28-Nov-18	07:28:06
104	1...	181127M1_104	IPA	28-Nov-18	07:38:39

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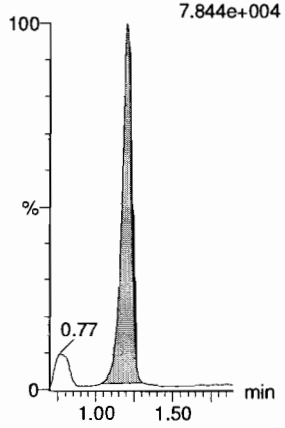
Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:09:49 Pacific Standard Time

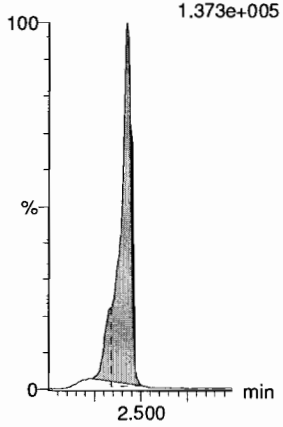
Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112718.mdb 28 Nov 2018 07:06:35
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

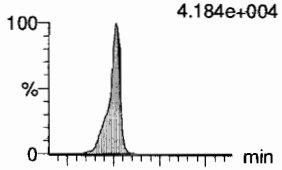
PFBA
F2:MRM of 1 channel,ES-
213.0 > 168.8
7.844e+004



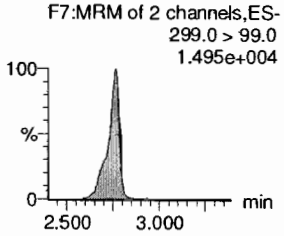
PFPeA
F5:MRM of 1 channel,ES-
263.1 > 218.9
1.373e+005



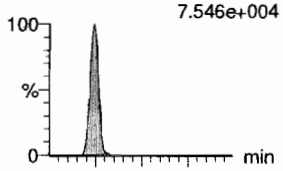
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
4.184e+004



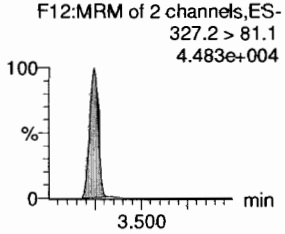
F7:MRM of 2 channels,ES-
299.0 > 99.0
1.495e+004



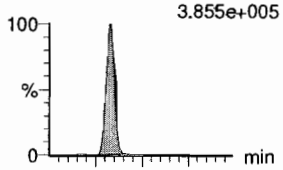
4:2 FTS
F12:MRM of 2 channels,ES-
327.2 > 307.2
7.546e+004



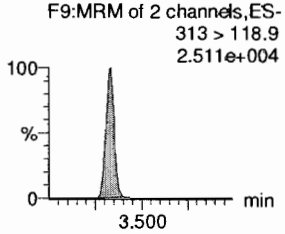
F12:MRM of 2 channels,ES-
327.2 > 81.1
4.483e+004



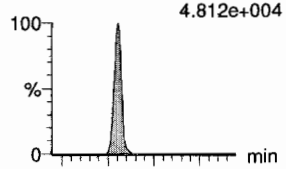
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
3.855e+005



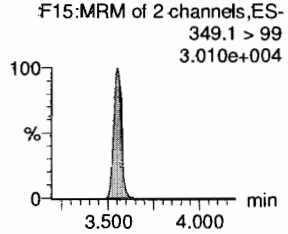
F9:MRM of 2 channels,ES-
313 > 118.9
2.511e+004



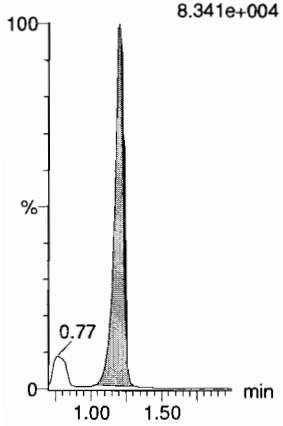
PFPeS
F15:MRM of 2 channels,ES-
349.1 > 80.1
4.812e+004



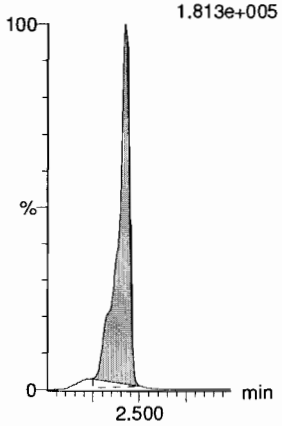
F15:MRM of 2 channels,ES-
349.1 > 99
3.010e+004



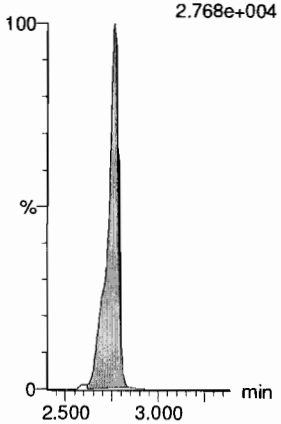
13C3-PFBA
F3:MRM of 1 channel,ES-
216.1 > 171.8
8.341e+004



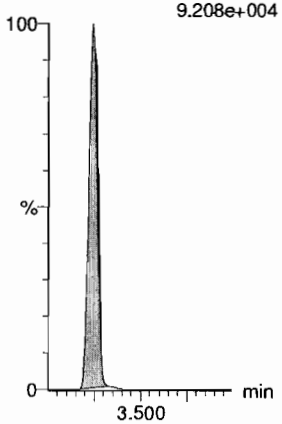
13C3-PFPeA
F6:MRM of 1 channel,ES-
266. > 221.8
1.813e+005



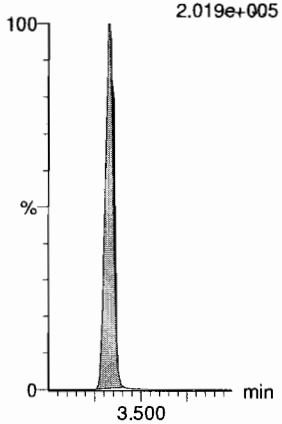
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
2.768e+004



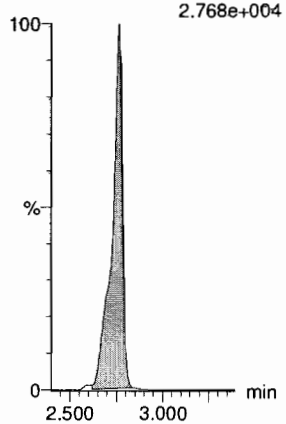
13C2-4:2 FTS
F13:MRM of 1 channel,ES-
329.2 > 308.9
9.208e+004



13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
2.019e+005



13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
2.768e+004



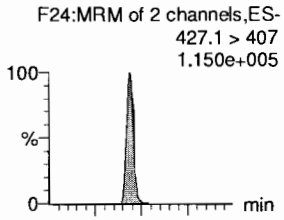
MJT 11/28/2018

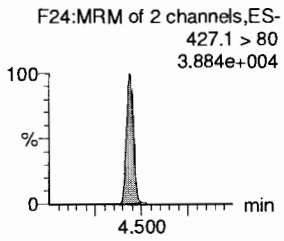
Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:09:49 Pacific Standard Time

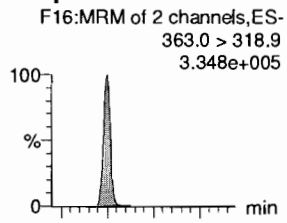
Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

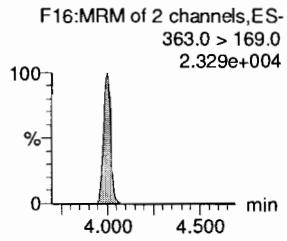
6:2 FTS



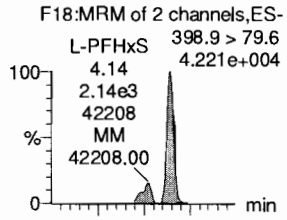


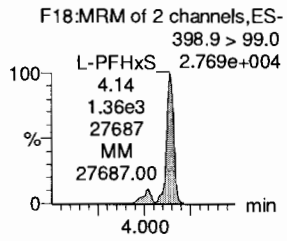
PFHpA



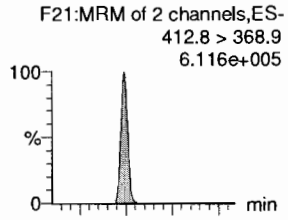


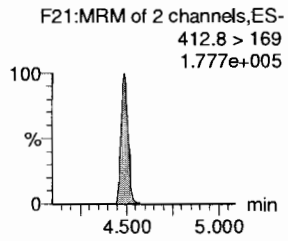
L-PFHxS



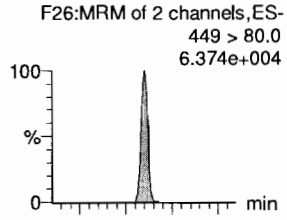


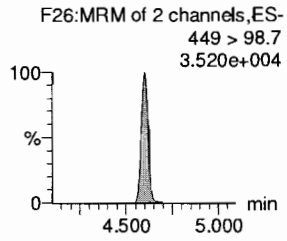
L-PFOA



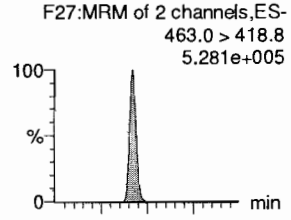


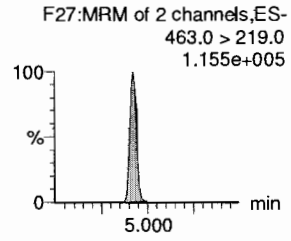
PFHpS



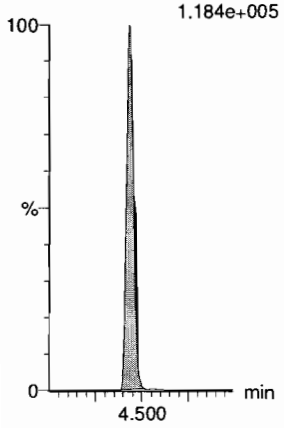


PFNA

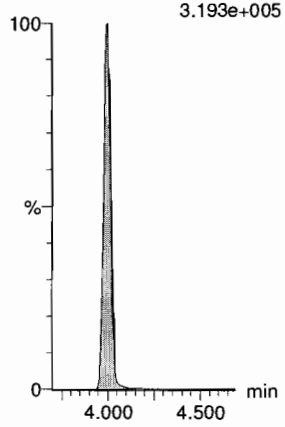




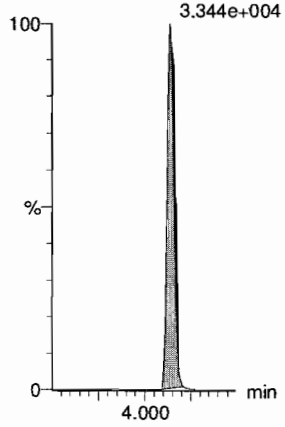
13C2-6:2 FTS



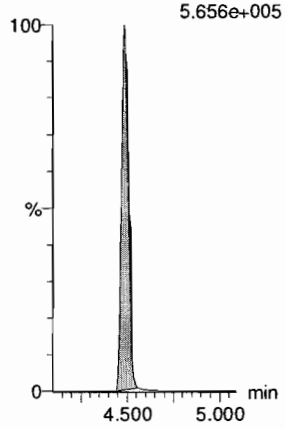
13C4-PFHpA



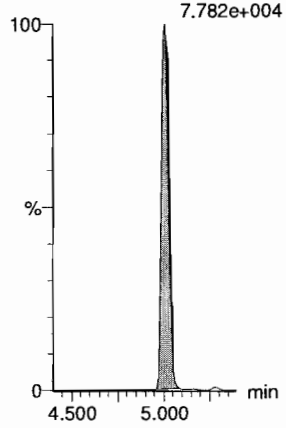
18O2-PFHxS



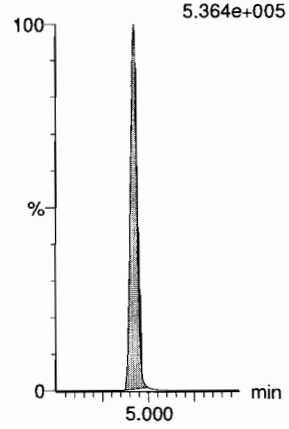
13C2-PFOA



13C8-PFOS



13C5-PFNA



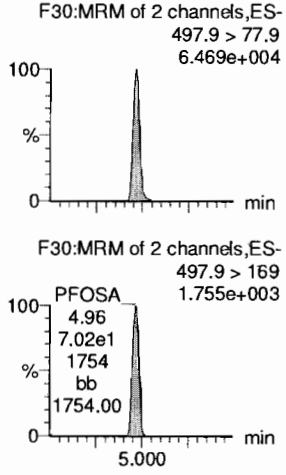
MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

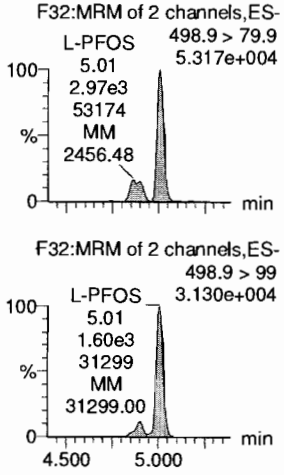
Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:09:49 Pacific Standard Time

Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

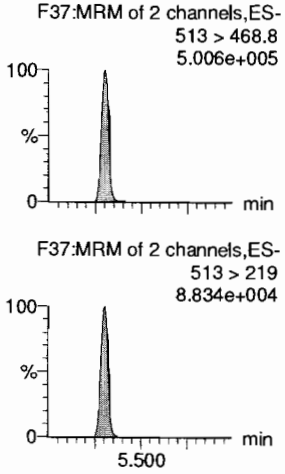
PFOSA



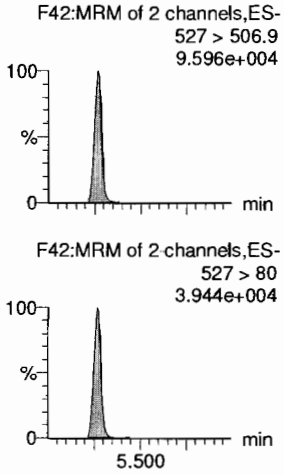
L-PFOS



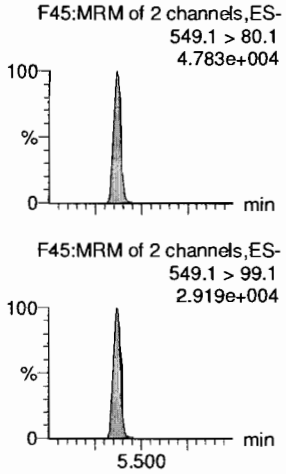
PFDA



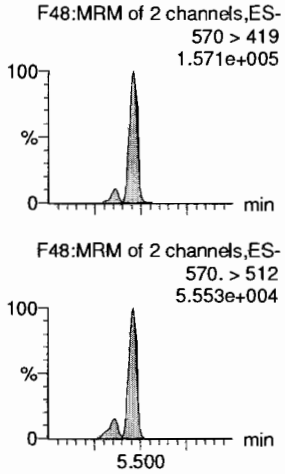
8:2 FTS



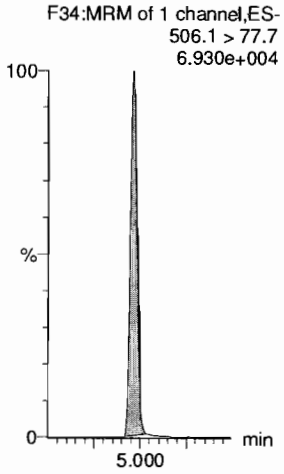
PFNS



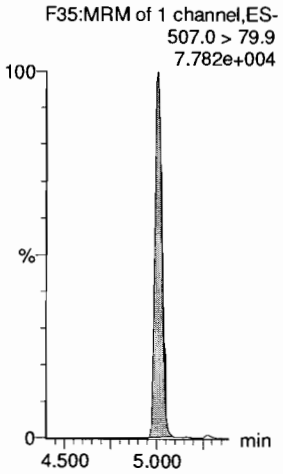
L-MeFOSAA



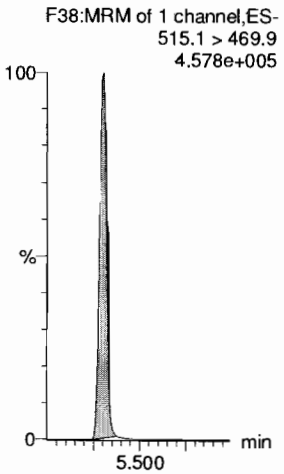
13C8-PFOSA



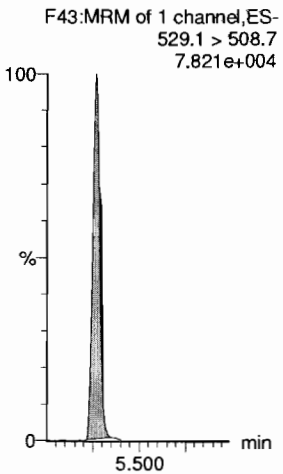
13C8-PFOS



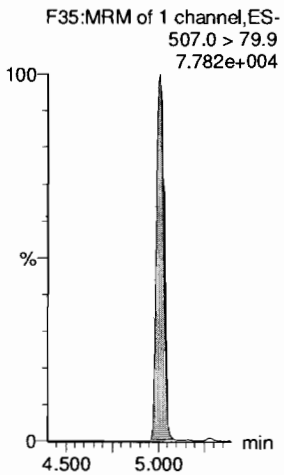
13C2-PFDA



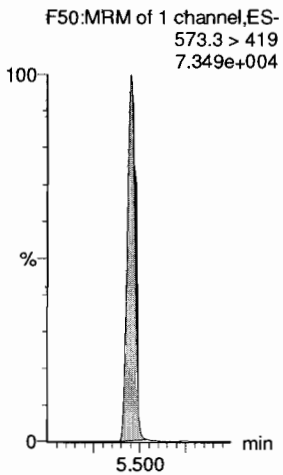
13C2-8:2 FTS



13C8-PFOS



d3-N-MeFOSAA



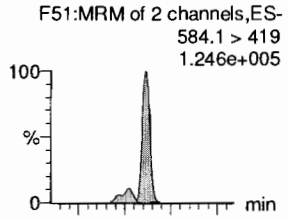
MJT 11/28/2018

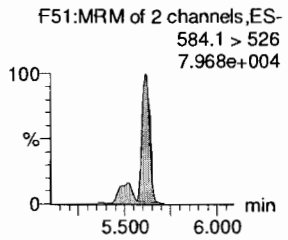
Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:09:49 Pacific Standard Time

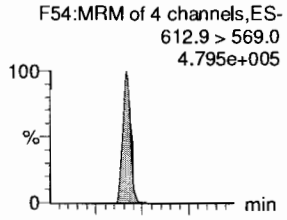
Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

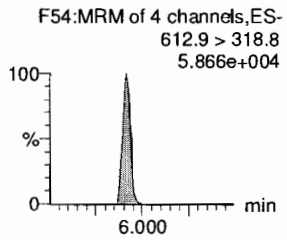
L-EtFOSAA



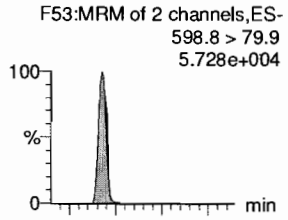


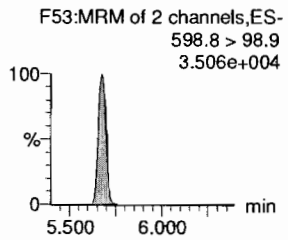
PFDoA



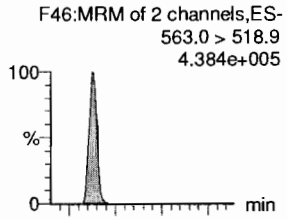


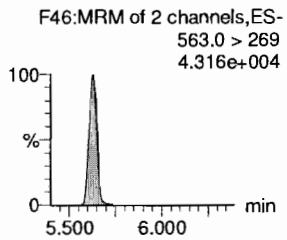
PFDS



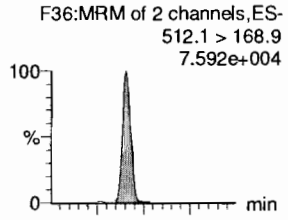


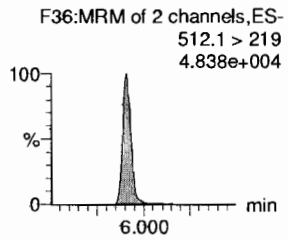
PFUdA



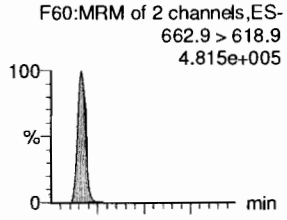


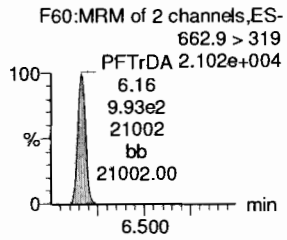
N-MeFOSA



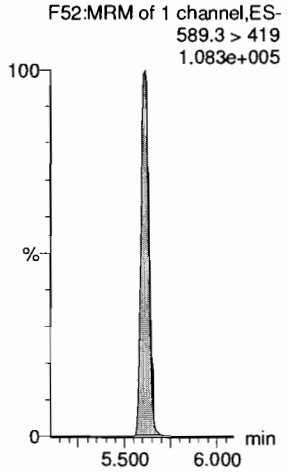


PFTrDA

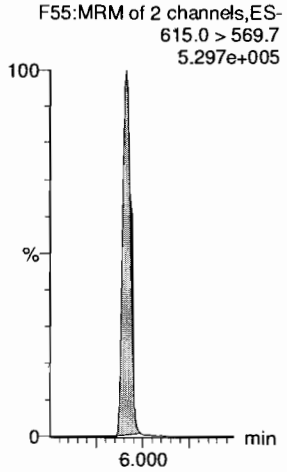




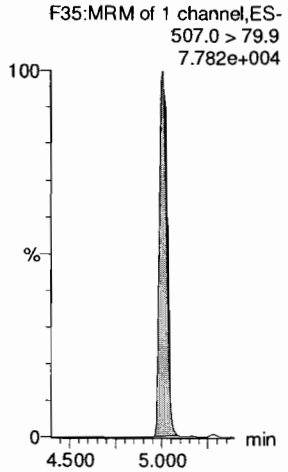
d5-N-EtFOSAA



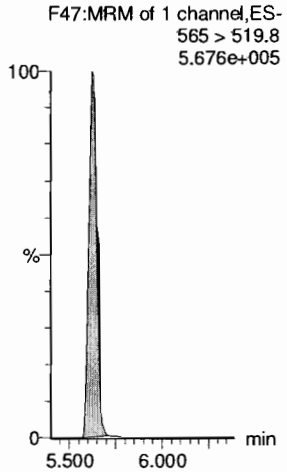
13C2-PFDoA



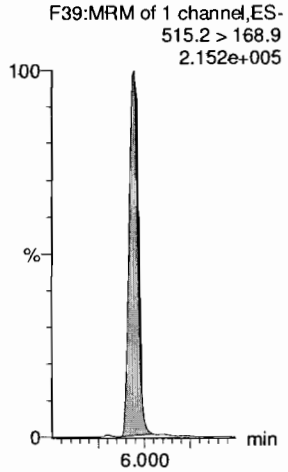
13C8-PFOS



13C2-PFUdA



d3-N-MeFOSA



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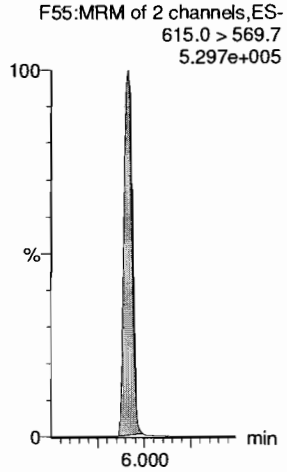


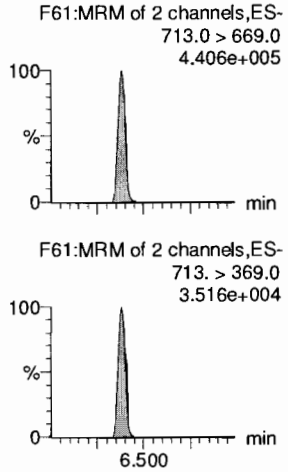
MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

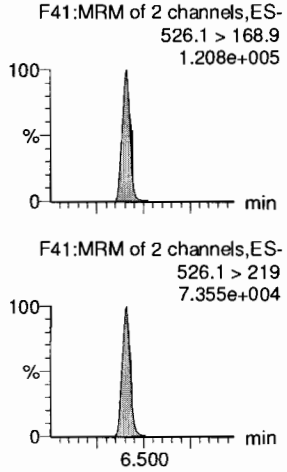
Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:09:49 Pacific Standard Time

Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

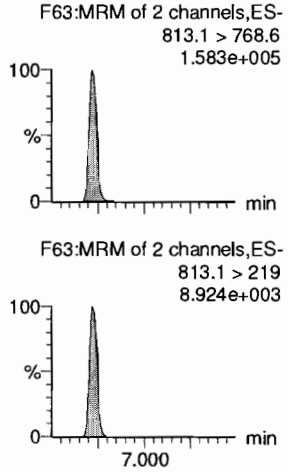
PFTeDA



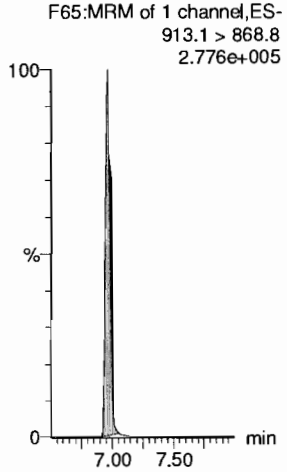
N-EtFOSA



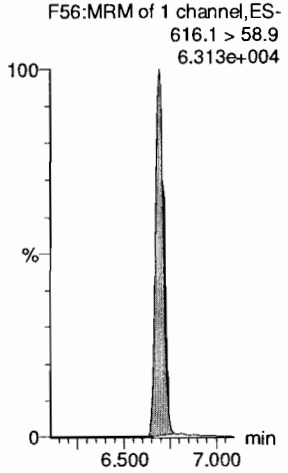
PFHxDA



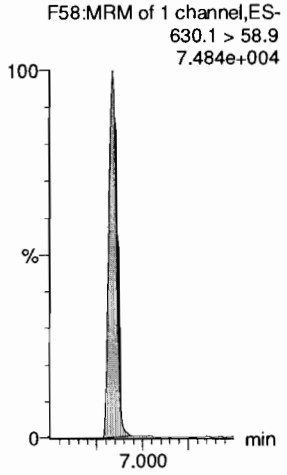
PFODA



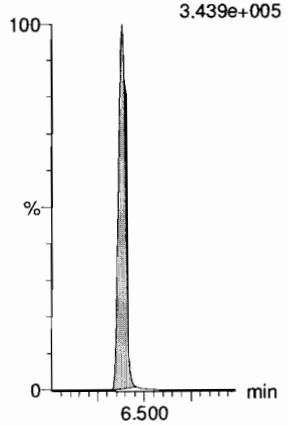
N-MeFOSE



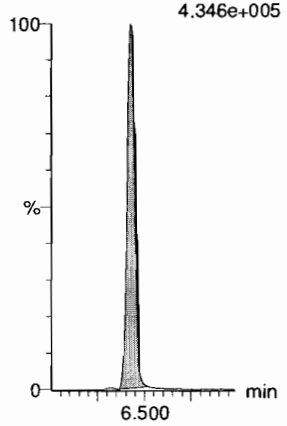
N-EtFOSE



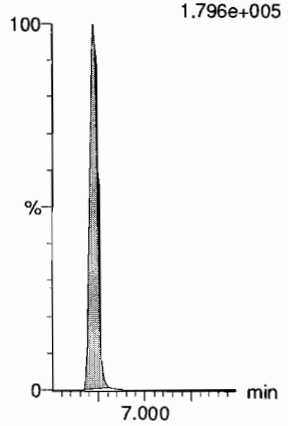
13C2-PFTeDA



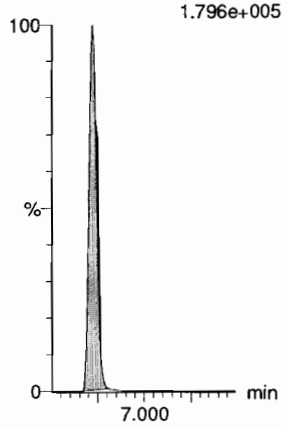
d5-N-ETFOSA



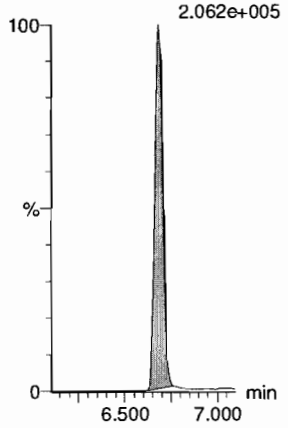
13C2-PFHxDA



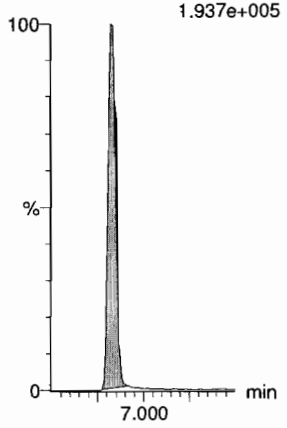
13C2-PFHxDA



d7-N-MeFOSE



d9-N-EtFOSE



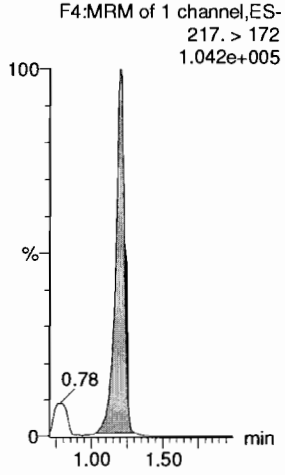
MJT 11/28/2018

Dataset: F:\Projects\PFAS.PRO\Results\181127M1\181127M1-9.qld

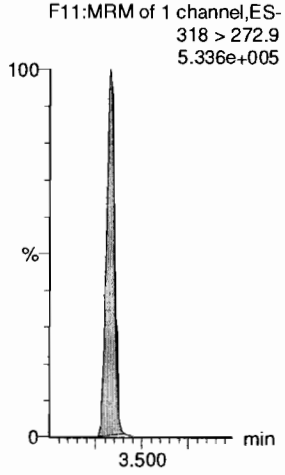
Last Altered: Wednesday, November 28, 2018 07:06:39 Pacific Standard Time
Printed: Wednesday, November 28, 2018 07:09:49 Pacific Standard Time

Name: 181127M1_9, Date: 27-Nov-2018, Time: 13:36:33, ID: ST181127M1-2 PFC CS3 18K1906, Description: PFC CS3 18K1906

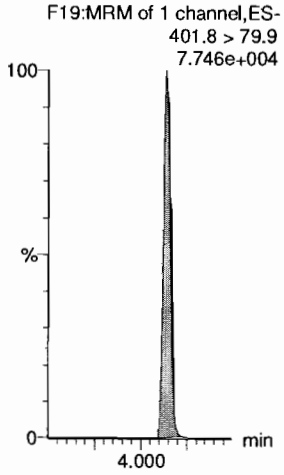
13C4-PFBA



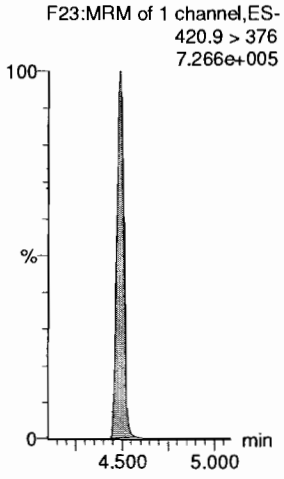
13C5-PFHxA



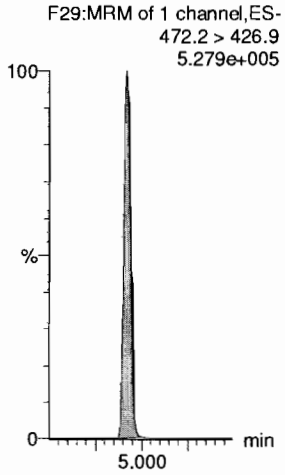
13C3-PFHxS



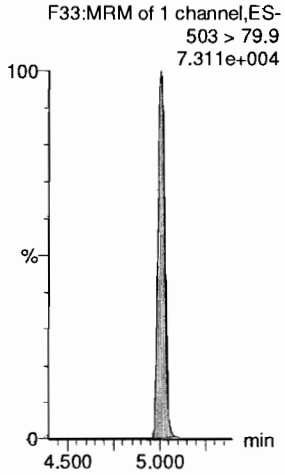
13C8-PFOA



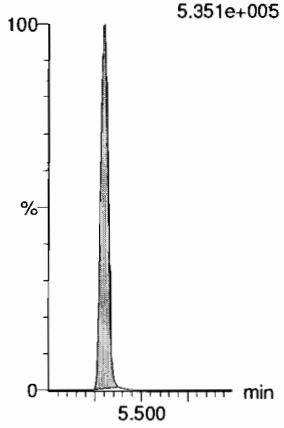
13C9-PFNA



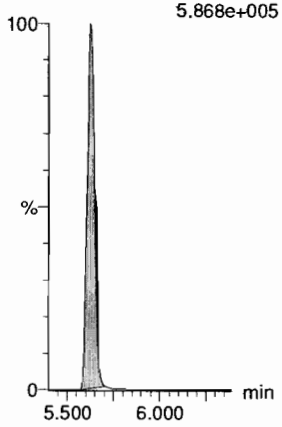
13C4-PFOS



13C6-PFDA



13C7-PFUdA



MJT 11/28/2018

INITIAL CALIBRATION (ICAL)

INCLUDING ASSOCIATED

INITIAL CALIBRATION VERIFICATION (ICV) AND INSTRUMENT BLANK (IB)

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:39:52 Pacific Standard Time

Low Points:
PFHpS = 0.5
L-MeFOSAA = ↓
AD 11/26/18

High Points:
4:2 FTS = 100.0
6:2 FTS = ↓
8:2 FTS = ↓

SCANNED
LE 11-27-18

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Compound name: PFBA
Correlation coefficient: r = 0.999908, r^2 = 0.999815
Calibration curve: 1.16478 * x + 0.0685845
Response type: Internal Std (Ref 36), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	1.24	183.738	6270.790	0.366	0.3	2.2	NO	1.000	NO	bb
2	2	181126M1_3	Standard	0.500	1.25	340.934	6633.369	0.642	0.5	-1.5	NO	1.000	NO	bb
3	3	181126M1_4	Standard	1.000	1.24	642.564	6764.591	1.187	1.0	-3.9	NO	1.000	NO	MM
4	4	181126M1_5	Standard	2.000	1.24	1322.368	7071.333	2.338	1.9	-2.6	NO	1.000	NO	bb
5	5	181126M1_6	Standard	5.000	1.25	3643.227	6957.322	6.546	5.6	11.2	NO	1.000	NO	bb
6	6	181126M1_7	Standard	10.000	1.24	6138.045	6644.186	11.548	9.9	-1.4	NO	1.000	NO	bb
7	7	181126M1_8	Standard	50.000	1.25	31426.422	6904.515	56.895	48.8	-2.4	NO	1.000	NO	bb
8	8	181126M1_9	Standard	100.000	1.25	61698.742	6776.515	113.810	97.7	-2.3	NO	1.000	NO	bb
9	9	181126M1_10	Standard	250.000	1.25	159628.000	6830.738	292.113	250.7	0.3	NO	1.000	NO	bb
10	10	181126M1_11	Standard	500.000	1.25	313498.281	6694.321	585.381	502.5	0.5	NO	1.000	NO	MM

Compound name: PFPeA
Coefficient of Determination: R^2 = 0.999820
Calibration curve: 4.72356e-006 * x^2 + 0.945965 * x + 0.0647094
Response type: Internal Std (Ref 37), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	2.46	296.702	13715.434	0.270	0.2	-13.0	NO	1.000	NO	bb
2	2	181126M1_3	Standard	0.500	2.46	576.677	13723.302	0.525	0.5	-2.6	NO	1.000	NO	bb
3	3	181126M1_4	Standard	1.000	2.47	1163.755	14561.754	0.999	1.0	-1.2	NO	1.000	NO	bb
4	4	181126M1_5	Standard	2.000	2.47	2351.481	14296.794	2.056	2.1	5.2	NO	1.000	NO	bb
5	5	181126M1_6	Standard	5.000	2.47	6422.912	14592.260	5.502	5.7	15.0	NO	1.000	NO	bb
6	6	181126M1_7	Standard	10.000	2.47	10510.064	13932.524	9.429	9.9	-1.0	NO	1.000	NO	bb
7	7	181126M1_8	Standard	50.000	2.47	54578.820	14718.107	46.353	48.9	-2.2	NO	1.000	NO	bb
8	8	181126M1_9	Standard	100.000	2.47	106488.234	14155.756	94.033	99.3	-0.7	NO	1.000	NO	bb
9	9	181126M1_10	Standard	250.000	2.47	265132.813	13897.646	238.469	251.7	0.7	NO	1.000	NO	bb
10	10	181126M1_11	Standard	500.000	2.47	488747.781	12898.420	473.651	499.4	-0.1	NO	1.000	NO	bb

✓Cod
11/26/18

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:39:52 Pacific Standard Time

Compound name: PFBS
Coefficient of Determination: R^2 = 0.997695
Calibration curve: -0.000161679 * x^2 + 2.06224 * x + 0.0291321
Response type: Internal Std (Ref 38), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	2.80	73.448	1786.299	0.514	0.2	-6.0	NO	0.998	NO	bb
2	2	181126M1_3	Standard	0.500	2.80	177.174	1802.877	1.228	0.6	16.3	NO	0.998	NO	bb
3	3	181126M1_4	Standard	1.000	2.80	282.362	1800.875	1.960	0.9	-6.4	NO	0.998	NO	bb
4	4	181126M1_5	Standard	2.000	2.80	575.266	1859.173	3.868	1.9	-6.9	NO	0.998	NO	bb
5	5	181126M1_6	Standard	5.000	2.80	1728.002	1822.236	11.854	5.7	14.7	NO	0.998	NO	bb
6	6	181126M1_7	Standard	10.000	2.80	2914.542	1802.554	20.211	9.8	-2.1	NO	0.998	NO	bd
7	7	181126M1_8	Standard	50.000	2.80	14242.043	1924.595	92.500	45.0	-10.0	NO	0.998	NO	bb
8	8	181126M1_9	Standard	100.000	2.80	27722.197	1781.169	194.551	95.0	-5.0	NO	0.998	NO	bb
9	9	181126M1_10	Standard	250.000	2.80	67245.094	1561.142	538.429	266.6	6.7	NO	0.998	NO	bb
10	10	181126M1_11	Standard	500.000	2.81	116742.313	1493.188	977.291	492.9	-1.4	NO	0.998	NO	bb

Compound name: 4:2 FTS
Coefficient of Determination: R^2 = 0.997744
Calibration curve: -0.00329241 * x^2 + 1.0746 * x + 0.0302455
Response type: Internal Std (Ref 39), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	3.27	90.849	4949.353	0.229	0.2	-25.8	NO	0.998	NO	bb
2	2	181126M1_3	Standard	0.500	3.27	222.315	4658.786	0.596	0.5	5.6	NO	0.998	NO	bb
3	3	181126M1_4	Standard	1.000	3.28	473.364	5081.407	1.164	1.1	5.9	NO	0.998	NO	bb
4	4	181126M1_5	Standard	2.000	3.28	868.578	4976.478	2.182	2.0	0.7	NO	0.998	NO	bb
5	5	181126M1_6	Standard	5.000	3.28	2461.108	4945.298	6.221	5.9	17.3	NO	0.998	NO	bb
6	6	181126M1_7	Standard	10.000	3.28	3902.045	4705.861	10.365	9.9	-0.8	NO	0.998	NO	bb
7	7	181126M1_8	Standard	50.000	3.28	18622.355	5303.523	43.891	47.8	-4.4	NO	0.998	NO	bb
8	8	181126M1_9	Standard	100.000	3.28	34287.551	5688.242	75.347	101.9	1.9	NO	0.998	NO	bb
9	9	181126M1_10	Standard	250.000	3.28	74749.492	6866.882	136.069			NO	0.998	NO	bbXl
10	10	181126M1_11	Standard	500.000	3.28	117960.859	8003.897	184.224			NO	0.998	NO	bbXl

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:39:52 Pacific Standard Time

Compound name: PFHxA
Coefficient of Determination: R^2 = 0.999832
Calibration curve: -0.000104875 * x^2 + 0.943399 * x + 0.0492708
Response type: Internal Std (Ref 40), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	3.36	543.690	9787.215	0.278	0.2	-3.1	NO	1.000	NO	MM
2	2	181126M1_3	Standard	0.500	3.36	1002.725	9629.179	0.521	0.5	-0.1	NO	1.000	NO	bb
3	3	181126M1_4	Standard	1.000	3.37	2160.279	10373.639	1.041	1.1	5.2	NO	1.000	NO	bb
4	4	181126M1_5	Standard	2.000	3.36	4246.874	10091.624	2.104	2.2	8.9	NO	1.000	NO	bb
5	5	181126M1_6	Standard	5.000	3.36	11085.394	10427.667	5.315	5.6	11.7	NO	1.000	NO	bb
6	6	181126M1_7	Standard	10.000	3.36	19080.154	10138.645	9.410	9.9	-0.7	NO	1.000	NO	bb
7	7	181126M1_8	Standard	50.000	3.36	95866.445	10164.805	47.156	50.2	0.4	NO	1.000	NO	bb
8	8	181126M1_9	Standard	100.000	3.36	187440.484	10236.929	91.551	98.1	-1.9	NO	1.000	NO	bb
9	9	181126M1_10	Standard	250.000	3.36	452512.406	9817.484	230.463	251.3	0.5	NO	1.000	NO	bb
10	10	181126M1_11	Standard	500.000	3.36	822435.563	9234.549	445.304	499.7	-0.1	NO	1.000	NO	bb

Compound name: PFPeS
Coefficient of Determination: R^2 = 0.998416
Calibration curve: -0.00034984 * x^2 + 1.67039 * x + 0.0318278
Response type: Internal Std (Ref 38), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	3.58	51.237	1786.299	0.359	0.2	-21.8	NO	0.998	NO	bb
2	2	181126M1_3	Standard	0.500	3.58	133.691	1802.877	0.927	0.5	7.2	NO	0.998	NO	bb
3	3	181126M1_4	Standard	1.000	3.58	238.063	1800.875	1.652	1.0	-3.0	NO	0.998	NO	bd
4	4	181126M1_5	Standard	2.000	3.58	574.238	1859.173	3.861	2.3	14.7	NO	0.998	NO	bb
5	5	181126M1_6	Standard	5.000	3.58	1401.943	1822.236	9.617	5.7	14.9	NO	0.998	NO	bb
6	6	181126M1_7	Standard	10.000	3.58	2301.248	1802.554	15.958	9.6	-4.5	NO	0.998	NO	bb
7	7	181126M1_8	Standard	50.000	3.58	11780.987	1924.595	76.516	46.2	-7.5	NO	0.998	NO	bb
8	8	181126M1_9	Standard	100.000	3.58	22362.012	1781.169	156.934	95.9	-4.1	NO	0.998	NO	bb
9	9	181126M1_10	Standard	250.000	3.58	51911.930	1561.142	415.657	263.3	5.3	NO	0.998	NO	bb
10	10	181126M1_11	Standard	500.000	3.58	88368.578	1493.188	739.764	494.0	-1.2	NO	0.998	NO	bb

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Compound name: PFHpA
Correlation coefficient: r = 0.999783, r^2 = 0.999567
Calibration curve: 1.30873 * x + 0.0886199
Response type: Internal Std (Ref 41), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	4.02	391.774	14063.499	0.348	0.2	-20.7	NO	1.000	NO	bb
2	2	181126M1_3	Standard	0.500	4.02	821.452	14566.622	0.705	0.5	-5.8	NO	1.000	NO	bb
3	3	181126M1_4	Standard	1.000	4.02	1646.863	14599.738	1.410	1.0	1.0	NO	1.000	NO	bb
4	4	181126M1_5	Standard	2.000	4.02	3230.693	13961.896	2.892	2.1	7.1	NO	1.000	NO	bb
5	5	181126M1_6	Standard	5.000	4.02	8943.927	14034.775	7.966	6.0	20.4	NO	1.000	NO	bb
6	6	181126M1_7	Standard	10.000	4.02	14191.912	13678.921	12.969	9.8	-1.6	NO	1.000	NO	bb
7	7	181126M1_8	Standard	50.000	4.02	73303.828	14249.999	64.302	49.1	-1.9	NO	1.000	NO	bb
8	8	181126M1_9	Standard	100.000	4.02	137761.203	13058.787	131.866	100.7	0.7	NO	1.000	NO	bb
9	9	181126M1_10	Standard	250.000	4.02	333762.781	12520.175	333.225	254.5	1.8	NO	1.000	NO	bb
10	10	181126M1_11	Standard	500.000	4.02	576309.688	11123.910	647.602	494.8	-1.0	NO	1.000	NO	bb

Compound name: L-PFHxS
Coefficient of Determination: R^2 = 0.998700
Calibration curve: 7.11978e-005 * x^2 + 1.94438 * x + -0.00102564
Response type: Internal Std (Ref 42), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	4.15	63.089	1490.698	0.529	0.3	9.0	NO	0.999	NO	MM
2	2	181126M1_3	Standard	0.500	4.16	102.182	1447.785	0.882	0.5	-9.1	NO	0.999	NO	MM
3	3	181126M1_4	Standard	1.000	4.16	242.957	1581.371	1.920	1.0	-1.2	NO	0.999	NO	MM
4	4	181126M1_5	Standard	2.000	4.16	471.273	1558.457	3.780	1.9	-2.8	NO	0.999	NO	MM
5	5	181126M1_6	Standard	5.000	4.16	1417.070	1526.846	11.601	6.0	19.3	NO	0.999	NO	MM
6	6	181126M1_7	Standard	10.000	4.16	2169.523	1542.694	17.579	9.0	-9.6	NO	0.999	NO	MM
7	7	181126M1_8	Standard	50.000	4.16	11650.288	1579.074	92.224	47.3	-5.3	NO	0.999	NO	MM
8	8	181126M1_9	Standard	100.000	4.16	22089.543	1478.125	186.804	95.7	-4.3	NO	0.999	NO	MM
9	9	181126M1_10	Standard	250.000	4.16	53430.172	1300.621	513.506	261.6	4.6	NO	0.999	NO	MM
10	10	181126M1_11	Standard	500.000	4.16	95683.875	1219.567	980.716	495.4	-0.9	NO	0.999	NO	MM

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Compound name: 6:2 FTS
Coefficient of Determination: R^2 = 0.997882
Calibration curve: -0.0044139 * x^2 + 1.28489 * x + 0.0365766
Response type: Internal Std (Ref 43), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	0.250	4.46	147.008	5225.320	0.352	0.2	-1.8	NO	0.998	NO	bb
2	2 181126M1_3	Standard	0.500	4.46	259.646	5165.596	0.628	0.5	-7.7	NO	0.998	NO	bb
3	3 181126M1_4	Standard	1.000	4.46	573.600	5387.143	1.331	1.0	1.1	NO	0.998	NO	bb
4	4 181126M1_5	Standard	2.000	4.46	1126.191	5074.225	2.774	2.1	7.3	NO	0.998	NO	bb
5	5 181126M1_6	Standard	5.000	4.46	3033.546	5181.676	7.318	5.8	15.6	NO	0.998	NO	bb
6	6 181126M1_7	Standard	10.000	4.46	4878.658	4894.738	12.459	10.0	0.1	NO	0.998	NO	bb
7	7 181126M1_8	Standard	50.000	4.46	22742.309	5563.122	51.101	47.5	-5.0	NO	0.998	NO	bb
8	8 181126M1_9	Standard	100.000	4.46	41145.855	6022.125	85.406	102.6	2.6	NO	0.998	NO	bb
9	9 181126M1_10	Standard	250.000	4.46	92251.859	7202.659	160.100			NO	0.998	NO	bbXl
10	10 181126M1_11	Standard	500.000	4.46	150251.734	9468.253	198.363			NO	0.998	NO	bbXl

Compound name: L-PFOA
Coefficient of Determination: R^2 = 0.999794
Calibration curve: 3.30794e-005 * x^2 + 1.35692 * x + 0.157598
Response type: Internal Std (Ref 44), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	0.250	4.50	859.697	24359.602	0.441	0.2	-16.4	NO	1.000	NO	bb
2	2 181126M1_3	Standard	0.500	4.51	1402.470	24354.520	0.720	0.4	-17.1	NO	1.000	NO	bb
3	3 181126M1_4	Standard	1.000	4.51	3123.076	24178.301	1.615	1.1	7.4	NO	1.000	NO	bb
4	4 181126M1_5	Standard	2.000	4.51	5800.527	23443.150	3.093	2.2	8.2	NO	1.000	NO	bb
5	5 181126M1_6	Standard	5.000	4.51	15085.033	23552.342	8.006	5.8	15.7	NO	1.000	NO	bb
6	6 181126M1_7	Standard	10.000	4.51	25699.873	22507.277	14.273	10.4	4.0	NO	1.000	NO	bb
7	7 181126M1_8	Standard	50.000	4.51	129049.719	23848.943	67.639	49.7	-0.7	NO	1.000	NO	bb
8	8 181126M1_9	Standard	100.000	4.52	241531.141	22357.822	135.037	99.2	-0.8	NO	1.000	NO	bb
9	9 181126M1_10	Standard	250.000	4.52	588288.500	21588.547	340.625	249.4	-0.2	NO	1.000	NO	bb
10	10 181126M1_11	Standard	500.000	4.52	1097817.125	19958.678	687.556	500.5	0.1	NO	1.000	NO	bb

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Compound name: PFHpS
Coefficient of Determination: R^2 = 0.999257
Calibration curve: -2.62046e-005 * x^2 + 0.932171 * x + 0.0595585
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	0.250	4.61	37.734	3276.263	0.144	0.1	-63.8	YES	0.999	NO	bbX
2	2 181126M1_3	Standard	0.500	4.62	124.551	3416.156	0.456	0.4	-15.0	NO	0.999	NO	bb
3	3 181126M1_4	Standard	1.000	4.62	296.909	3743.129	0.992	1.0	-0.0	NO	0.999	NO	bb
4	4 181126M1_5	Standard	2.000	4.62	580.380	3748.331	1.935	2.0	0.6	NO	0.999	NO	bb
5	5 181126M1_6	Standard	5.000	4.62	1591.427	3674.965	5.413	5.7	14.9	NO	0.999	NO	bb
6	6 181126M1_7	Standard	10.000	4.62	2597.803	3393.818	9.568	10.2	2.0	NO	0.999	NO	bb
7	7 181126M1_8	Standard	50.000	4.62	13942.404	3698.358	47.124	50.6	1.1	NO	0.999	NO	bb
8	8 181126M1_9	Standard	100.000	4.63	25496.764	3638.886	87.584	94.1	-5.9	NO	0.999	NO	bb
9	9 181126M1_10	Standard	250.000	4.63	60578.254	3187.154	237.588	256.7	2.7	NO	0.999	NO	bb
10	10 181126M1_11	Standard	500.000	4.63	106407.352	2906.952	457.556	497.8	-0.4	NO	0.999	NO	bb

Compound name: PFNA
Coefficient of Determination: R^2 = 0.999758
Calibration curve: -0.000123392 * x^2 + 1.25051 * x + 0.0436441
Response type: Internal Std (Ref 45), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	0.250	4.93	537.912	22295.369	0.302	0.2	-17.5	NO	1.000	NO	bd
2	2 181126M1_3	Standard	0.500	4.94	1200.616	21931.633	0.684	0.5	2.5	NO	1.000	NO	bd
3	3 181126M1_4	Standard	1.000	4.94	2409.214	23014.137	1.309	1.0	1.2	NO	1.000	NO	bb
4	4 181126M1_5	Standard	2.000	4.94	4898.088	22367.645	2.737	2.2	7.7	NO	1.000	NO	bb
5	5 181126M1_6	Standard	5.000	4.94	13174.647	23199.723	7.098	5.6	12.9	NO	1.000	NO	bb
6	6 181126M1_7	Standard	10.000	4.94	21293.529	22312.191	11.929	9.5	-4.9	NO	1.000	NO	bb
7	7 181126M1_8	Standard	50.000	4.94	111154.172	22610.824	61.450	49.3	-1.3	NO	1.000	NO	bb
8	8 181126M1_9	Standard	100.000	4.94	210237.266	21568.918	121.840	98.4	-1.6	NO	1.000	NO	bb
9	9 181126M1_10	Standard	250.000	4.94	500506.188	20252.943	308.910	253.3	1.3	NO	1.000	NO	bb
10	10 181126M1_11	Standard	500.000	4.94	857858.188	18084.188	592.962	498.7	-0.3	NO	1.000	NO	bb

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Compound name: PFOSA
Coefficient of Determination: R^2 = 0.999684
Calibration curve: 0.000109224 * x^2 + 1.13948 * x + -0.0243111
Response type: Internal Std (Ref 46), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	4.98	37.764	2329.393	0.203	0.2	-20.3	NO	1.000	NO	bb
2	2	181126M1_3	Standard	0.500	4.98	110.152	2448.447	0.562	0.5	3.0	NO	1.000	NO	bb
3	3	181126M1_4	Standard	1.000	4.98	237.631	2561.796	1.159	1.0	3.9	NO	1.000	NO	bb
4	4	181126M1_5	Standard	2.000	4.98	493.075	2603.493	2.367	2.1	4.9	NO	1.000	NO	bb
5	5	181126M1_6	Standard	5.000	4.98	1413.673	2769.347	6.381	5.6	12.4	NO	1.000	NO	bb
6	6	181126M1_7	Standard	10.000	4.98	2401.244	2637.660	11.380	10.0	-0.0	NO	1.000	NO	bb
7	7	181126M1_8	Standard	50.000	4.98	12441.413	2806.031	55.423	48.4	-3.1	NO	1.000	NO	bb
8	8	181126M1_9	Standard	100.000	4.99	23978.666	2666.454	112.409	97.8	-2.2	NO	1.000	NO	bb
9	9	181126M1_10	Standard	250.000	4.99	61185.637	2571.153	297.462	254.8	1.9	NO	1.000	NO	bb
10	10	181126M1_11	Standard	500.000	4.99	114742.234	2411.273	594.822	498.2	-0.4	NO	1.000	NO	bb

Compound name: L-PFOS
Correlation coefficient: r = 0.999291, r^2 = 0.998583
Calibration curve: 1.09502 * x + 0.0459904
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	5.03	84.610	3276.263	0.323	0.3	1.1	NO	0.999	NO	MM
2	2	181126M1_3	Standard	0.500	5.02	184.315	3416.156	0.674	0.6	14.8	NO	0.999	NO	MM
3	3	181126M1_4	Standard	1.000	5.03	353.854	3743.129	1.182	1.0	3.7	NO	0.999	NO	MM
4	4	181126M1_5	Standard	2.000	5.03	653.485	3748.331	2.179	1.9	-2.6	NO	0.999	NO	MM
5	5	181126M1_6	Standard	5.000	5.03	1798.805	3674.965	6.118	5.5	10.9	NO	0.999	NO	MM
6	6	181126M1_7	Standard	10.000	5.03	2942.006	3393.818	10.836	9.9	-1.5	NO	0.999	NO	MM
7	7	181126M1_8	Standard	50.000	5.03	15189.169	3698.358	51.338	46.8	-6.3	NO	0.999	NO	MM
8	8	181126M1_9	Standard	100.000	5.03	29498.684	3638.886	101.331	92.5	-7.5	NO	0.999	NO	MM
9	9	181126M1_10	Standard	250.000	5.03	72760.766	3187.154	285.367	260.6	4.2	NO	0.999	NO	MM
10	10	181126M1_11	Standard	500.000	5.03	127245.672	2906.952	547.161	499.6	-0.1	NO	0.999	NO	MM

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Compound name: PFDA
Coefficient of Determination: R^2 = 0.999437
Calibration curve: -0.000121158 * x^2 + 1.3134 * x + 0.026774
Response type: Internal Std (Ref 48), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	5.31	493.215	21127.947	0.292	0.2	-19.3	NO	0.999	NO	bb
2	2	181126M1_3	Standard	0.500	5.31	1055.351	20915.982	0.631	0.5	-8.0	NO	0.999	NO	bb
3	3	181126M1_4	Standard	1.000	5.31	2556.062	22735.521	1.405	1.0	5.0	NO	0.999	NO	bb
4	4	181126M1_5	Standard	2.000	5.32	4856.033	22345.748	2.716	2.0	2.4	NO	0.999	NO	bb
5	5	181126M1_6	Standard	5.000	5.31	14504.808	21456.660	8.450	6.4	28.3	NO	0.999	NO	bb
6	6	181126M1_7	Standard	10.000	5.32	21679.984	22033.270	12.300	9.4	-6.5	NO	0.999	NO	bb
7	7	181126M1_8	Standard	50.000	5.32	113078.391	22018.436	64.195	49.1	-1.8	NO	0.999	NO	bb
8	8	181126M1_9	Standard	100.000	5.32	219513.250	21141.234	129.790	99.7	-0.3	NO	0.999	NO	bb
9	9	181126M1_10	Standard	250.000	5.32	513148.719	19950.951	321.506	250.6	0.2	NO	0.999	NO	bb
10	10	181126M1_11	Standard	500.000	5.33	913019.563	18223.094	626.279	499.9	-0.0	NO	0.999	NO	bb

Compound name: 8:2 FTS
Coefficient of Determination: R^2 = 0.998754
Calibration curve: -0.0045567 * x^2 + 1.55189 * x + 0.0660151
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	5.28	148.253	4148.165	0.447	0.2	-1.8	NO	0.999	NO	bb
2	2	181126M1_3	Standard	0.500	5.28	290.829	4224.977	0.860	0.5	2.5	NO	0.999	NO	bb
3	3	181126M1_4	Standard	1.000	5.28	463.741	4109.911	1.410	0.9	-13.1	NO	0.999	NO	bb
4	4	181126M1_5	Standard	2.000	5.28	953.692	3657.264	3.260	2.1	3.5	NO	0.999	NO	bb
5	5	181126M1_6	Standard	5.000	5.28	2650.359	3800.459	8.717	5.7	13.4	NO	0.999	NO	bb
6	6	181126M1_7	Standard	10.000	5.29	4293.809	3672.164	14.616	9.6	-3.5	NO	0.999	NO	bb
7	7	181126M1_8	Standard	50.000	5.28	21138.963	4037.449	65.447	49.3	-1.5	NO	0.999	NO	bb
8	8	181126M1_9	Standard	100.000	5.29	38432.820	4363.402	110.100	100.6	0.6	NO	0.999	NO	bb
9	9	181126M1_10	Standard	250.000	5.29	81069.391	5899.837	171.762			NO	0.999	NO	bbXI
10	10	181126M1_11	Standard	500.000	5.29	131198.281	7314.130	224.221			NO	0.999	YES	bbXI

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Compound name: PFNS
Coefficient of Determination: R^2 = 0.998671
Calibration curve: -6.14234e-005 * x^2 + 0.762317 * x + 0.0530889
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	5.38	71.132	3276.263	0.271	0.3	14.5	NO	0.999	NO	bb
2	2	181126M1_3	Standard	0.500	5.38	88.689	3416.156	0.325	0.4	-28.8	NO	0.999	NO	bb
3	3	181126M1_4	Standard	1.000	5.38	264.160	3743.129	0.882	1.1	8.8	NO	0.999	NO	bb
4	4	181126M1_5	Standard	2.000	5.38	447.030	3748.331	1.491	1.9	-5.7	NO	0.999	NO	bb
5	5	181126M1_6	Standard	5.000	5.38	1279.236	3674.965	4.351	5.6	12.8	NO	0.999	NO	bb
6	6	181126M1_7	Standard	10.000	5.38	2185.486	3393.818	8.050	10.5	5.0	NO	0.999	NO	bb
7	7	181126M1_8	Standard	50.000	5.38	10731.038	3698.358	36.270	47.7	-4.6	NO	0.999	NO	bb
8	8	181126M1_9	Standard	100.000	5.39	20767.127	3638.886	71.338	94.2	-5.8	NO	0.999	NO	bb
9	9	181126M1_10	Standard	250.000	5.38	49811.875	3187.154	195.362	261.7	4.7	NO	0.999	NO	bb
10	10	181126M1_11	Standard	500.000	5.39	84324.992	2906.952	362.601	495.4	-0.9	NO	0.999	NO	bb

Compound name: L-MeFOSAA
Coefficient of Determination: R^2 = 0.998550
Calibration curve: -0.00052965 * x^2 + 2.90523 * x + 0.0881852
Response type: Internal Std (Ref 50), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	5.47	110.370	3699.583	0.373	0.1	-60.8	YES	0.999	NO	MMX
2	2	181126M1_3	Standard	0.500	5.47	405.738	3511.724	1.444	0.5	-6.6	NO	0.999	NO	MM
3	3	181126M1_4	Standard	1.000	5.47	973.701	3825.910	3.181	1.1	6.5	NO	0.999	NO	MM
4	4	181126M1_5	Standard	2.000	5.48	1860.614	3744.315	6.211	2.1	5.4	NO	0.999	NO	MM
5	5	181126M1_6	Standard	5.000	5.47	4599.163	3621.836	15.873	5.4	8.8	NO	0.999	NO	MM
6	6	181126M1_7	Standard	10.000	5.48	8016.689	3678.562	27.241	9.4	-6.4	NO	0.999	NO	MM
7	7	181126M1_8	Standard	50.000	5.48	42003.703	3541.941	148.237	51.5	3.0	NO	0.999	NO	MM
8	8	181126M1_9	Standard	100.000	5.48	79657.992	3788.505	262.828	92.0	-8.0	NO	0.999	NO	MM
9	9	181126M1_10	Standard	250.000	5.48	188039.656	3255.628	721.979	260.9	4.4	NO	0.999	NO	MM
10	10	181126M1_11	Standard	500.000	5.48	330967.375	3157.978	1310.045	495.7	-0.9	NO	0.999	NO	MM

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Compound name: L-EtFOSAA
Coefficient of Determination: R^2 = 0.999862
Calibration curve: 0.000386736 * x^2 + 1.61077 * x + 0.0602011
Response type: Internal Std (Ref 52), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	5.63	146.384	4528.725	0.404	0.2	-14.6	NO	1.000	NO	MM
2	2	181126M1_3	Standard	0.500	5.63	332.970	5076.554	0.820	0.5	-5.7	NO	1.000	NO	MM
3	3	181126M1_4	Standard	1.000	5.63	779.600	5526.345	1.763	1.1	5.7	NO	1.000	NO	MM
4	4	181126M1_5	Standard	2.000	5.63	1485.310	5456.494	3.403	2.1	3.7	NO	1.000	NO	MM
5	5	181126M1_6	Standard	5.000	5.63	4041.750	5491.763	9.200	5.7	13.3	NO	1.000	NO	MM
6	6	181126M1_7	Standard	10.000	5.63	6876.887	5467.541	15.722	9.7	-3.0	NO	1.000	NO	MM
7	7	181126M1_8	Standard	50.000	5.63	34404.953	5239.788	82.076	50.3	0.6	NO	1.000	NO	MM
8	8	181126M1_9	Standard	100.000	5.63	64816.547	4876.164	166.157	100.7	0.7	NO	1.000	NO	MM
9	9	181126M1_10	Standard	250.000	5.63	148925.406	4403.293	422.767	247.7	-0.9	NO	1.000	NO	MM
10	10	181126M1_11	Standard	500.000	5.63	256751.625	3550.520	903.923	500.9	0.2	NO	1.000	NO	MM

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Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Compound name: PFUdA
Coefficient of Determination: R^2 = 0.999703
Calibration curve: -0.000152898 * x^2 + 0.969236 * x + 0.0723136
Response type: Internal Std (Ref 51), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	5.64	595.664	25976.096	0.287	0.2	-11.5	NO	1.000	NO	bd
2	2	181126M1_3	Standard	0.500	5.65	1120.343	25586.691	0.547	0.5	-2.0	NO	1.000	NO	bb
3	3	181126M1_4	Standard	1.000	5.65	2211.564	27670.049	0.999	1.0	-4.4	NO	1.000	NO	db
4	4	181126M1_5	Standard	2.000	5.65	4563.838	26258.051	2.173	2.2	8.4	NO	1.000	NO	bb
5	5	181126M1_6	Standard	5.000	5.65	12366.179	27247.850	5.673	5.8	15.7	NO	1.000	NO	bb
6	6	181126M1_7	Standard	10.000	5.65	19330.379	25918.631	9.323	9.6	-4.4	NO	1.000	NO	bb
7	7	181126M1_8	Standard	50.000	5.65	100258.570	26225.896	47.786	49.6	-0.8	NO	1.000	NO	bb
8	8	181126M1_9	Standard	100.000	5.65	191519.938	25584.975	93.571	98.0	-2.0	NO	1.000	NO	bb
9	9	181126M1_10	Standard	250.000	5.65	441344.219	23407.137	235.689	253.2	1.3	NO	1.000	NO	bb
10	10	181126M1_11	Standard	500.000	5.65	761098.375	21357.555	445.450	498.8	-0.2	NO	1.000	NO	bb

Compound name: PFDS
Coefficient of Determination: R^2 = 0.998317
Calibration curve: -0.000138966 * x^2 + 1.04937 * x + 0.0115389
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	5.69	61.728	3276.263	0.236	0.2	-14.6	NO	0.998	NO	bb
2	2	181126M1_3	Standard	0.500	5.69	164.466	3416.156	0.602	0.6	12.5	NO	0.998	NO	bb
3	3	181126M1_4	Standard	1.000	5.69	281.841	3743.129	0.941	0.9	-11.4	NO	0.998	NO	bb
4	4	181126M1_5	Standard	2.000	5.70	697.649	3748.331	2.327	2.2	10.3	NO	0.998	NO	bb
5	5	181126M1_6	Standard	5.000	5.69	1721.918	3674.965	5.857	5.6	11.5	NO	0.998	NO	bb
6	6	181126M1_7	Standard	10.000	5.70	2829.394	3393.818	10.421	9.9	-0.7	NO	0.998	NO	bb
7	7	181126M1_8	Standard	50.000	5.70	14431.456	3698.358	48.777	46.8	-6.5	NO	0.998	NO	bb
8	8	181126M1_9	Standard	100.000	5.70	28465.041	3638.886	97.781	94.3	-5.7	NO	0.998	NO	bb
9	9	181126M1_10	Standard	250.000	5.70	68244.000	3187.154	267.653	264.3	5.7	NO	0.998	NO	bb
10	10	181126M1_11	Standard	500.000	5.70	112661.602	2906.952	484.449	494.0	-1.2	NO	0.998	NO	bb

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Compound name: PFDoA
Coefficient of Determination: R^2 = 0.999868
Calibration curve: -0.000134587 * x^2 + 1.16156 * x + 0.0671424
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	0.250	5.93	645.754	25354.904	0.318	0.2	-13.5	NO	1.000	NO	bb
2	2 181126M1_3	Standard	0.500	5.93	1238.638	25224.803	0.614	0.5	-5.9	NO	1.000	NO	bd
3	3 181126M1_4	Standard	1.000	5.93	2640.428	26488.537	1.246	1.0	1.5	NO	1.000	NO	bb
4	4 181126M1_5	Standard	2.000	5.93	5064.328	25356.541	2.497	2.1	4.6	NO	1.000	NO	bb
5	5 181126M1_6	Standard	5.000	5.93	13815.301	27050.830	6.384	5.4	8.8	NO	1.000	NO	bb
6	6 181126M1_7	Standard	10.000	5.93	23006.129	23270.566	12.358	10.6	5.9	NO	1.000	NO	bb
7	7 181126M1_8	Standard	50.000	5.93	115967.875	25114.900	57.719	49.9	-0.2	NO	1.000	NO	bb
8	8 181126M1_9	Standard	100.000	5.93	220463.922	24371.867	113.073	98.4	-1.6	NO	1.000	NO	bb
9	9 181126M1_10	Standard	250.000	5.93	523928.125	23172.217	282.627	250.5	0.2	NO	1.000	NO	bb
10	10 181126M1_11	Standard	500.000	5.93	906910.813	20714.875	547.258	500.1	0.0	NO	1.000	NO	bb

Compound name: N-MeFOSA
Coefficient of Determination: R^2 = 0.999421
Calibration curve: -3.87935e-005 * x^2 + 0.953523 * x + 0.468324
Response type: Internal Std (Ref 54), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	1.250	5.93	119.766	11953.504	1.503	1.1	-13.2	NO	0.999	NO	bb
2	2 181126M1_3	Standard	2.500	5.94	247.098	11746.337	3.155	2.8	12.7	NO	0.999	NO	bb
3	3 181126M1_4	Standard	5.000	5.94	443.889	11694.007	5.694	5.5	9.6	NO	0.999	NO	bb
4	4 181126M1_5	Standard	10.000	5.94	851.844	11465.957	11.144	11.2	12.0	NO	0.999	NO	bb
5	5 181126M1_6	Standard	25.000	5.94	2224.112	11840.089	28.177	29.1	16.4	NO	0.999	NO	bb
6	6 181126M1_7	Standard	50.000	5.94	3701.474	11131.010	49.881	51.9	3.9	NO	0.999	NO	bb
7	7 181126M1_8	Standard	250.000	5.94	18637.240	12241.498	228.370	241.4	-3.4	NO	0.999	NO	bb
8	8 181126M1_9	Standard	500.000	5.95	37200.367	11611.420	480.566	514.3	2.9	NO	0.999	NO	bb
9	9 181126M1_10	Standard	1250.000	5.95	87847.688	11864.808	1110.608	1225.3	-2.0	NO	0.999	NO	bb
10	10 181126M1_11	Standard	2500.000	5.95	161531.891	11267.006	2150.508	2511.4	0.5	NO	0.999	NO	bb

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Compound name: PFTrDA
Coefficient of Determination: R^2 = 0.999827
Calibration curve: -4.24277e-005 * x^2 + 1.15539 * x + 0.0691663
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	6.17	650.821	25354.904	0.321	0.2	-12.9	NO	1.000	NO	bd
2	2	181126M1_3	Standard	0.500	6.18	1256.560	25224.803	0.623	0.5	-4.2	NO	1.000	NO	bb
3	3	181126M1_4	Standard	1.000	6.18	2471.074	26488.537	1.166	0.9	-5.1	NO	1.000	NO	bb
4	4	181126M1_5	Standard	2.000	6.18	5185.712	25356.541	2.556	2.2	7.6	NO	1.000	NO	bb
5	5	181126M1_6	Standard	5.000	6.18	14089.136	27050.830	6.510	5.6	11.5	NO	1.000	NO	bb
6	6	181126M1_7	Standard	10.000	6.18	22218.727	23270.566	11.935	10.3	2.7	NO	1.000	NO	bb
7	7	181126M1_8	Standard	50.000	6.18	118548.289	25114.900	59.003	51.1	2.2	NO	1.000	NO	bb
8	8	181126M1_9	Standard	100.000	6.18	220604.203	24371.867	113.145	98.2	-1.8	NO	1.000	NO	bb
9	9	181126M1_10	Standard	250.000	6.18	528676.313	23172.217	285.189	249.1	-0.4	NO	1.000	NO	bb
10	10	181126M1_11	Standard	500.000	6.18	941217.875	20714.875	567.960	500.7	0.1	NO	1.000	NO	bb

Compound name: PFTeDA
Coefficient of Determination: R^2 = 0.999640
Calibration curve: -0.000300636 * x^2 + 1.62832 * x + 0.0899878
Response type: Internal Std (Ref 55), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	6.39	539.250	14333.310	0.470	0.2	-6.6	NO	1.000	NO	bb
2	2	181126M1_3	Standard	0.500	6.40	1051.210	14532.341	0.904	0.5	0.0	NO	1.000	NO	bb
3	3	181126M1_4	Standard	1.000	6.40	2050.983	15629.965	1.640	1.0	-4.8	NO	1.000	NO	bb
4	4	181126M1_5	Standard	2.000	6.39	4309.994	15493.746	3.477	2.1	4.0	NO	1.000	NO	bb
5	5	181126M1_6	Standard	5.000	6.40	11641.705	15853.647	9.179	5.6	11.8	NO	1.000	NO	bb
6	6	181126M1_7	Standard	10.000	6.40	19449.658	14923.140	16.292	10.0	-0.3	NO	1.000	NO	bb
7	7	181126M1_8	Standard	50.000	6.40	100572.320	16310.112	77.078	47.7	-4.6	NO	1.000	NO	bb
8	8	181126M1_9	Standard	100.000	6.40	196100.344	15502.673	158.118	98.9	-1.1	NO	1.000	NO	bb
9	9	181126M1_10	Standard	250.000	6.39	469956.969	14833.304	396.032	255.2	2.1	NO	1.000	NO	bb
10	10	181126M1_11	Standard	500.000	6.40	791250.375	13438.607	735.986	497.7	-0.5	NO	1.000	NO	bb

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Compound name: N-EtFOSA
Coefficient of Determination: R^2 = 0.999752
Calibration curve: -4.89024e-005 * x^2 + 0.875046 * x + 0.265554
Response type: Internal Std (Ref 56), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	1.250	6.43	140.858	15262.959	1.384	1.3	2.3	NO	1.000	NO	bb
2	2 181126M1_3	Standard	2.500	6.43	232.454	16027.104	2.176	2.2	-12.7	NO	1.000	NO	bb
3	3 181126M1_4	Standard	5.000	6.43	585.605	18601.041	4.722	5.1	1.9	NO	1.000	NO	bb
4	4 181126M1_5	Standard	10.000	6.43	1230.676	19918.102	9.268	10.3	2.9	NO	1.000	NO	bb
5	5 181126M1_6	Standard	25.000	6.43	3266.325	20324.578	24.106	27.3	9.1	NO	1.000	NO	bb
6	6 181126M1_7	Standard	50.000	6.43	5529.787	19247.895	43.094	49.1	-1.8	NO	1.000	NO	bb
7	7 181126M1_8	Standard	250.000	6.43	28386.855	19814.482	214.895	248.7	-0.5	NO	1.000	NO	bb
8	8 181126M1_9	Standard	500.000	6.43	53878.910	19491.674	414.630	486.8	-2.6	NO	1.000	NO	bb
9	9 181126M1_10	Standard	1250.000	6.43	132572.609	19221.986	1034.539	1272.5	1.8	NO	1.000	NO	bb
10	10 181126M1_11	Standard	2500.000	6.43	224072.266	17915.363	1876.090	2490.3	-0.4	NO	1.000	NO	bb

Compound name: PFHxDA
Coefficient of Determination: R^2 = 0.998670
Calibration curve: -9.94628e-005 * x^2 + 0.395894 * x + 0.0669369
Response type: Internal Std (Ref 57), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	0.250	6.73	225.952	6889.798	0.164	0.2	-1.9	NO	0.999	NO	bb
2	2 181126M1_3	Standard	0.500	6.73	376.403	7098.292	0.265	0.5	0.1	NO	0.999	NO	bb
3	3 181126M1_4	Standard	1.000	6.73	727.130	8009.421	0.454	1.0	-2.2	NO	0.999	NO	bb
4	4 181126M1_5	Standard	2.000	6.73	1397.181	8091.949	0.863	2.0	0.6	NO	0.999	NO	bb
5	5 181126M1_6	Standard	5.000	6.73	4085.416	8466.808	2.413	5.9	18.7	NO	0.999	NO	MM
6	6 181126M1_7	Standard	10.000	6.73	5486.094	7582.587	3.618	9.0	-10.1	NO	0.999	NO	MM
7	7 181126M1_8	Standard	50.000	6.73	32428.545	8679.925	18.680	47.6	-4.8	NO	0.999	NO	bb
8	8 181126M1_9	Standard	100.000	6.74	63093.250	8488.328	37.165	96.0	-4.0	NO	0.999	NO	bb
9	9 181126M1_10	Standard	250.000	6.74	156318.594	8060.974	96.960	262.0	4.8	NO	0.999	NO	bb
10	10 181126M1_11	Standard	500.000	6.74	266713.313	7776.927	171.477	494.4	-1.1	NO	0.999	NO	bb

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Compound name: PFODA
Coefficient of Determination: R^2 = 0.999437
Calibration curve: -0.000110262 * x^2 + 0.704083 * x + 0.0275186
Response type: Internal Std (Ref 57), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	0.250	6.97	264.722	6889.798	0.192	0.2	-6.5	NO	0.999	NO	bb
2	2	181126M1_3	Standard	0.500	6.97	535.462	7098.292	0.377	0.5	-0.7	NO	0.999	NO	bb
3	3	181126M1_4	Standard	1.000	6.97	1192.476	8009.421	0.744	1.0	1.8	NO	0.999	NO	bb
4	4	181126M1_5	Standard	2.000	6.97	2386.819	8091.949	1.475	2.1	2.8	NO	0.999	NO	bb
5	5	181126M1_6	Standard	5.000	6.97	7024.528	8466.808	4.148	5.9	17.2	NO	0.999	NO	bb
6	6	181126M1_7	Standard	10.000	6.97	11199.354	7582.587	7.385	10.5	4.7	NO	0.999	NO	bb
7	7	181126M1_8	Standard	50.000	6.97	59971.836	8679.925	34.546	49.4	-1.2	NO	0.999	NO	bb
8	8	181126M1_9	Standard	100.000	6.97	112768.000	8488.328	66.425	95.7	-4.3	NO	0.999	NO	bb
9	9	181126M1_10	Standard	250.000	6.97	278318.969	8060.974	172.634	255.4	2.1	NO	0.999	NO	bb
10	10	181126M1_11	Standard	500.000	6.97	502972.500	7776.927	323.375	498.1	-0.4	NO	0.999	NO	bb

Compound name: N-MeFOSE
Coefficient of Determination: R^2 = 0.999885
Calibration curve: 1.26969e-005 * x^2 + 0.895945 * x + 0.479162
Response type: Internal Std (Ref 58), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	1.250	6.70	102.481	9613.644	1.599	1.2	-0.0	NO	1.000	NO	MM
2	2	181126M1_3	Standard	2.500	6.70	175.783	9970.688	2.644	2.4	-3.3	NO	1.000	NO	bb
3	3	181126M1_4	Standard	5.000	6.70	320.276	10409.790	4.615	4.6	-7.7	NO	1.000	NO	bb
4	4	181126M1_5	Standard	10.000	6.70	685.982	10378.408	9.915	10.5	5.3	NO	1.000	NO	bb
5	5	181126M1_6	Standard	25.000	6.69	1741.865	10389.321	25.149	27.5	10.1	NO	1.000	NO	bb
6	6	181126M1_7	Standard	50.000	6.70	2858.348	9705.995	44.174	48.7	-2.5	NO	1.000	NO	bb
7	7	181126M1_8	Standard	250.000	6.69	15229.308	10357.785	220.549	244.8	-2.1	NO	1.000	NO	bb
8	8	181126M1_9	Standard	500.000	6.70	30430.609	10143.168	450.016	498.2	-0.4	NO	1.000	NO	bb
9	9	181126M1_10	Standard	1250.000	6.70	78307.102	10223.422	1148.937	1259.4	0.7	NO	1.000	NO	bb
10	10	181126M1_11	Standard	2500.000	6.70	148090.328	9590.735	2316.147	2496.3	-0.1	NO	1.000	NO	bb

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Compound name: N-EtFOSE
Coefficient of Determination: R^2 = 0.999668
Calibration curve: 1.15732e-006 * x^2 + 1.14211 * x + 0.352591
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	1.250	6.84	93.317	8485.106	1.650	1.1	-9.1	NO	1.000	NO	bb
2	2 181126M1_3	Standard	2.500	6.84	177.386	8904.628	2.988	2.3	-7.7	NO	1.000	NO	bb
3	3 181126M1_4	Standard	5.000	6.84	435.865	9999.587	6.538	5.4	8.3	NO	1.000	NO	bb
4	4 181126M1_5	Standard	10.000	6.84	813.770	9705.979	12.576	10.7	7.0	NO	1.000	NO	bb
5	5 181126M1_6	Standard	25.000	6.84	2093.998	9902.425	31.719	27.5	9.9	NO	1.000	NO	bb
6	6 181126M1_7	Standard	50.000	6.84	3449.748	9565.112	54.099	47.1	-5.9	NO	1.000	NO	bb
7	7 181126M1_8	Standard	250.000	6.84	18169.016	9699.960	280.965	245.6	-1.7	NO	1.000	NO	bb
8	8 181126M1_9	Standard	500.000	6.85	36455.391	9803.931	557.767	487.8	-2.4	NO	1.000	NO	bb
9	9 181126M1_10	Standard	1250.000	6.84	93862.227	9641.881	1460.227	1276.6	2.1	NO	1.000	NO	bb
10	10 181126M1_11	Standard	2500.000	6.84	176096.641	9265.136	2850.956	2489.6	-0.4	NO	1.000	NO	bb

Compound name: 13C3-PFBA
Response Factor: 0.787485
RRF SD: 0.0228362, Relative SD: 2.89989
Response type: Internal Std (Ref 60), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	1.23	6270.790	7908.070	9.912	12.6	0.7	NO		NO	bb
2	2 181126M1_3	Standard	12.500	1.24	6633.369	8749.445	9.477	12.0	-3.7	NO		NO	MM
3	3 181126M1_4	Standard	12.500	1.24	6764.591	8407.808	10.057	12.8	2.2	NO		NO	bb
4	4 181126M1_5	Standard	12.500	1.24	7071.333	8750.237	10.102	12.8	2.6	NO		NO	MM
5	5 181126M1_6	Standard	12.500	1.24	6957.322	8717.376	9.976	12.7	1.3	NO		NO	bb
6	6 181126M1_7	Standard	12.500	1.24	6644.186	8412.910	9.872	12.5	0.3	NO		NO	bb
7	7 181126M1_8	Standard	12.500	1.24	6904.515	8782.584	9.827	12.5	-0.2	NO		NO	bb
8	8 181126M1_9	Standard	12.500	1.24	6776.515	8534.894	9.925	12.6	0.8	NO		NO	bb
9	9 181126M1_10	Standard	12.500	1.25	6830.738	8472.024	10.078	12.8	2.4	NO		NO	bb
10	10 181126M1_11	Standard	12.500	1.24	6694.321	9085.835	9.210	11.7	-6.4	NO		NO	MM

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Compound name: 13C3-PFPeA
Response Factor: 0.555876
RRF SD: 0.0136707, Relative SD: 2.45931
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	2.46	13715.434	25192.414	6.805	12.2	-2.1	NO		NO	bb
2	2 181126M1_3	Standard	12.500	2.47	13723.302	25514.697	6.723	12.1	-3.2	NO		NO	bb
3	3 181126M1_4	Standard	12.500	2.47	14561.754	26136.416	6.964	12.5	0.2	NO		NO	bb
4	4 181126M1_5	Standard	12.500	2.47	14296.794	26095.398	6.848	12.3	-1.4	NO		NO	bb
5	5 181126M1_6	Standard	12.500	2.47	14592.260	26363.371	6.919	12.4	-0.4	NO		NO	bb
6	6 181126M1_7	Standard	12.500	2.47	13932.524	25322.297	6.878	12.4	-1.0	NO		NO	bb
7	7 181126M1_8	Standard	12.500	2.47	14718.107	26522.105	6.937	12.5	-0.2	NO		NO	bb
8	8 181126M1_9	Standard	12.500	2.47	14155.756	25558.145	6.923	12.5	-0.4	NO		NO	bb
9	9 181126M1_10	Standard	12.500	2.47	13897.646	23924.270	7.261	13.1	4.5	NO		NO	bb
10	10 181126M1_11	Standard	12.500	2.47	12898.420	22313.770	7.226	13.0	4.0	NO		NO	bb

Compound name: 13C3-PFBS
Response Factor: 0.536974
RRF SD: 0.0212494, Relative SD: 3.95724
Response type: Internal Std (Ref 62), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	2.80	1786.299	3368.764	6.628	12.3	-1.3	NO		NO	bb
2	2 181126M1_3	Standard	12.500	2.80	1802.877	3301.831	6.825	12.7	1.7	NO		NO	bb
3	3 181126M1_4	Standard	12.500	2.80	1800.875	3474.822	6.478	12.1	-3.5	NO		NO	bb
4	4 181126M1_5	Standard	12.500	2.80	1859.173	3365.570	6.905	12.9	2.9	NO		NO	bd
5	5 181126M1_6	Standard	12.500	2.81	1822.236	3524.441	6.463	12.0	-3.7	NO		NO	bb
6	6 181126M1_7	Standard	12.500	2.80	1802.554	3327.563	6.771	12.6	0.9	NO		NO	bb
7	7 181126M1_8	Standard	12.500	2.81	1924.595	3604.044	6.675	12.4	-0.6	NO		NO	bb
8	8 181126M1_9	Standard	12.500	2.81	1781.169	3316.433	6.713	12.5	0.0	NO		NO	bb
9	9 181126M1_10	Standard	12.500	2.81	1561.142	3064.151	6.369	11.9	-5.1	NO		NO	bb
10	10 181126M1_11	Standard	12.500	2.81	1493.188	2559.058	7.294	13.6	8.7	NO		NO	bb

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Compound name: 13C2-4:2 FTS
Response Factor: 1.47815
RRF SD: 0.100555, Relative SD: 6.80276
Response type: Internal Std (Ref 62), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	3.27	4949.353	3368.764	18.365	12.4	-0.6	NO		NO	bb
2	2 181126M1_3	Standard	12.500	3.28	4658.786	3301.831	17.637	11.9	-4.5	NO		NO	bb
3	3 181126M1_4	Standard	12.500	3.28	5081.407	3474.822	18.279	12.4	-1.1	NO		NO	bb
4	4 181126M1_5	Standard	12.500	3.28	4976.478	3365.570	18.483	12.5	0.0	NO		NO	bb
5	5 181126M1_6	Standard	12.500	3.28	4945.298	3524.441	17.539	11.9	-5.1	NO		NO	bb
6	6 181126M1_7	Standard	12.500	3.28	4705.861	3327.563	17.678	12.0	-4.3	NO		NO	bb
7	7 181126M1_8	Standard	12.500	3.28	5303.523	3604.044	18.394	12.4	-0.4	NO		NO	bd
8	8 181126M1_9	Standard	12.500	3.28	5688.242	3316.433	21.440	14.5	16.0	NO		NO	bb
9	9 181126M1_10	Standard	12.500	3.28	6866.882	3064.151	28.013	19.0	51.6	NO		NO	bbX
10	10 181126M1_11	Standard	12.500	3.28	8003.897	2559.058	39.096	26.4	111.6	NO		NO	bbX

Compound name: 13C2-PFHxA
Response Factor: 0.98836
RRF SD: 0.029012, Relative SD: 2.93537
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	5.000	3.36	9787.215	25192.414	4.856	4.9	-1.7	NO		NO	bb
2	2 181126M1_3	Standard	5.000	3.36	9629.179	25514.697	4.717	4.8	-4.5	NO		NO	bb
3	3 181126M1_4	Standard	5.000	3.36	10373.639	26136.416	4.961	5.0	0.4	NO		NO	bb
4	4 181126M1_5	Standard	5.000	3.36	10091.624	26095.398	4.834	4.9	-2.2	NO		NO	bb
5	5 181126M1_6	Standard	5.000	3.37	10427.667	26363.371	4.944	5.0	0.0	NO		NO	bb
6	6 181126M1_7	Standard	5.000	3.37	10138.645	25322.297	5.005	5.1	1.3	NO		NO	bb
7	7 181126M1_8	Standard	5.000	3.37	10164.805	26522.105	4.791	4.8	-3.1	NO		NO	bb
8	8 181126M1_9	Standard	5.000	3.37	10236.929	25558.145	5.007	5.1	1.3	NO		NO	bb
9	9 181126M1_10	Standard	5.000	3.37	9817.484	23924.270	5.129	5.2	3.8	NO		NO	bb
10	10 181126M1_11	Standard	5.000	3.37	9234.549	22313.770	5.173	5.2	4.7	NO		NO	bb

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Compound name: 13C4-PFHpA
Response Factor: 0.536542
RRF SD: 0.0222304, Relative SD: 4.14328
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	4.02	14063.499	25192.414	6.978	13.0	4.0	NO		NO	bb
2	2 181126M1_3	Standard	12.500	4.02	14566.622	25514.697	7.136	13.3	6.4	NO		NO	bb
3	3 181126M1_4	Standard	12.500	4.02	14599.738	26136.416	6.982	13.0	4.1	NO		NO	bb
4	4 181126M1_5	Standard	12.500	4.02	13961.896	26095.398	6.688	12.5	-0.3	NO		NO	bb
5	5 181126M1_6	Standard	12.500	4.02	14034.775	26363.371	6.654	12.4	-0.8	NO		NO	bb
6	6 181126M1_7	Standard	12.500	4.02	13678.921	25322.297	6.752	12.6	0.7	NO		NO	bb
7	7 181126M1_8	Standard	12.500	4.02	14249.999	26522.105	6.716	12.5	0.1	NO		NO	bb
8	8 181126M1_9	Standard	12.500	4.03	13058.787	25558.145	6.387	11.9	-4.8	NO		NO	bb
9	9 181126M1_10	Standard	12.500	4.03	12520.175	23924.270	6.542	12.2	-2.5	NO		NO	bb
10	10 181126M1_11	Standard	12.500	4.03	11123.910	22313.770	6.232	11.6	-7.1	NO		NO	bb

Compound name: 18O2-PFHxS
Response Factor: 0.448083
RRF SD: 0.0160995, Relative SD: 3.59298
Response type: Internal Std (Ref 62), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	4.16	1490.698	3368.764	5.531	12.3	-1.2	NO		NO	bb
2	2 181126M1_3	Standard	12.500	4.16	1447.785	3301.831	5.481	12.2	-2.1	NO		NO	bb
3	3 181126M1_4	Standard	12.500	4.16	1581.371	3474.822	5.689	12.7	1.6	NO		NO	bb
4	4 181126M1_5	Standard	12.500	4.16	1558.457	3365.570	5.788	12.9	3.3	NO		NO	bb
5	5 181126M1_6	Standard	12.500	4.16	1526.846	3524.441	5.415	12.1	-3.3	NO		NO	bb
6	6 181126M1_7	Standard	12.500	4.16	1542.694	3327.563	5.795	12.9	3.5	NO		NO	bb
7	7 181126M1_8	Standard	12.500	4.16	1579.074	3604.044	5.477	12.2	-2.2	NO		NO	bb
8	8 181126M1_9	Standard	12.500	4.16	1478.125	3316.433	5.571	12.4	-0.5	NO		NO	bb
9	9 181126M1_10	Standard	12.500	4.16	1300.621	3064.151	5.306	11.8	-5.3	NO		NO	bb
10	10 181126M1_11	Standard	12.500	4.16	1219.567	2559.058	5.957	13.3	6.4	NO		NO	bb

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Compound name: 13C2-6:2 FTS
Response Factor: 1.56299
RRF SD: 0.106642, Relative SD: 6.82298
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	4.46	5225.320	3462.963	18.861	12.1	-3.5	NO		NO	bb
2	2 181126M1_3	Standard	12.500	4.46	5165.596	3224.760	20.023	12.8	2.5	NO		NO	bb
3	3 181126M1_4	Standard	12.500	4.46	5387.143	3512.134	19.173	12.3	-1.9	NO		NO	bb
4	4 181126M1_5	Standard	12.500	4.46	5074.225	3358.832	18.884	12.1	-3.3	NO		NO	bb
5	5 181126M1_6	Standard	12.500	4.46	5181.676	3378.300	19.173	12.3	-1.9	NO		NO	bb
6	6 181126M1_7	Standard	12.500	4.46	4894.738	3393.990	18.027	11.5	-7.7	NO		NO	bb
7	7 181126M1_8	Standard	12.500	4.46	5563.122	3536.995	19.660	12.6	0.6	NO		NO	bb
8	8 181126M1_9	Standard	12.500	4.46	6022.125	3346.116	22.497	14.4	15.1	NO		NO	bb
9	9 181126M1_10	Standard	12.500	4.46	7202.659	3217.784	27.980	17.9	43.2	NO		NO	bbX
10	10 181126M1_11	Standard	12.500	4.46	9468.253	2856.125	41.438	26.5	112.1	NO		NO	bbX

Compound name: 13C2-PFOA
Response Factor: 0.754885
RRF SD: 0.0195047, Relative SD: 2.5838
Response type: Internal Std (Ref 63), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	4.50	24359.602	30823.398	9.879	13.1	4.7	NO		NO	bb
2	2 181126M1_3	Standard	12.500	4.51	24354.520	31989.600	9.517	12.6	0.9	NO		NO	bb
3	3 181126M1_4	Standard	12.500	4.51	24178.301	32072.896	9.423	12.5	-0.1	NO		NO	bb
4	4 181126M1_5	Standard	12.500	4.51	23443.150	31406.428	9.331	12.4	-1.1	NO		NO	bb
5	5 181126M1_6	Standard	12.500	4.51	23552.342	31457.979	9.359	12.4	-0.8	NO		NO	bb
6	6 181126M1_7	Standard	12.500	4.51	22507.277	30564.838	9.205	12.2	-2.5	NO		NO	bb
7	7 181126M1_8	Standard	12.500	4.51	23848.943	32979.738	9.039	12.0	-4.2	NO		NO	bb
8	8 181126M1_9	Standard	12.500	4.52	22357.822	29964.543	9.327	12.4	-1.2	NO		NO	bb
9	9 181126M1_10	Standard	12.500	4.52	21588.547	28178.553	9.577	12.7	1.5	NO		NO	bb
10	10 181126M1_11	Standard	12.500	4.52	19958.678	25705.412	9.705	12.9	2.9	NO		NO	bb

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Compound name: 13C5-PFNA
Response Factor: 0.990648
RRF SD: 0.0224267, Relative SD: 2.26384
Response type: Internal Std (Ref 64), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	4.93	22295.369	22519.746	12.375	12.5	-0.1	NO		NO	bb
2	2 181126M1_3	Standard	12.500	4.94	21931.633	22448.209	12.212	12.3	-1.4	NO		NO	bb
3	3 181126M1_4	Standard	12.500	4.94	23014.137	22991.566	12.512	12.6	1.0	NO		NO	bb
4	4 181126M1_5	Standard	12.500	4.94	22367.645	23074.576	12.117	12.2	-2.1	NO		NO	bb
5	5 181126M1_6	Standard	12.500	4.94	23199.723	22849.063	12.692	12.8	2.5	NO		NO	bb
6	6 181126M1_7	Standard	12.500	4.94	22312.191	21600.799	12.912	13.0	4.3	NO		NO	bb
7	7 181126M1_8	Standard	12.500	4.94	22610.824	22741.340	12.428	12.5	0.4	NO		NO	bb
8	8 181126M1_9	Standard	12.500	4.94	21568.918	22540.299	11.961	12.1	-3.4	NO		NO	bb
9	9 181126M1_10	Standard	12.500	4.94	20252.943	20378.484	12.423	12.5	0.3	NO		NO	bb
10	10 181126M1_11	Standard	12.500	4.94	18084.188	18532.297	12.198	12.3	-1.5	NO		NO	bb

Compound name: 13C8-PFOSA
Response Factor: 0.0971265
RRF SD: 0.0077469, Relative SD: 7.9761
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	4.98	2329.393	26672.982	1.092	11.2	-10.1	NO		NO	bb
2	2 181126M1_3	Standard	12.500	4.99	2448.447	26794.484	1.142	11.8	-5.9	NO		NO	bb
3	3 181126M1_4	Standard	12.500	4.98	2561.796	28575.072	1.121	11.5	-7.7	NO		NO	bb
4	4 181126M1_5	Standard	12.500	4.99	2603.493	28337.990	1.148	11.8	-5.4	NO		NO	bb
5	5 181126M1_6	Standard	12.500	4.99	2769.347	28551.758	1.212	12.5	-0.1	NO		NO	bb
6	6 181126M1_7	Standard	12.500	4.99	2637.660	27162.783	1.214	12.5	-0.0	NO		NO	bb
7	7 181126M1_8	Standard	12.500	4.99	2806.031	28301.350	1.239	12.8	2.1	NO		NO	bb
8	8 181126M1_9	Standard	12.500	4.99	2666.454	26656.619	1.250	12.9	3.0	NO		NO	bb
9	9 181126M1_10	Standard	12.500	4.99	2571.153	24614.043	1.306	13.4	7.5	NO		NO	bb
10	10 181126M1_11	Standard	12.500	4.99	2411.273	21283.375	1.416	14.6	16.6	NO		NO	bb

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Compound name: 13C8-PFOS
Response Factor: 1.04163
RRF SD: 0.0524138, Relative SD: 5.03189
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	5.02	3276.263	3462.963	11.826	11.4	-9.2	NO		NO	bb
2	2 181126M1_3	Standard	12.500	5.02	3416.156	3224.760	13.242	12.7	1.7	NO		NO	bb
3	3 181126M1_4	Standard	12.500	5.03	3743.129	3512.134	13.322	12.8	2.3	NO		NO	bb
4	4 181126M1_5	Standard	12.500	5.03	3748.331	3358.832	13.950	13.4	7.1	NO		NO	bb
5	5 181126M1_6	Standard	12.500	5.03	3674.965	3378.300	13.598	13.1	4.4	NO		NO	bb
6	6 181126M1_7	Standard	12.500	5.03	3393.818	3393.990	12.499	12.0	-4.0	NO		NO	bb
7	7 181126M1_8	Standard	12.500	5.03	3698.358	3536.995	13.070	12.5	0.4	NO		NO	bb
8	8 181126M1_9	Standard	12.500	5.03	3638.886	3346.116	13.594	13.1	4.4	NO		NO	bb
9	9 181126M1_10	Standard	12.500	5.03	3187.154	3217.784	12.381	11.9	-4.9	NO		NO	bb
10	10 181126M1_11	Standard	12.500	5.03	2906.952	2856.125	12.722	12.2	-2.3	NO		NO	bb

Compound name: 13C2-PFDA
Response Factor: 0.902341
RRF SD: 0.0371522, Relative SD: 4.11731
Response type: Internal Std (Ref 66), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	5.31	21127.947	23842.426	11.077	12.3	-1.8	NO		NO	bb
2	2 181126M1_3	Standard	12.500	5.31	20915.982	24662.998	10.601	11.7	-6.0	NO		NO	bb
3	3 181126M1_4	Standard	12.500	5.31	22735.521	24277.797	11.706	13.0	3.8	NO		NO	bb
4	4 181126M1_5	Standard	12.500	5.32	22345.748	24205.205	11.540	12.8	2.3	NO		NO	bb
5	5 181126M1_6	Standard	12.500	5.31	21456.660	25346.094	10.582	11.7	-6.2	NO		NO	bb
6	6 181126M1_7	Standard	12.500	5.32	22033.270	23846.875	11.549	12.8	2.4	NO		NO	bb
7	7 181126M1_8	Standard	12.500	5.32	22018.436	24795.838	11.100	12.3	-1.6	NO		NO	bb
8	8 181126M1_9	Standard	12.500	5.32	21141.234	23591.418	11.202	12.4	-0.7	NO		NO	bb
9	9 181126M1_10	Standard	12.500	5.32	19950.951	21882.871	11.396	12.6	1.0	NO		NO	bb
10	10 181126M1_11	Standard	12.500	5.32	18223.094	18919.330	12.040	13.3	6.7	NO		NO	bb

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Compound name: 13C2-8:2 FTS
Response Factor: 1.17744
RRF SD: 0.0887368, Relative SD: 7.53641
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	12.500	5.28	4148.165	3462.963	14.973	12.7	1.7	NO		NO	bb
2	2	181126M1_3	Standard	12.500	5.28	4224.977	3224.760	16.377	13.9	11.3	NO		NO	bb
3	3	181126M1_4	Standard	12.500	5.29	4109.911	3512.134	14.628	12.4	-0.6	NO		NO	bb
4	4	181126M1_5	Standard	12.500	5.28	3657.264	3358.832	13.611	11.6	-7.5	NO		NO	bb
5	5	181126M1_6	Standard	12.500	5.29	3800.459	3378.300	14.062	11.9	-4.5	NO		NO	bb
6	6	181126M1_7	Standard	12.500	5.29	3672.164	3393.990	13.525	11.5	-8.1	NO		NO	bb
7	7	181126M1_8	Standard	12.500	5.29	4037.449	3536.995	14.269	12.1	-3.1	NO		NO	bb
8	8	181126M1_9	Standard	12.500	5.29	4363.402	3346.116	16.300	13.8	10.8	NO		NO	bb
9	9	181126M1_10	Standard	12.500	5.29	5899.837	3217.784	22.919	19.5	55.7	NO		NO	bbX
10	10	181126M1_11	Standard	12.500	5.29	7314.130	2856.125	32.011	27.2	117.5	NO		NO	bbX

Compound name: d3-N-MeFOSAA
Response Factor: 0.134598
RRF SD: 0.00697461, Relative SD: 5.18181
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	12.500	5.46	3699.583	26672.982	1.734	12.9	3.0	NO		NO	bb
2	2	181126M1_3	Standard	12.500	5.47	3511.724	26794.484	1.638	12.2	-2.6	NO		NO	bb
3	3	181126M1_4	Standard	12.500	5.47	3825.910	28575.072	1.674	12.4	-0.5	NO		NO	bb
4	4	181126M1_5	Standard	12.500	5.47	3744.315	28337.990	1.652	12.3	-1.8	NO		NO	bb
5	5	181126M1_6	Standard	12.500	5.47	3621.836	28551.758	1.586	11.8	-5.8	NO		NO	bb
6	6	181126M1_7	Standard	12.500	5.47	3678.562	27162.783	1.693	12.6	0.6	NO		NO	bb
7	7	181126M1_8	Standard	12.500	5.47	3541.941	28301.350	1.564	11.6	-7.0	NO		NO	bb
8	8	181126M1_9	Standard	12.500	5.47	3788.505	26656.619	1.777	13.2	5.6	NO		NO	bb
9	9	181126M1_10	Standard	12.500	5.47	3255.628	24614.043	1.653	12.3	-1.7	NO		NO	bb
10	10	181126M1_11	Standard	12.500	5.47	3157.978	21283.375	1.855	13.8	10.2	NO		NO	bb

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Compound name: 13C2-PFUdA
Response Factor: 0.957317
RRF SD: 0.0223124, Relative SD: 2.33072
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	12.500	5.64	25976.096	26672.982	12.173	12.7	1.7	NO		NO	bb
2	2	181126M1_3	Standard	12.500	5.65	25586.691	26794.484	11.937	12.5	-0.3	NO		NO	bb
3	3	181126M1_4	Standard	12.500	5.65	27670.049	28575.072	12.104	12.6	1.2	NO		NO	bb
4	4	181126M1_5	Standard	12.500	5.65	26258.051	28337.990	11.583	12.1	-3.2	NO		NO	bb
5	5	181126M1_6	Standard	12.500	5.64	27247.850	28551.758	11.929	12.5	-0.3	NO		NO	bb
6	6	181126M1_7	Standard	12.500	5.65	25918.631	27162.783	11.927	12.5	-0.3	NO		NO	bb
7	7	181126M1_8	Standard	12.500	5.65	26225.896	28301.350	11.583	12.1	-3.2	NO		NO	bb
8	8	181126M1_9	Standard	12.500	5.65	25584.975	26656.619	11.997	12.5	0.3	NO		NO	bb
9	9	181126M1_10	Standard	12.500	5.65	23407.137	24614.043	11.887	12.4	-0.7	NO		NO	bb
10	10	181126M1_11	Standard	12.500	5.65	21357.555	21283.375	12.544	13.1	4.8	NO		NO	bb

Compound name: d5-N-EtFOSAA
Response Factor: 0.185261
RRF SD: 0.0109011, Relative SD: 5.88419
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	12.500	5.62	4528.725	26672.982	2.122	11.5	-8.4	NO		NO	bb
2	2	181126M1_3	Standard	12.500	5.63	5076.554	26794.484	2.368	12.8	2.3	NO		NO	bb
3	3	181126M1_4	Standard	12.500	5.63	5526.345	28575.072	2.417	13.0	4.4	NO		NO	bb
4	4	181126M1_5	Standard	12.500	5.63	5456.494	28337.990	2.407	13.0	3.9	NO		NO	bb
5	5	181126M1_6	Standard	12.500	5.63	5491.763	28551.758	2.404	13.0	3.8	NO		NO	bb
6	6	181126M1_7	Standard	12.500	5.63	5467.541	27162.783	2.516	13.6	8.7	NO		NO	bb
7	7	181126M1_8	Standard	12.500	5.63	5239.788	28301.350	2.314	12.5	-0.1	NO		NO	bb
8	8	181126M1_9	Standard	12.500	5.63	4876.164	26656.619	2.287	12.3	-1.3	NO		NO	bb
9	9	181126M1_10	Standard	12.500	5.63	4403.293	24614.043	2.236	12.1	-3.4	NO		NO	bb
10	10	181126M1_11	Standard	12.500	5.63	3550.520	21283.375	2.085	11.3	-10.0	NO		NO	bb

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Compound name: 13C2-PFDoA
Response Factor: 1.04677
RRF SD: 0.0366194, Relative SD: 3.49832
Response type: Internal Std (Ref 66), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	5.92	25354.904	23842.426	13.293	12.7	1.6	NO		NO	bb
2	2 181126M1_3	Standard	12.500	5.93	25224.803	24662.998	12.785	12.2	-2.3	NO		NO	bb
3	3 181126M1_4	Standard	12.500	5.93	26488.537	24277.797	13.638	13.0	4.2	NO		NO	bb
4	4 181126M1_5	Standard	12.500	5.93	25356.541	24205.205	13.095	12.5	0.1	NO		NO	bb
5	5 181126M1_6	Standard	12.500	5.93	27050.830	25346.094	13.341	12.7	2.0	NO		NO	bb
6	6 181126M1_7	Standard	12.500	5.93	23270.566	23846.875	12.198	11.7	-6.8	NO		NO	bb
7	7 181126M1_8	Standard	12.500	5.93	25114.900	24795.838	12.661	12.1	-3.2	NO		NO	bb
8	8 181126M1_9	Standard	12.500	5.93	24371.867	23591.418	12.914	12.3	-1.3	NO		NO	bb
9	9 181126M1_10	Standard	12.500	5.93	23172.217	21882.871	13.237	12.6	1.2	NO		NO	bb
10	10 181126M1_11	Standard	12.500	5.93	20714.875	18919.330	13.686	13.1	4.6	NO		NO	bb

Compound name: d3-N-MeFOSA
Response Factor: 0.0367035
RRF SD: 0.00324533, Relative SD: 8.84204
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	150.000	5.97	11953.504	26672.982	5.602	152.6	1.8	NO		NO	bd
2	2 181126M1_3	Standard	150.000	5.97	11746.337	26794.484	5.480	149.3	-0.5	NO		NO	bb
3	3 181126M1_4	Standard	150.000	5.97	11694.007	28575.072	5.115	139.4	-7.1	NO		NO	bb
4	4 181126M1_5	Standard	150.000	5.98	11465.957	28337.990	5.058	137.8	-8.1	NO		NO	bb
5	5 181126M1_6	Standard	150.000	5.97	11840.089	28551.758	5.184	141.2	-5.8	NO		NO	bb
6	6 181126M1_7	Standard	150.000	5.98	11131.010	27162.783	5.122	139.6	-7.0	NO		NO	bb
7	7 181126M1_8	Standard	150.000	5.98	12241.498	28301.350	5.407	147.3	-1.8	NO		NO	bb
8	8 181126M1_9	Standard	150.000	5.98	11611.420	26656.619	5.445	148.3	-1.1	NO		NO	bb
9	9 181126M1_10	Standard	150.000	5.98	11864.808	24614.043	6.025	164.2	9.4	NO		NO	bb
10	10 181126M1_11	Standard	150.000	5.98	11267.006	21283.375	6.617	180.3	20.2	NO		NO	bb

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Compound name: 13C2-PFTeDA
Response Factor: 0.567004
RRF SD: 0.0306617, Relative SD: 5.40767
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	6.39	14333.310	26672.982	6.717	11.8	-5.2	NO		NO	bb
2	2 181126M1_3	Standard	12.500	6.40	14532.341	26794.484	6.780	12.0	-4.3	NO		NO	bb
3	3 181126M1_4	Standard	12.500	6.40	15629.965	28575.072	6.837	12.1	-3.5	NO		NO	bb
4	4 181126M1_5	Standard	12.500	6.40	15493.746	28337.990	6.834	12.1	-3.6	NO		NO	bb
5	5 181126M1_6	Standard	12.500	6.40	15853.647	28551.758	6.941	12.2	-2.1	NO		NO	bb
6	6 181126M1_7	Standard	12.500	6.40	14923.140	27162.783	6.867	12.1	-3.1	NO		NO	bb
7	7 181126M1_8	Standard	12.500	6.40	16310.112	28301.350	7.204	12.7	1.6	NO		NO	bb
8	8 181126M1_9	Standard	12.500	6.40	15502.673	26656.619	7.270	12.8	2.6	NO		NO	bb
9	9 181126M1_10	Standard	12.500	6.40	14833.304	24614.043	7.533	13.3	6.3	NO		NO	bb
10	10 181126M1_11	Standard	12.500	6.40	13438.607	21283.375	7.893	13.9	11.4	NO		NO	bb

Compound name: d5-N-ETFOSA
Response Factor: 0.0583225
RRF SD: 0.00662878, Relative SD: 11.3657
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	150.000	6.44	15262.959	26672.982	7.153	122.6	-18.2	NO		NO	bb
2	2 181126M1_3	Standard	150.000	6.45	16027.104	26794.484	7.477	128.2	-14.5	NO		NO	bb
3	3 181126M1_4	Standard	150.000	6.45	18601.041	28575.072	8.137	139.5	-7.0	NO		NO	bb
4	4 181126M1_5	Standard	150.000	6.45	19918.102	28337.990	8.786	150.6	0.4	NO		NO	bb
5	5 181126M1_6	Standard	150.000	6.45	20324.578	28551.758	8.898	152.6	1.7	NO		NO	bb
6	6 181126M1_7	Standard	150.000	6.45	19247.895	27162.783	8.858	151.9	1.2	NO		NO	bb
7	7 181126M1_8	Standard	150.000	6.45	19814.482	28301.350	8.752	150.1	0.0	NO		NO	bb
8	8 181126M1_9	Standard	150.000	6.45	19491.674	26656.619	9.140	156.7	4.5	NO		NO	bb
9	9 181126M1_10	Standard	150.000	6.45	19221.986	24614.043	9.762	167.4	11.6	NO		NO	bb
10	10 181126M1_11	Standard	150.000	6.45	17915.363	21283.375	10.522	180.4	20.3	NO		NO	bb

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Compound name: 13C2-PFHxDA
Response Factor: 0.745697
RRF SD: 0.0807983, Relative SD: 10.8353
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	5.000	6.73	6889.798	26672.982	3.229	4.3	-13.4	NO		NO	bb
2	2	181126M1_3	Standard	5.000	6.73	7098.292	26794.484	3.311	4.4	-11.2	NO		NO	bb
3	3	181126M1_4	Standard	5.000	6.73	8009.421	28575.072	3.504	4.7	-6.0	NO		NO	bb
4	4	181126M1_5	Standard	5.000	6.73	8091.949	28337.990	3.569	4.8	-4.3	NO		NO	bb
5	5	181126M1_6	Standard	5.000	6.73	8466.808	28551.758	3.707	5.0	-0.6	NO		NO	bb
6	6	181126M1_7	Standard	5.000	6.73	7582.587	27162.783	3.489	4.7	-6.4	NO		NO	bb
7	7	181126M1_8	Standard	5.000	6.73	8679.925	28301.350	3.834	5.1	2.8	NO		NO	bb
8	8	181126M1_9	Standard	5.000	6.74	8488.328	26656.619	3.980	5.3	6.8	NO		NO	bb
9	9	181126M1_10	Standard	5.000	6.73	8060.974	24614.043	4.094	5.5	9.8	NO		NO	bb
10	10	181126M1_11	Standard	5.000	6.74	7776.927	21283.375	4.567	6.1	22.5	NO		NO	bb

Compound name: d7-N-MeFOSE
Response Factor: 0.0316395
RRF SD: 0.00249814, Relative SD: 7.89562
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	150.000	6.68	9613.644	26672.982	4.505	142.4	-5.1	NO		NO	bb
2	2	181126M1_3	Standard	150.000	6.68	9970.688	26794.484	4.651	147.0	-2.0	NO		NO	bb
3	3	181126M1_4	Standard	150.000	6.68	10409.790	28575.072	4.554	143.9	-4.1	NO		NO	bb
4	4	181126M1_5	Standard	150.000	6.68	10378.408	28337.990	4.578	144.7	-3.5	NO		NO	bb
5	5	181126M1_6	Standard	150.000	6.68	10389.321	28551.758	4.548	143.8	-4.2	NO		NO	bb
6	6	181126M1_7	Standard	150.000	6.68	9705.995	27162.783	4.467	141.2	-5.9	NO		NO	bb
7	7	181126M1_8	Standard	150.000	6.68	10357.785	28301.350	4.575	144.6	-3.6	NO		NO	bb
8	8	181126M1_9	Standard	150.000	6.68	10143.168	26656.619	4.756	150.3	0.2	NO		NO	bb
9	9	181126M1_10	Standard	150.000	6.68	10223.422	24614.043	5.192	164.1	9.4	NO		NO	MM
10	10	181126M1_11	Standard	150.000	6.68	9590.735	21283.375	5.633	178.0	18.7	NO		NO	bb

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Compound name: d9-N-EtFOSE
Response Factor: 0.0298286
RRF SD: 0.00279971, Relative SD: 9.38599
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	150.000	6.83	8485.106	26672.982	3.976	133.3	-11.1	NO		NO	bb
2	2	181126M1_3	Standard	150.000	6.83	8904.628	26794.484	4.154	139.3	-7.2	NO		NO	bb
3	3	181126M1_4	Standard	150.000	6.83	9999.587	28575.072	4.374	146.6	-2.2	NO		NO	bb
4	4	181126M1_5	Standard	150.000	6.83	9705.979	28337.990	4.281	143.5	-4.3	NO		NO	bb
5	5	181126M1_6	Standard	150.000	6.83	9902.425	28551.758	4.335	145.3	-3.1	NO		NO	bb
6	6	181126M1_7	Standard	150.000	6.83	9565.112	27162.783	4.402	147.6	-1.6	NO		NO	bb
7	7	181126M1_8	Standard	150.000	6.83	9699.960	28301.350	4.284	143.6	-4.2	NO		NO	bb
8	8	181126M1_9	Standard	150.000	6.83	9803.931	26656.619	4.597	154.1	2.7	NO		NO	bb
9	9	181126M1_10	Standard	150.000	6.83	9641.881	24614.043	4.897	164.2	9.4	NO		NO	bb
10	10	181126M1_11	Standard	150.000	6.83	9265.136	21283.375	5.442	182.4	21.6	NO		NO	bb

Compound name: 13C4-PFBA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 60), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	12.500	1.24	7908.070	7908.070	12.500	12.5	0.0	NO		NO	bb
2	2	181126M1_3	Standard	12.500	1.24	8749.445	8749.445	12.500	12.5	0.0	NO		NO	db
3	3	181126M1_4	Standard	12.500	1.24	8407.808	8407.808	12.500	12.5	0.0	NO		NO	bb
4	4	181126M1_5	Standard	12.500	1.24	8750.237	8750.237	12.500	12.5	0.0	NO		NO	bb
5	5	181126M1_6	Standard	12.500	1.24	8717.376	8717.376	12.500	12.5	0.0	NO		NO	bb
6	6	181126M1_7	Standard	12.500	1.24	8412.910	8412.910	12.500	12.5	0.0	NO		NO	bb
7	7	181126M1_8	Standard	12.500	1.24	8782.584	8782.584	12.500	12.5	0.0	NO		NO	bb
8	8	181126M1_9	Standard	12.500	1.24	8534.894	8534.894	12.500	12.5	0.0	NO		NO	bb
9	9	181126M1_10	Standard	12.500	1.24	8472.024	8472.024	12.500	12.5	0.0	NO		NO	bb
10	10	181126M1_11	Standard	12.500	1.24	9085.835	9085.835	12.500	12.5	0.0	NO		NO	db

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Compound name: 13C5-PFHxA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 61), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	3.35	25192.414	25192.414	12.500	12.5	0.0	NO		NO	bb
2	2 181126M1_3	Standard	12.500	3.36	25514.697	25514.697	12.500	12.5	0.0	NO		NO	bb
3	3 181126M1_4	Standard	12.500	3.36	26136.416	26136.416	12.500	12.5	0.0	NO		NO	bb
4	4 181126M1_5	Standard	12.500	3.36	26095.398	26095.398	12.500	12.5	0.0	NO		NO	bb
5	5 181126M1_6	Standard	12.500	3.37	26363.371	26363.371	12.500	12.5	0.0	NO		NO	bb
6	6 181126M1_7	Standard	12.500	3.36	25322.297	25322.297	12.500	12.5	0.0	NO		NO	bb
7	7 181126M1_8	Standard	12.500	3.37	26522.105	26522.105	12.500	12.5	0.0	NO		NO	bb
8	8 181126M1_9	Standard	12.500	3.37	25558.145	25558.145	12.500	12.5	0.0	NO		NO	bb
9	9 181126M1_10	Standard	12.500	3.37	23924.270	23924.270	12.500	12.5	0.0	NO		NO	bb
10	10 181126M1_11	Standard	12.500	3.37	22313.770	22313.770	12.500	12.5	0.0	NO		NO	bb

Compound name: 13C3-PFHxS
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 62), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	4.16	3368.764	3368.764	12.500	12.5	0.0	NO		NO	bb
2	2 181126M1_3	Standard	12.500	4.16	3301.831	3301.831	12.500	12.5	0.0	NO		NO	bb
3	3 181126M1_4	Standard	12.500	4.16	3474.822	3474.822	12.500	12.5	0.0	NO		NO	bb
4	4 181126M1_5	Standard	12.500	4.16	3365.570	3365.570	12.500	12.5	0.0	NO		NO	bb
5	5 181126M1_6	Standard	12.500	4.16	3524.441	3524.441	12.500	12.5	0.0	NO		NO	bb
6	6 181126M1_7	Standard	12.500	4.16	3327.563	3327.563	12.500	12.5	0.0	NO		NO	bb
7	7 181126M1_8	Standard	12.500	4.16	3604.044	3604.044	12.500	12.5	0.0	NO		NO	bb
8	8 181126M1_9	Standard	12.500	4.16	3316.433	3316.433	12.500	12.5	0.0	NO		NO	bb
9	9 181126M1_10	Standard	12.500	4.16	3064.151	3064.151	12.500	12.5	0.0	NO		NO	bb
10	10 181126M1_11	Standard	12.500	4.16	2559.058	2559.058	12.500	12.5	0.0	NO		NO	bb

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Compound name: 13C8-PFOA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 63), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	12.500	4.50	30823.398	30823.398	12.500	12.5	0.0	NO		NO	bb
2	2	181126M1_3	Standard	12.500	4.51	31989.600	31989.600	12.500	12.5	0.0	NO		NO	bb
3	3	181126M1_4	Standard	12.500	4.51	32072.896	32072.896	12.500	12.5	0.0	NO		NO	bb
4	4	181126M1_5	Standard	12.500	4.51	31406.428	31406.428	12.500	12.5	0.0	NO		NO	bb
5	5	181126M1_6	Standard	12.500	4.51	31457.979	31457.979	12.500	12.5	0.0	NO		NO	bb
6	6	181126M1_7	Standard	12.500	4.51	30564.838	30564.838	12.500	12.5	0.0	NO		NO	bb
7	7	181126M1_8	Standard	12.500	4.51	32979.738	32979.738	12.500	12.5	0.0	NO		NO	bb
8	8	181126M1_9	Standard	12.500	4.52	29964.543	29964.543	12.500	12.5	0.0	NO		NO	bb
9	9	181126M1_10	Standard	12.500	4.52	28178.553	28178.553	12.500	12.5	0.0	NO		NO	bb
10	10	181126M1_11	Standard	12.500	4.52	25705.412	25705.412	12.500	12.5	0.0	NO		NO	bb

Compound name: 13C9-PFNA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 64), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	12.500	4.93	22519.746	22519.746	12.500	12.5	0.0	NO		NO	bb
2	2	181126M1_3	Standard	12.500	4.94	22448.209	22448.209	12.500	12.5	0.0	NO		NO	bb
3	3	181126M1_4	Standard	12.500	4.94	22991.566	22991.566	12.500	12.5	0.0	NO		NO	bb
4	4	181126M1_5	Standard	12.500	4.94	23074.576	23074.576	12.500	12.5	0.0	NO		NO	bb
5	5	181126M1_6	Standard	12.500	4.94	22849.063	22849.063	12.500	12.5	0.0	NO		NO	bb
6	6	181126M1_7	Standard	12.500	4.94	21600.799	21600.799	12.500	12.5	0.0	NO		NO	bb
7	7	181126M1_8	Standard	12.500	4.94	22741.340	22741.340	12.500	12.5	0.0	NO		NO	bb
8	8	181126M1_9	Standard	12.500	4.94	22540.299	22540.299	12.500	12.5	0.0	NO		NO	bb
9	9	181126M1_10	Standard	12.500	4.94	20378.484	20378.484	12.500	12.5	0.0	NO		NO	bb
10	10	181126M1_11	Standard	12.500	4.94	18532.297	18532.297	12.500	12.5	0.0	NO		NO	bb

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Compound name: 13C4-PFOS
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 65), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	5.02	3462.963	3462.963	12.500	12.5	0.0	NO		NO	bb
2	2 181126M1_3	Standard	12.500	5.03	3224.760	3224.760	12.500	12.5	0.0	NO		NO	bb
3	3 181126M1_4	Standard	12.500	5.03	3512.134	3512.134	12.500	12.5	0.0	NO		NO	bb
4	4 181126M1_5	Standard	12.500	5.03	3358.832	3358.832	12.500	12.5	0.0	NO		NO	bb
5	5 181126M1_6	Standard	12.500	5.03	3378.300	3378.300	12.500	12.5	0.0	NO		NO	bb
6	6 181126M1_7	Standard	12.500	5.03	3393.990	3393.990	12.500	12.5	0.0	NO		NO	bb
7	7 181126M1_8	Standard	12.500	5.03	3536.995	3536.995	12.500	12.5	0.0	NO		NO	bb
8	8 181126M1_9	Standard	12.500	5.03	3346.116	3346.116	12.500	12.5	0.0	NO		NO	bb
9	9 181126M1_10	Standard	12.500	5.03	3217.784	3217.784	12.500	12.5	0.0	NO		NO	bb
10	10 181126M1_11	Standard	12.500	5.03	2856.125	2856.125	12.500	12.5	0.0	NO		NO	bb

Compound name: 13C6-PFDA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 66), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1 181126M1_2	Standard	12.500	5.32	23842.426	23842.426	12.500	12.5	0.0	NO		NO	bb
2	2 181126M1_3	Standard	12.500	5.32	24662.998	24662.998	12.500	12.5	0.0	NO		NO	bb
3	3 181126M1_4	Standard	12.500	5.32	24277.797	24277.797	12.500	12.5	0.0	NO		NO	bb
4	4 181126M1_5	Standard	12.500	5.32	24205.205	24205.205	12.500	12.5	0.0	NO		NO	bb
5	5 181126M1_6	Standard	12.500	5.32	25346.094	25346.094	12.500	12.5	0.0	NO		NO	bb
6	6 181126M1_7	Standard	12.500	5.32	23846.875	23846.875	12.500	12.5	0.0	NO		NO	bb
7	7 181126M1_8	Standard	12.500	5.32	24795.838	24795.838	12.500	12.5	0.0	NO		NO	bb
8	8 181126M1_9	Standard	12.500	5.32	23591.418	23591.418	12.500	12.5	0.0	NO		NO	bb
9	9 181126M1_10	Standard	12.500	5.32	21882.871	21882.871	12.500	12.5	0.0	NO		NO	bb
10	10 181126M1_11	Standard	12.500	5.32	18919.330	18919.330	12.500	12.5	0.0	NO		NO	bb

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Compound name: 13C7-PFUdA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 67), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Type	Std. Conc	RT	Area	IS Area	Response	Conc.	%Dev	Conc. Flag	CoD	CoD Flag	x=excluded
1	1	181126M1_2	Standard	12.500	5.64	26672.982	26672.982	12.500	12.5	0.0	NO		NO	bb
2	2	181126M1_3	Standard	12.500	5.64	26794.484	26794.484	12.500	12.5	0.0	NO		NO	bb
3	3	181126M1_4	Standard	12.500	5.64	28575.072	28575.072	12.500	12.5	0.0	NO		NO	bb
4	4	181126M1_5	Standard	12.500	5.65	28337.990	28337.990	12.500	12.5	0.0	NO		NO	bb
5	5	181126M1_6	Standard	12.500	5.64	28551.758	28551.758	12.500	12.5	0.0	NO		NO	bb
6	6	181126M1_7	Standard	12.500	5.65	27162.783	27162.783	12.500	12.5	0.0	NO		NO	bb
7	7	181126M1_8	Standard	12.500	5.65	28301.350	28301.350	12.500	12.5	0.0	NO		NO	bb
8	8	181126M1_9	Standard	12.500	5.65	26656.619	26656.619	12.500	12.5	0.0	NO		NO	bb
9	9	181126M1_10	Standard	12.500	5.65	24614.043	24614.043	12.500	12.5	0.0	NO		NO	bb
10	10	181126M1_11	Standard	12.500	5.65	21283.375	21283.375	12.500	12.5	0.0	NO		NO	bb

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:39:52 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

1 AD 11/27/18

Name: 181126M1_2, Date: 26-Nov-2018, Time: 11:45:59, ID: ST181126M2-1 PFC CS-2 18K1901, Description: PFC CS-2 18K1901

	#	Name	IS#	CoD	CoD Flag	%RSD
1	1	PFBA	36	0.9998	NO	
2	2	PFPeA	37	0.9998	NO	
3	3	PFBS	38	0.9977	NO	
4	4	4:2 FTS	39	0.9977	NO	
5	5	PFHxA	40	0.9998	NO	
6	6	PFPeS	38	0.9984	NO	
7	7	PFHpA	41	0.9996	NO	
8	8	L-PFHxS	42	0.9987	NO	
9	10	6:2 FTS	43	0.9979	NO	
10	11	L-PFOA	44	0.9998	NO	
11	13	PFHpS	47	0.9993	NO	
12	14	PFNA	45	0.9998	NO	
13	15	PFOSA	46	0.9997	NO	
14	16	L-PFOS	47	0.9986	NO	
15	18	PFDA	48	0.9994	NO	
16	19	8:2 FTS	49	0.9988	NO	
17	20	PFNS	47	0.9987	NO	
18	21	L-MeFOSAA	50	0.9986	NO	
19	23	L-EtFOSAA	52	0.9999	NO	

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:42:51 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

1 -AD 11/27/18

Name: 181126M1_2, Date: 26-Nov-2018, Time: 11:45:59, ID: ST181126M2-1 PFC CS-2 18K1901, Description: PFC CS-2 18K1901

	#	Name	IS#	CoD	CoD Flag	%RSD
1	25	PFUdA	51	0.9997	NO	
2	26	PFDS	47	0.9983	NO	
3	27	PFDoA	53	0.9999	NO	
4	28	N-MeFOSA	54	0.9994	NO	
5	29	PFTrDA	53	0.9998	NO	
6	30	PFTeDA	55	0.9996	NO	
7	31	N-EtFOSA	56	0.9998	NO	
8	32	PFHxDA	57	0.9987	NO	
9	33	PFODA	57	0.9994	NO	
10	34	N-MeFOSE	58	0.9999	NO	
11	35	N-EtFOSE	59	0.9997	NO	
12	36	13C3-PFBA	60		NO	2.900
13	37	13C3-PFPeA	61		NO	2.459
14	38	13C3-PFBS	62		NO	3.957
15	39	13C2-4:2 FTS	62		NO	6.803
16	40	13C2-PFHxA	61		NO	2.935
17	41	13C4-PFHpA	61		NO	4.143
18	42	18O2-PFHxS	62		NO	3.593
19	43	13C2-6:2 FTS	65		NO	6.823
20	44	13C2-PFOA	63		NO	2.584
21	45	13C5-PFNA	64		NO	2.264
22	46	13C8-PFOSA	67		NO	7.976
23	47	13C8-PFOS	65		NO	5.032
24	48	13C2-PFDA	66		NO	4.117
25	49	13C2-8:2 FTS	65		NO	7.536
26	50	d3-N-MeFOSAA	67		NO	5.182
27	51	13C2-PFUdA	67		NO	2.331
28	52	d5-N-EtFOSAA	67		NO	5.884
29	53	13C2-PFDoA	66		NO	3.498
30	54	d3-N-MeFOSA	67		NO	8.842
31	55	13C2-PFTeDA	67		NO	5.408
32	56	d5-N-ETFOSA	67		NO	11.366

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:42:51 Pacific Standard Time

1 -AD 11/27/18

Name: 181126M1_2, Date: 26-Nov-2018, Time: 11:45:59, ID: ST181126M2-1 PFC CS-2 18K1901, Description: PFC CS-2 18K1901

	#	Name	IS#	CoD	CoD Flag	%RSD
33	57	13C2-PFHxDA	67		NO	10.835
34	58	d7-N-MeFOSE	67		NO	7.896
35	59	d9-N-EtFOSE	67		NO	9.386
36	60	13C4-PFBA	60		NO	0.000
37	61	13C5-PFHxA	61		NO	0.000
38	62	13C3-PFHxS	62		NO	0.000
39	63	13C8-PFOA	63		NO	0.000
40	64	13C9-PFNA	64		NO	0.000
41	65	13C4-PFOS	65		NO	0.000
42	66	13C6-PFDA	66		NO	0.000
43	67	13C7-PFUdA	67		NO	0.000

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:51:30 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

1 AD 11/27/18

Name: 181126M1_7, Date: 26-Nov-2018, Time: 12:38:59, ID: ST181126M2-6 PFC CS3 18K1906, Description: PFC CS3 18K1906

	Name	Ion Ratio	Ratio out?
1	PFBA		
2	PFPeA		
3	PFBS	2.741	NO
4	4:2 FTS	1.665	NO
5	PFHxA	15.286	NO
6	PFPeS	1.601	NO
7	PFHpA	13.863	NO
8	L-PFHxS	1.609	NO
9	6:2 FTS	2.822	NO
10	L-PFOA	3.429	NO
11	PFHpS	1.865	NO
12	PFNA	4.488	NO
13	PFOSA	22.987	NO
14	L-PFOS	1.888	NO
15	PFDA	5.551	NO
16	8:2 FTS	2.335	NO
17	PFNS	1.645	NO
18	L-MeFOSAA	2.554	NO
19	L-EtFOSAA	1.424	NO

Vista Analytical Laboratory

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:51:46 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

AD 11/27/18

Name: 181126M1_7, Date: 26-Nov-2018, Time: 12:38:59, ID: ST181126M2-6 PFC CS3 18K1906, Description: PFC CS3 18K1906

	Name	Ion Ratio	Ratio out?
1	PFUdA	9.527	NO
2	PFDS	1.667	NO
3	PFDoA	8.645	NO
4	N-MeFOSA	1.410	NO
5	PFTrDA	23.378	NO
6	PFTeDA	12.484	NO
7	N-EtFOSA	1.533	NO
8	PFHxDA	12.632	NO
9	PFODA		
10	N-MeFOSE		
11	N-EtFOSE		

Vista Analytical Laboratory

Dataset: Untitled

Last Altered: Tuesday, November 27, 2018 09:21:08 Pacific Standard Time
Printed: Tuesday, November 27, 2018 09:21:18 Pacific Standard Time

Method: Z:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: Z:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Compound name: PFBA

	#	Name	ID	Acq.Date	Acq.Time
1	1	181126M1_1	IPA	26-Nov-18	11:35:18
2	2	181126M1_2	ST181126M1-1 PFC CS-2 18K1901	26-Nov-18	11:45:59
3	3	181126M1_3	ST181126M1-2 PFC CS-1 18K1902	26-Nov-18	11:56:32
4	4	181126M1_4	ST181126M1-3 PFC CS0 18K1903	26-Nov-18	12:07:10
5	5	181126M1_5	ST181126M1-4 PFC CS1 18K1904	26-Nov-18	12:17:48
6	6	181126M1_6	ST181126M1-5 PFC CS2 18K1905	26-Nov-18	12:28:21
7	7	181126M1_7	ST181126M1-6 PFC CS3 18K1906	26-Nov-18	12:38:59
8	8	181126M1_8	ST181126M1-7 PFC CS4 1810907	26-Nov-18	12:49:38
9	9	181126M1_9	ST181126M1-8 PFC CS5 18K1908	26-Nov-18	13:00:11
10	10	181126M1_10	ST181126M1-9 PFC CS6 18K1909	26-Nov-18	13:10:49
11	11	181126M1_11	ST181126M1-10 PFC CS7 18K1910	26-Nov-18	13:21:23
12	12	181126M1_12	IPA	26-Nov-18	13:32:01
13	13	181126M1_13	ICV181126M1-1 PFC ICV 18K1911	26-Nov-18	13:42:34
14	14	181126M1_14	IPA	26-Nov-18	13:53:12

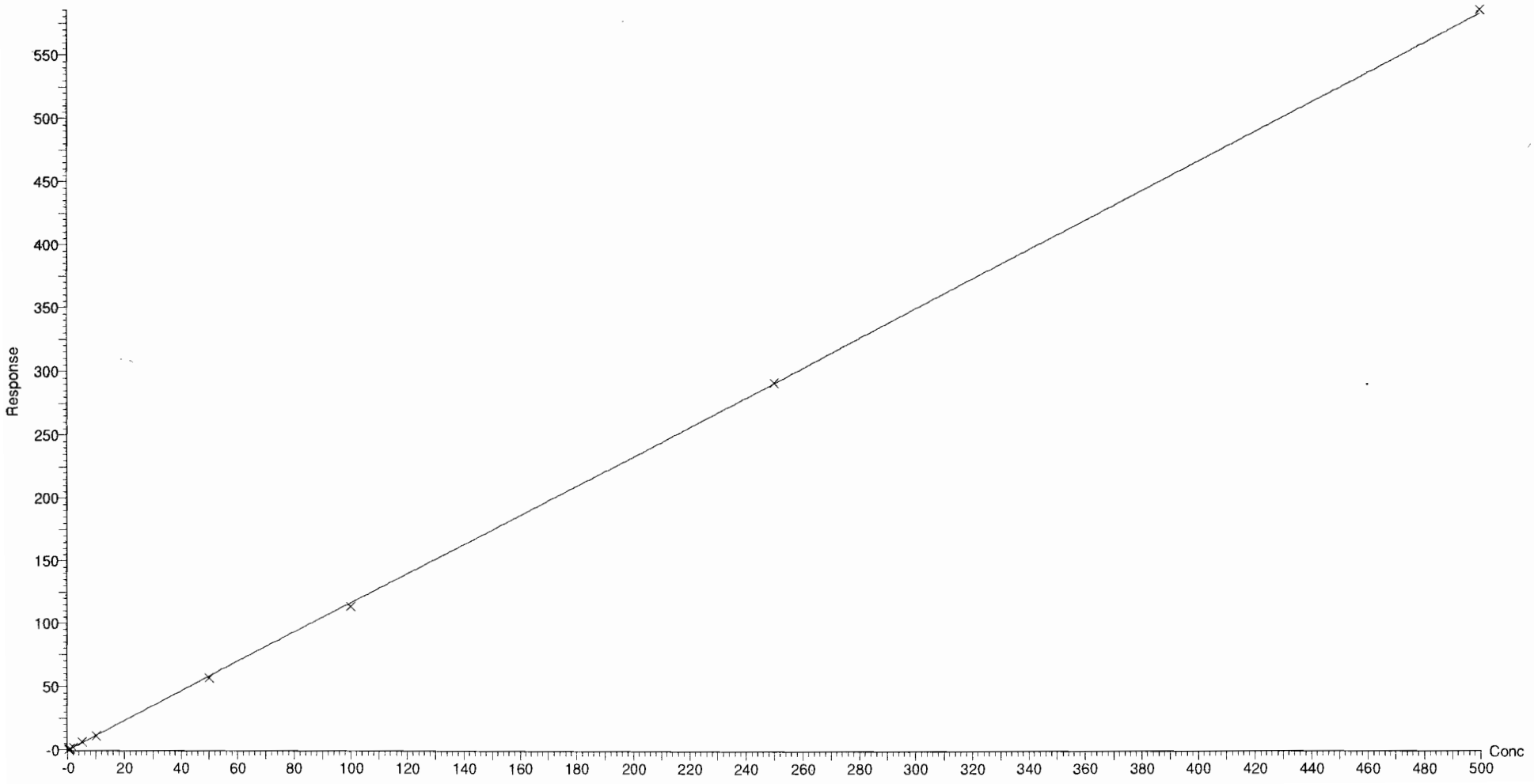
Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

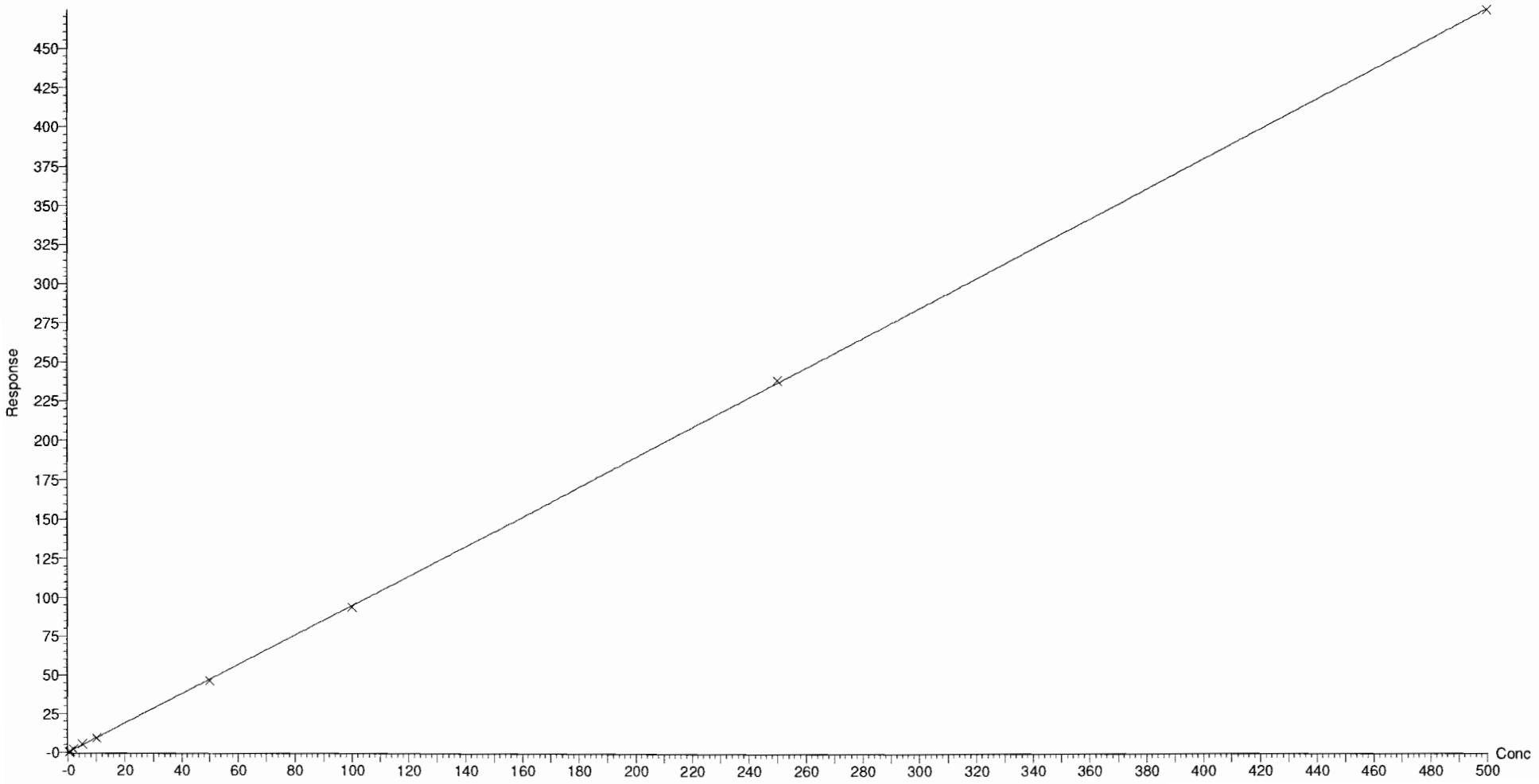
Compound name: PFBA
Correlation coefficient: r = 0.999908, r^2 = 0.999815
Calibration curve: 1.16478 * x + 0.0685845
Response type: Internal Std (Ref 36), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

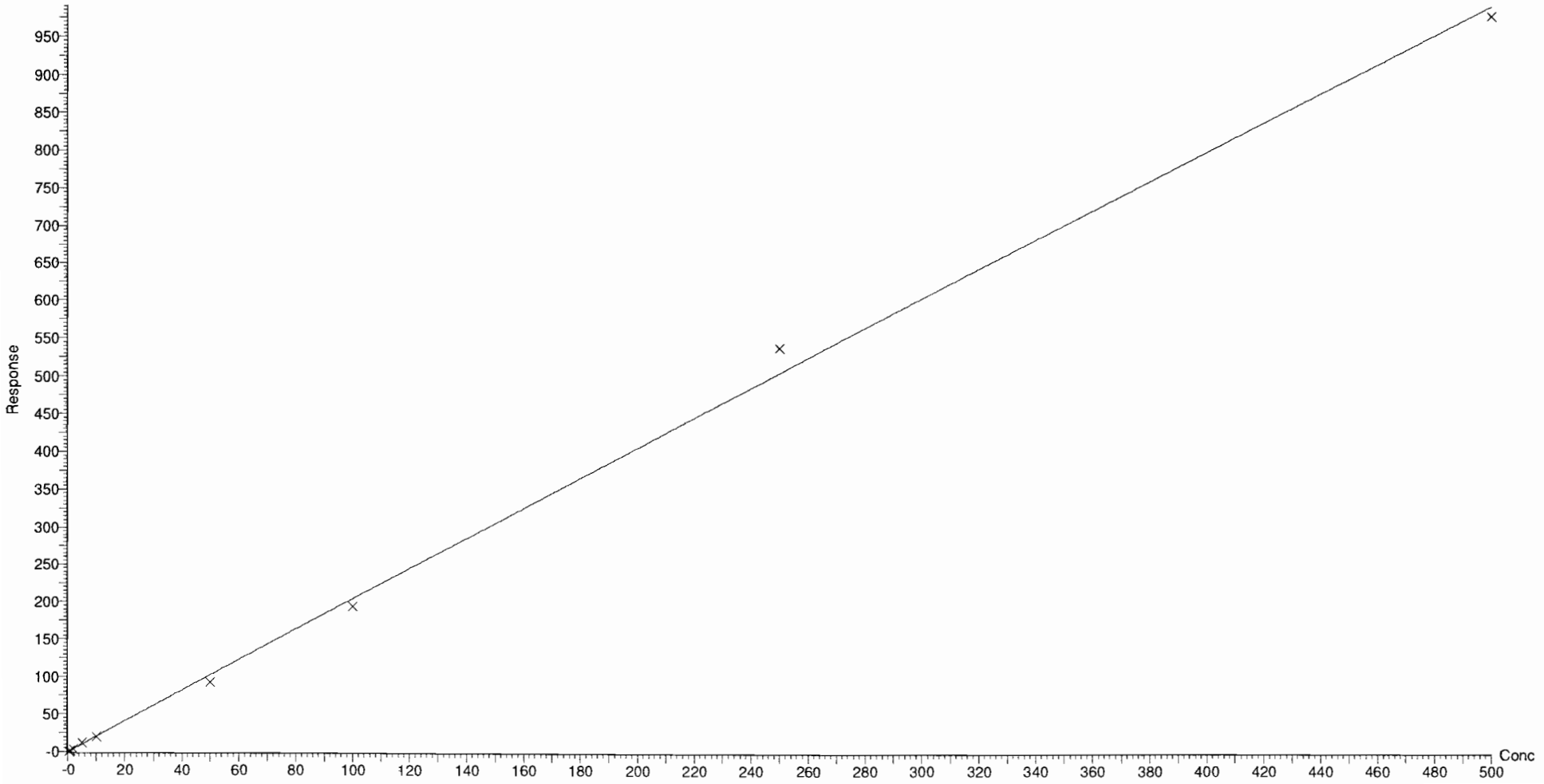
Compound name: PFPeA
Coefficient of Determination: R^2 = 0.999820
Calibration curve: 4.72356e-006 * x^2 + 0.945965 * x + 0.0647094
Response type: Internal Std (Ref 37), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

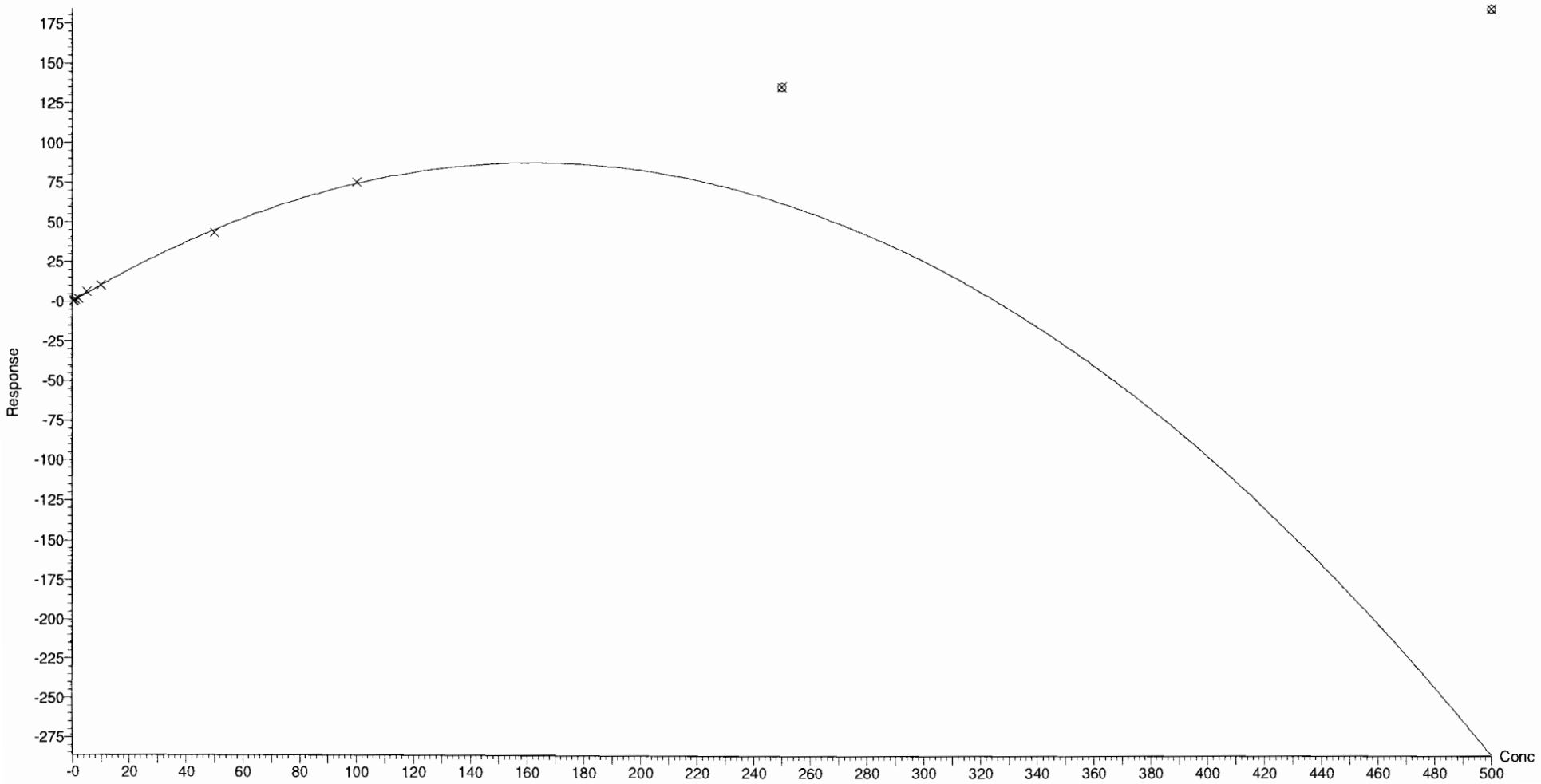
Compound name: PFBS
Coefficient of Determination: R^2 = 0.997695
Calibration curve: -0.000161679 * x^2 + 2.06224 * x + 0.0291321
Response type: Internal Std (Ref 38), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

Compound name: 4:2 FTS
Coefficient of Determination: R^2 = 0.997744
Calibration curve: -0.00329241 * x^2 + 1.0746 * x + 0.0302455
Response type: Internal Std (Ref 39), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

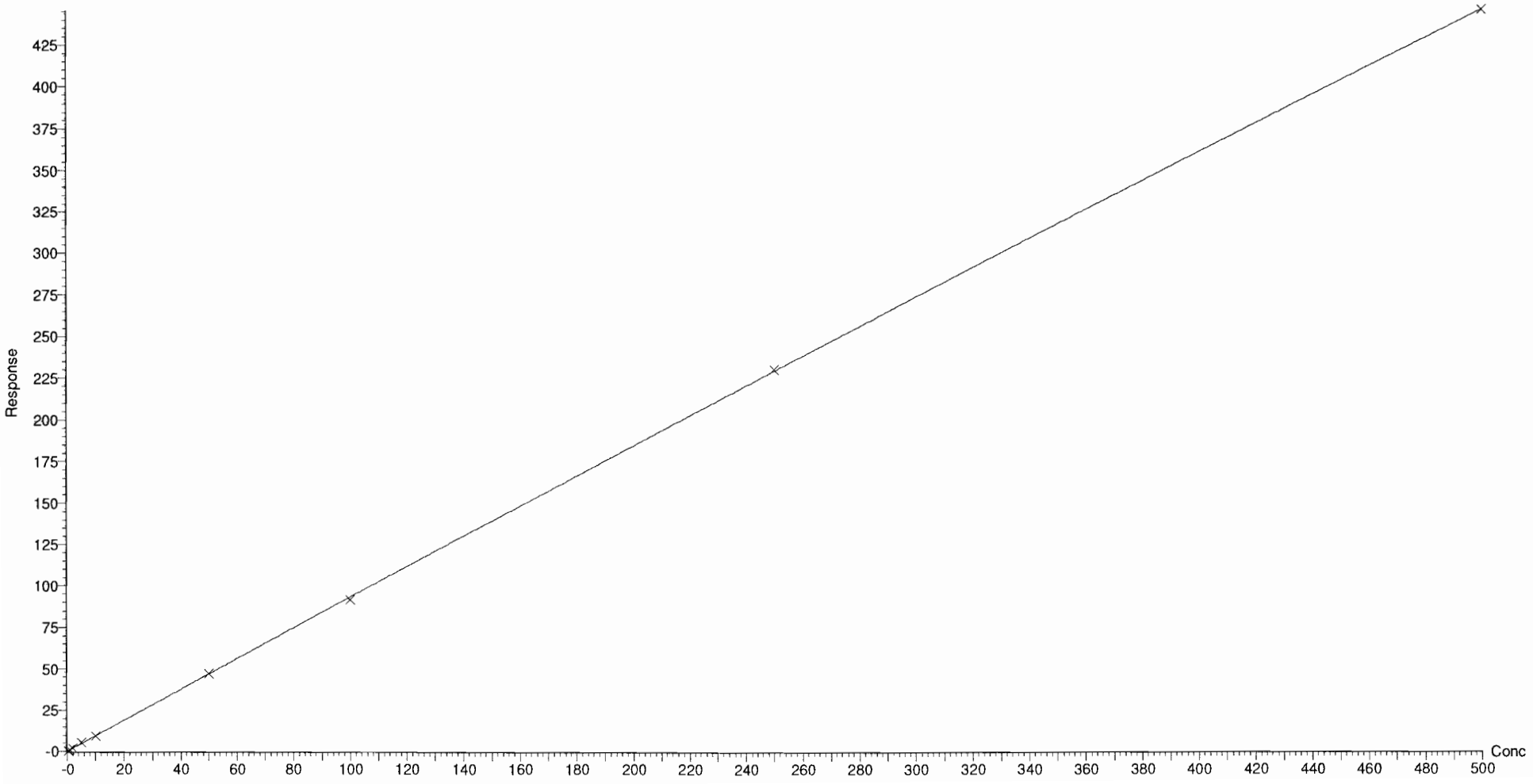


Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

Compound name: PFHxA
Coefficient of Determination: R^2 = 0.999832
Calibration curve: -0.000104875 * x^2 + 0.943399 * x + 0.0492708
Response type: Internal Std (Ref 40), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

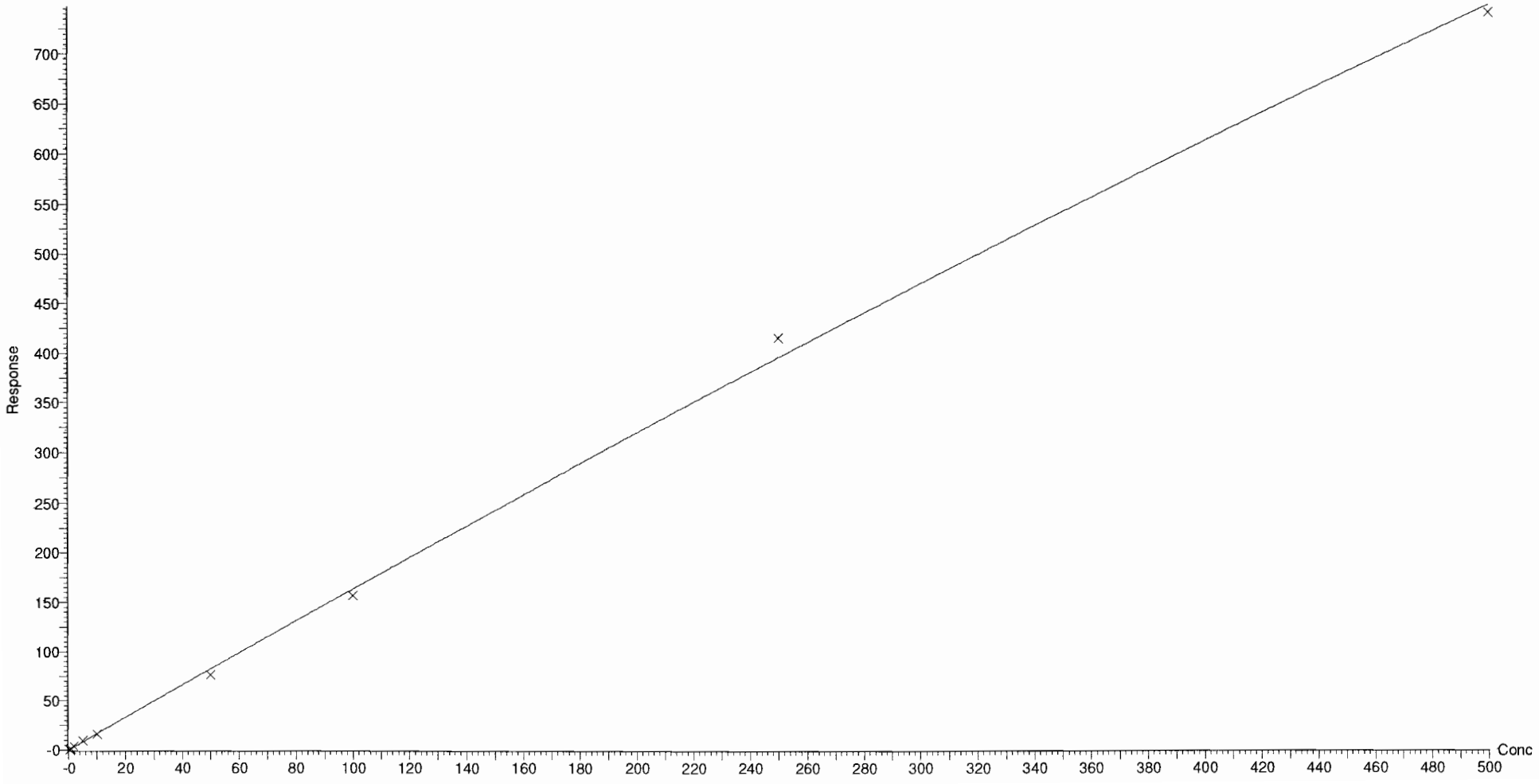


Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

Compound name: PFPeS
Coefficient of Determination: R^2 = 0.998416
Calibration curve: -0.00034984 * x^2 + 1.67039 * x + 0.0318278
Response type: Internal Std (Ref 38), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

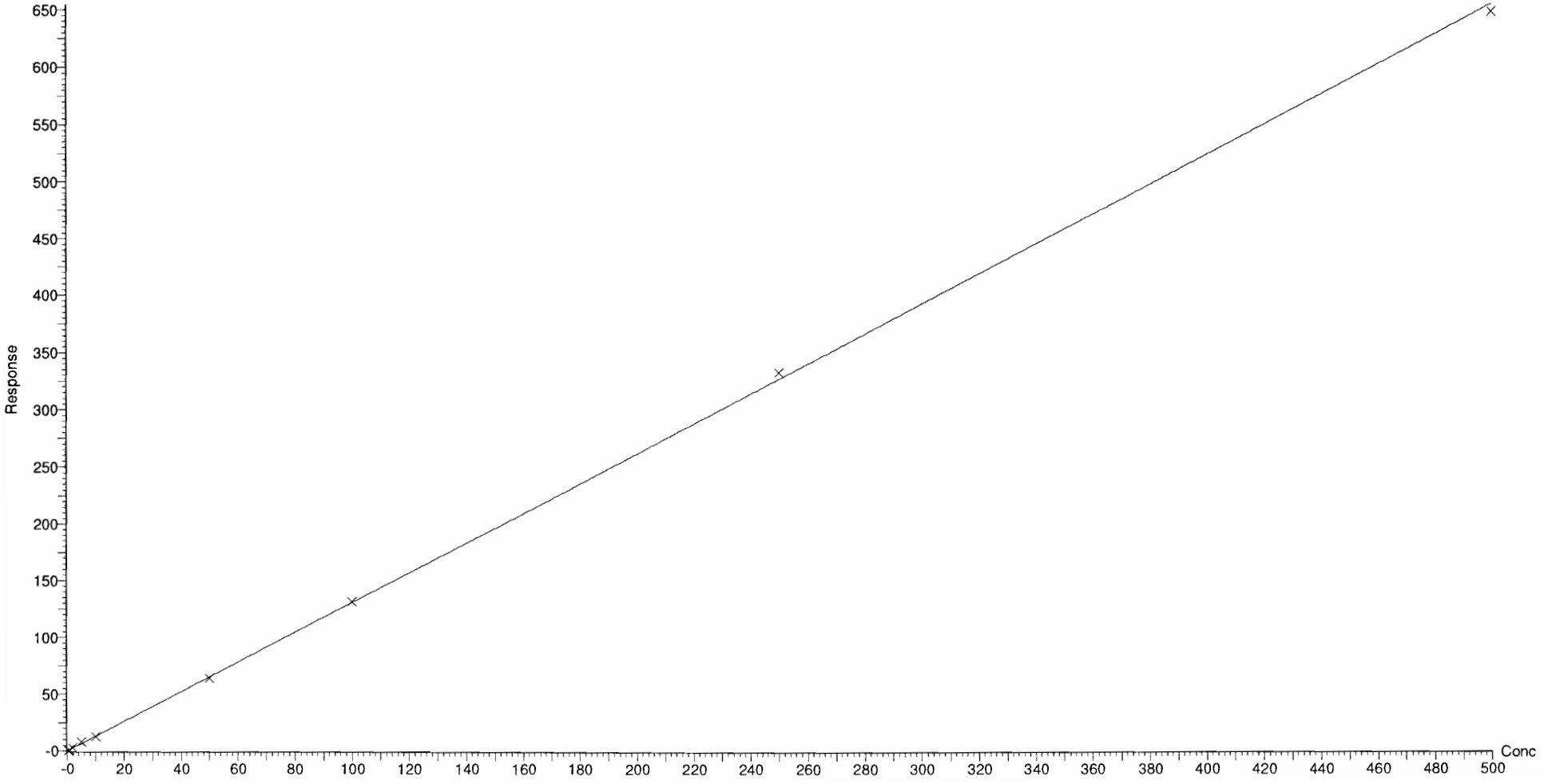


Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

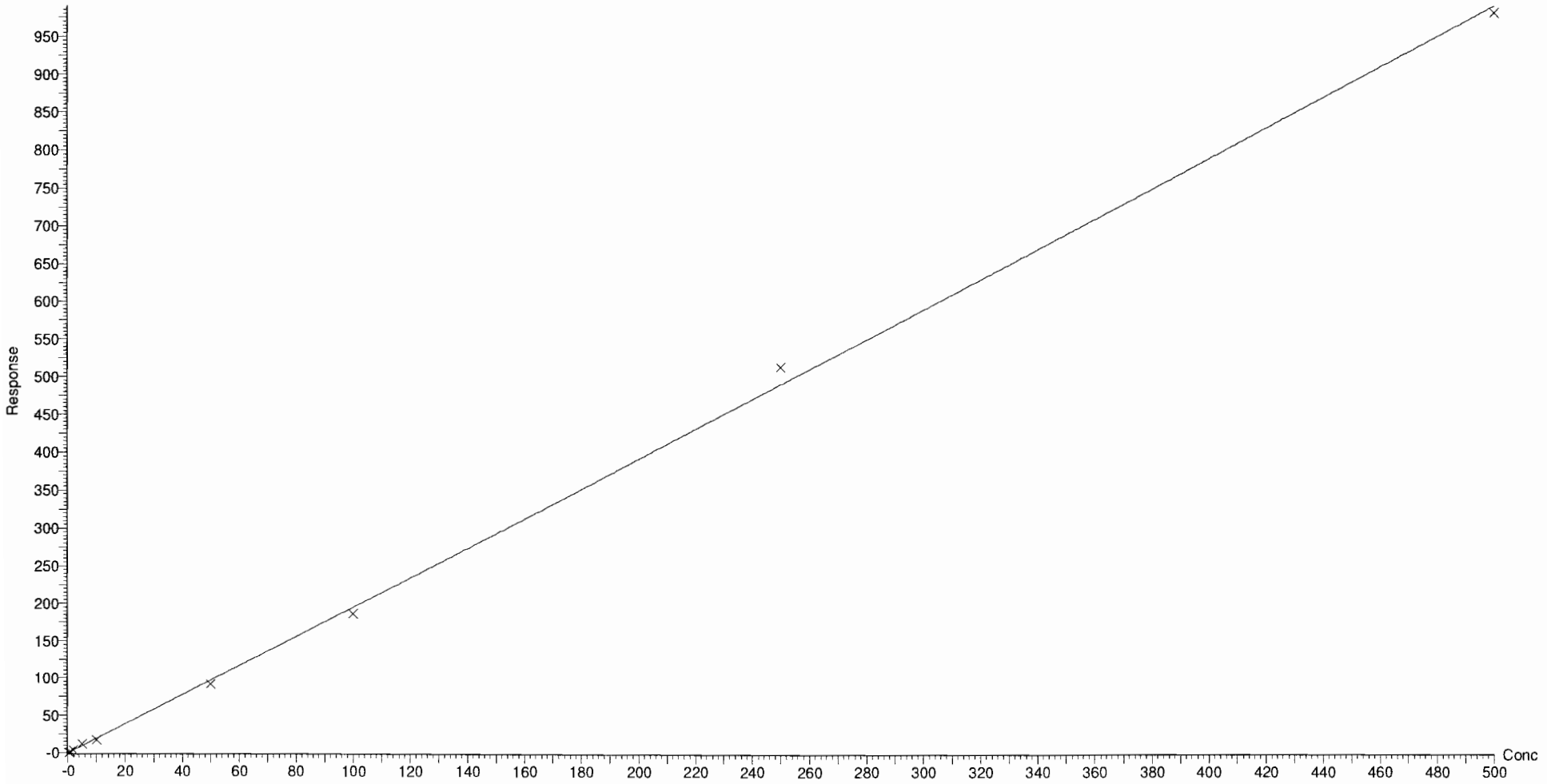
Compound name: PFHpA
Correlation coefficient: r = 0.999783, r^2 = 0.999567
Calibration curve: 1.30873 * x + 0.0886199
Response type: Internal Std (Ref 41), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

Compound name: L-PFHxS
Coefficient of Determination: R^2 = 0.998700
Calibration curve: 7.11978e-005 * x^2 + 1.94438 * x + -0.00102564
Response type: Internal Std (Ref 42), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

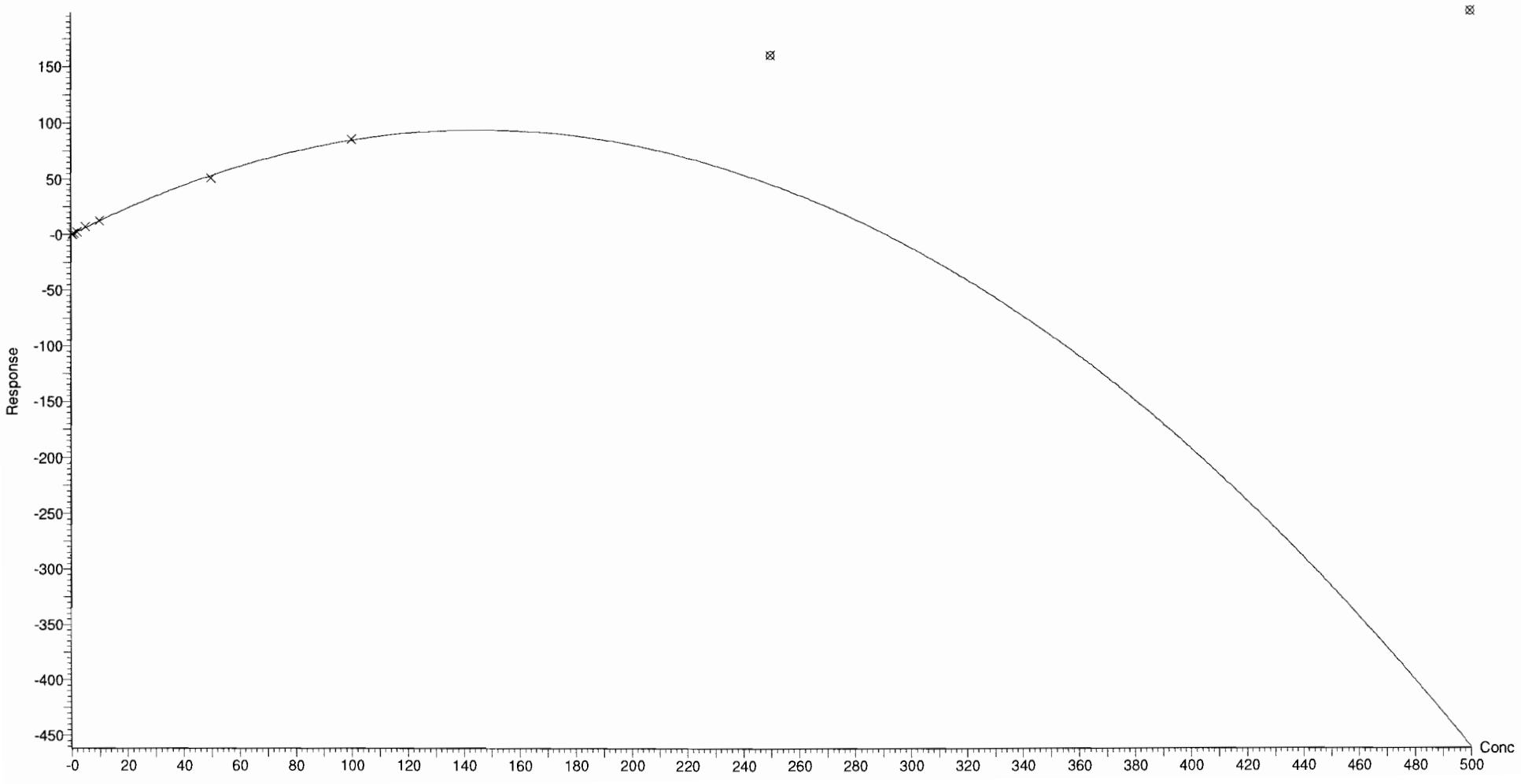


Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

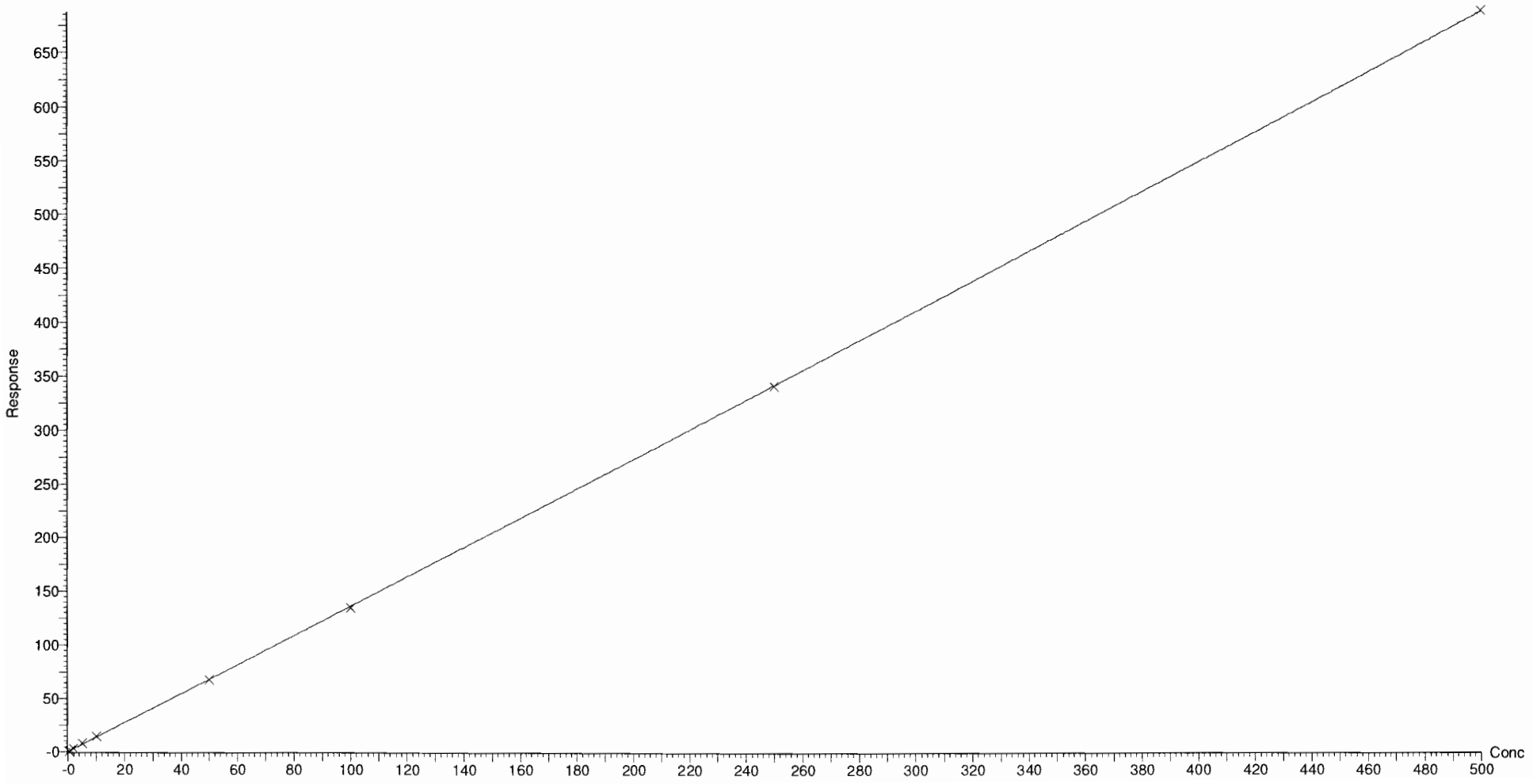
Compound name: 6:2 FTS
Coefficient of Determination: R^2 = 0.997882
Calibration curve: -0.0044139 * x^2 + 1.28489 * x + 0.0365766
Response type: Internal Std (Ref 43), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

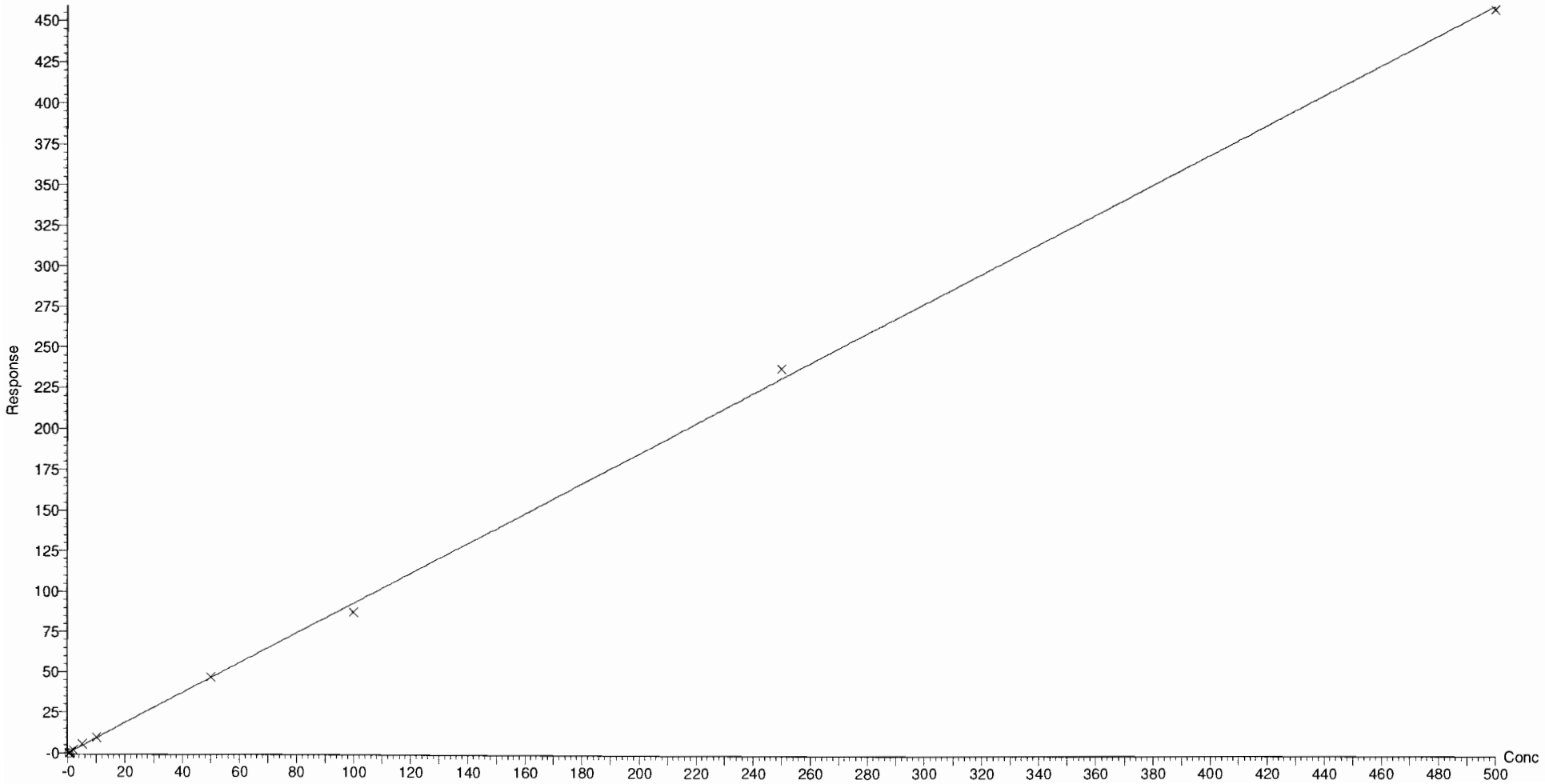
Compound name: L-PFOA
Coefficient of Determination: R^2 = 0.999794
Calibration curve: 3.30794e-005 * x^2 + 1.35692 * x + 0.157598
Response type: Internal Std (Ref 44), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

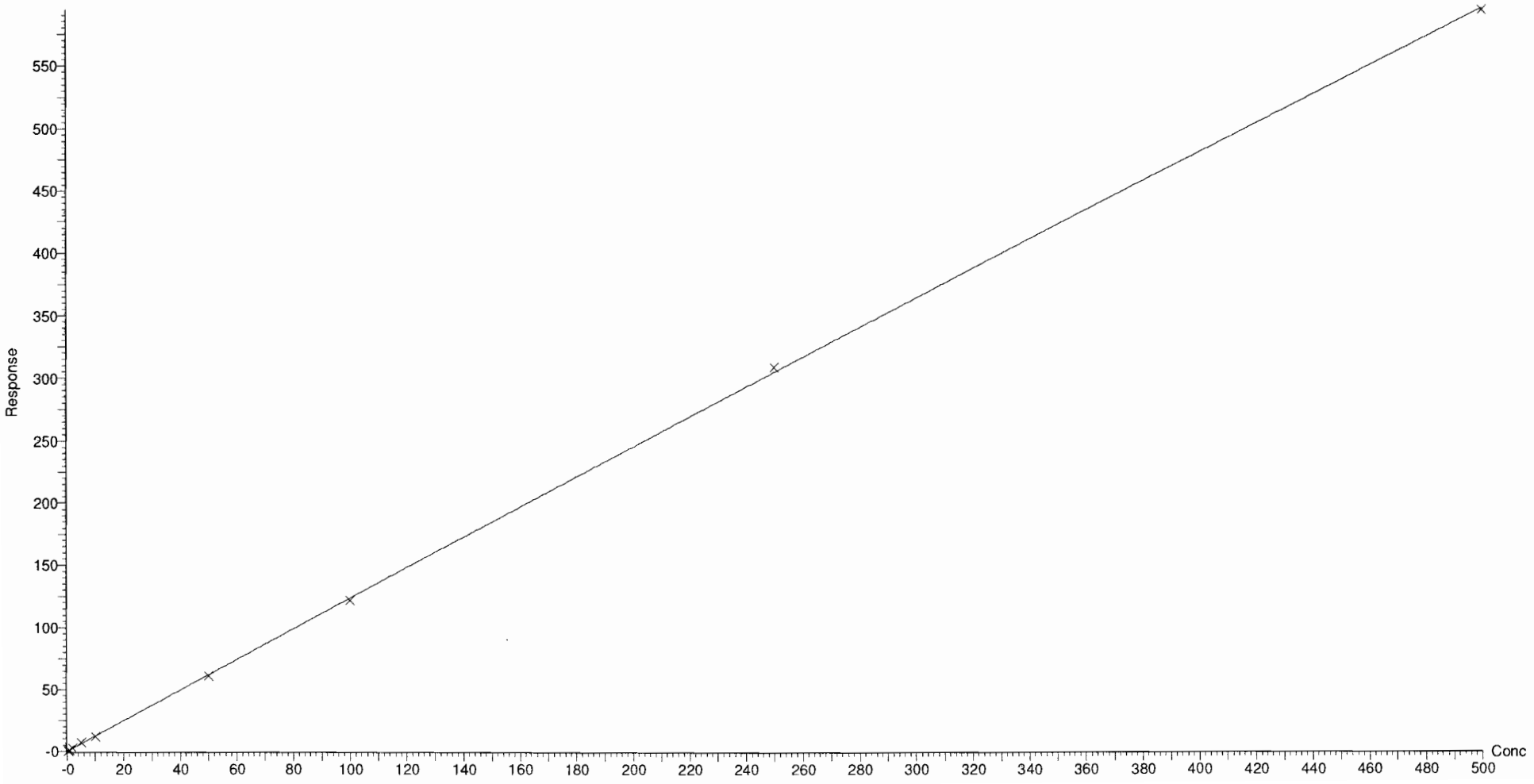
Compound name: PFHpS
Coefficient of Determination: R^2 = 0.999257
Calibration curve: -2.62046e-005 * x^2 + 0.932171 * x + 0.0595585
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

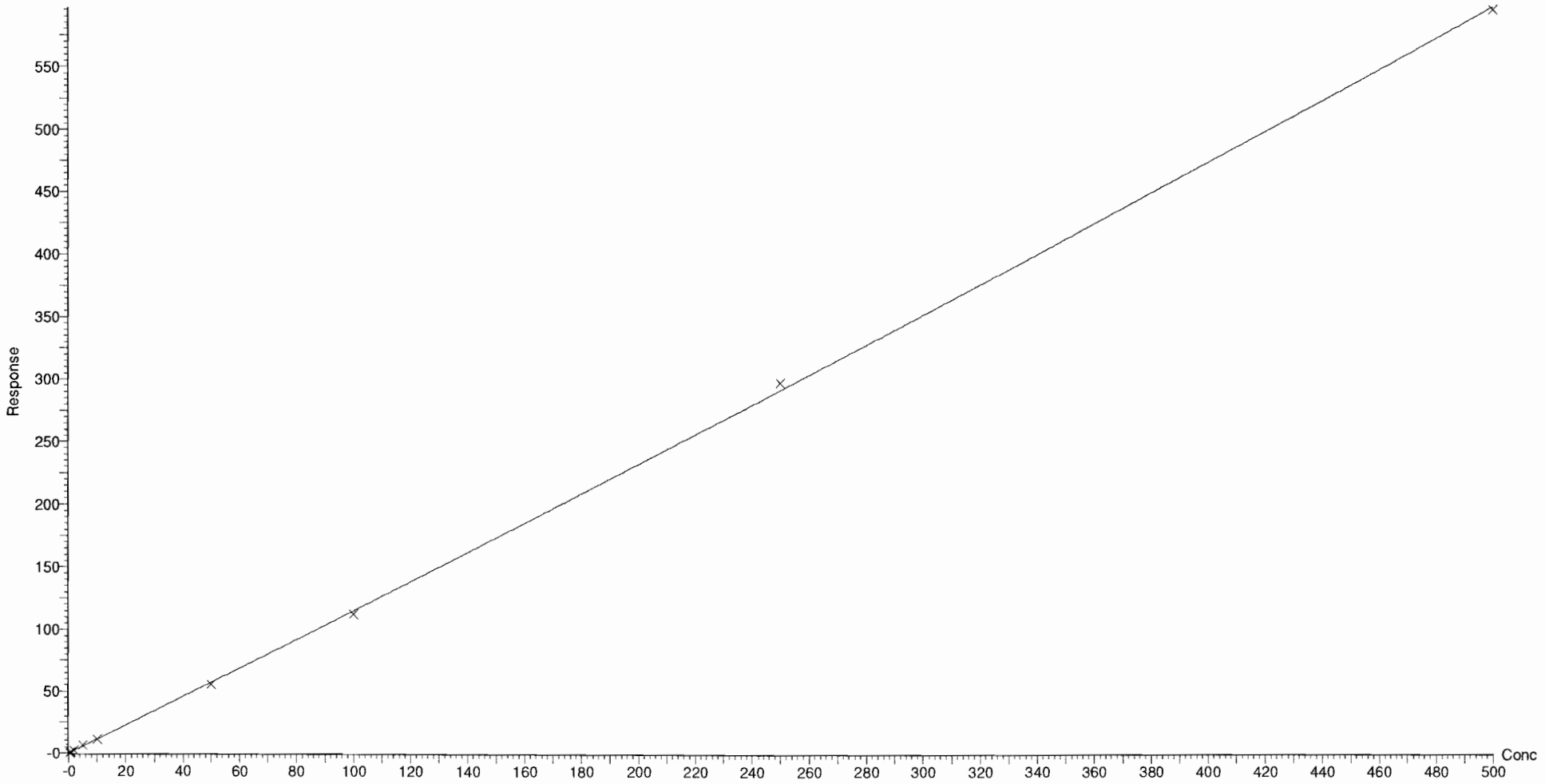
Compound name: PFNA
Coefficient of Determination: R^2 = 0.999758
Calibration curve: -0.000123392 * x^2 + 1.25051 * x + 0.0436441
Response type: Internal Std (Ref 45), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

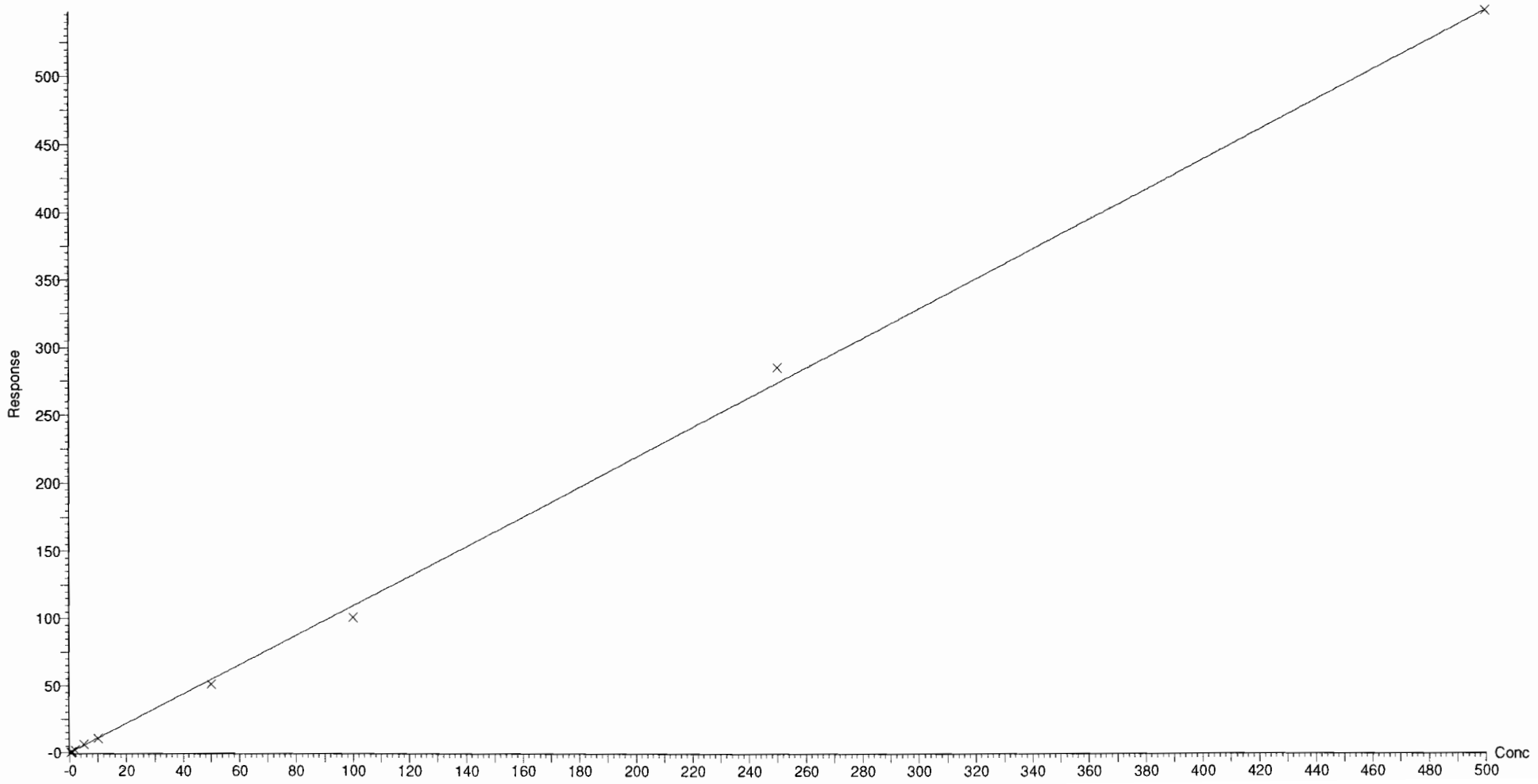
Compound name: PFOSA
Coefficient of Determination: R^2 = 0.999684
Calibration curve: 0.000109224 * x^2 + 1.13948 * x + -0.0243111
Response type: Internal Std (Ref 46), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

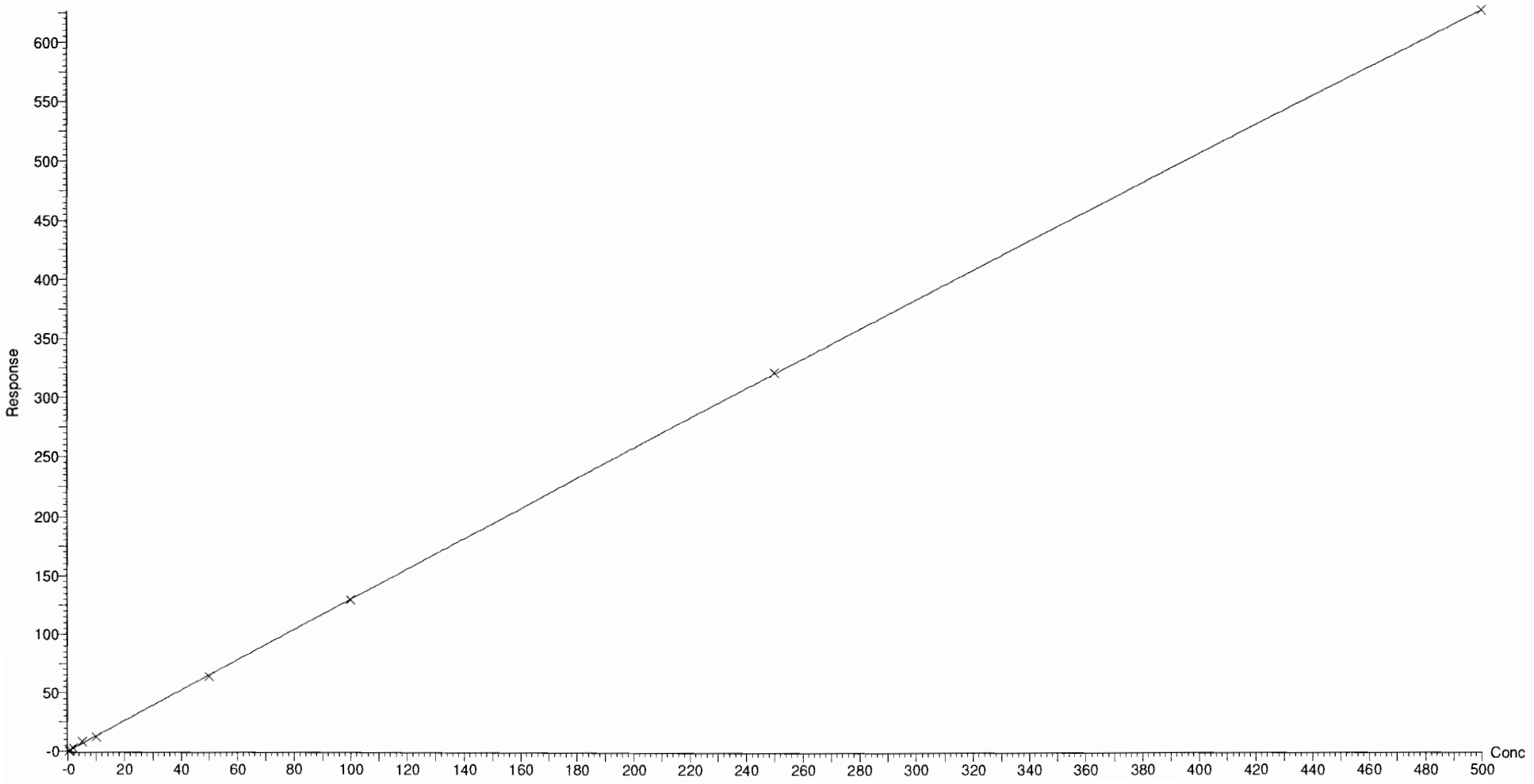
Compound name: L-PFOS
Correlation coefficient: r = 0.999291, r^2 = 0.998583
Calibration curve: 1.09502 * x + 0.0459904
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

Compound name: PFDA
Coefficient of Determination: R^2 = 0.999437
Calibration curve: -0.000121158 * x^2 + 1.3134 * x + 0.026774
Response type: Internal Std (Ref 48), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

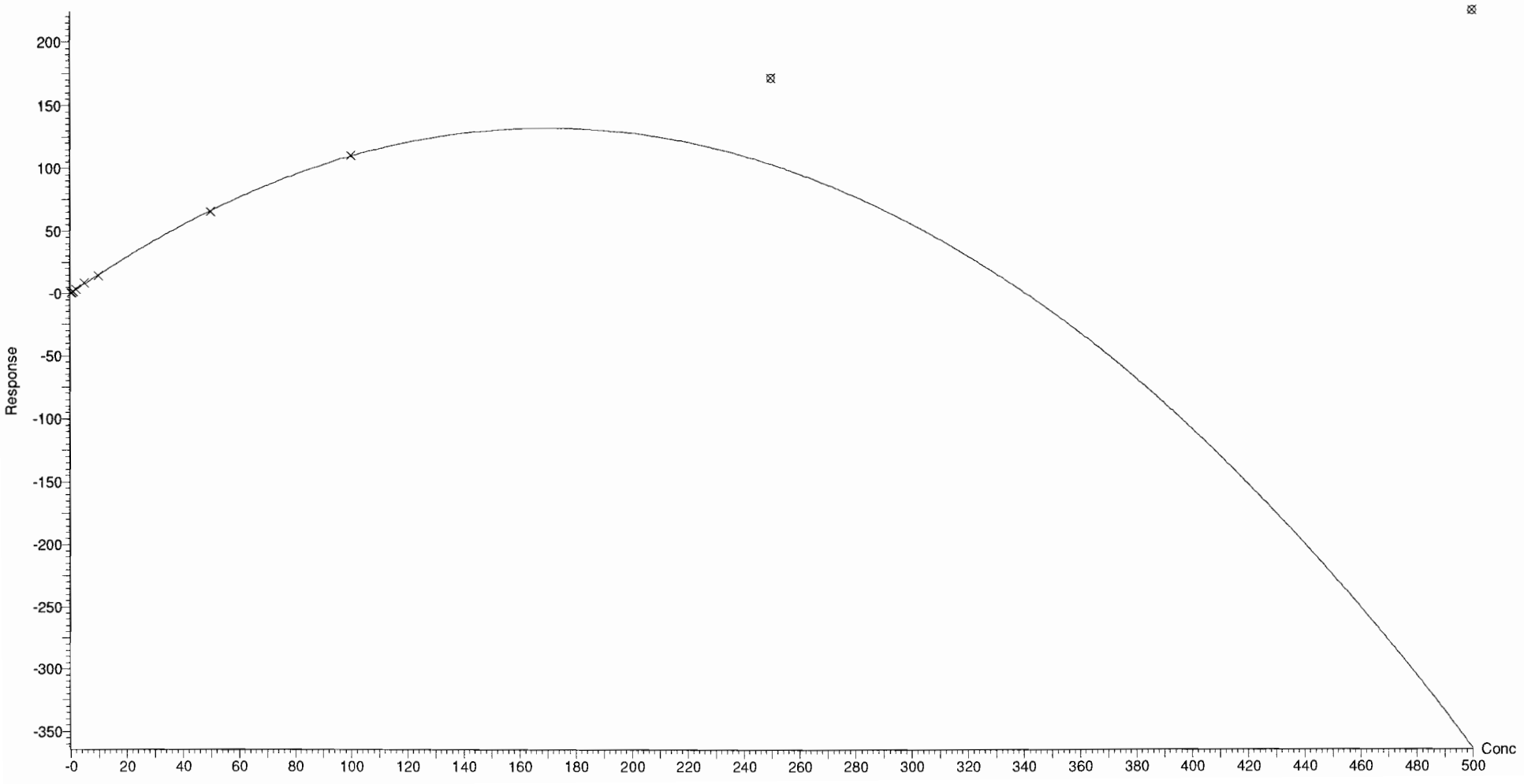


Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

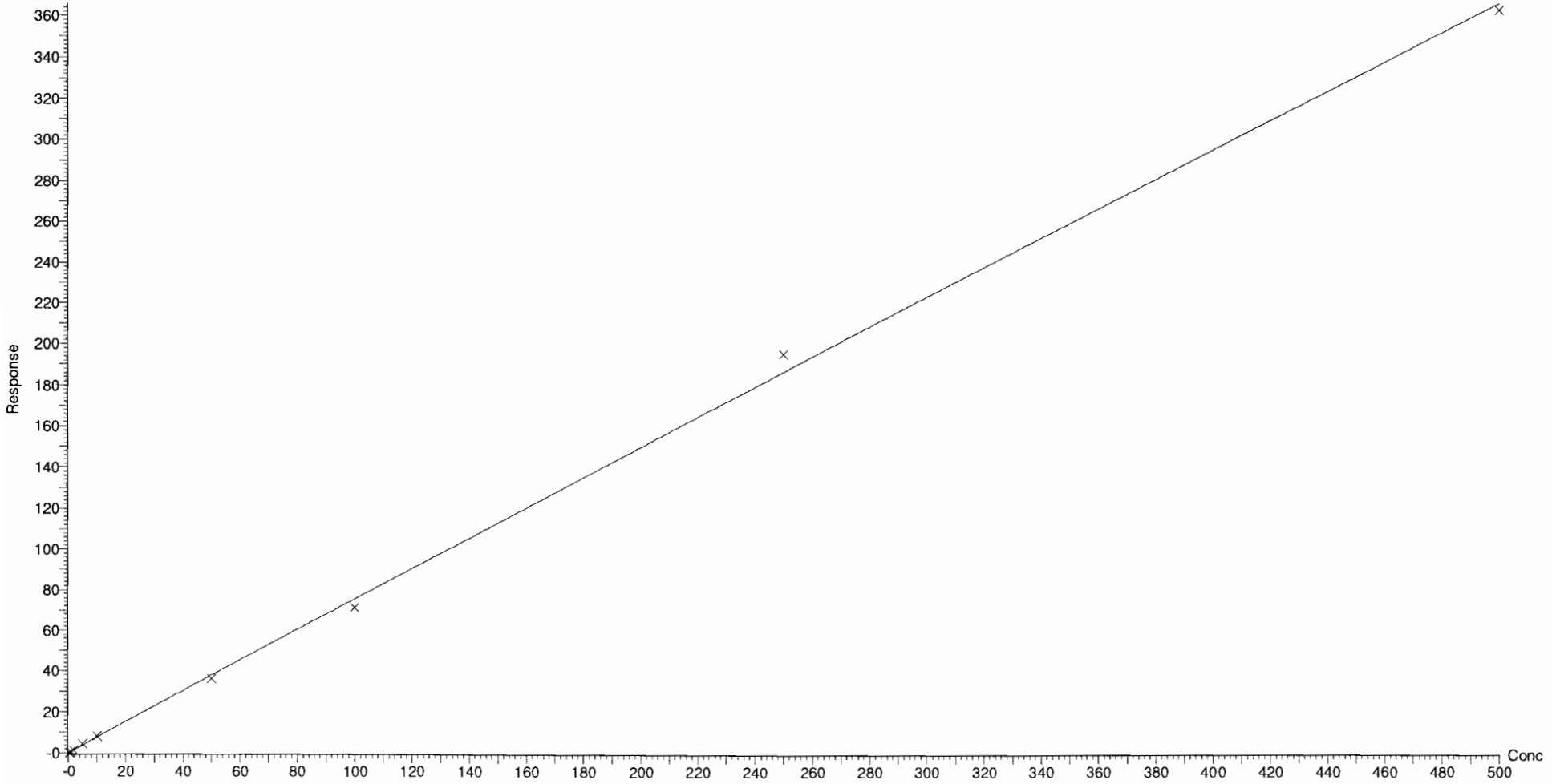
Compound name: 8:2 FTS
Coefficient of Determination: R^2 = 0.998754
Calibration curve: -0.0045567 * x^2 + 1.55189 * x + 0.0660151
Response type: Internal Std (Ref 49), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

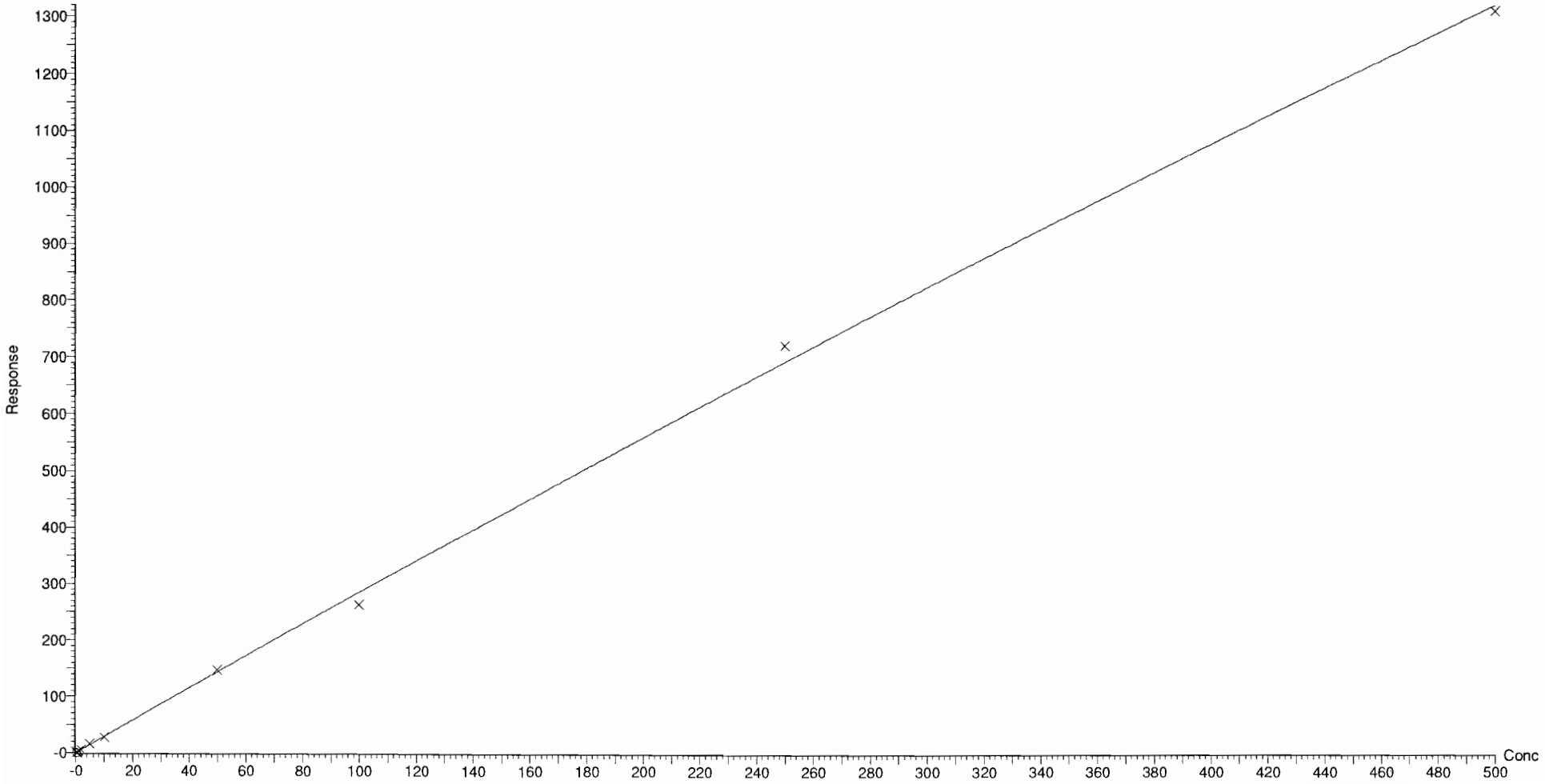
Compound name: PFNS
Coefficient of Determination: R^2 = 0.998671
Calibration curve: -6.14234e-005 * x^2 + 0.762317 * x + 0.0530889
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

Compound name: L-MeFOSAA
Coefficient of Determination: R^2 = 0.998550
Calibration curve: -0.00052965 * x^2 + 2.90523 * x + 0.0881852
Response type: Internal Std (Ref 50), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

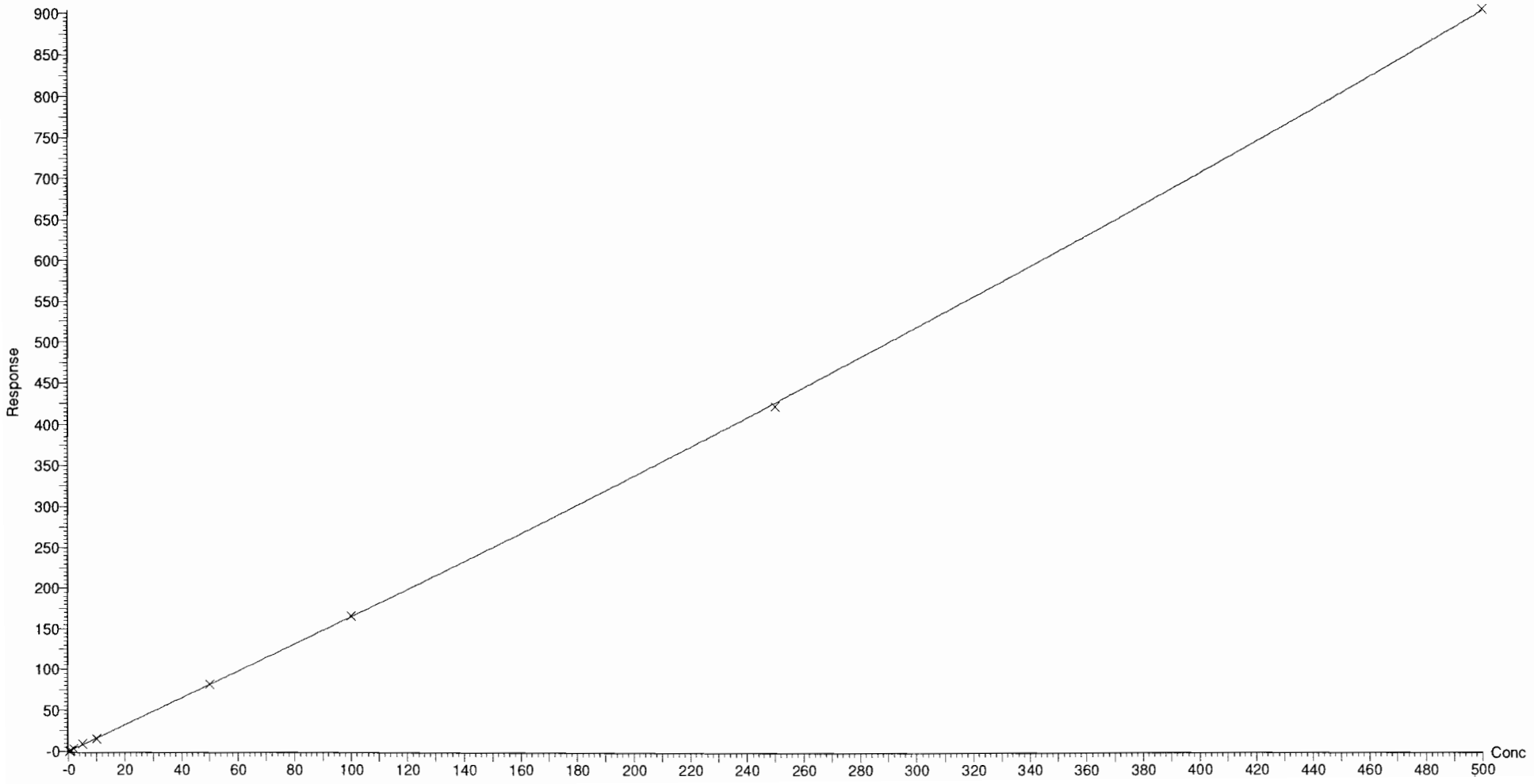


Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:13 Pacific Standard Time

Compound name: L-EtFOSAA
Coefficient of Determination: R^2 = 0.999862
Calibration curve: 0.000386736 * x^2 + 1.61077 * x + 0.0602011
Response type: Internal Std (Ref 52), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



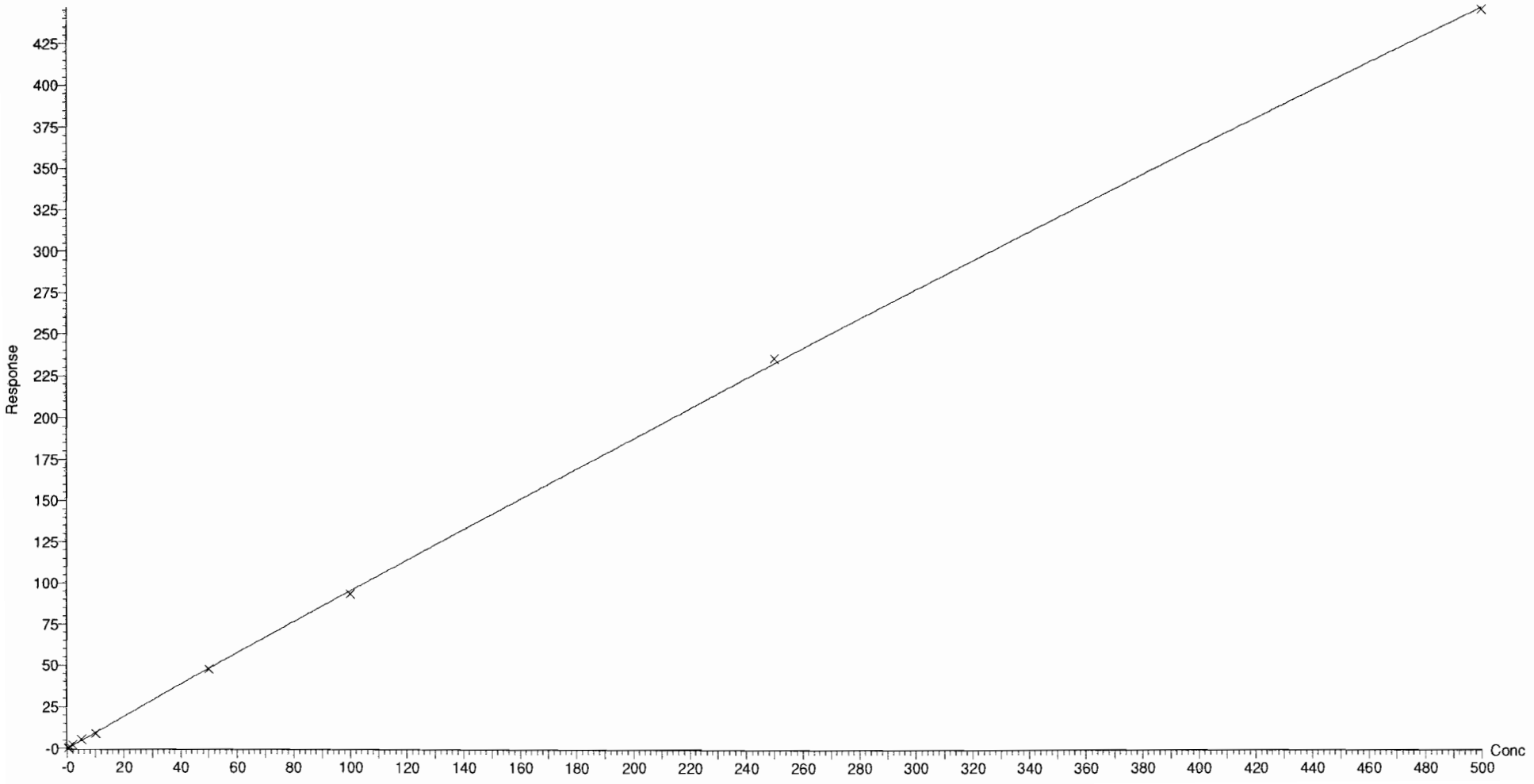
Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Compound name: PFUdA
Coefficient of Determination: R^2 = 0.999703
Calibration curve: -0.000152898 * x^2 + 0.969236 * x + 0.0723136
Response type: Internal Std (Ref 51), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

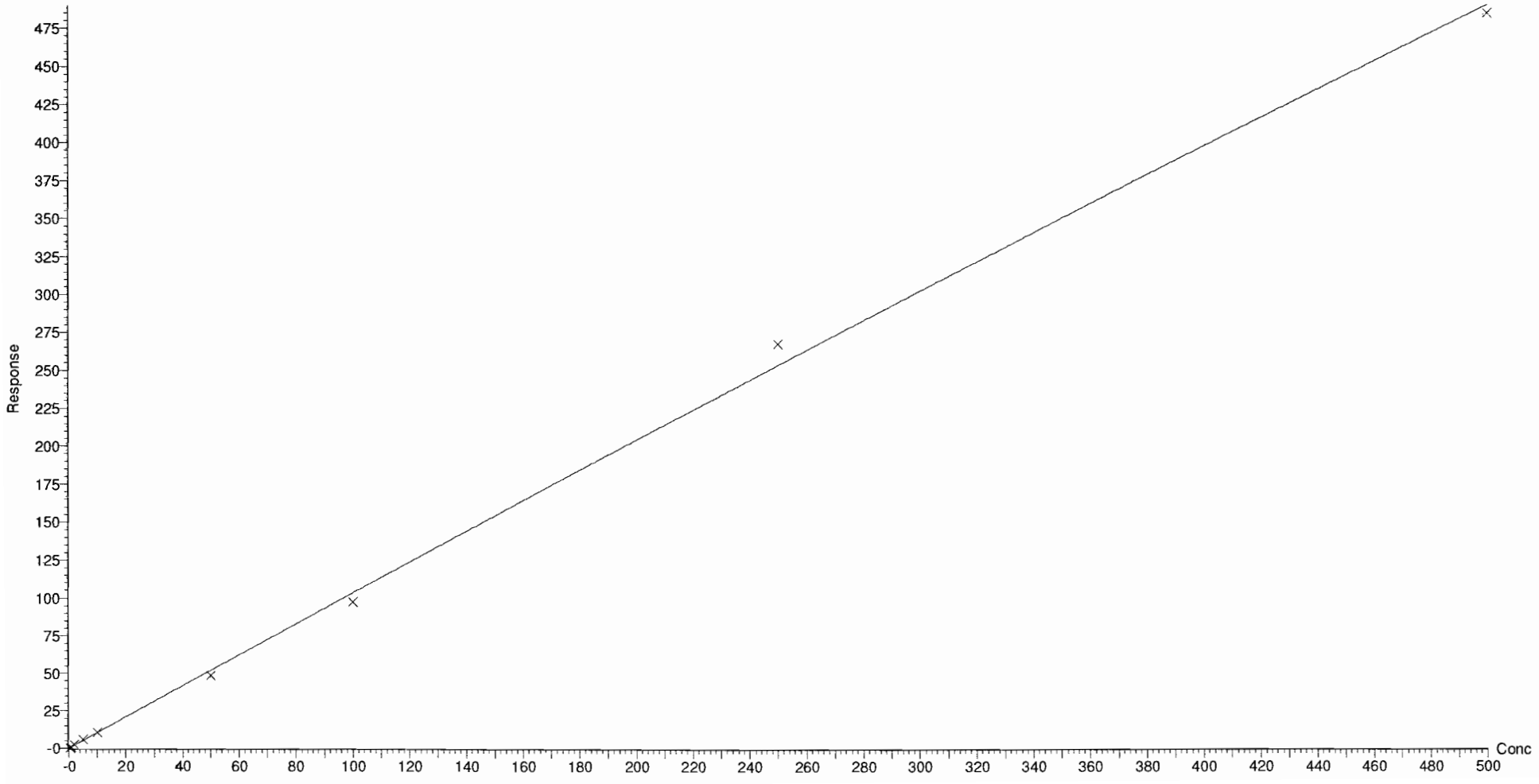


Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

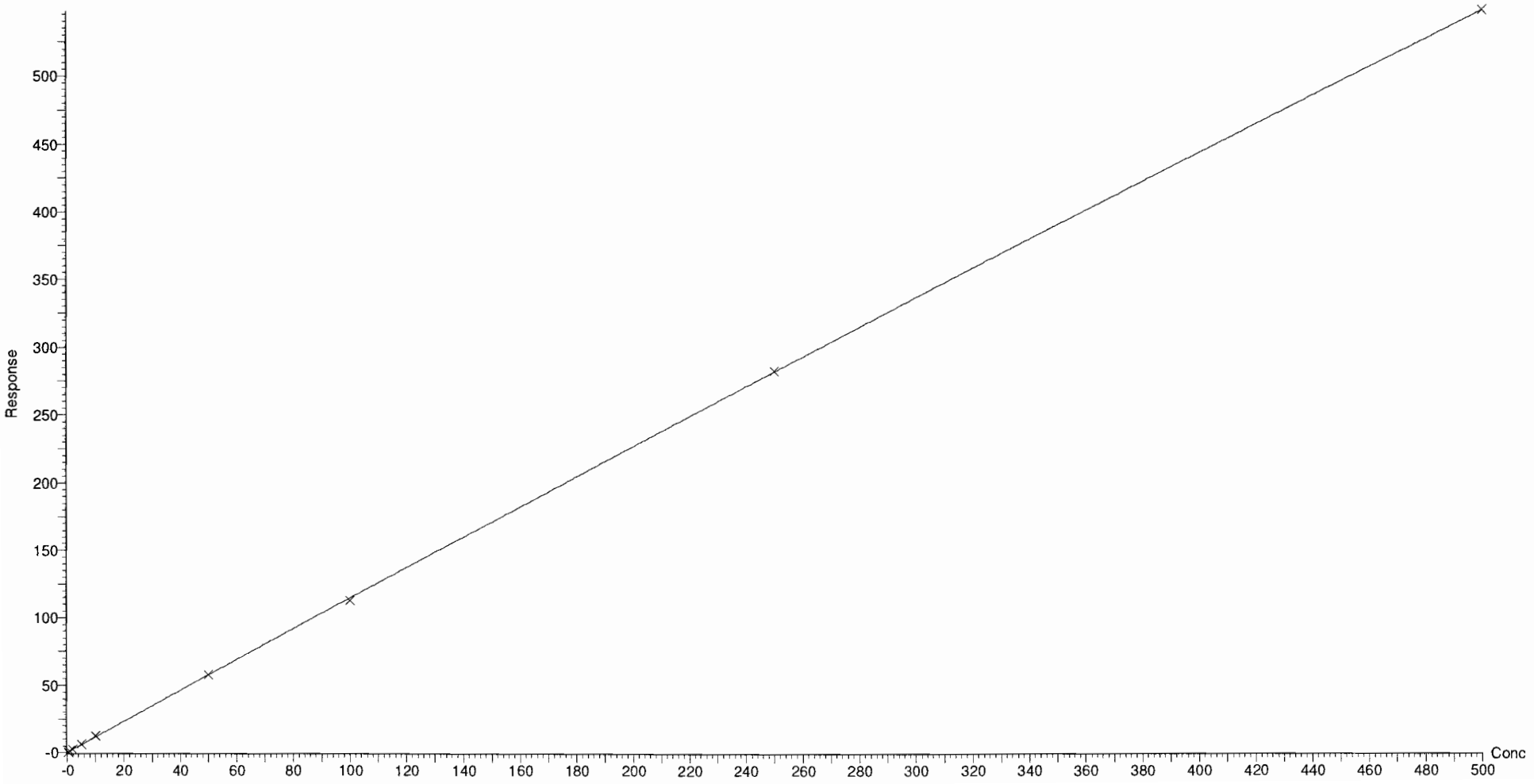
Compound name: PFDS
Coefficient of Determination: R^2 = 0.998317
Calibration curve: -0.000138966 * x^2 + 1.04937 * x + 0.0115389
Response type: Internal Std (Ref 47), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

Compound name: PFDoA
Coefficient of Determination: R^2 = 0.999868
Calibration curve: -0.000134587 * x^2 + 1.16156 * x + 0.0671424
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

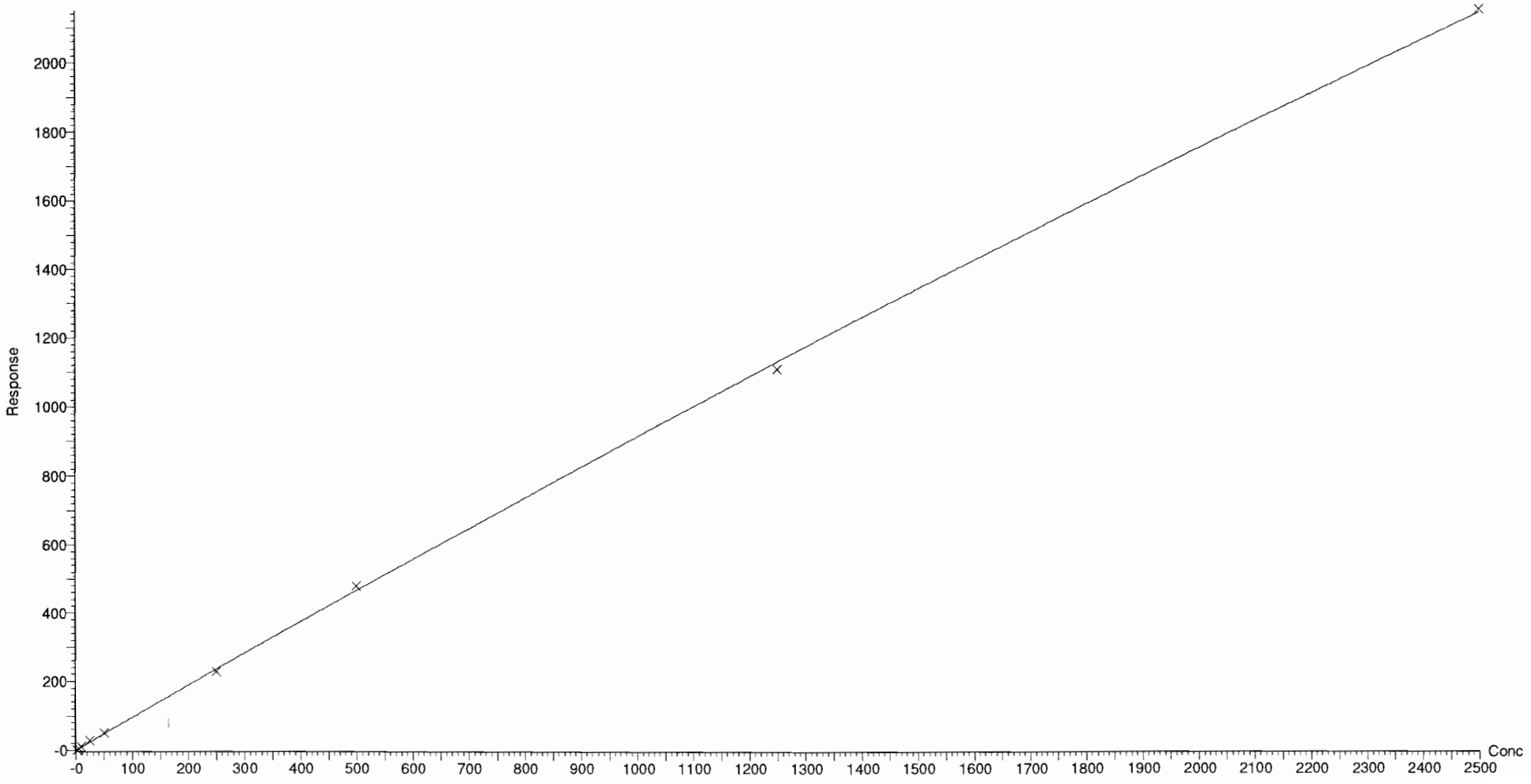


Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

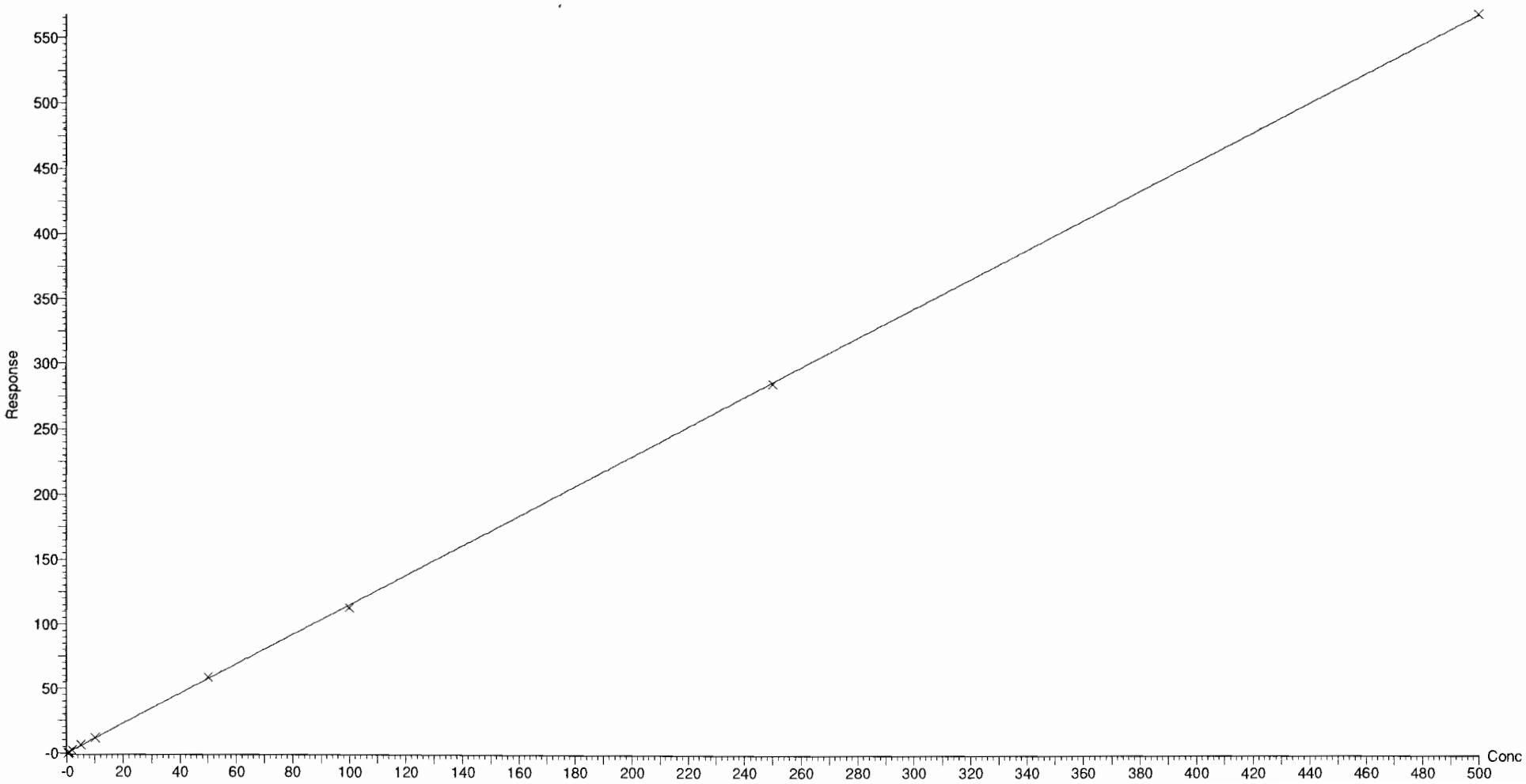
Compound name: N-MeFOSA
Coefficient of Determination: R^2 = 0.999421
Calibration curve: -3.87935e-005 * x^2 + 0.953523 * x + 0.468324
Response type: Internal Std (Ref 54), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

Compound name: PFTrDA
Coefficient of Determination: R^2 = 0.999827
Calibration curve: -4.24277e-005 * x^2 + 1.15539 * x + 0.0691663
Response type: Internal Std (Ref 53), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

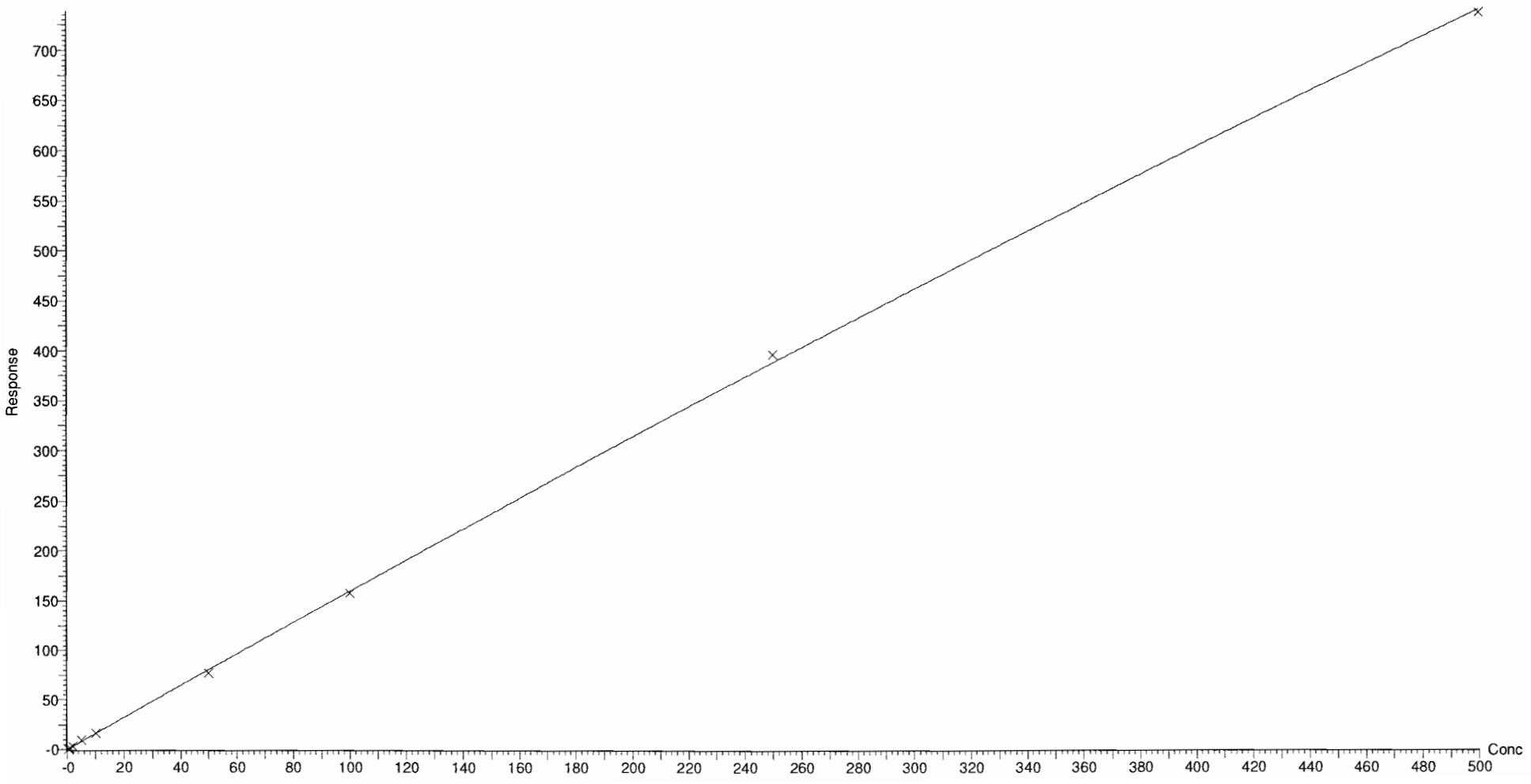


Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

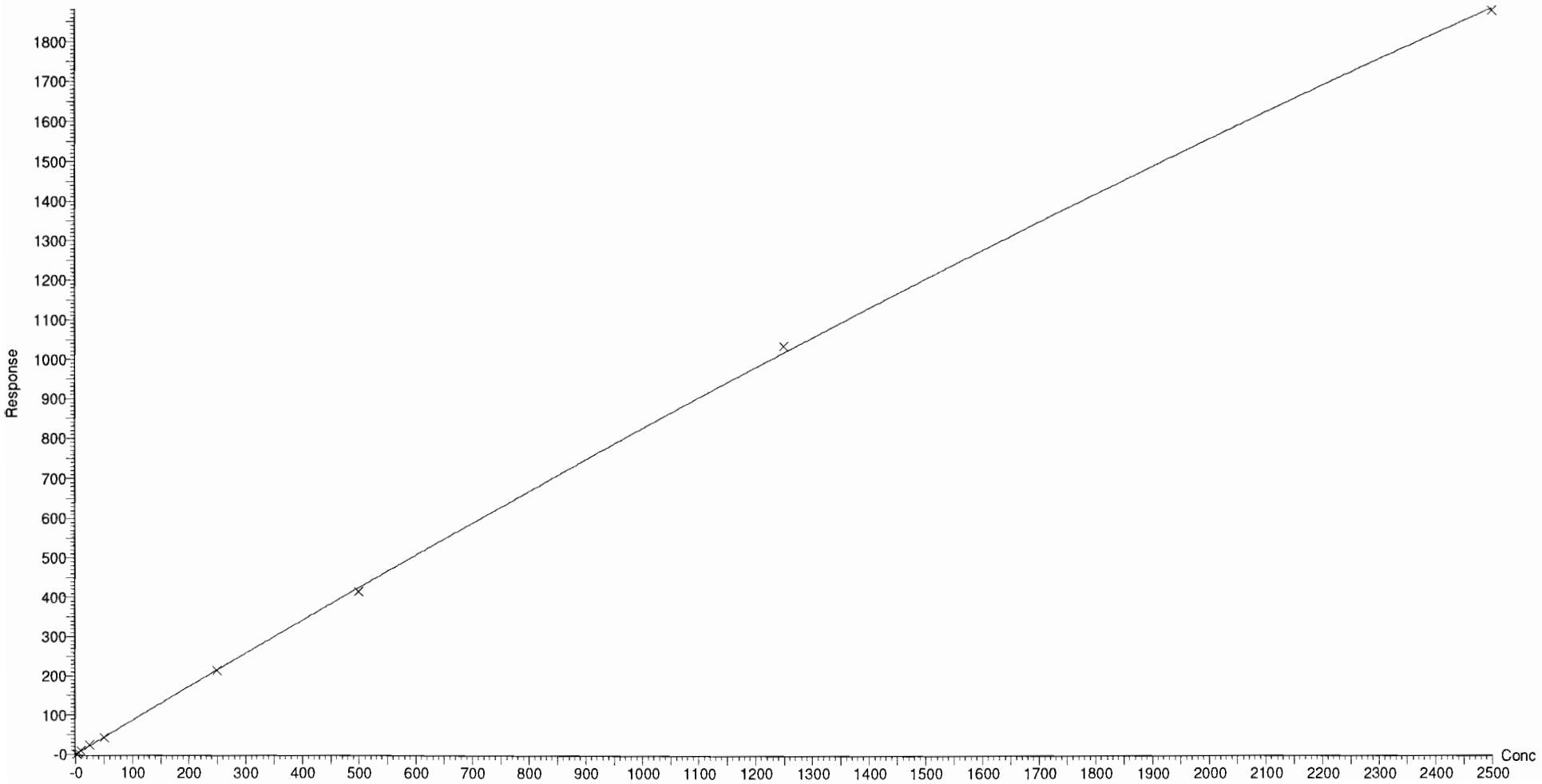
Compound name: PFTeDA
Coefficient of Determination: R^2 = 0.999640
Calibration curve: -0.000300636 * x^2 + 1.62832 * x + 0.0899878
Response type: Internal Std (Ref 55), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

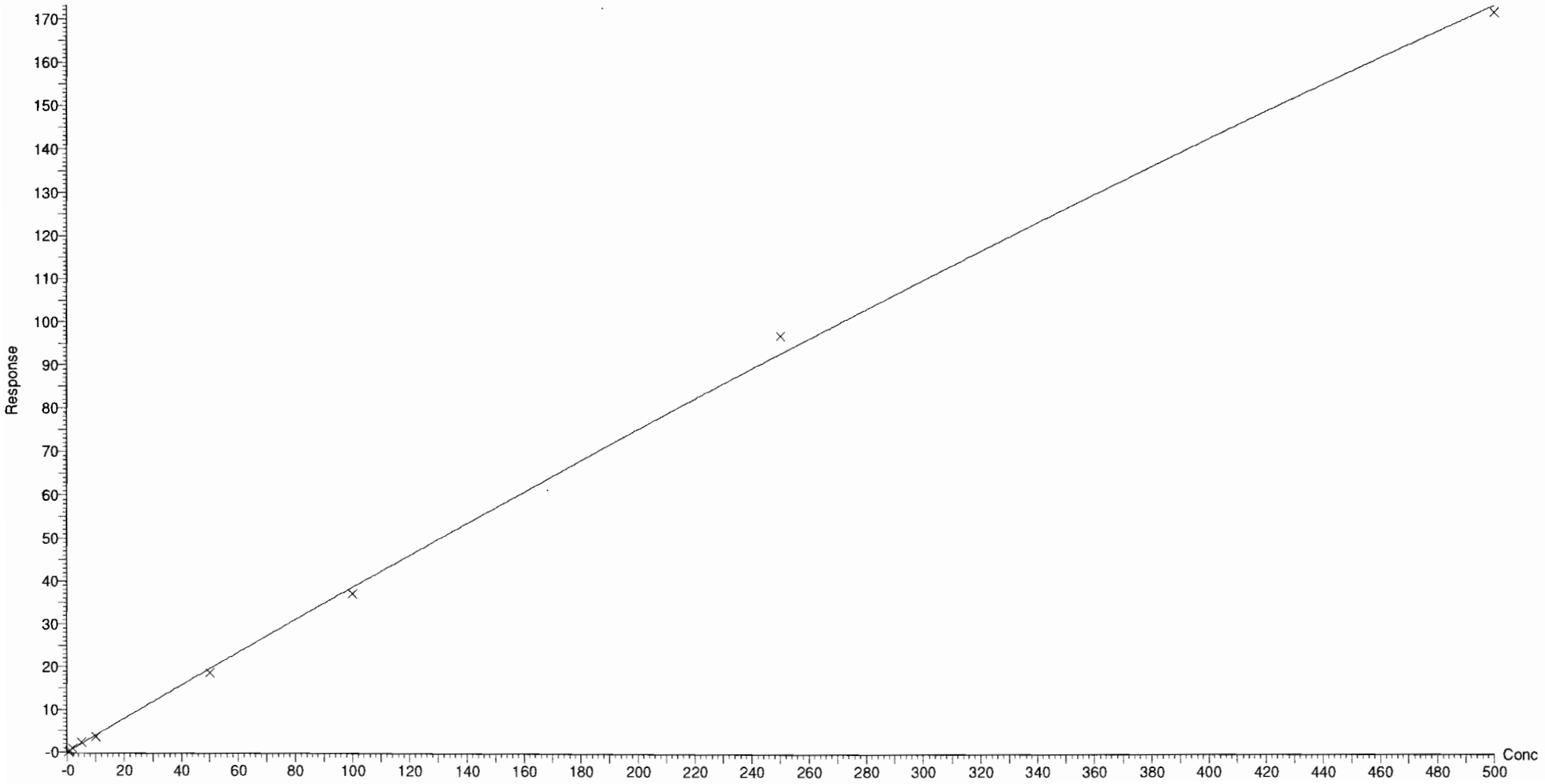
Compound name: N-EtFOSA
Coefficient of Determination: R^2 = 0.999752
Calibration curve: -4.89024e-005 * x^2 + 0.875046 * x + 0.265554
Response type: Internal Std (Ref 56), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

Compound name: PFHxDA
Coefficient of Determination: R^2 = 0.998670
Calibration curve: -9.94628e-005 * x^2 + 0.395894 * x + 0.0669369
Response type: Internal Std (Ref 57), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

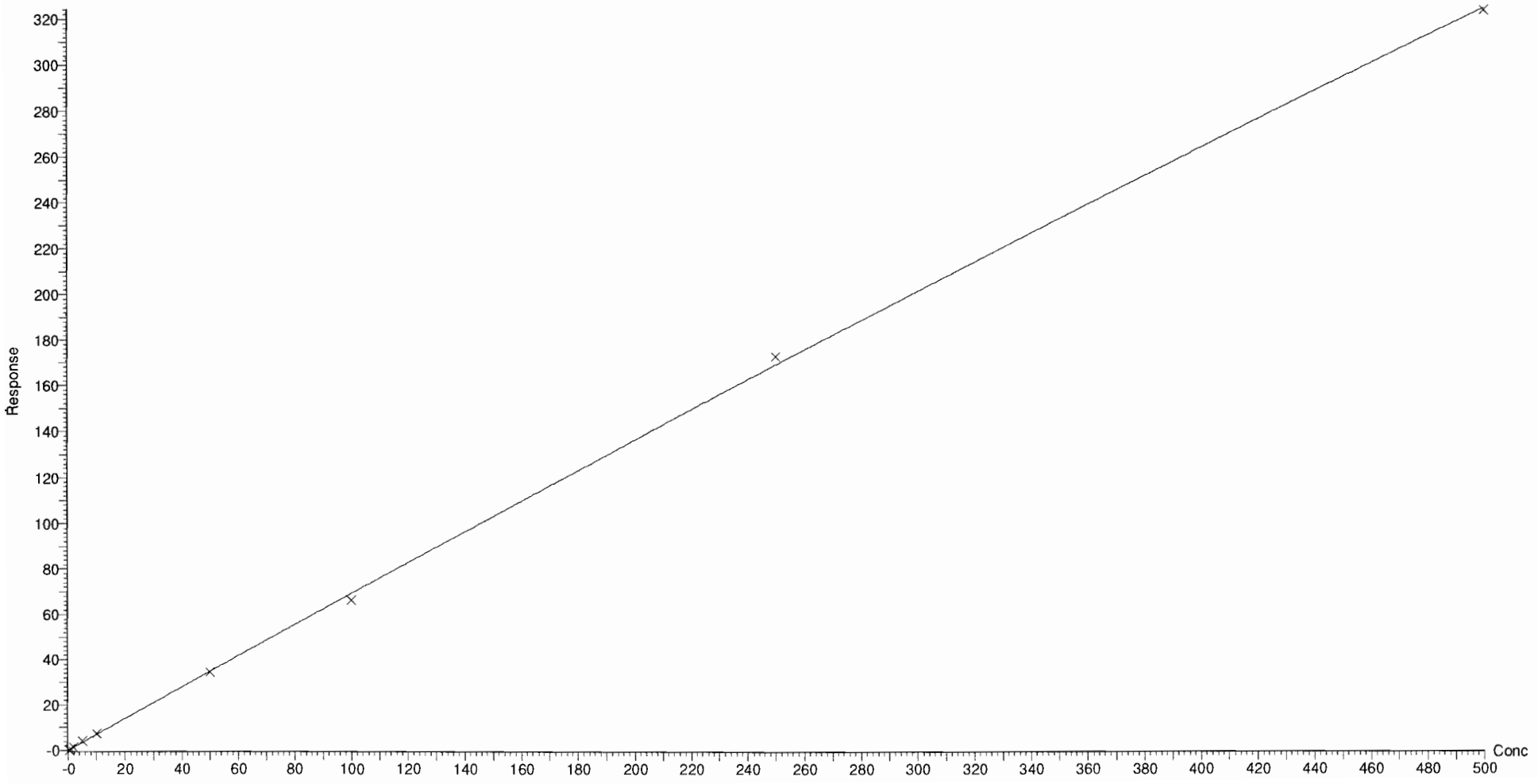


Vista Analytical Laboratory Q1

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

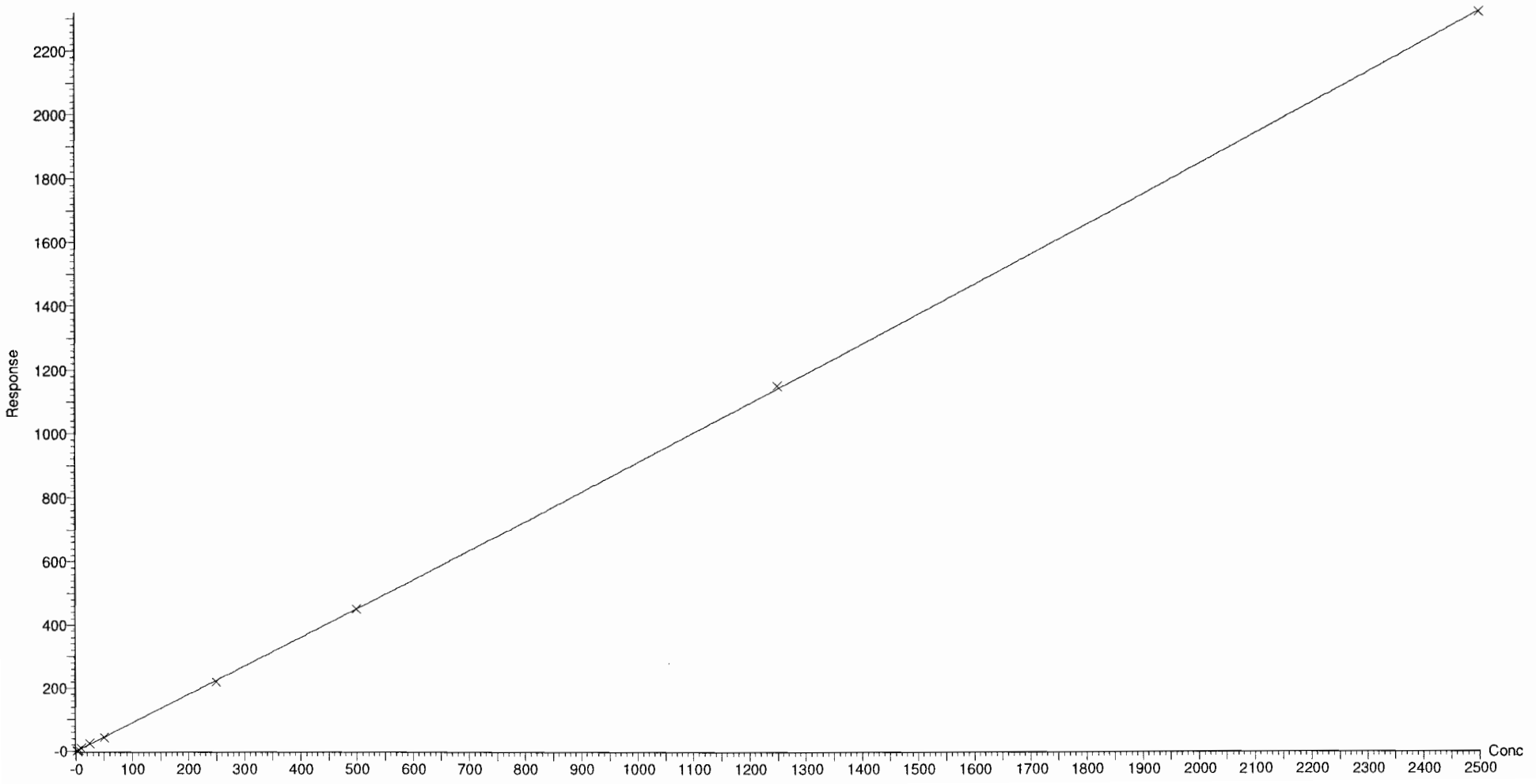
Compound name: PFODA
Coefficient of Determination: R^2 = 0.999437
Calibration curve: -0.000110262 * x^2 + 0.704083 * x + 0.0275186
Response type: Internal Std (Ref 57), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

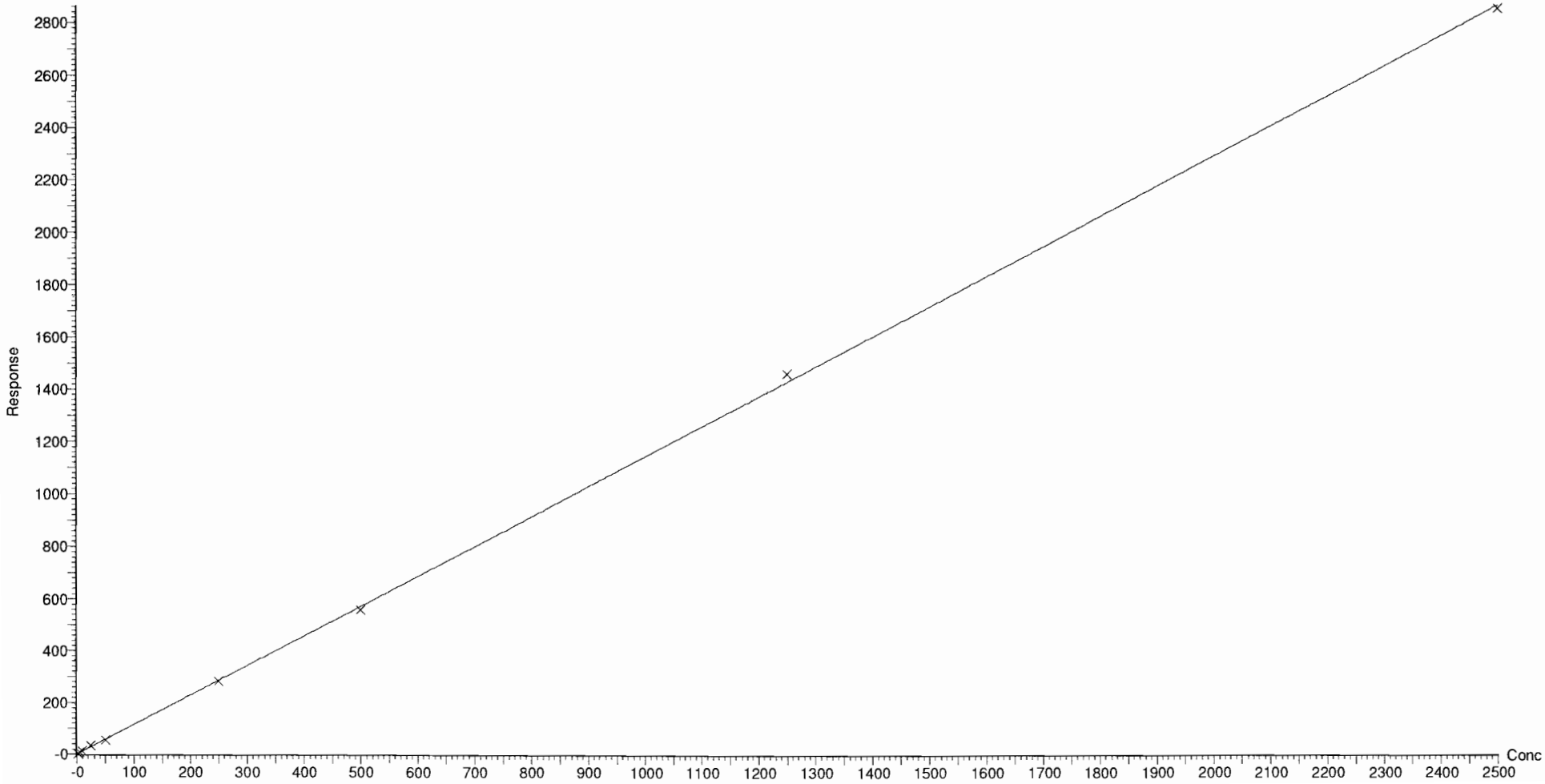
Compound name: N-MeFOSE
Coefficient of Determination: R^2 = 0.999885
Calibration curve: 1.26969e-005 * x^2 + 0.895945 * x + 0.479162
Response type: Internal Std (Ref 58), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:52:30 Pacific Standard Time

Compound name: N-EtFOSE
Coefficient of Determination: R^2 = 0.999668
Calibration curve: 1.15732e-006 * x^2 + 1.14211 * x + 0.352591
Response type: Internal Std (Ref 59), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

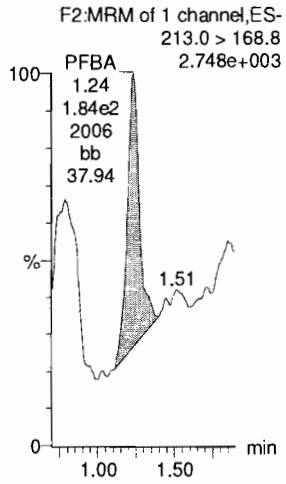
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: 26 Nov 2018 14:09:42

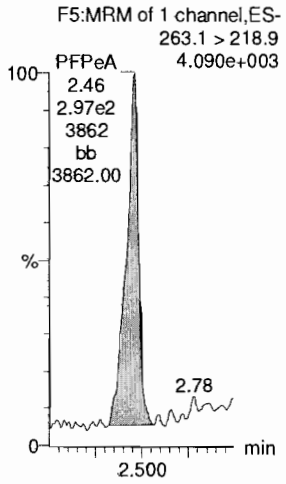
1 AD 11/27/18

Name: 181126M1_2, Date: 26-Nov-2018, Time: 11:45:59, ID: ST181126M2-1 PFC CS-2 18K1901, Description: PFC CS-2 18K1901

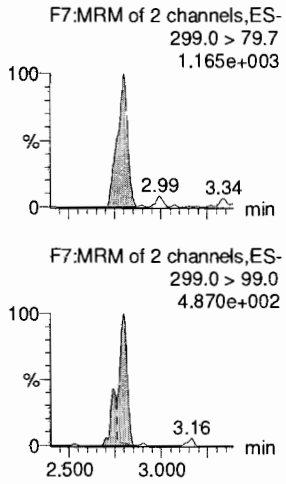
PFBA



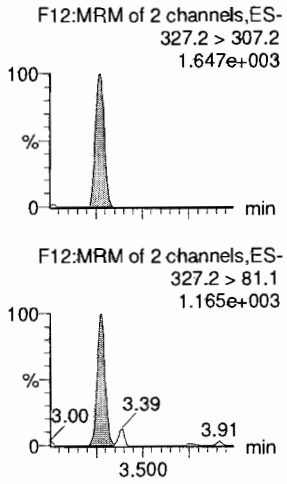
PFPeA



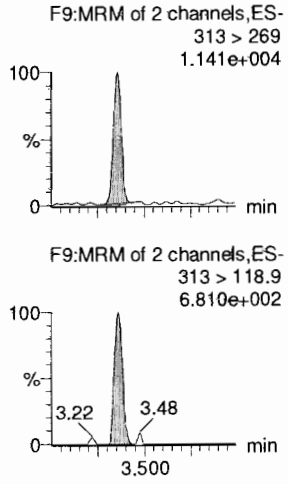
PFBS



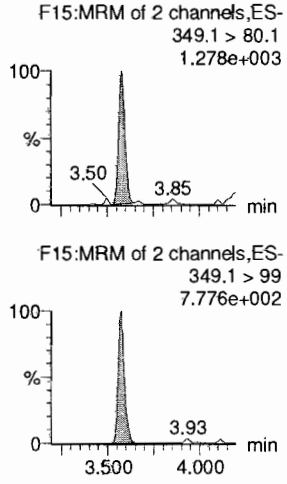
4:2 FTS



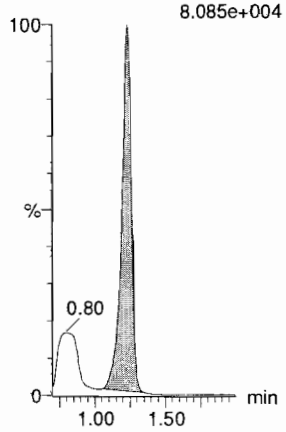
PFHxA



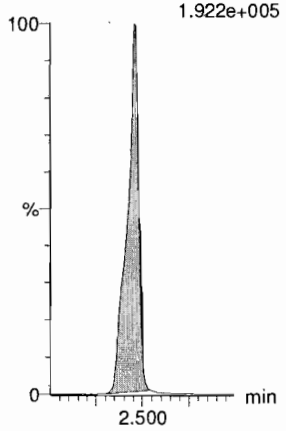
PFPeS



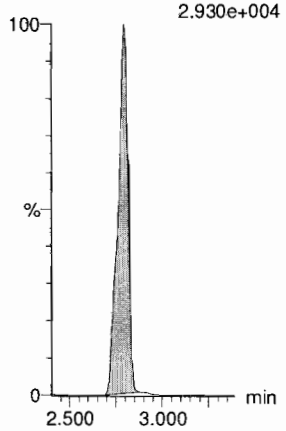
13C3-PFBA



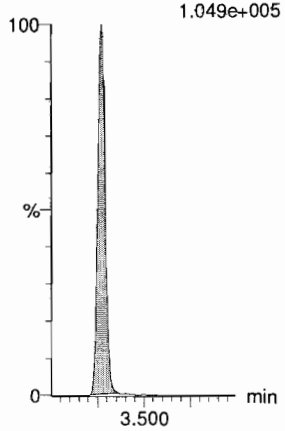
13C3-PFPeA



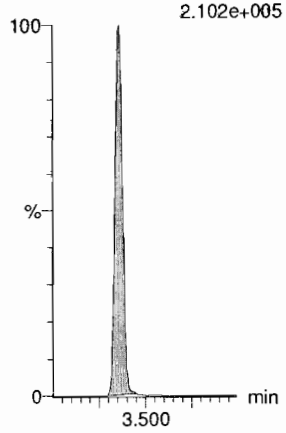
13C3-PFBS



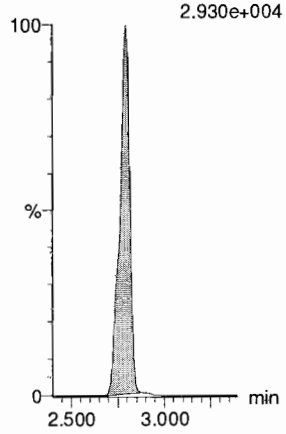
13C2-4:2 FTS



13C2-PFHxA



13C3-PFBS

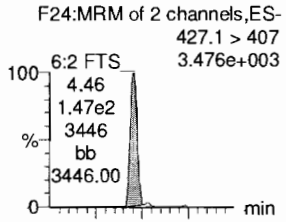


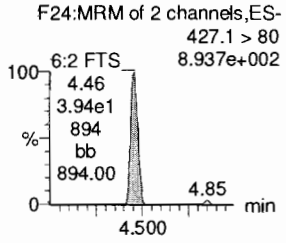
Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

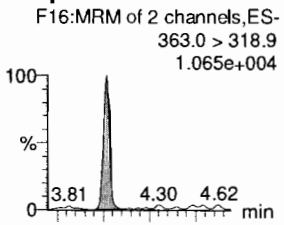
Name: 181126M1_2, Date: 26-Nov-2018, Time: 11:45:59, ID: ST181126M2-1 PFC CS-2 18K1901, Description: PFC CS-2 18K1901

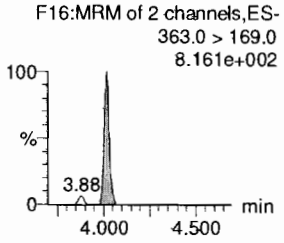
6:2 FTS





PFHpA





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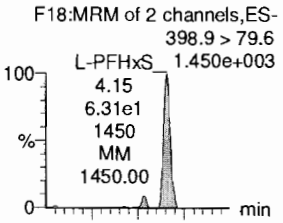
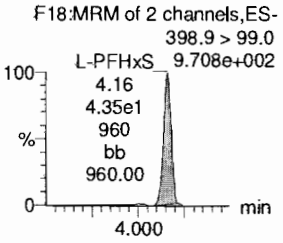
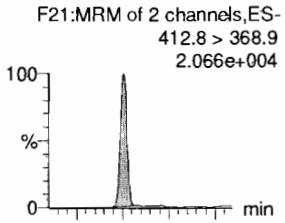
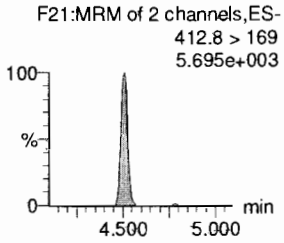




L-PFOA





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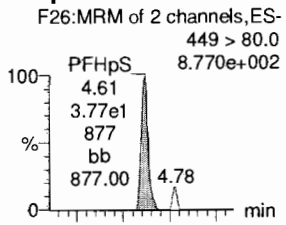

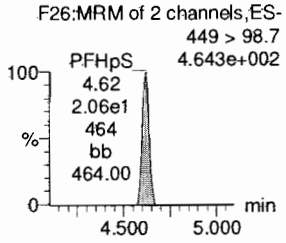

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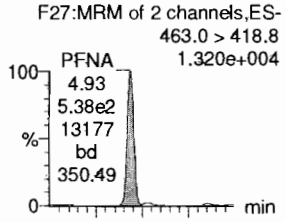
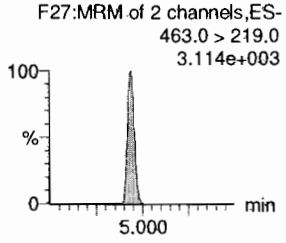
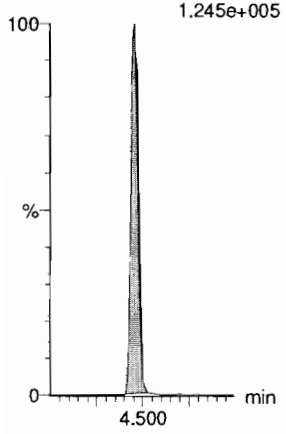
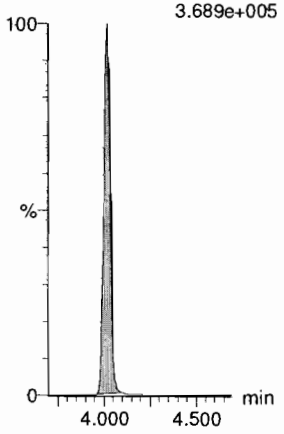




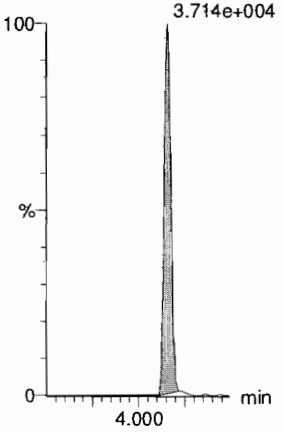
13C2-6:2 FTS



13C4-PFHpA



18O2-PFHxS



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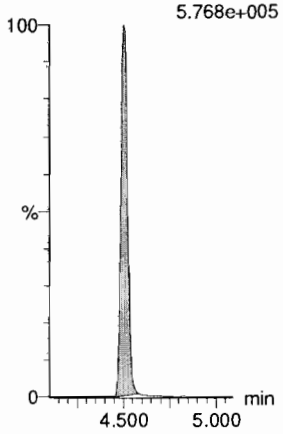
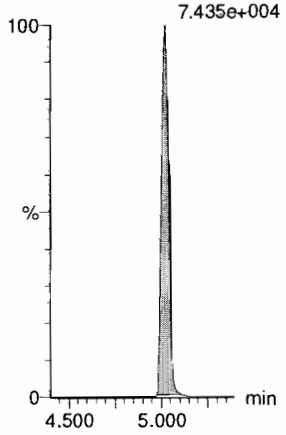


13C8-PFOS



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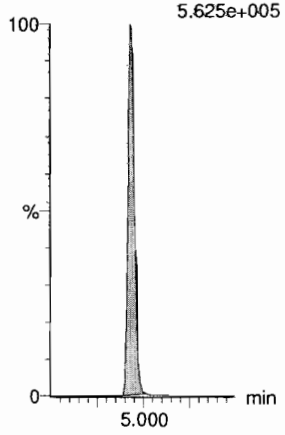

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Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_2, Date: 26-Nov-2018, Time: 11:45:59, ID: ST181126M2-1 PFC CS-2 18K1901, Description: PFC CS-2 18K1901

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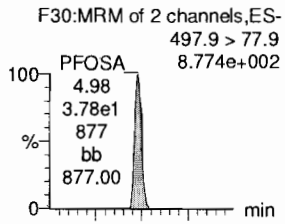

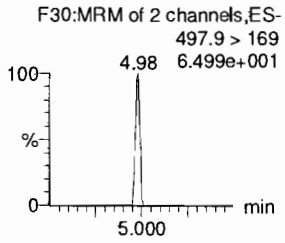

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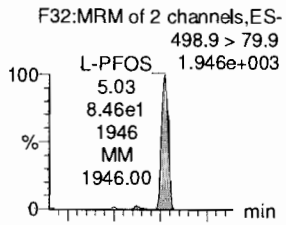

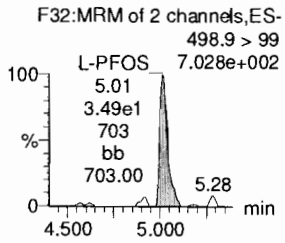

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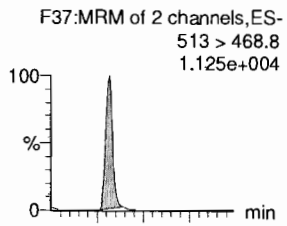
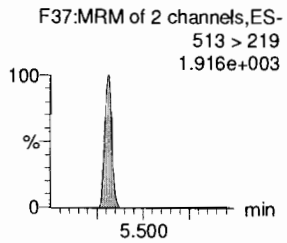
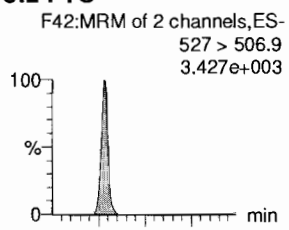
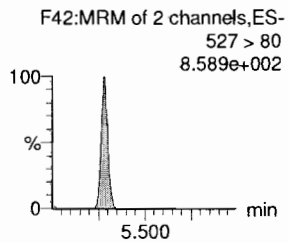




8:2 FTS





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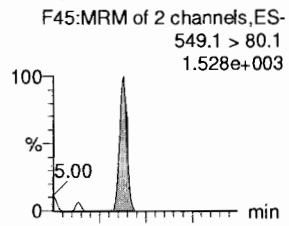
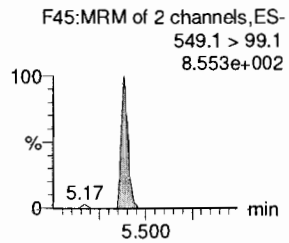
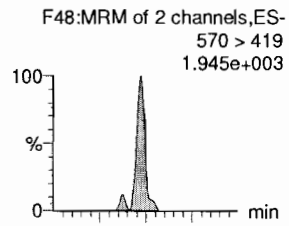
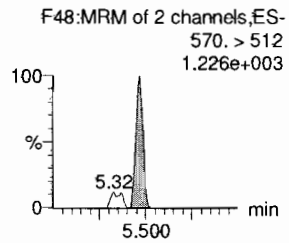


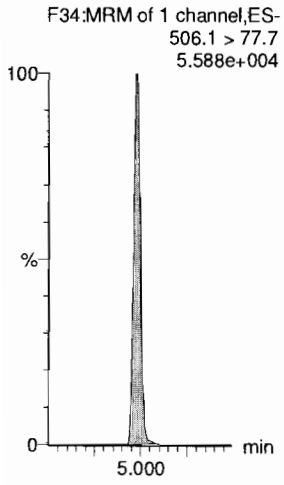


L-MeFOSAA





13C8-PFOSA



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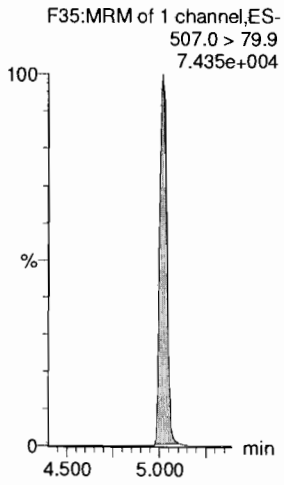

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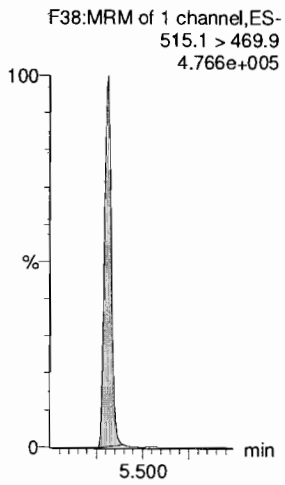
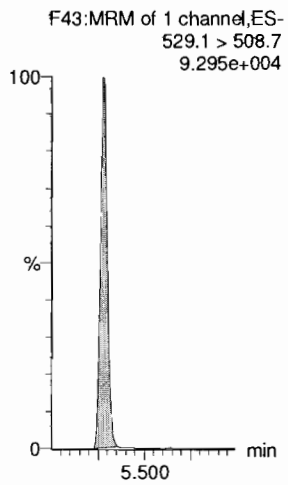


13C2-8:2 FTS



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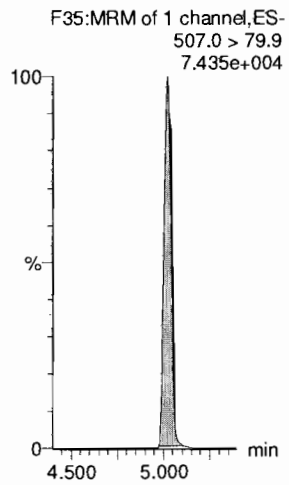
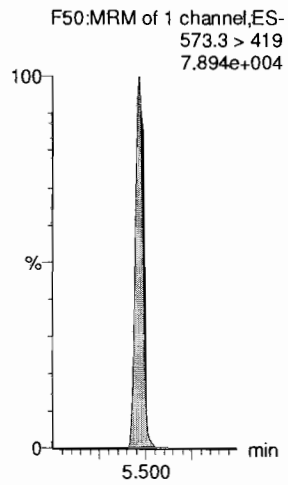


d3-N-MeFOSAA



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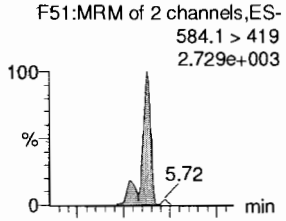
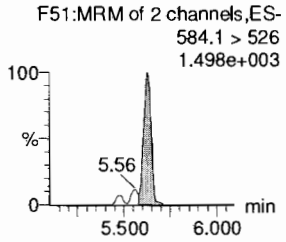
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

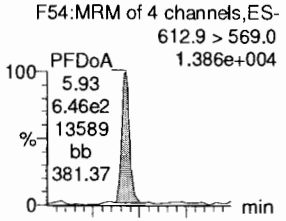
Name: 181126M1_2, Date: 26-Nov-2018, Time: 11:45:59, ID: ST181126M2-1 PFC CS-2 18K1901, Description: PFC CS-2 18K1901

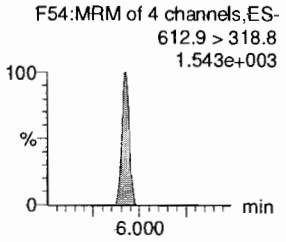
L-EtFOSAA





PFDoA





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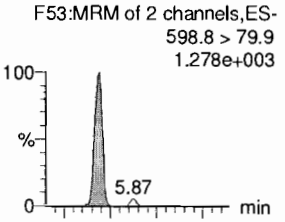

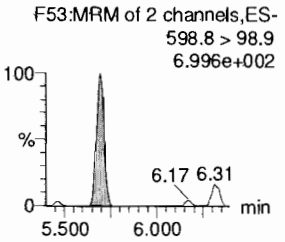

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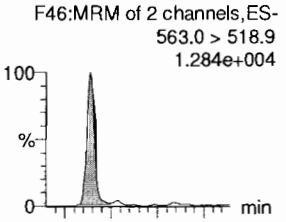
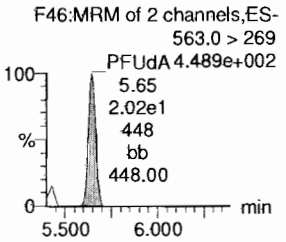
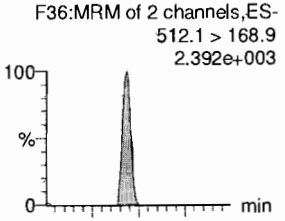
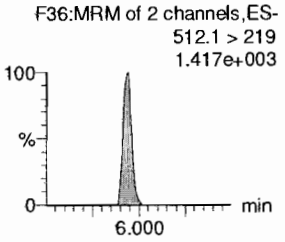




N-MeFOSA





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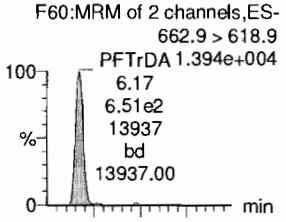
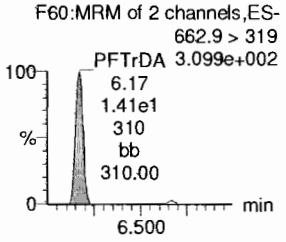
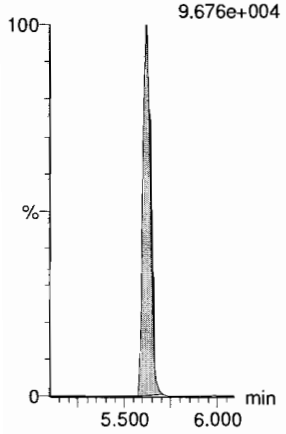
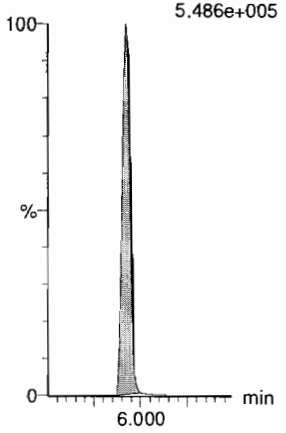




d5-N-EtFOSAA



13C2-PFDoA



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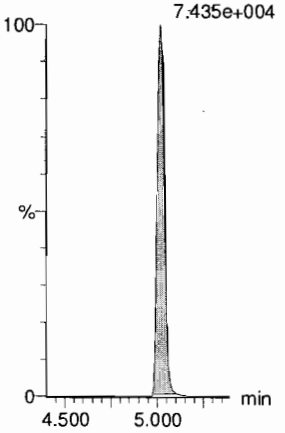

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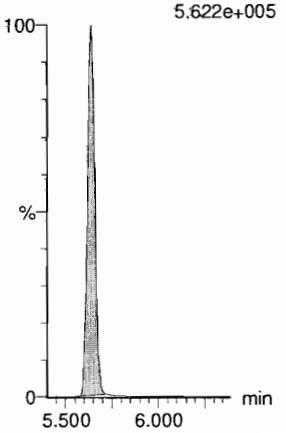

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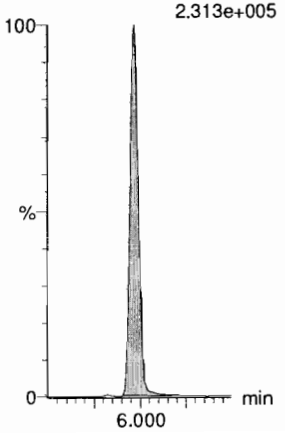

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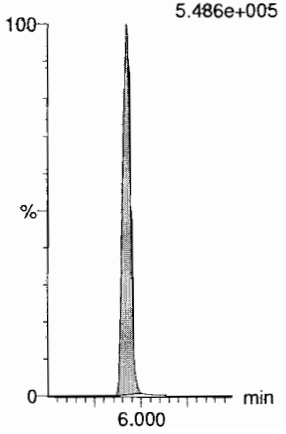

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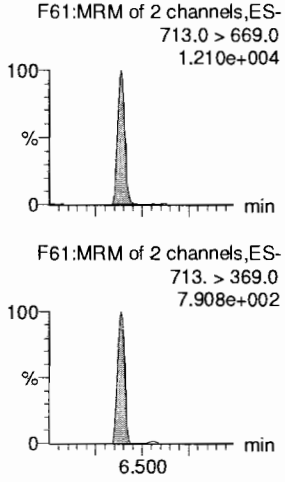
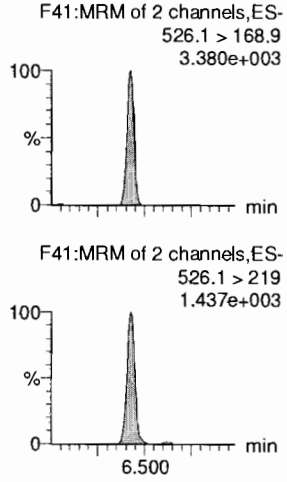
Name: 181126M1_2, Date: 26-Nov-2018, Time: 11:45:59, ID: ST181126M2-1 PFC CS-2 18K1901, Description: PFC CS-2 18K1901

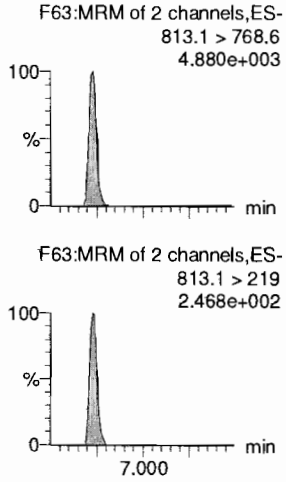
PFTeDA



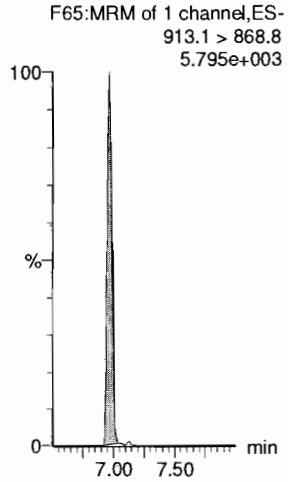
N-EtFOSA



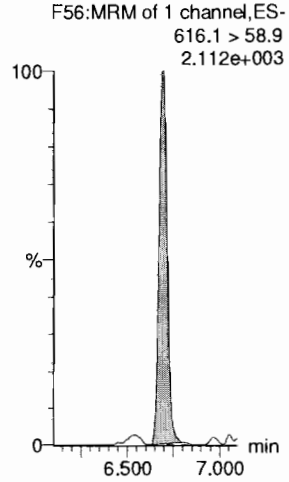
PFHxDA



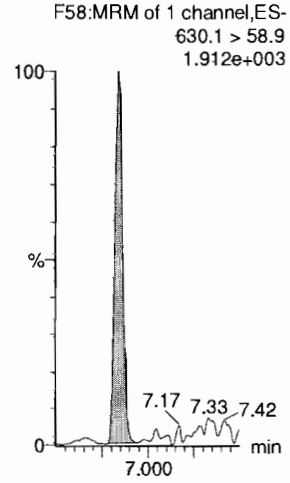
PFODA



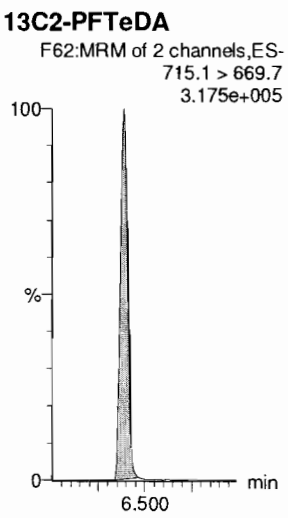
N-MeFOSE



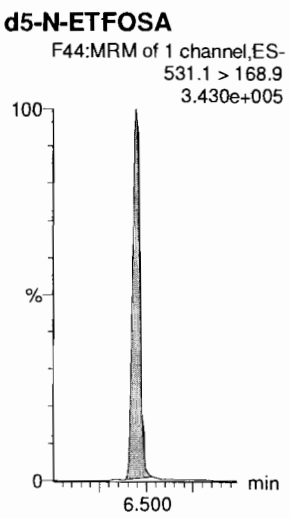
N-EtFOSE



13C2-PFTeDA



d5-N-ETFOSA



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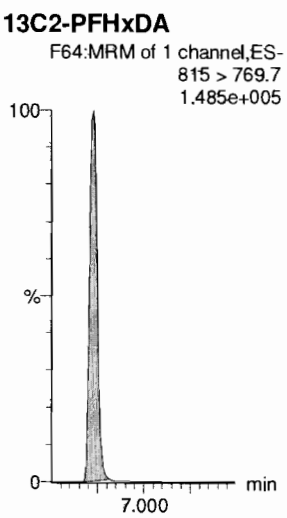

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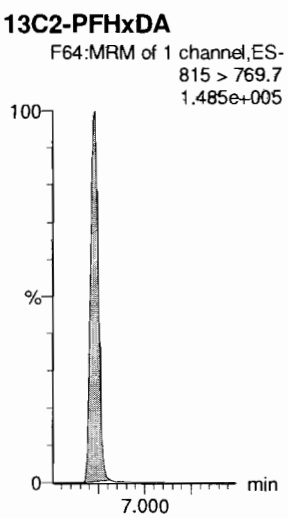
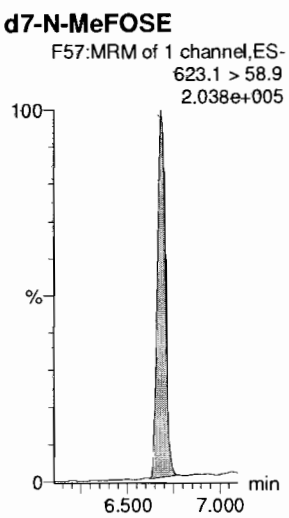
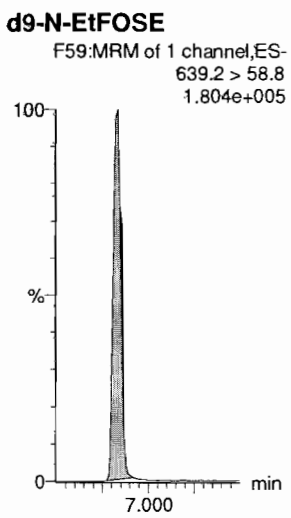


d7-N-MeFOSE



d9-N-EtFOSE



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

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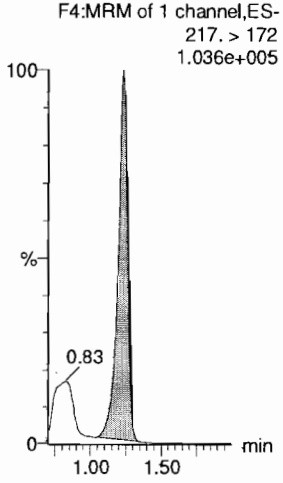
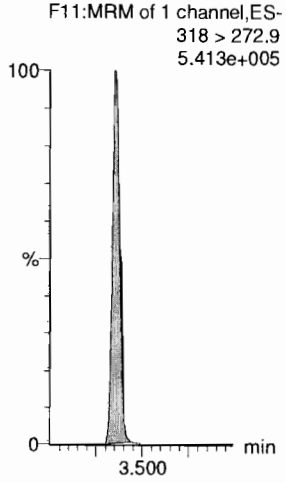
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_2, Date: 26-Nov-2018, Time: 11:45:59, ID: ST181126M2-1 PFC CS-2 18K1901, Description: PFC CS-2 18K1901

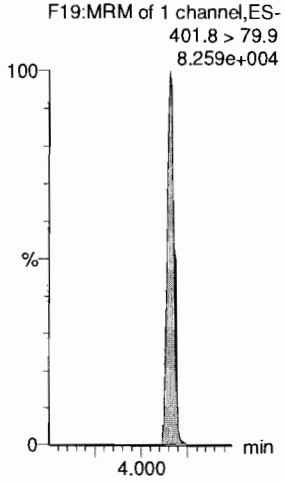
13C4-PFBA



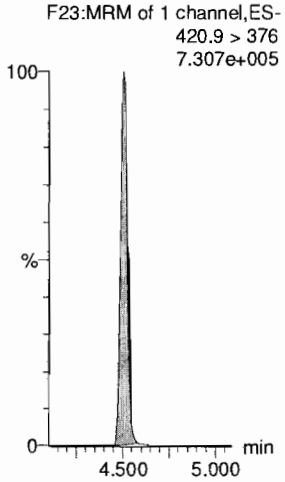
13C5-PFHxA



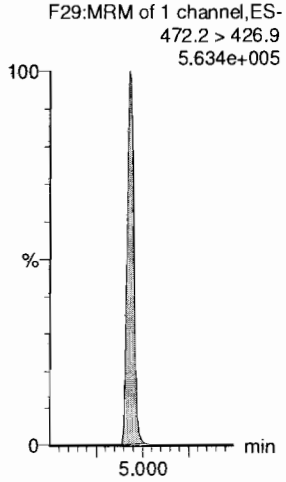
13C3-PFHxS



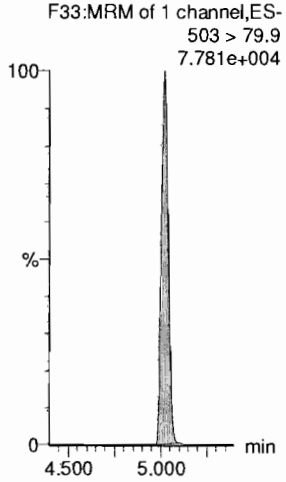
13C8-PFOA



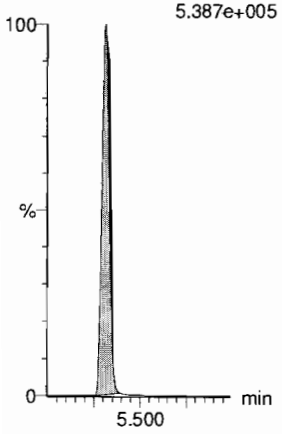
13C9-PFNA



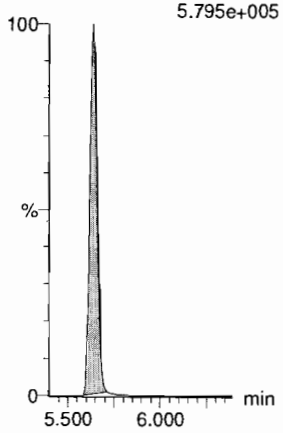
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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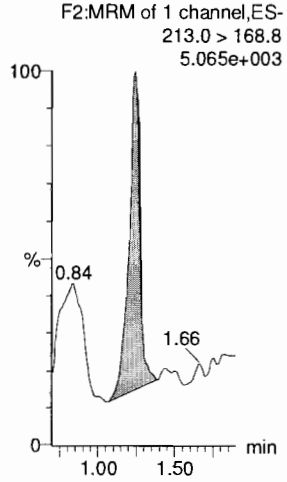
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

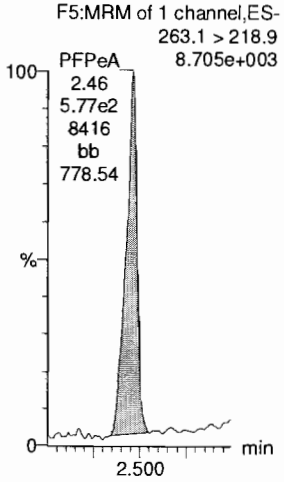
1 AD 11/27/18

Name: 181126M1_3, Date: 26-Nov-2018, Time: 11:56:32, ID: ST181126M1-2 PFC CS-1 18K1902, Description: PFC CS-1 18K1902

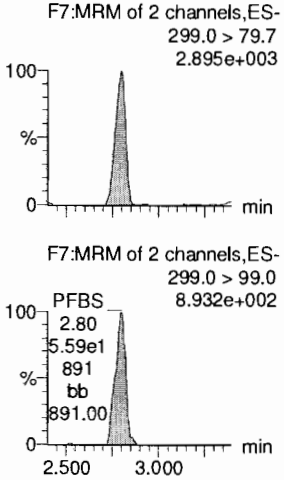
PFBA



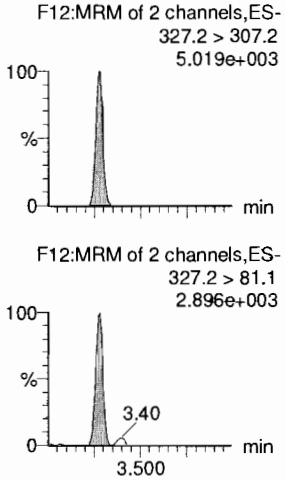
PFPeA



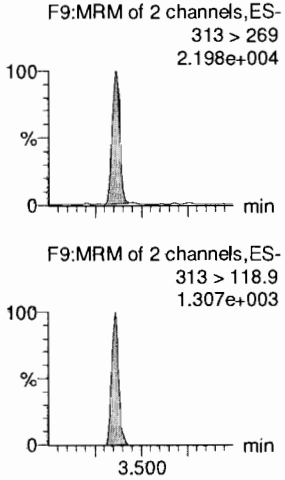
PFBS



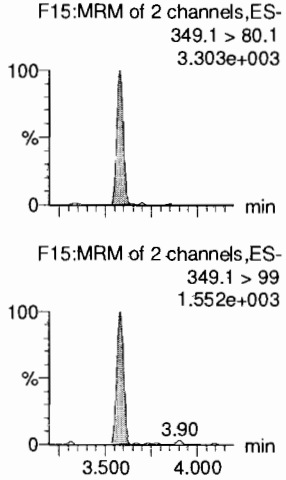
4:2 FTS



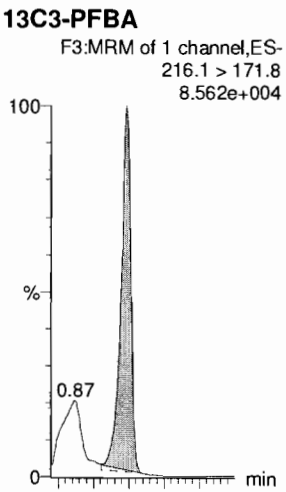
PFHxA



PFPeS



13C3-PFBA



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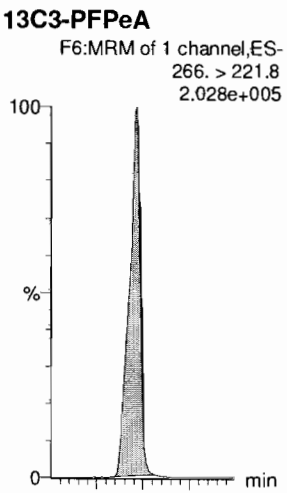

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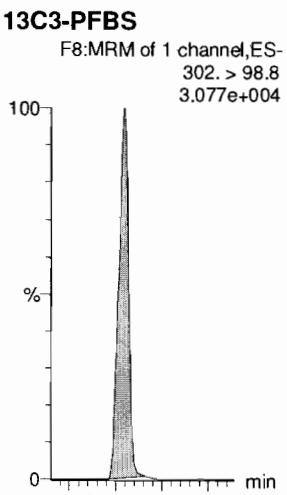
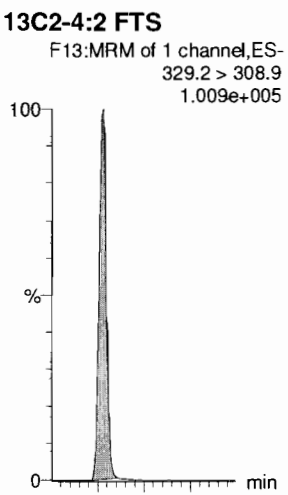


13C2-4:2 FTS



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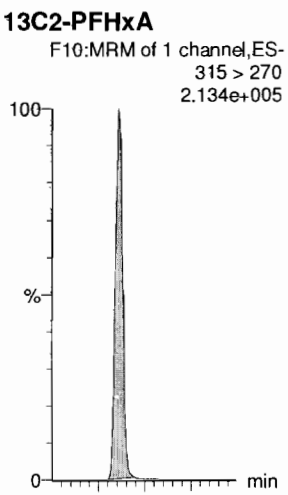

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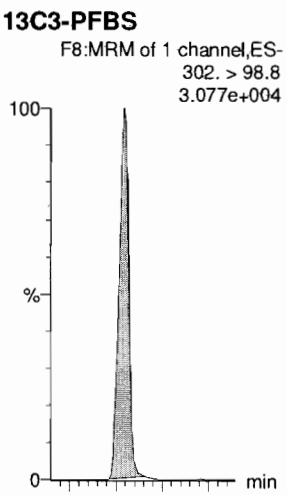

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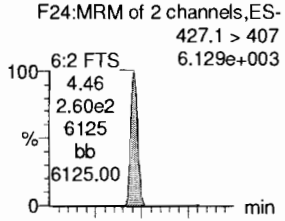
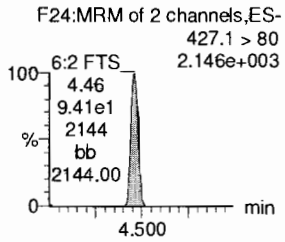
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

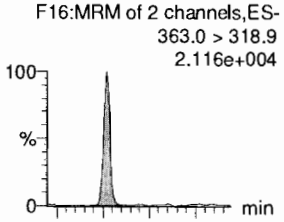
Name: 181126M1_3, Date: 26-Nov-2018, Time: 11:56:32, ID: ST181126M2-2 PFC CS-1 18K1902, Description: PFC CS-1 18K1902

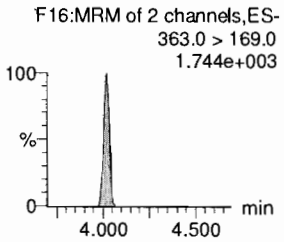
6:2 FTS



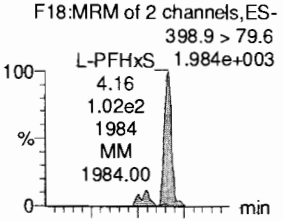


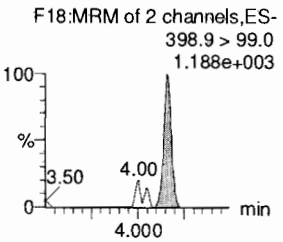
PFHpA



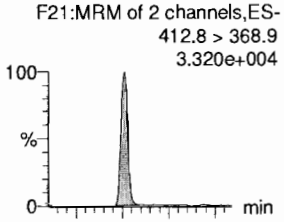


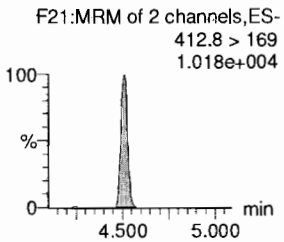
L-PFHxS



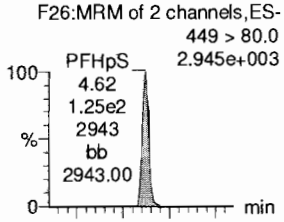


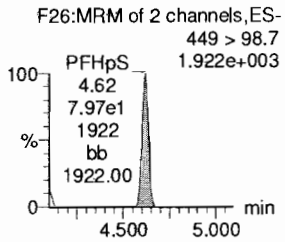
L-PFOA



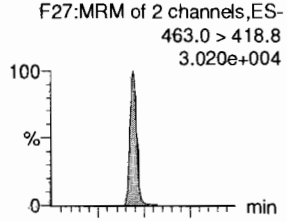


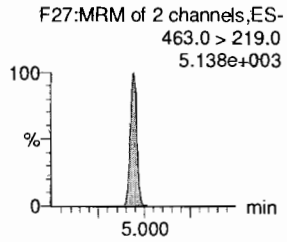
PFHpS



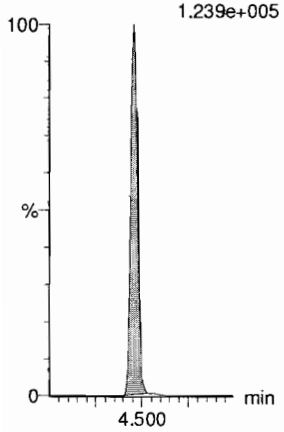


PFNA

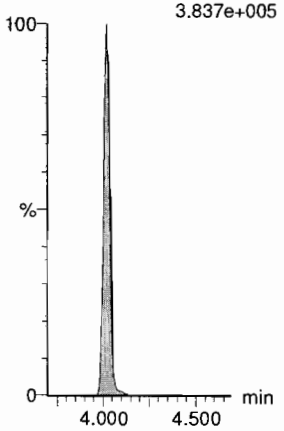




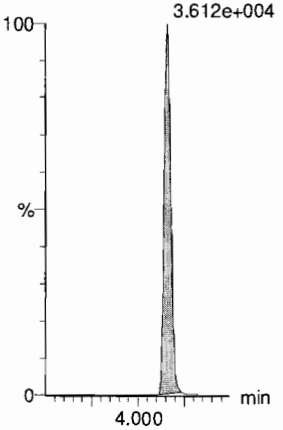
13C2-6:2 FTS



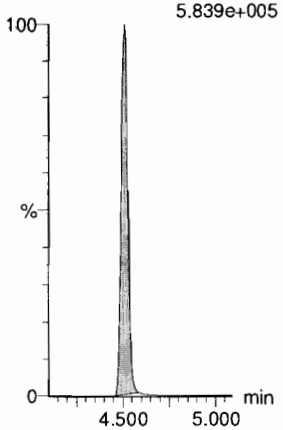
13C4-PFHpA



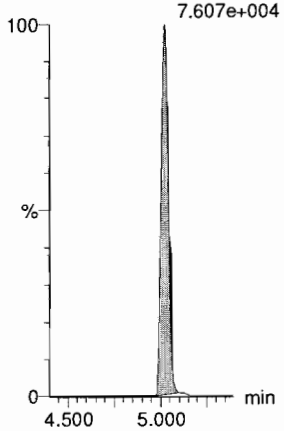
18O2-PFHxS



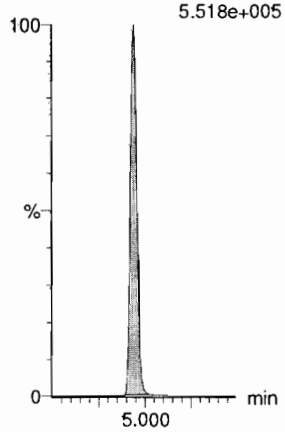
13C2-PFOA



13C8-PFOS



13C5-PFNA



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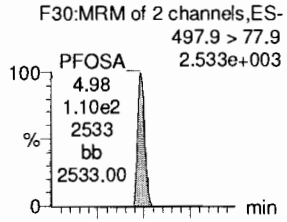
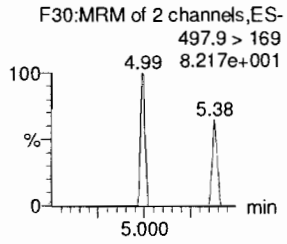
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

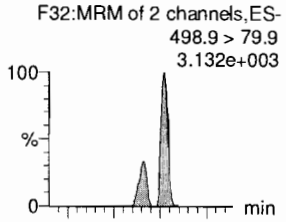
Name: 181126M1_3, Date: 26-Nov-2018, Time: 11:56:32, ID: ST181126M2-2 PFC CS-1 18K1902, Description: PFC CS-1 18K1902

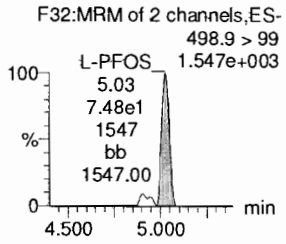
PFOSA





L-PFOS





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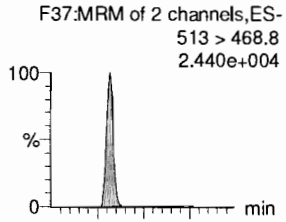
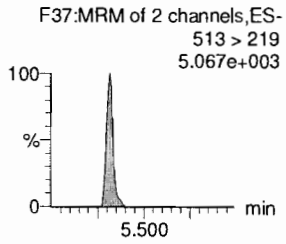
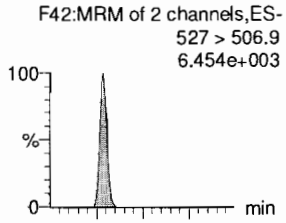
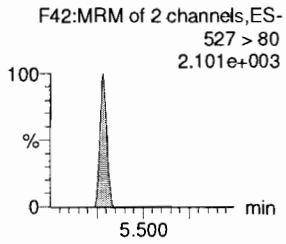




8:2 FTS





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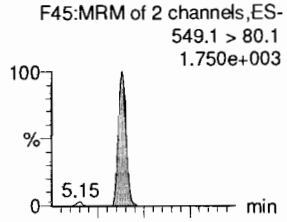

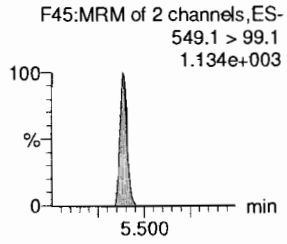

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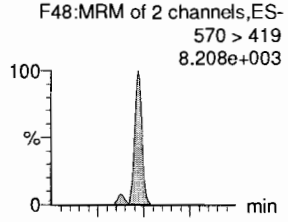
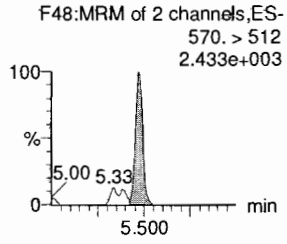
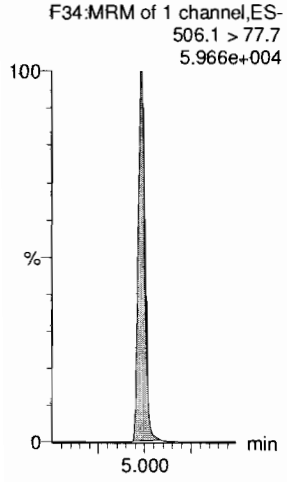




13C8-PFOSA



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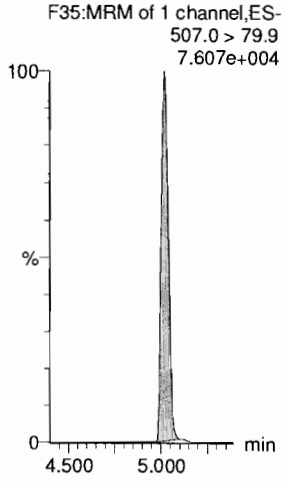

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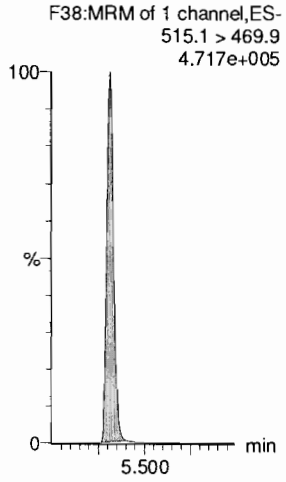

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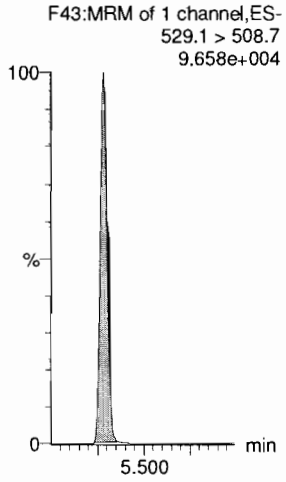

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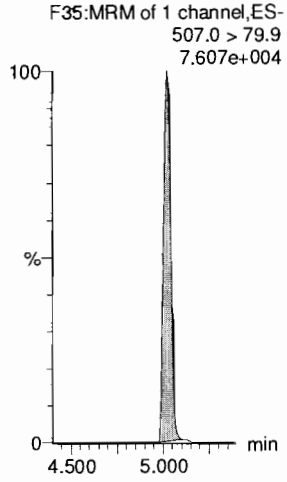
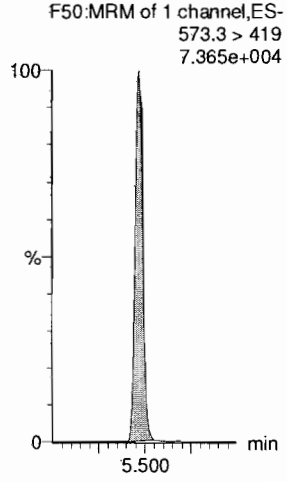


d3-N-MeFOSAA



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Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_3, Date: 26-Nov-2018, Time: 11:56:32, ID: ST181126M2-2 PFC CS-1 18K1902, Description: PFC CS-1 18K1902

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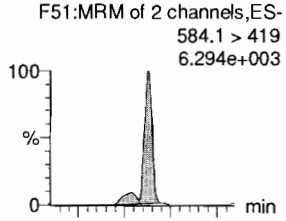

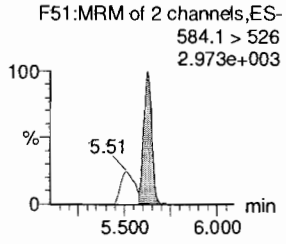

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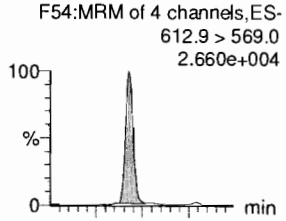

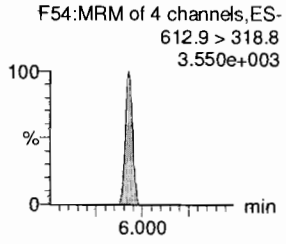

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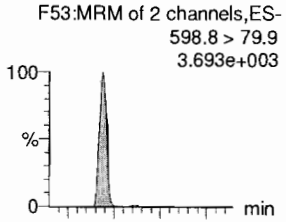

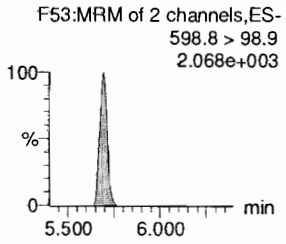

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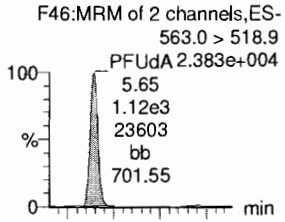

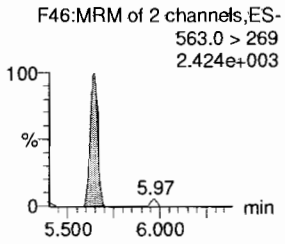

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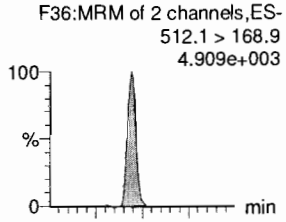

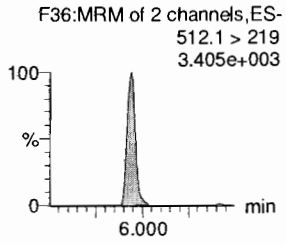

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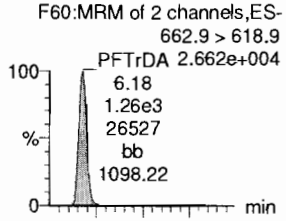

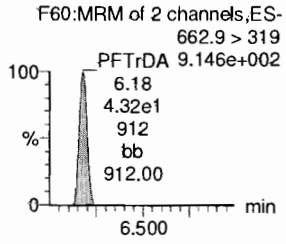

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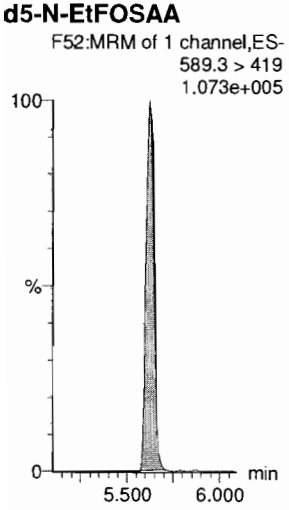

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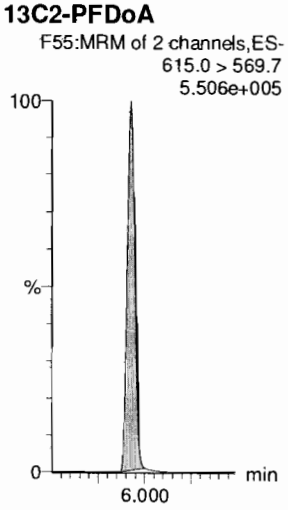

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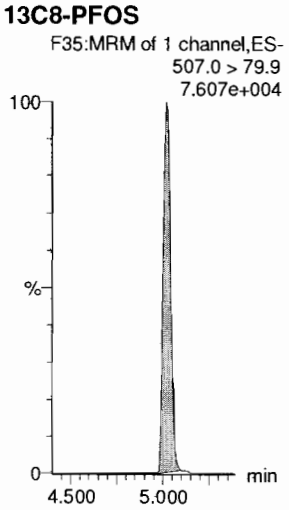
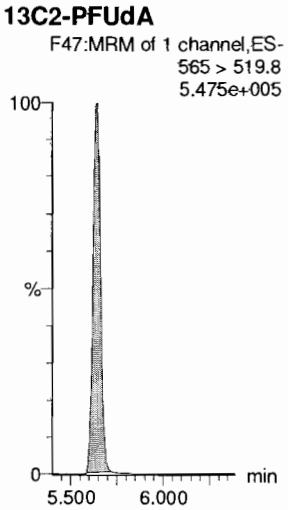


13C2-PFUdA



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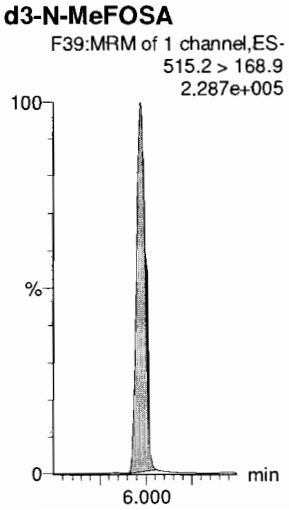

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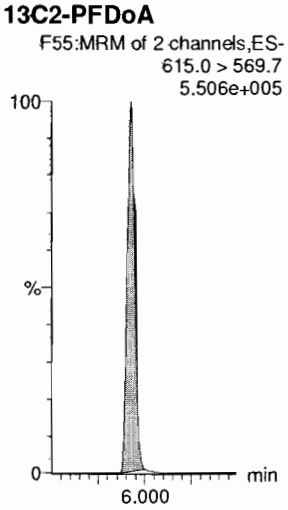

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Name: 181126M1_3, Date: 26-Nov-2018, Time: 11:56:32, ID: ST181126M2-2 PFC CS-1 18K1902, Description: PFC CS-1 18K1902

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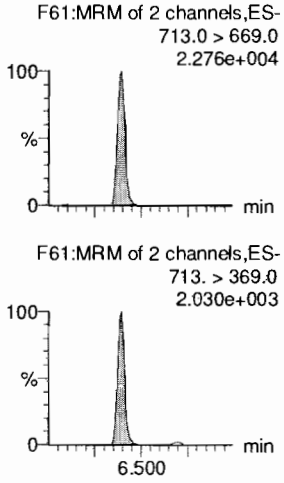

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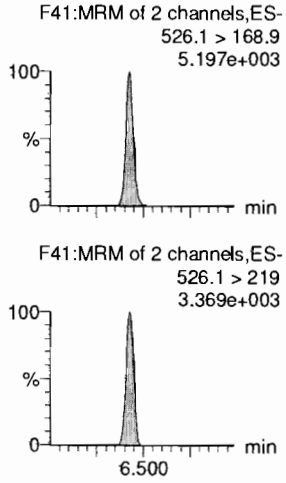

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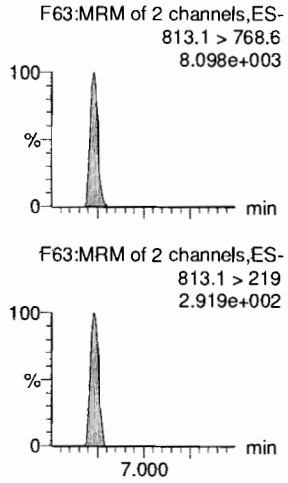
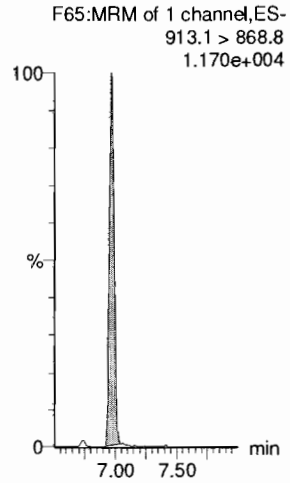
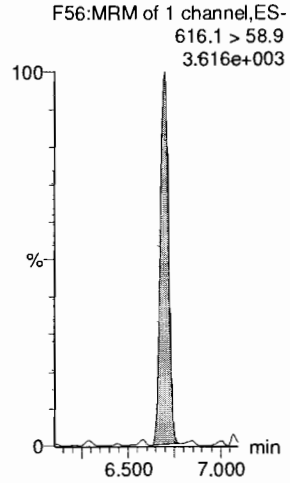


PFODA



N-MeFOSE



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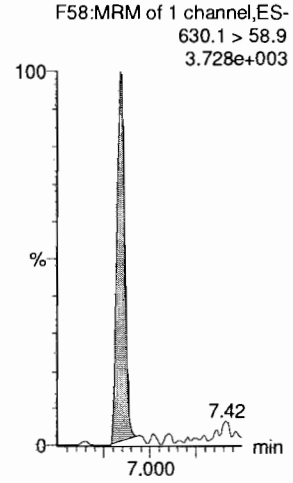

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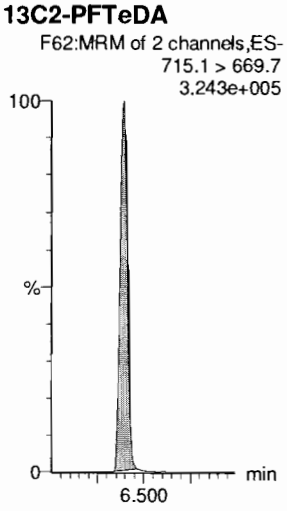
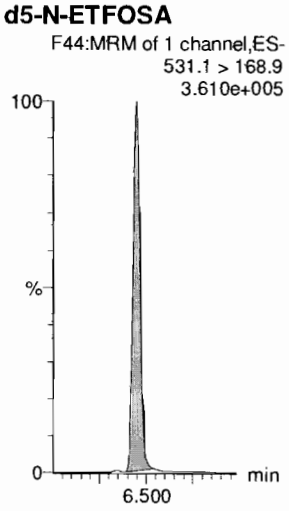


d5-N-ETFOSA



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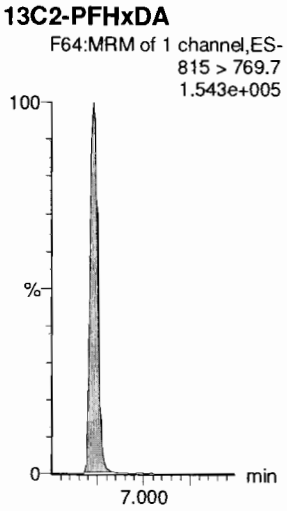

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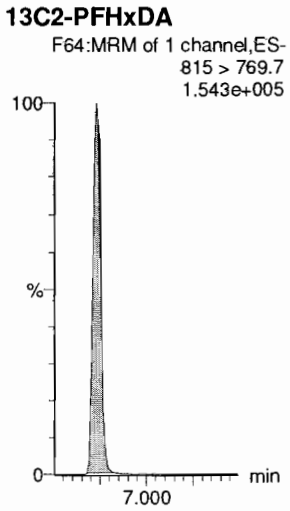

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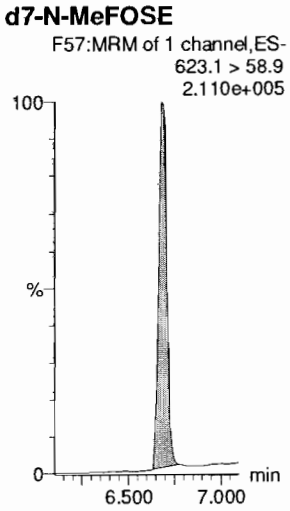
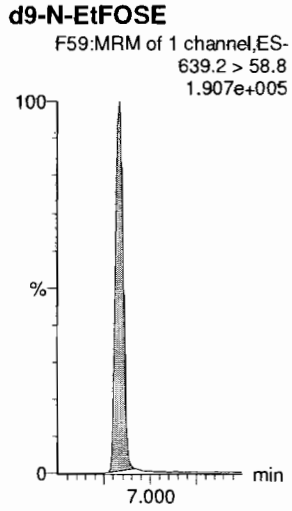


d9-N-EtFOSE



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Name: 181126M1_3, Date: 26-Nov-2018, Time: 11:56:32, ID: ST181126M2-2 PFC CS-1 18K1902, Description: PFC CS-1 18K1902

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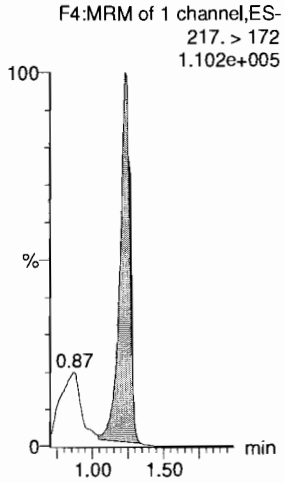

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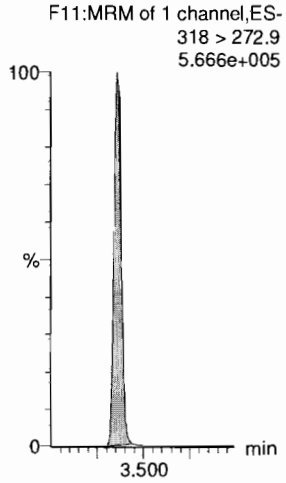
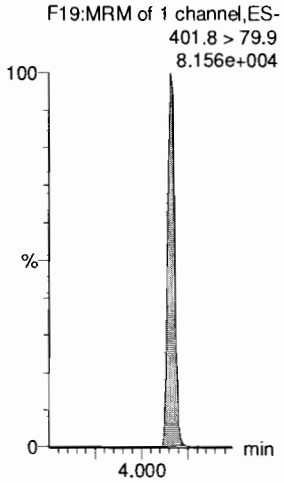


13C3-PFHxS



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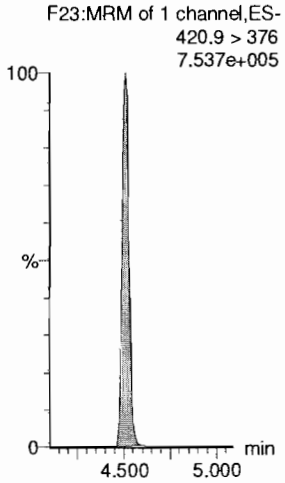

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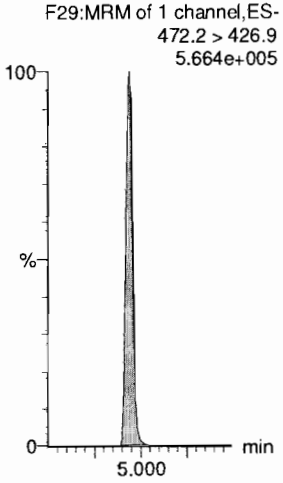

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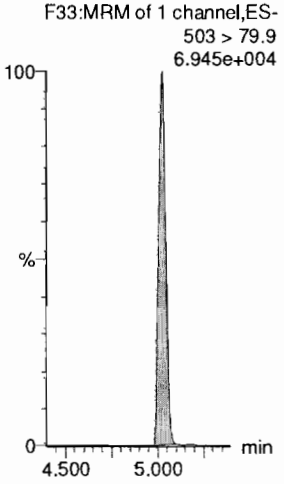

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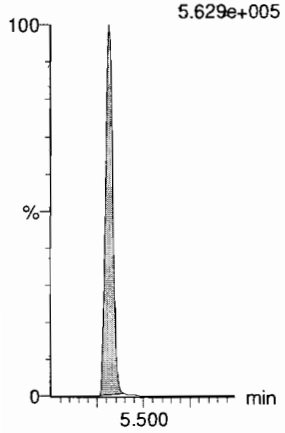
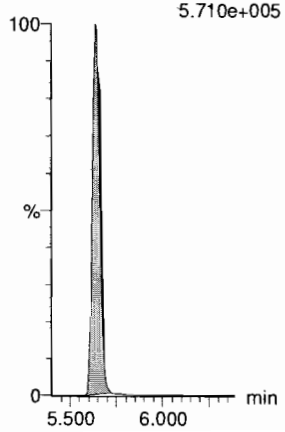


13C7-PFUdA



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Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
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1 AD 11/27/18

Name: 181126M1_4, Date: 26-Nov-2018, Time: 12:07:10, ID: ST181126M2-3 PFC CS0 18K1903, Description: PFC CS0 18K1903

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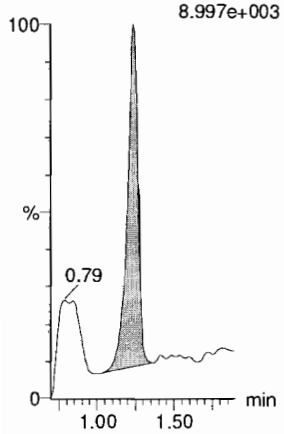

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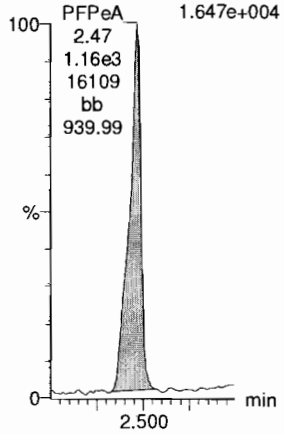

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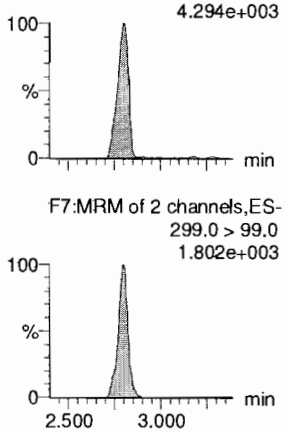
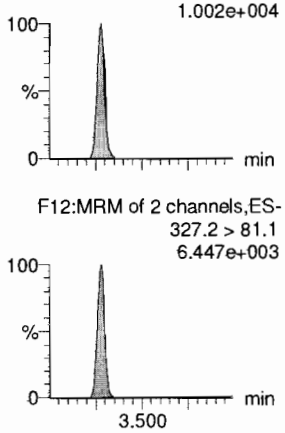


4:2 FTS



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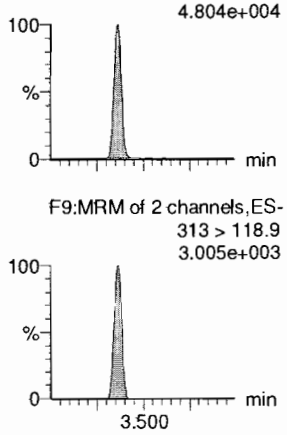

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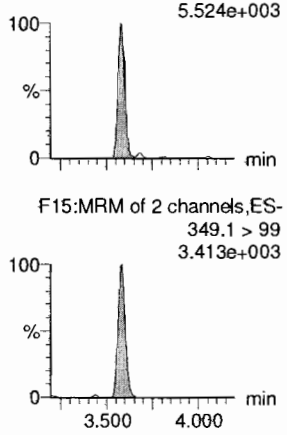

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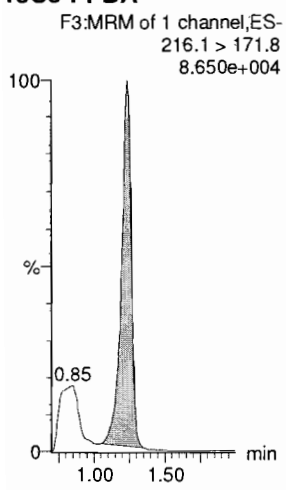

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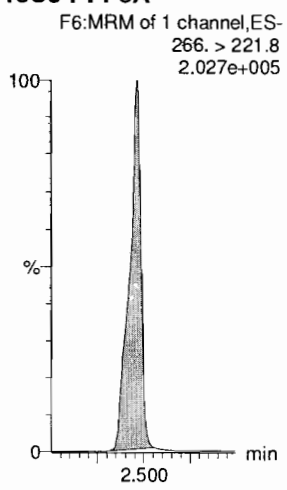

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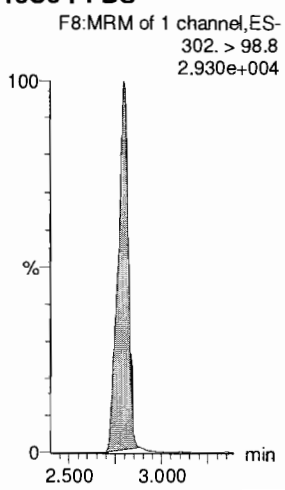
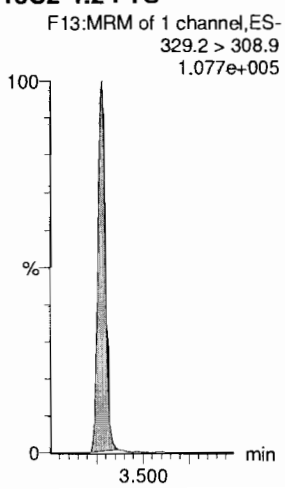


13C2-4:2 FTS



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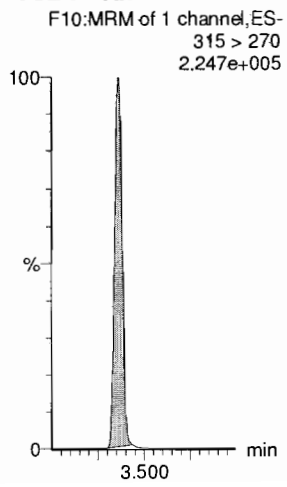

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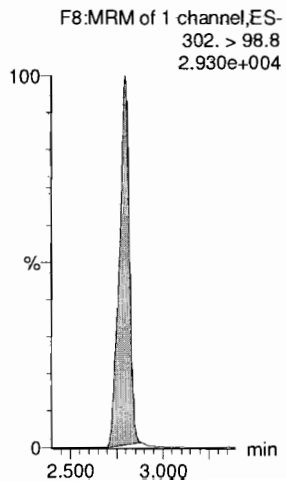

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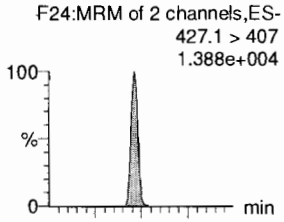
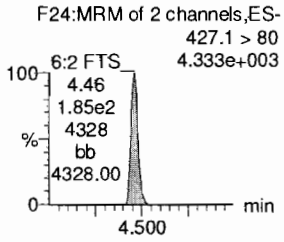
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_4, Date: 26-Nov-2018, Time: 12:07:10, ID: ST181126M2-3 PFC CS0 18K1903, Description: PFC CS0 18K1903

6:2 FTS





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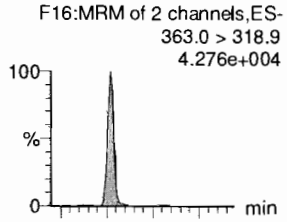
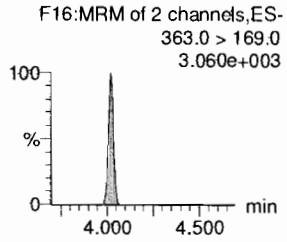
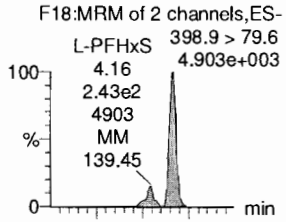
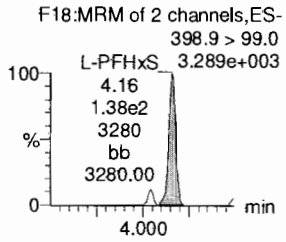


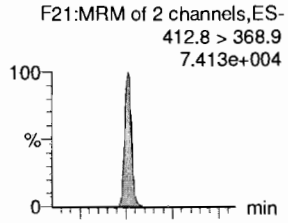


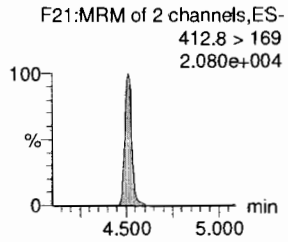
L-PFHxS





L-PFOA





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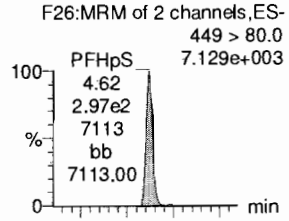

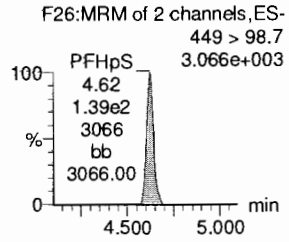

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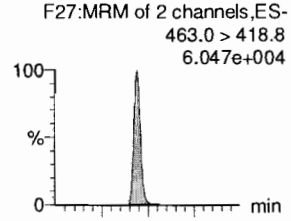
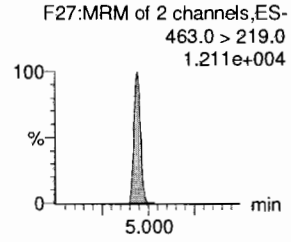
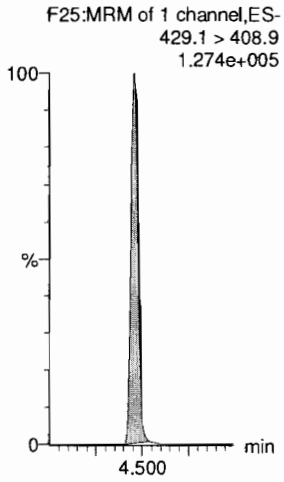




13C2-6:2 FTS



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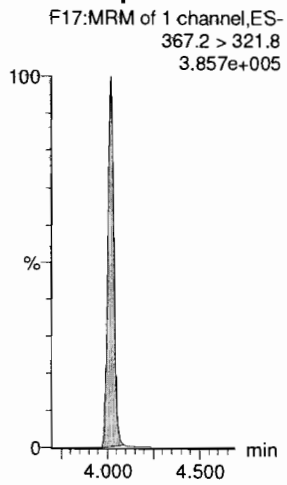

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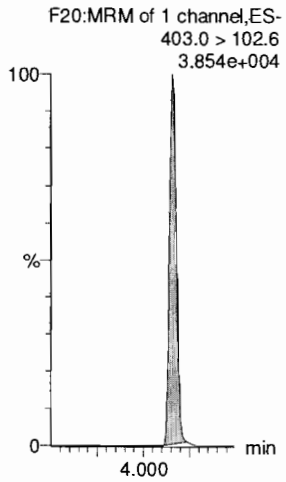

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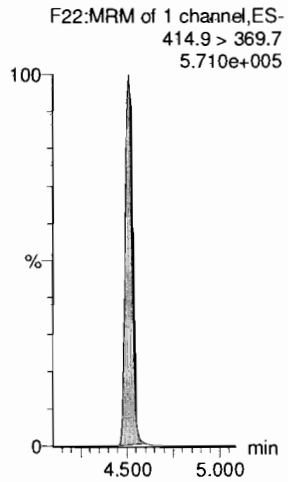

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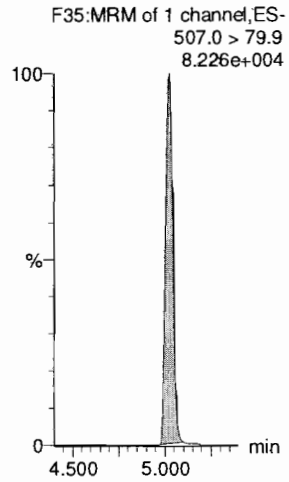

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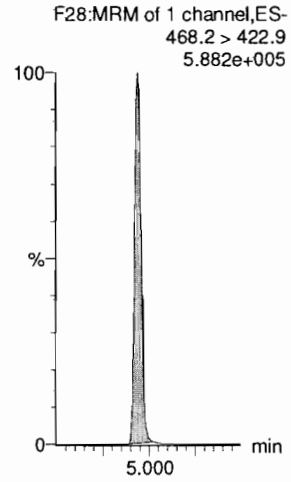

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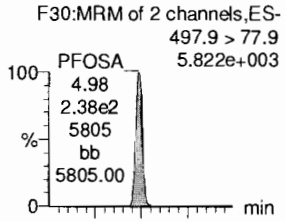
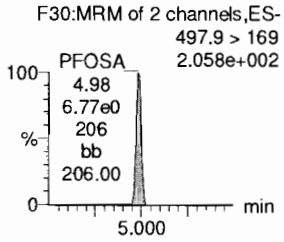
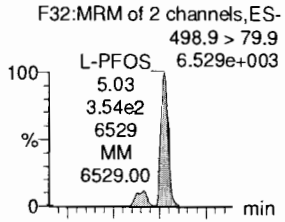
Name: 181126M1_4, Date: 26-Nov-2018, Time: 12:07:10, ID: ST181126M2-3 PFC CS0 18K1903, Description: PFC CS0 18K1903

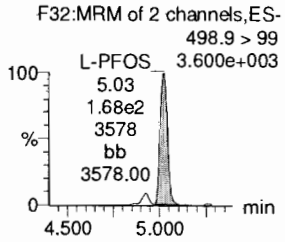
PFOSA





L-PFOS





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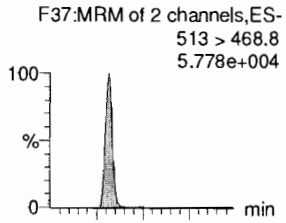
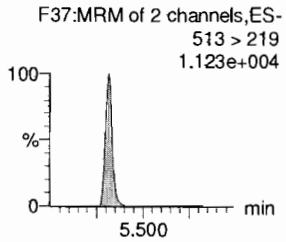
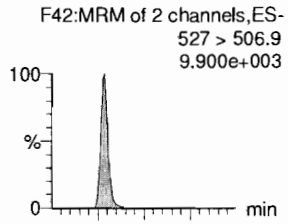
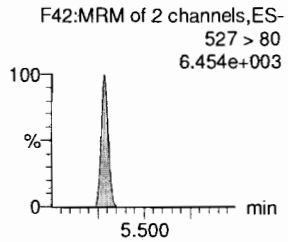




8:2 FTS





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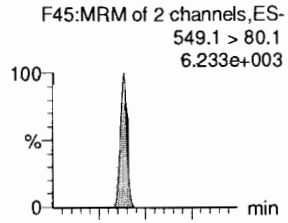

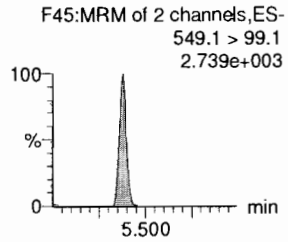

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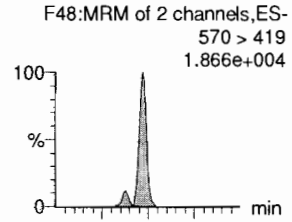
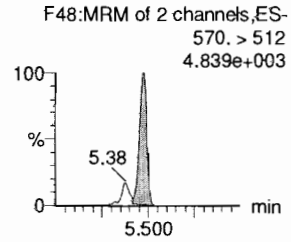
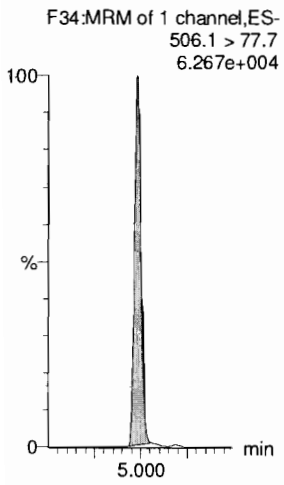




13C8-PFOSA



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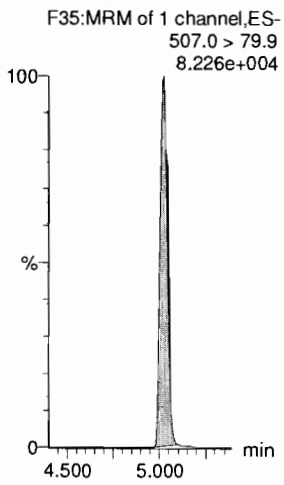

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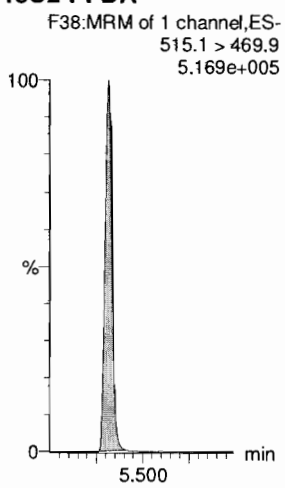
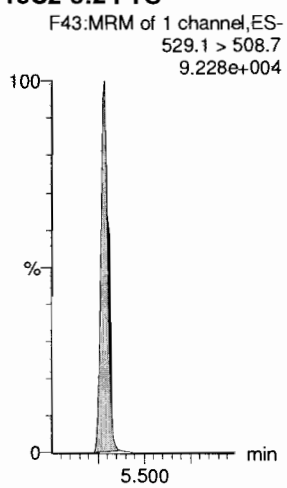


13C2-8:2 FTS



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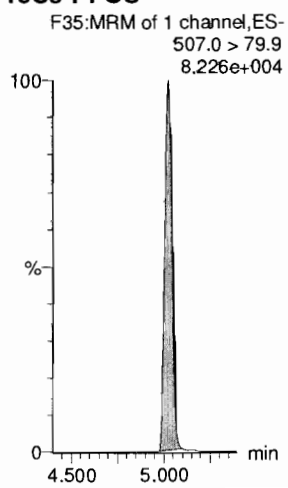

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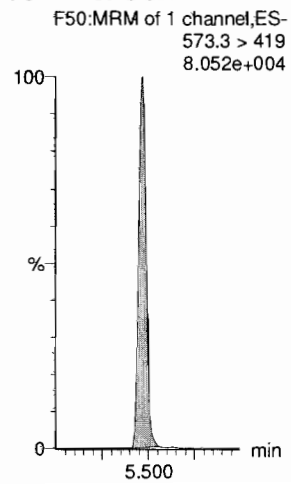

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Name: 181126M1_4, Date: 26-Nov-2018, Time: 12:07:10, ID: ST181126M2-3 PFC CS0 18K1903, Description: PFC CS0 18K1903

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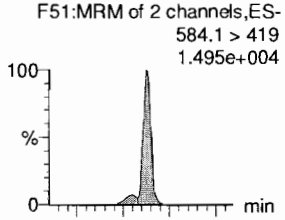
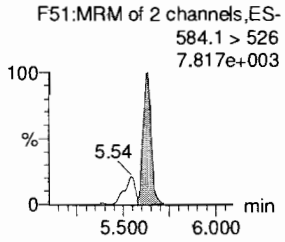
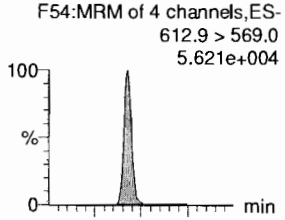
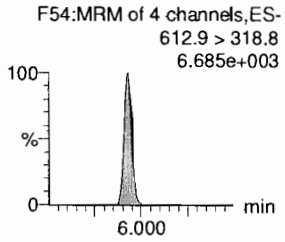


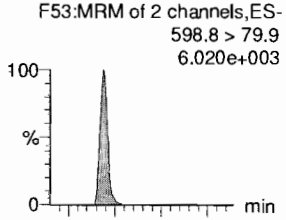


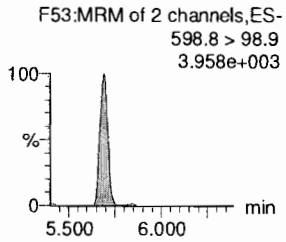
PFDoA



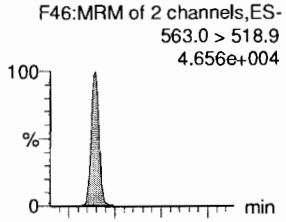


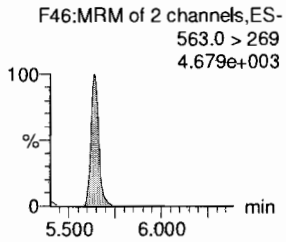
PFDS



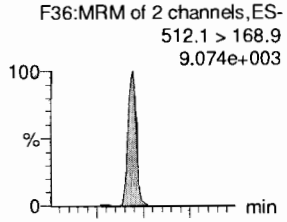


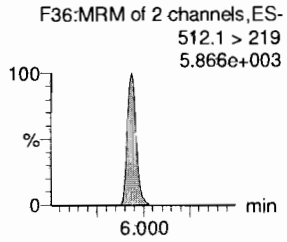
PFUdA



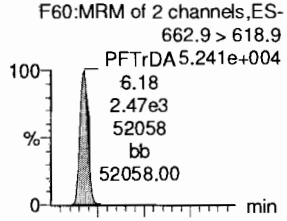


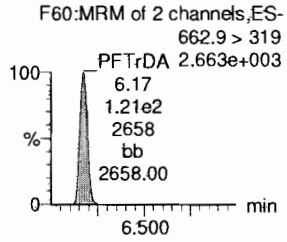
N-MeFOSA



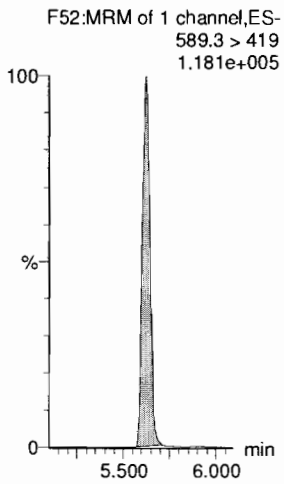


PFTrDA

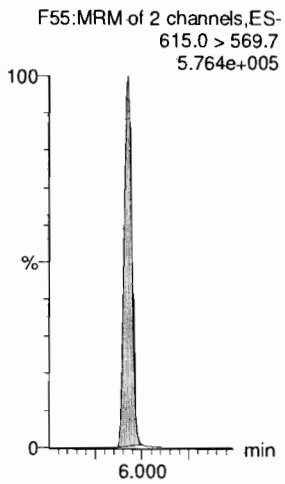




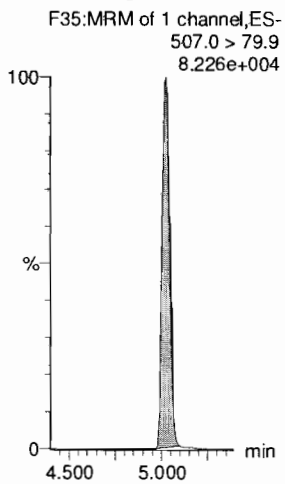
d5-N-EtFOSAA



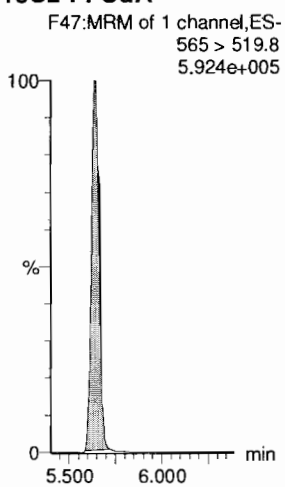
13C2-PFDoA



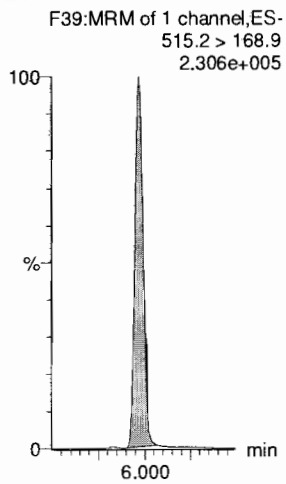
13C8-PFOS



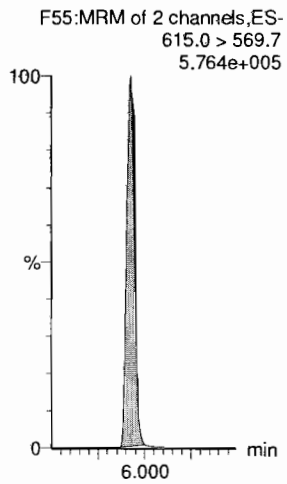
13C2-PFUdA



d3-N-MeFOSA



13C2-PFDoA

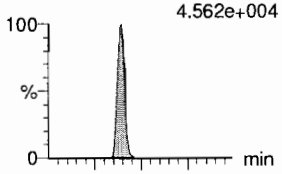


Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

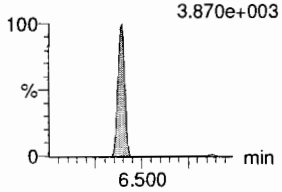
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_4, Date: 26-Nov-2018, Time: 12:07:10, ID: ST181126M2-3 PFC CS0 18K1903, Description: PFC CS0 18K1903

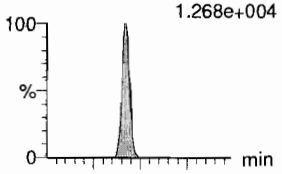
PFTeDA
F61:MRM of 2 channels,ES-
713.0 > 669.0
4.562e+004



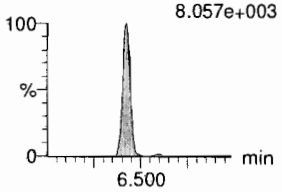
F61:MRM of 2 channels,ES-
713. > 369.0
3.870e+003



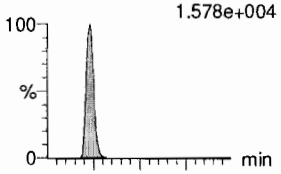
N-EtFOSA
F41:MRM of 2 channels,ES-
526.1 > 168.9
1.268e+004



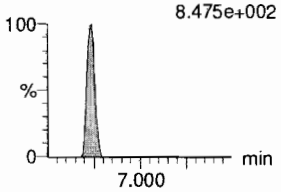
F41:MRM of 2 channels,ES-
526.1 > 219
8.057e+003



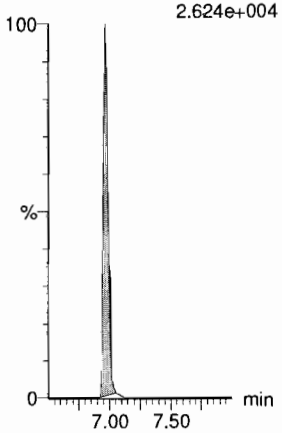
PFHxDA
F63:MRM of 2 channels,ES-
813.1 > 768.6
1.578e+004



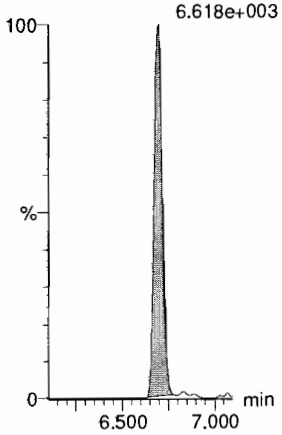
F63:MRM of 2 channels,ES-
813.1 > 219
8.475e+002



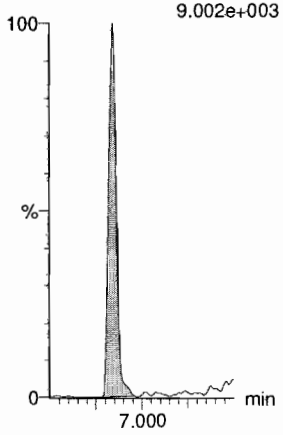
PFODA
F65:MRM of 1 channel,ES-
913.1 > 868.8
2.624e+004



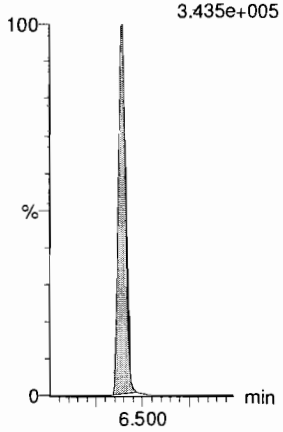
N-MeFOSE
F56:MRM of 1 channel,ES-
616.1 > 58.9
6.618e+003



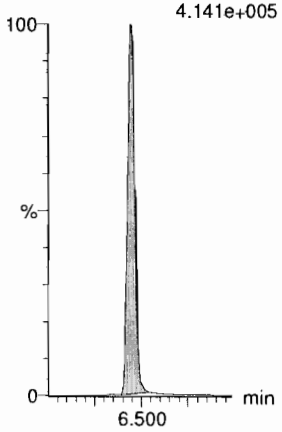
N-EtFOSE
F58:MRM of 1 channel,ES-
630.1 > 58.9
9.002e+003



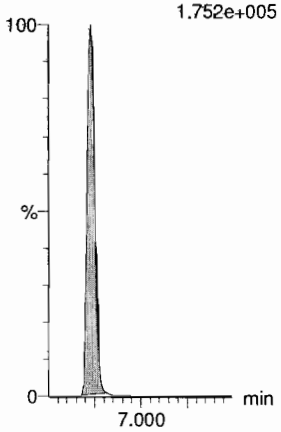
13C2-PFTeDA
F62:MRM of 2 channels,ES-
715.1 > 669.7
3.435e+005



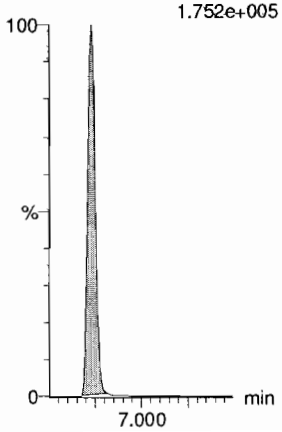
d5-N-ETFOSA
F44:MRM of 1 channel,ES-
531.1 > 168.9
4.141e+005



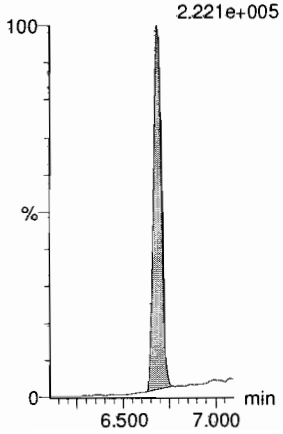
13C2-PFHxDA
F64:MRM of 1 channel,ES-
815 > 769.7
1.752e+005



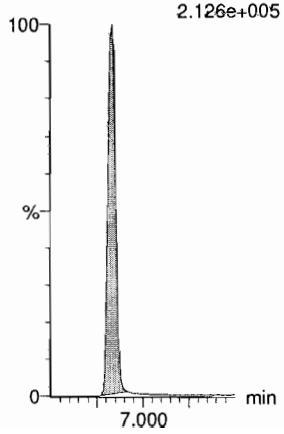
13C2-PFHxDA
F64:MRM of 1 channel,ES-
815 > 769.7
1.752e+005



d7-N-MeFOSE
F57:MRM of 1 channel,ES-
623.1 > 58.9
2.221e+005



d9-N-EtFOSE
F59:MRM of 1 channel,ES-
639.2 > 58.8
2.126e+005

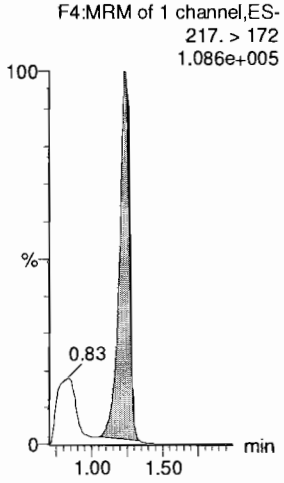


Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

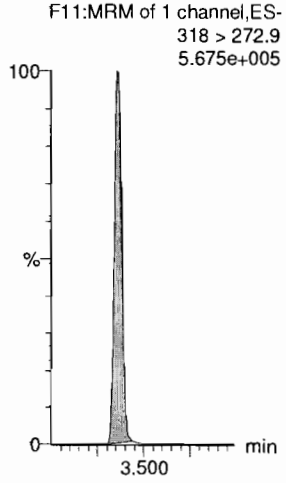
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_4, Date: 26-Nov-2018, Time: 12:07:10, ID: ST181126M2-3 PFC CS0 18K1903, Description: PFC CS0 18K1903

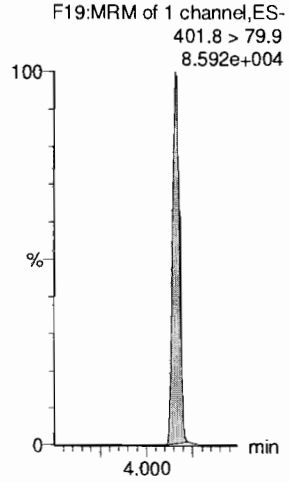
13C4-PFBA



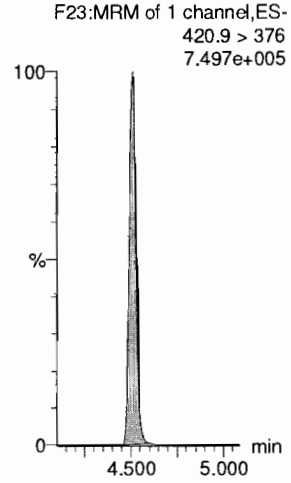
13C5-PFHxA



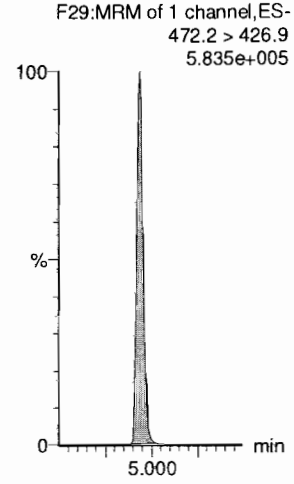
13C3-PFHxS



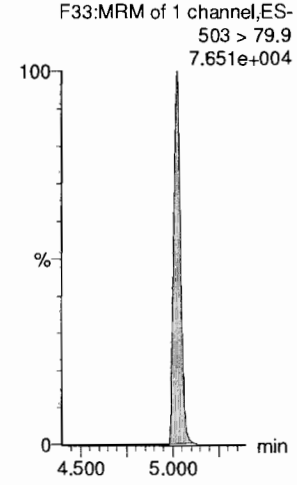
13C8-PFOA



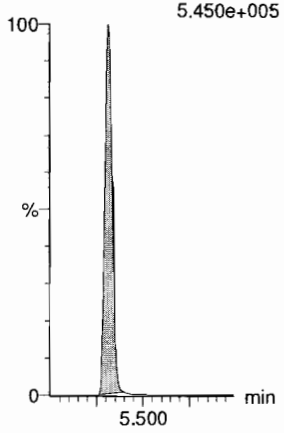
13C9-PFNA



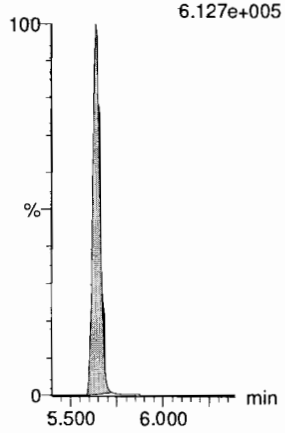
13C4-PFOS



13C6-PFDA



13C7-PFUdA



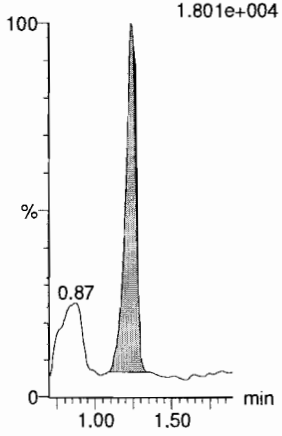
Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

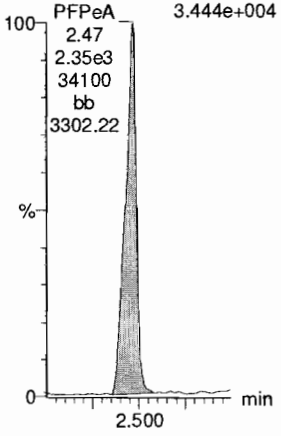
1 AD 11/27/18

Name: 181126M1_5, Date: 26-Nov-2018, Time: 12:17:48, ID: ST181126M2-4 PFC CS1 18K1904, Description: PFC CS1 18K1904

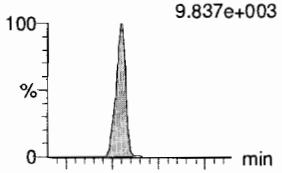
PFBA
F2:MRM of 1 channel,ES-
213.0 > 168.8
1.801e+004



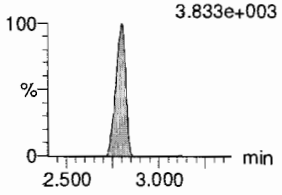
PFPeA
F5:MRM of 1 channel,ES-
263.1 > 218.9
3.444e+004



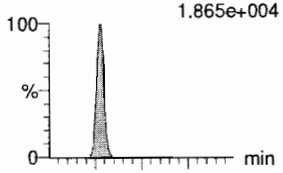
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
9.837e+003



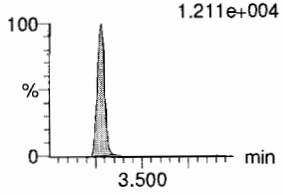
F7:MRM of 2 channels,ES-
299.0 > 99.0
3.833e+003



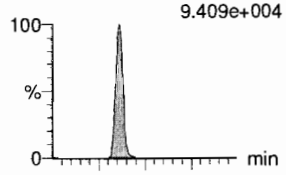
4:2 FTS
F12:MRM of 2 channels,ES-
327.2 > 307.2
1.865e+004



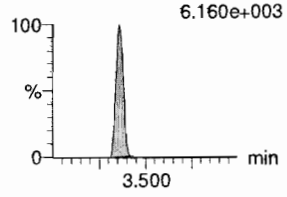
F12:MRM of 2 channels,ES-
327.2 > 81.1
1.211e+004



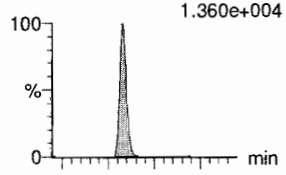
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
9.409e+004



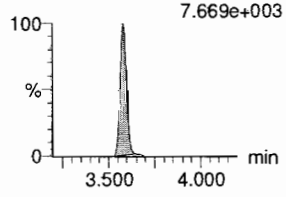
F9:MRM of 2 channels,ES-
313 > 118.9
6.160e+003



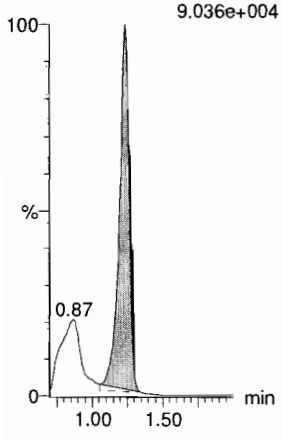
PFPeS
F15:MRM of 2 channels,ES-
349.1 > 80.1
1.360e+004



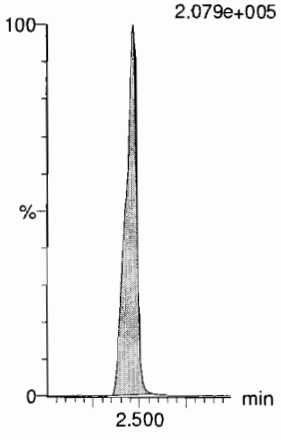
F15:MRM of 2 channels,ES-
349.1 > 99
7.669e+003



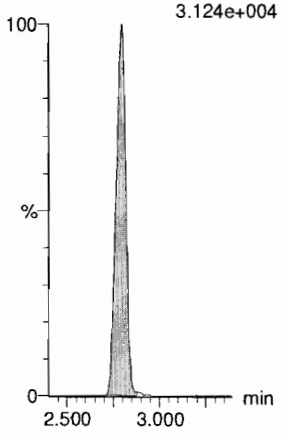
13C3-PFBA
F3:MRM of 1 channel,ES-
216.1 > 171.8
9.036e+004



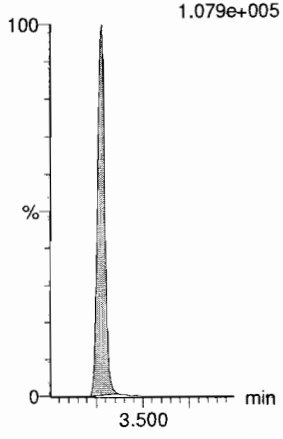
13C3-PFPeA
F6:MRM of 1 channel,ES-
266. > 221.8
2.079e+005



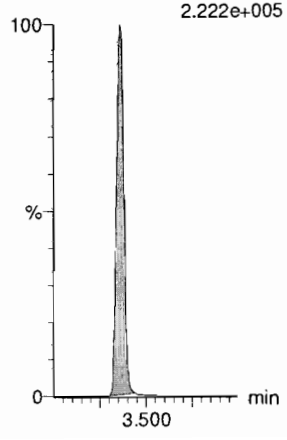
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.124e+004



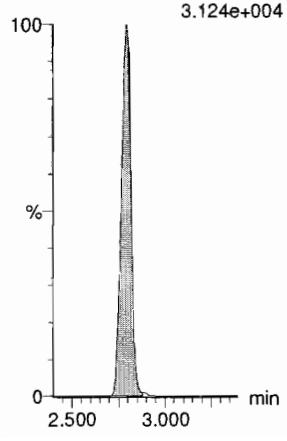
13C2-4:2 FTS
F13:MRM of 1 channel,ES-
329.2 > 308.9
1.079e+005



13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
2.222e+005



13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.124e+004



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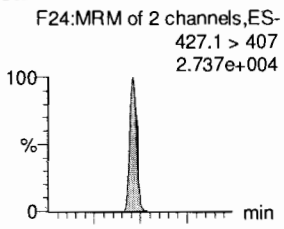
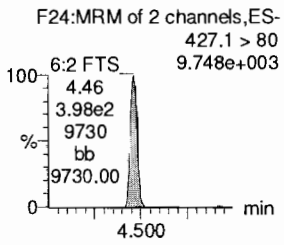
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

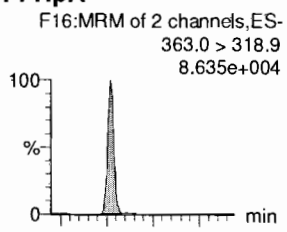
Name: 181126M1_5, Date: 26-Nov-2018, Time: 12:17:48, ID: ST181126M2-4 PFC CS1 18K1904, Description: PFC CS1 18K1904

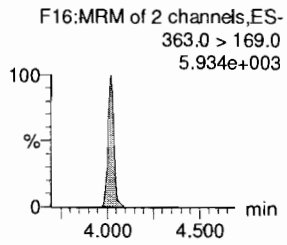
6:2 FTS



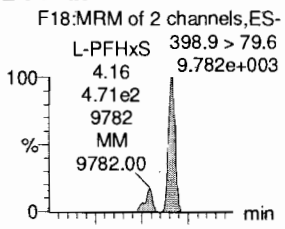


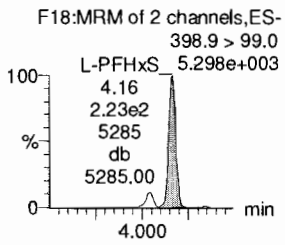
PFHpA



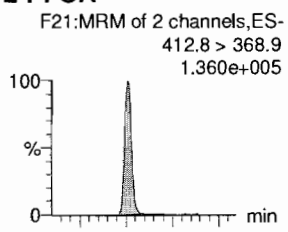


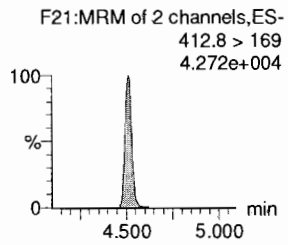
L-PFHxS



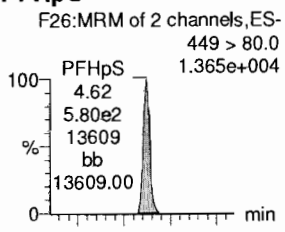


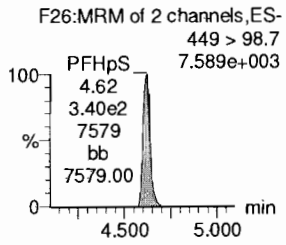
L-PFOA





PFHpS





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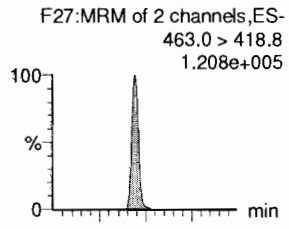
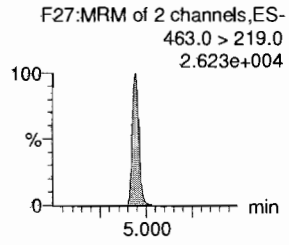
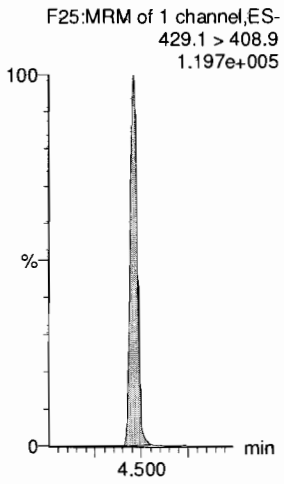
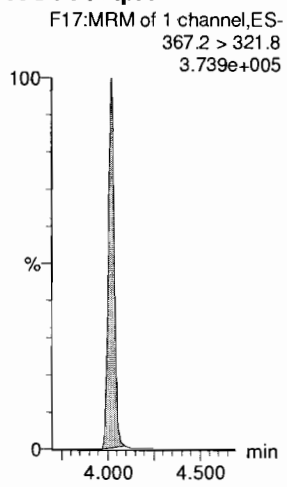




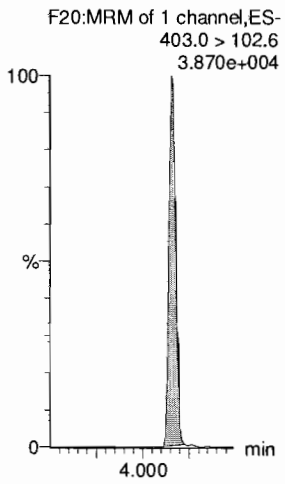
13C2-6:2 FTS



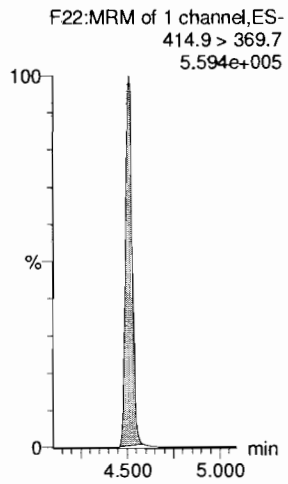
13C4-PFHpA



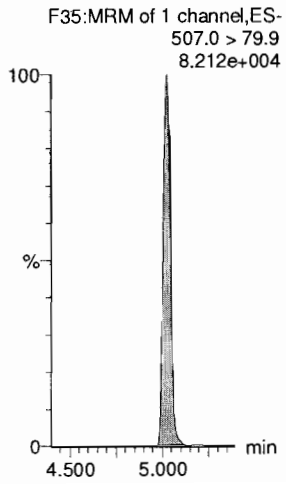
18O2-PFHxS



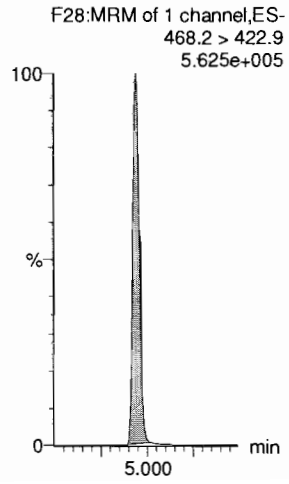
13C2-PFOA



13C8-PFOS



13C5-PFNA



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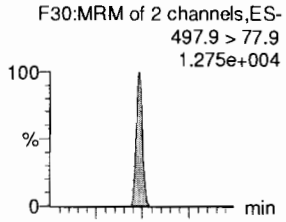
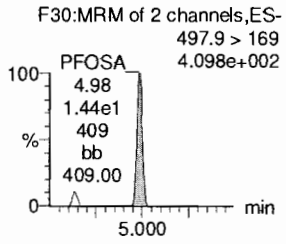
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

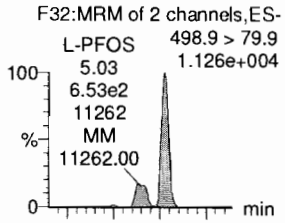
Name: 181126M1_5, Date: 26-Nov-2018, Time: 12:17:48, ID: ST181126M2-4 PFC CS1 18K1904, Description: PFC CS1 18K1904

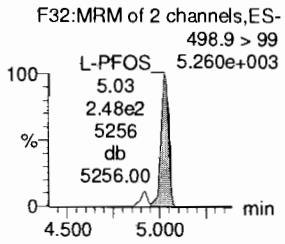
PFOSA





L-PFOS





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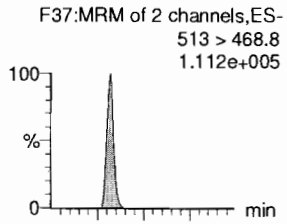
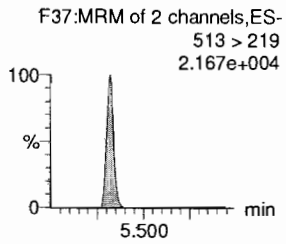
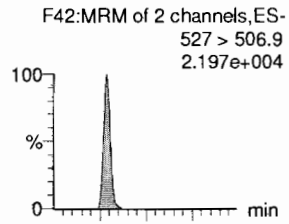
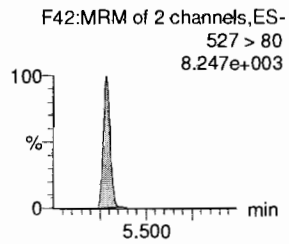


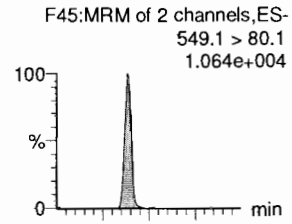


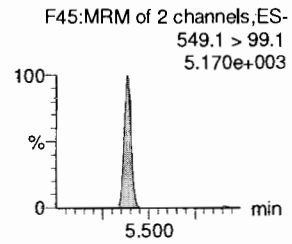
8:2 FTS



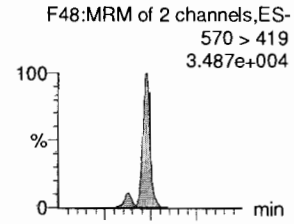


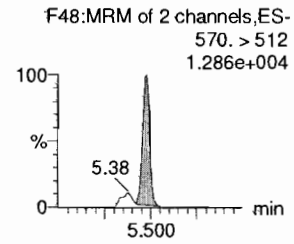
PFNS



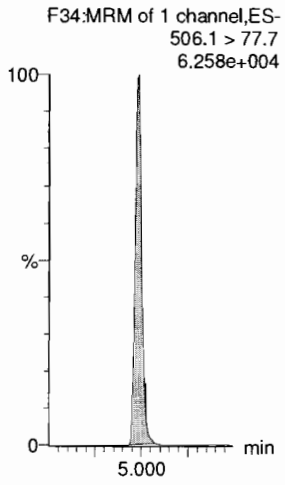


L-MeFOSAA

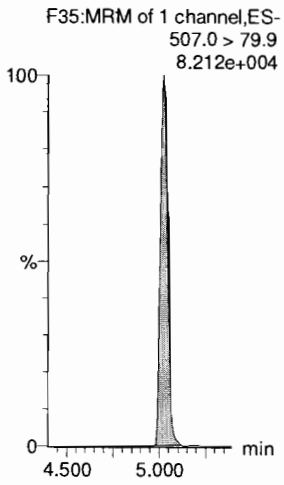




13C8-PFOSA



13C8-PFOS



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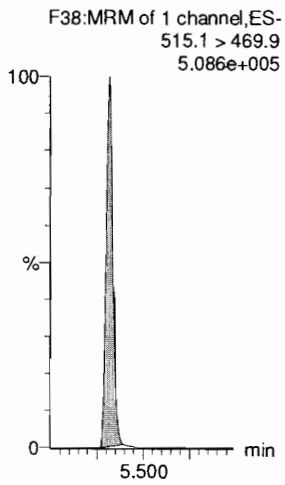
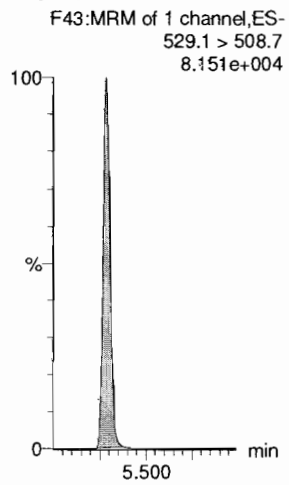


13C2-8:2 FTS



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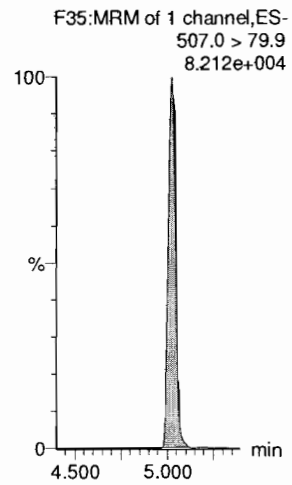
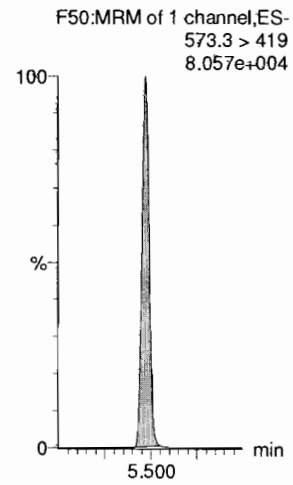


d3-N-MeFOSAA



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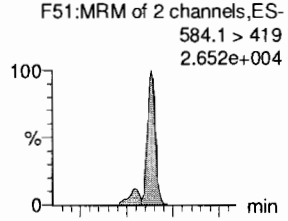
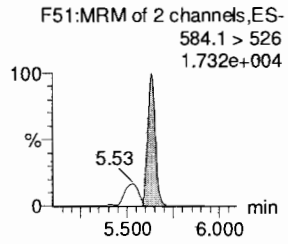
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

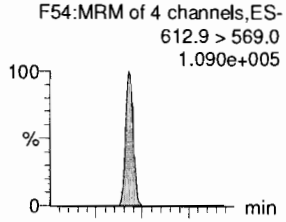
Name: 181126M1_5, Date: 26-Nov-2018, Time: 12:17:48, ID: ST181126M2-4 PFC CS1 18K1904, Description: PFC CS1 18K1904

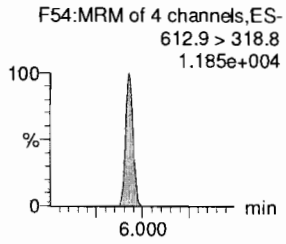
L-EtFOSAA



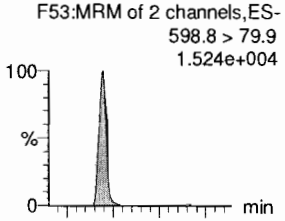


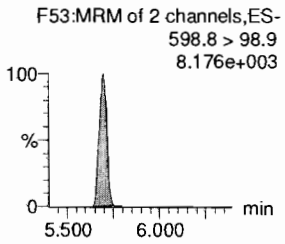
PFDoA





PFDS





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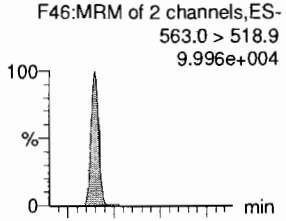
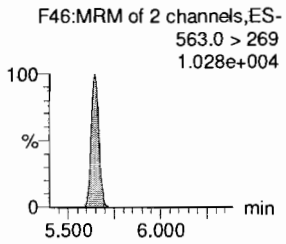
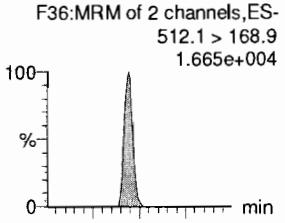
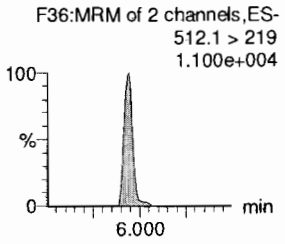


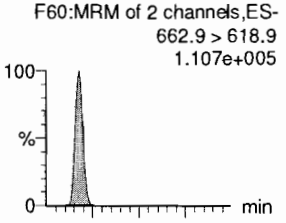


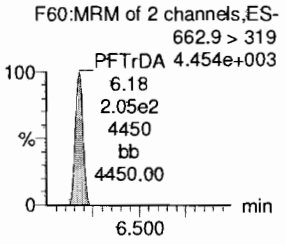
N-MeFOSA



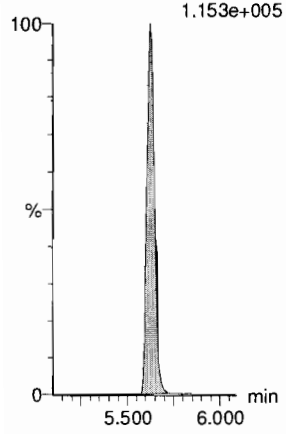


PFTrDA

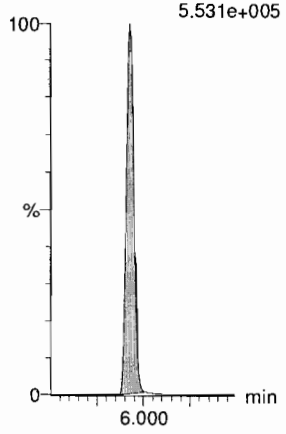




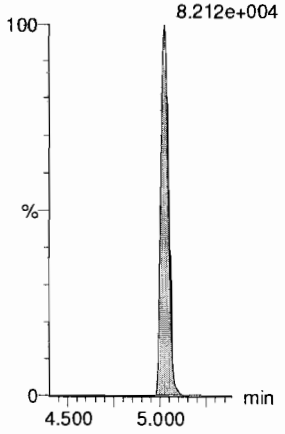
d5-N-EtFOSAA



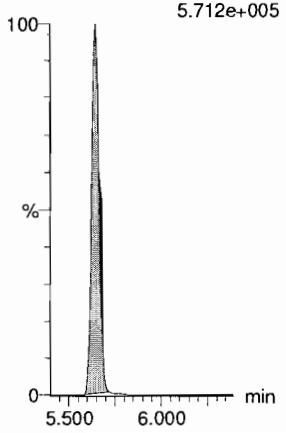
13C2-PFDoA



13C8-PFOS



13C2-PFUdA



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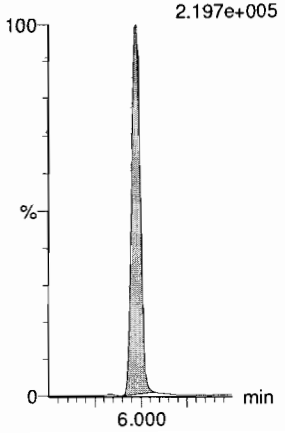

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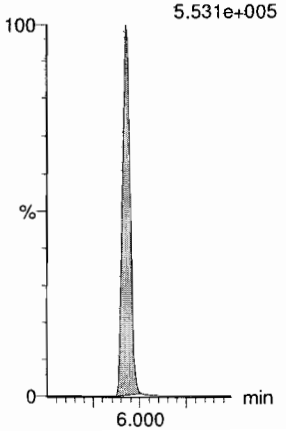

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_5, Date: 26-Nov-2018, Time: 12:17:48, ID: ST181126M2-4 PFC CS1 18K1904, Description: PFC CS1 18K1904

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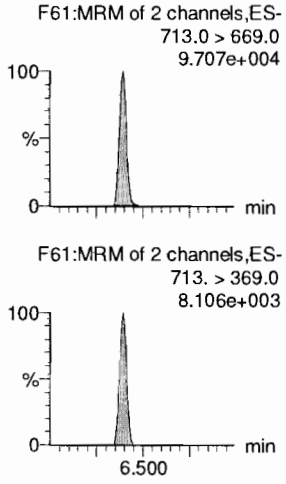

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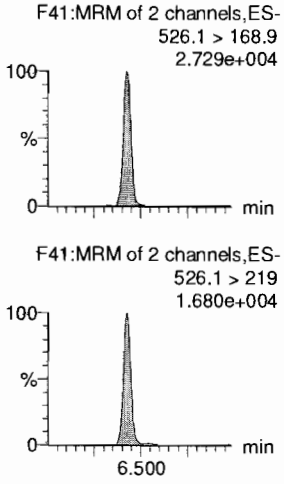
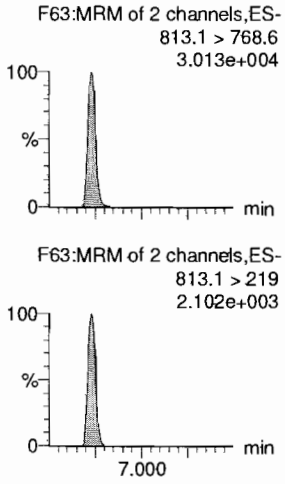
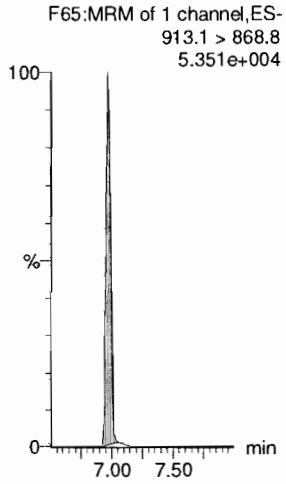


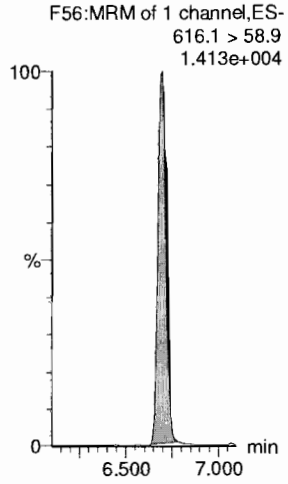
PFHxDA



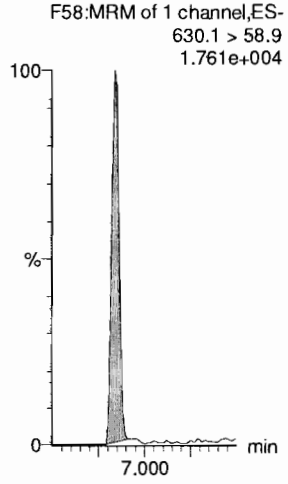
PFODA



N-MeFOSE



N-EtFOSE



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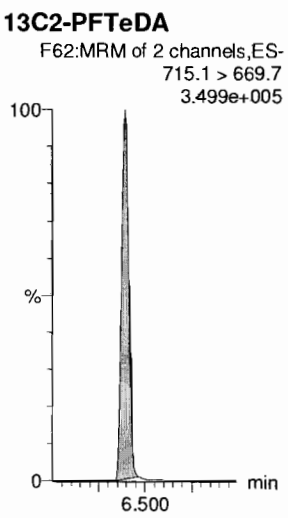

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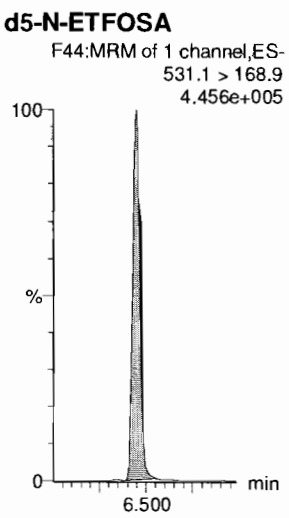

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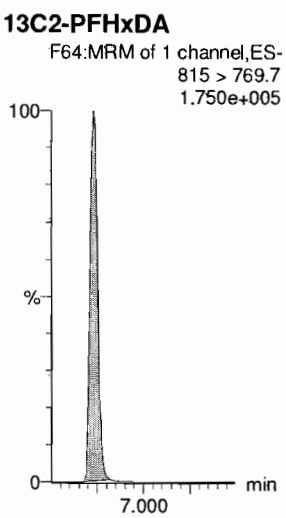

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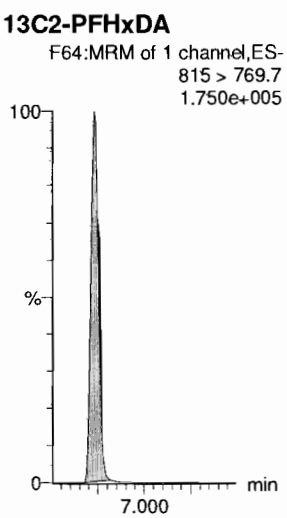

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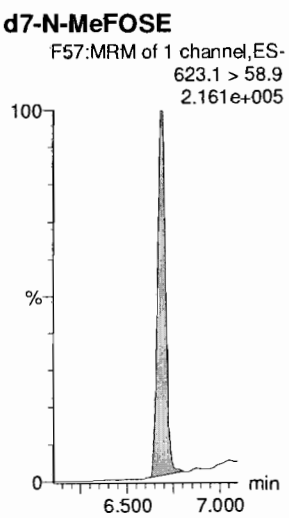

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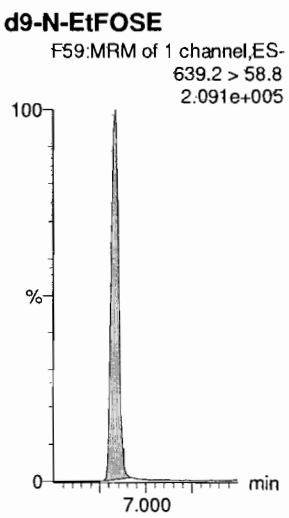

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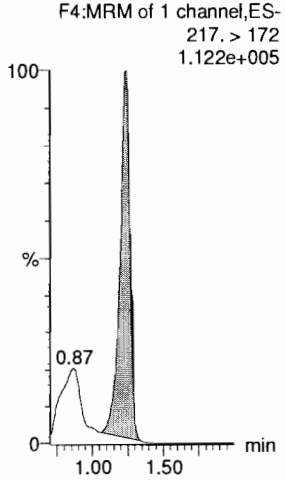
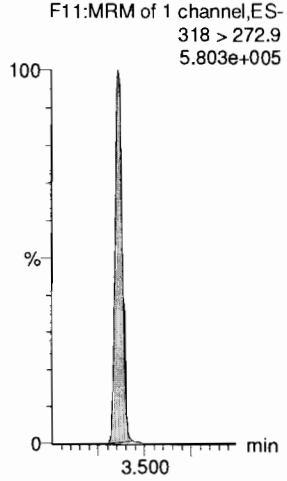
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_5, Date: 26-Nov-2018, Time: 12:17:48, ID: ST181126M2-4 PFC CS1 18K1904, Description: PFC CS1 18K1904

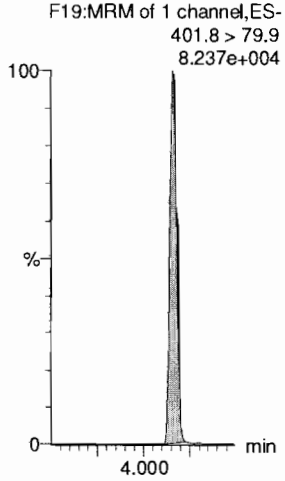
13C4-PFBA



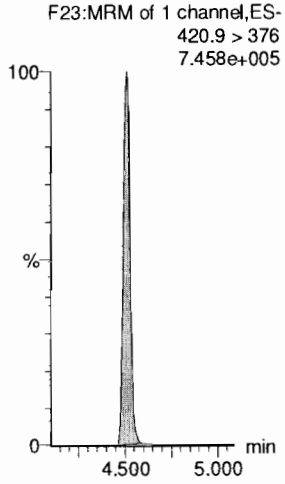
13C5-PFHxA



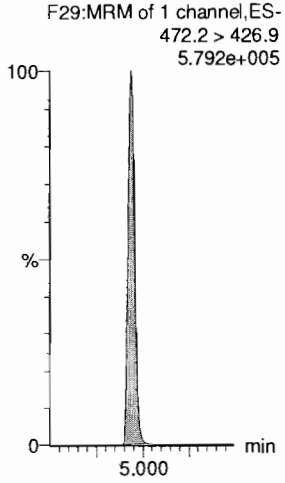
13C3-PFHxS



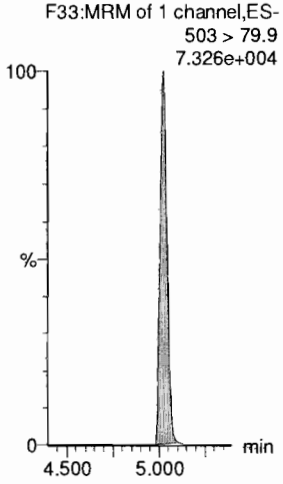
13C8-PFOA



13C9-PFNA



13C4-PFOS



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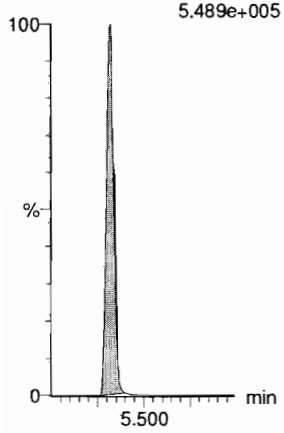
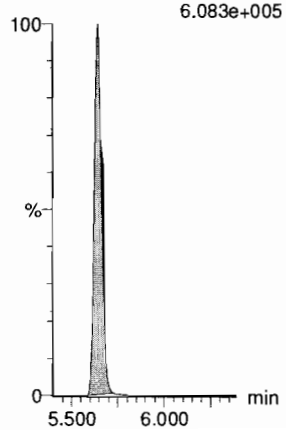


13C7-PFUdA



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Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
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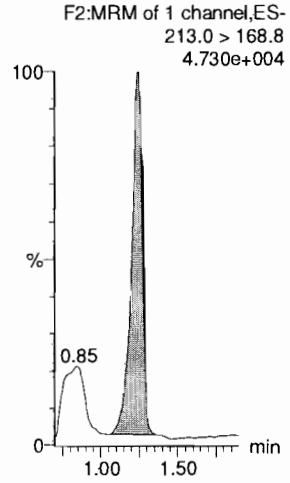
1 AD 11/27/18

Name: 181126M1_6, Date: 26-Nov-2018, Time: 12:28:21, ID: ST181126M1-5 PFC CS2 18K1905, Description: PFC CS2 18K1905

PFBA



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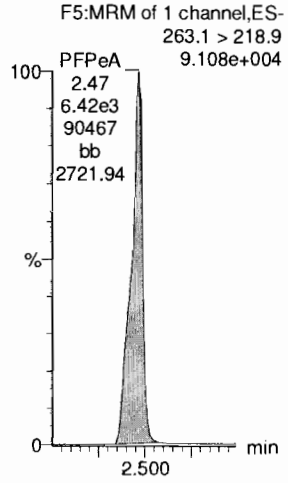
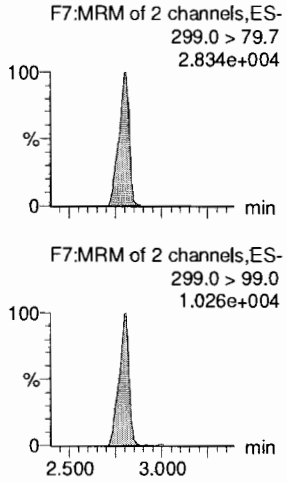
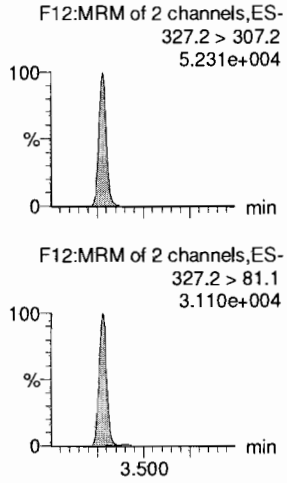


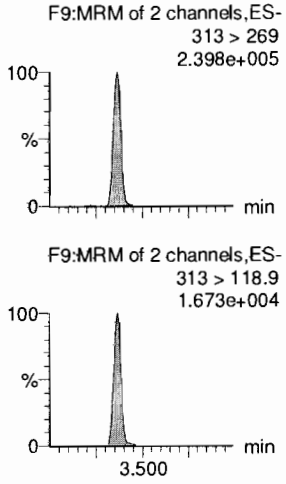
PFBS



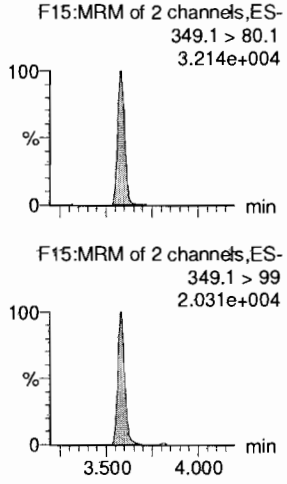
4:2 FTS



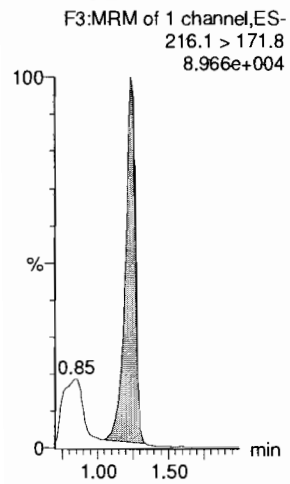
PFHxA



PFPeS



13C3-PFBA



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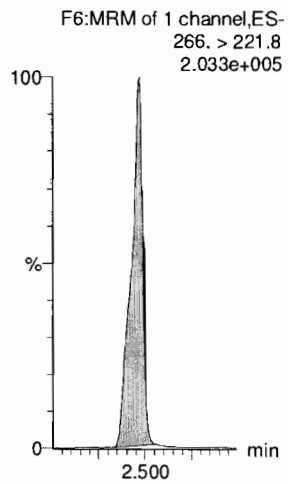
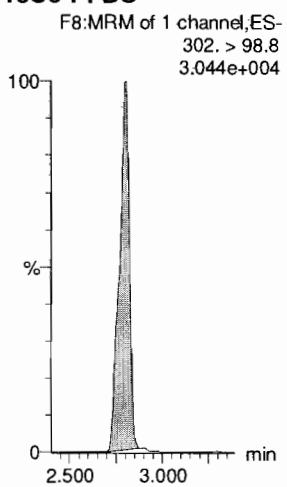
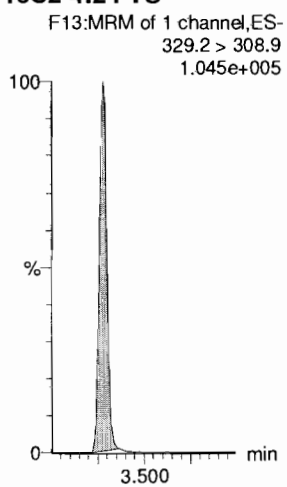


13C3-PFBS



13C2-4:2 FTS



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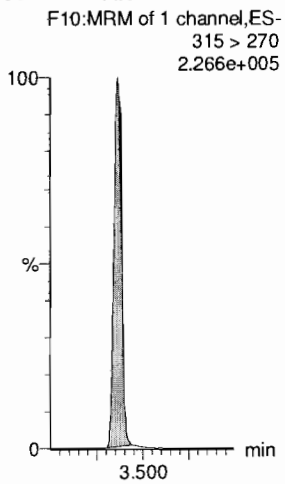

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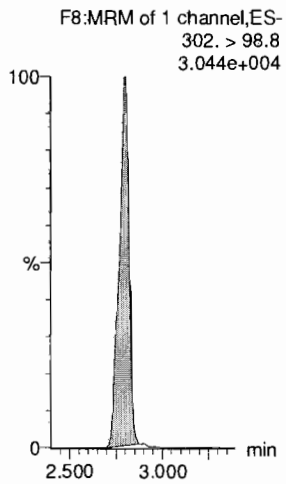

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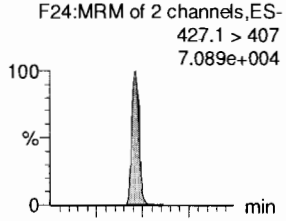
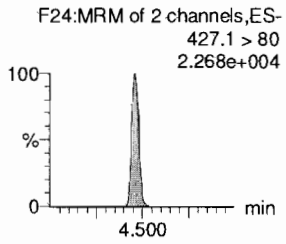
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_6, Date: 26-Nov-2018, Time: 12:28:21, ID: ST181126M2-5 PFC CS2 18K1905, Description: PFC CS2 18K1905

6:2 FTS





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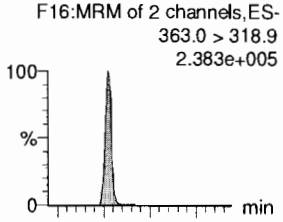
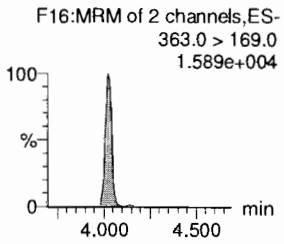
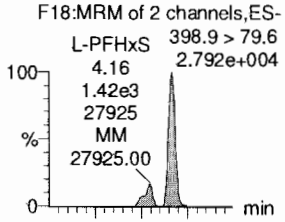
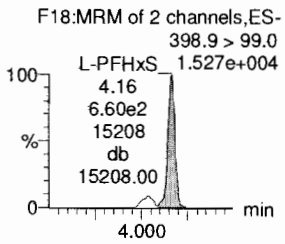


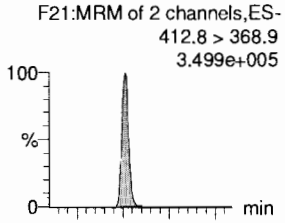


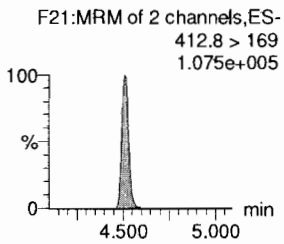
L-PFHxS





L-PFOA





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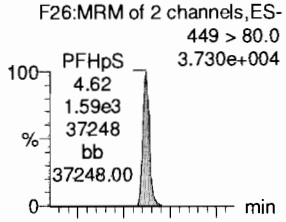

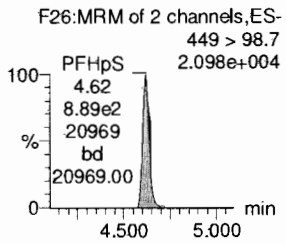

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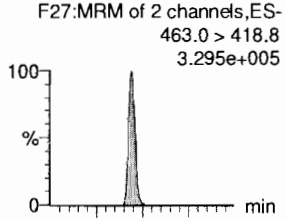
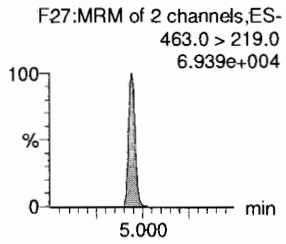
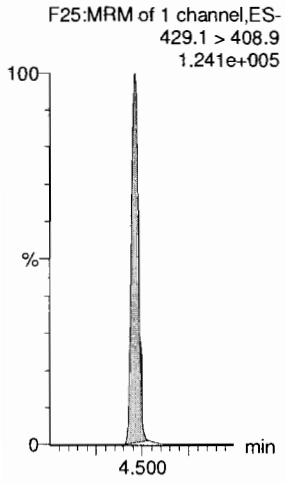
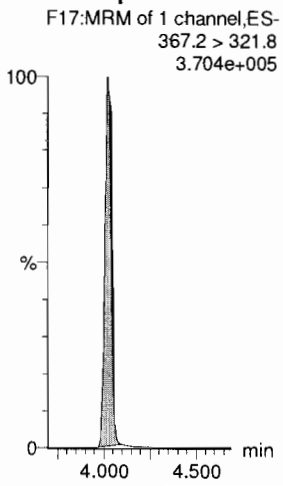




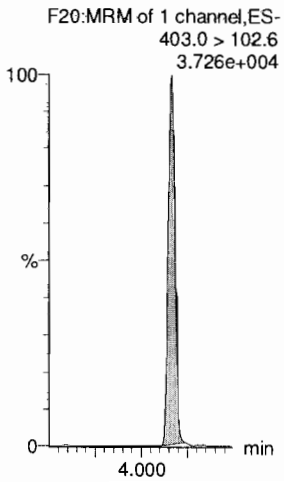
13C2-6:2 FTS



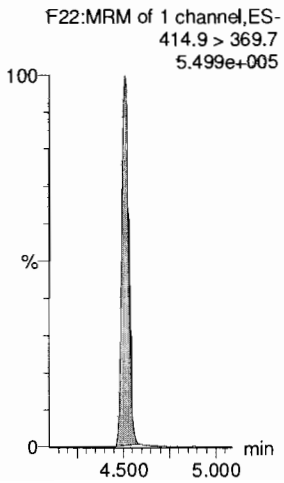
13C4-PFHpA



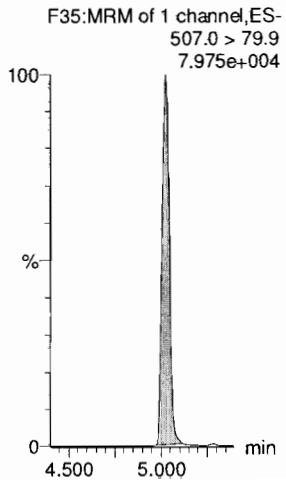
18O2-PFHxS



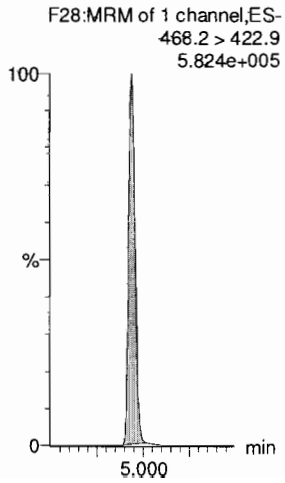
13C2-PFOA



13C8-PFOS



13C5-PFNA



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Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_6, Date: 26-Nov-2018, Time: 12:28:21, ID: ST181126M2-5 PFC CS2 18K1905, Description: PFC CS2 18K1905

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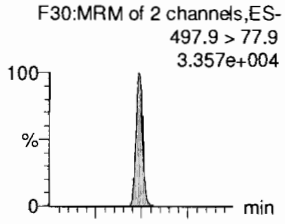
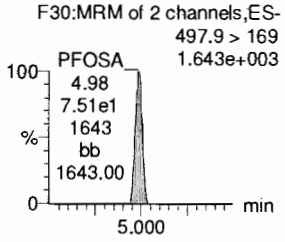
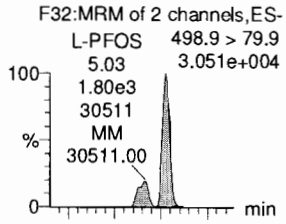
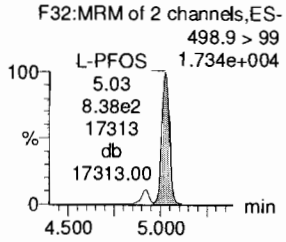




L-PFOS





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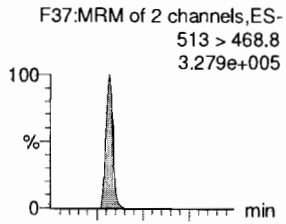
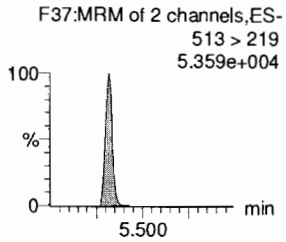
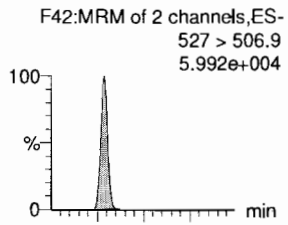
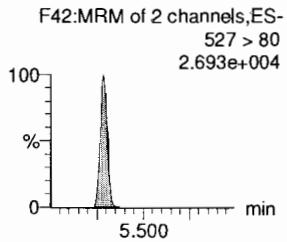


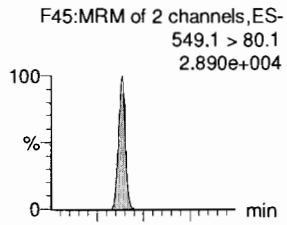


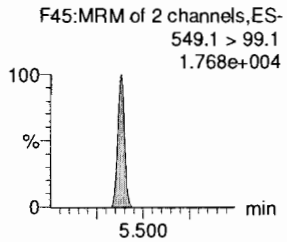
8:2 FTS





PFNS





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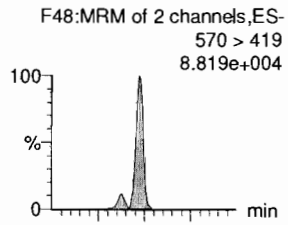
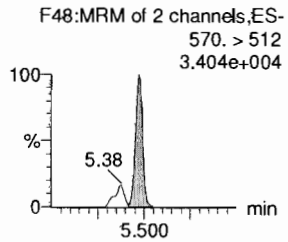
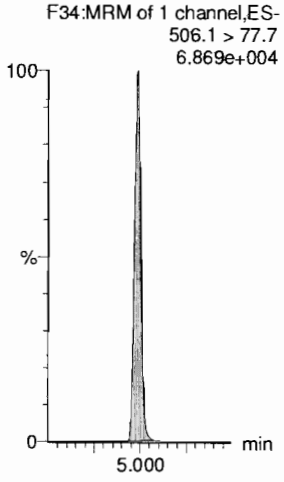
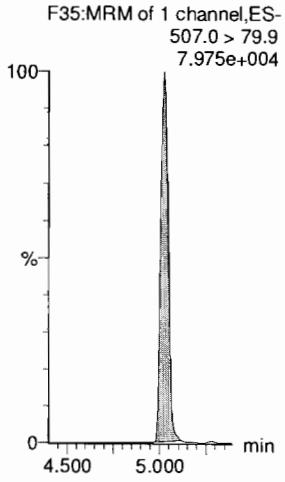




13C8-PFOSA



13C8-PFOS



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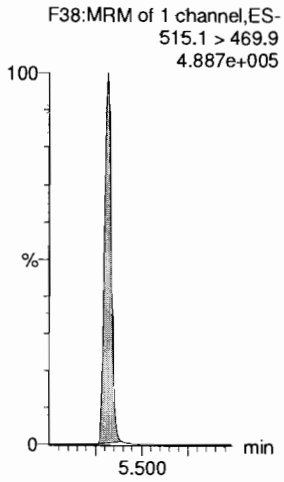
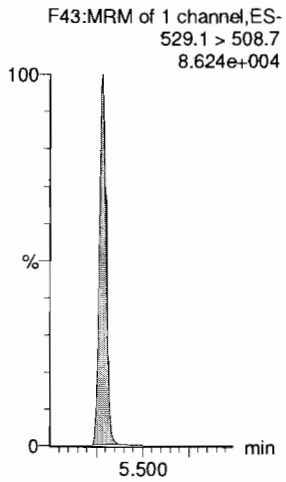
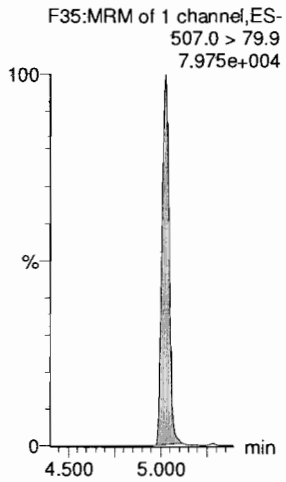


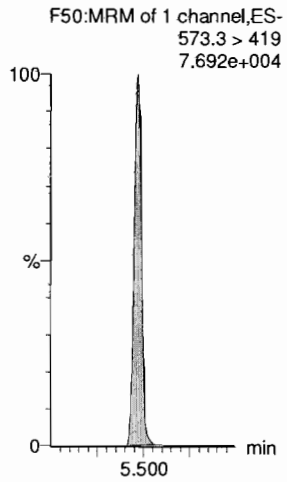
13C2-8:2 FTS



13C8-PFOS



d3-N-MeFOSAA



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Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_6, Date: 26-Nov-2018, Time: 12:28:21, ID: ST181126M2-5 PFC CS2 18K1905, Description: PFC CS2 18K1905

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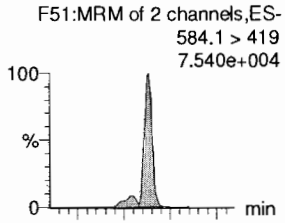

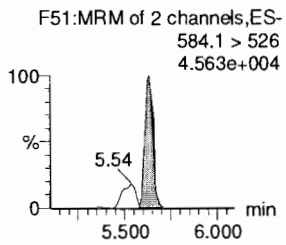

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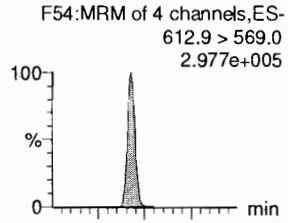

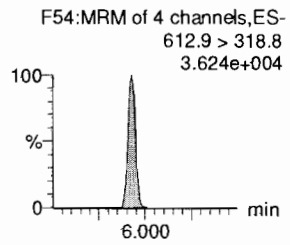

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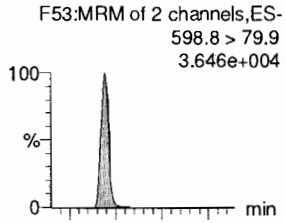

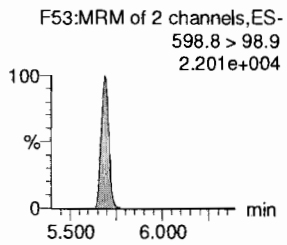

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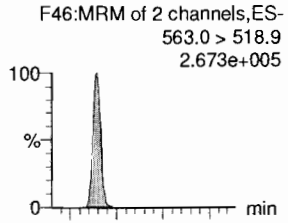

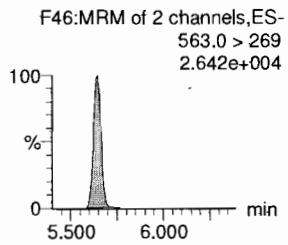

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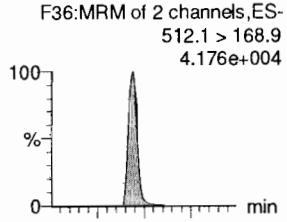

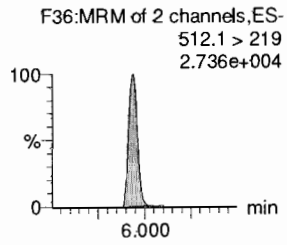

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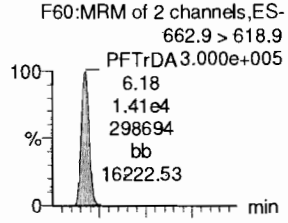
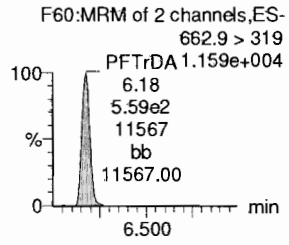
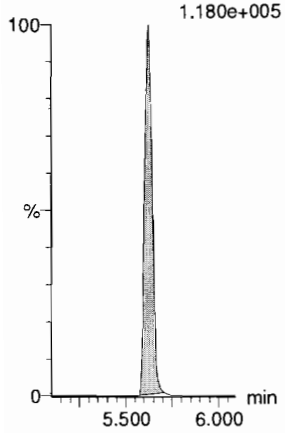
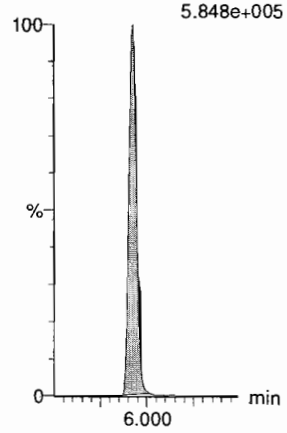




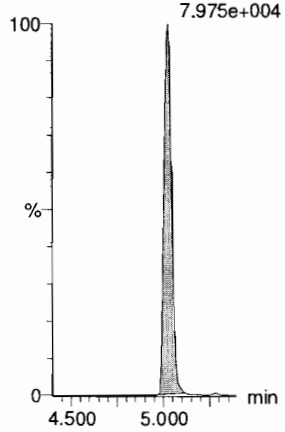
d5-N-EtFOSAA



13C2-PFDoA



13C8-PFOS



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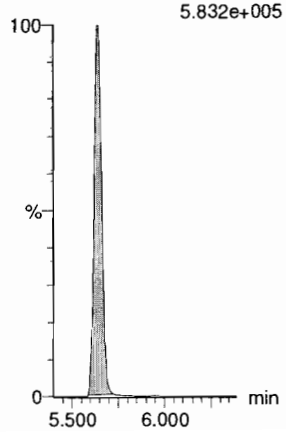

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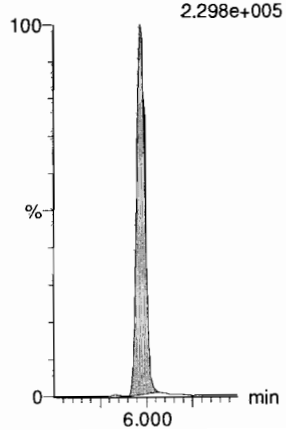

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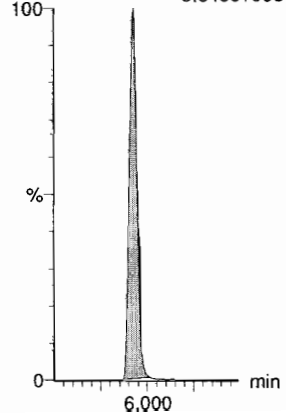

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Name: 181126M1_6, Date: 26-Nov-2018, Time: 12:28:21, ID: ST181126M2-5 PFC CS2 18K1905, Description: PFC CS2 18K1905

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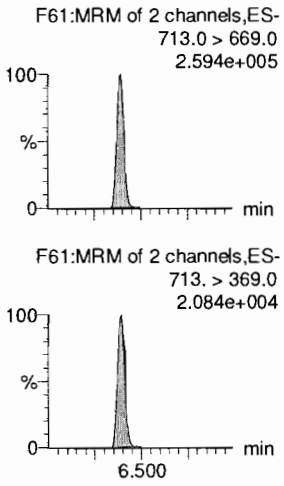

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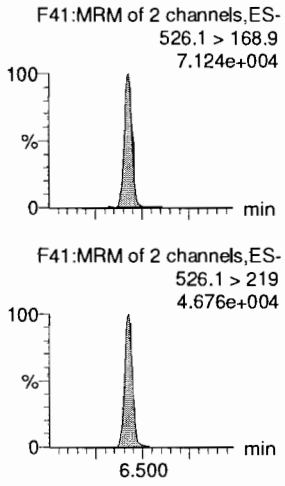

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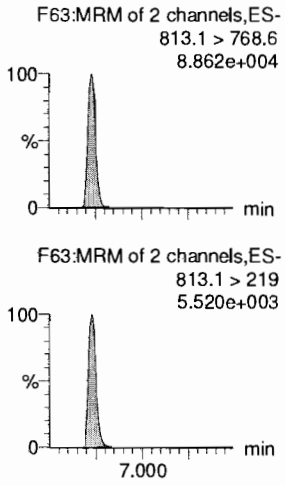

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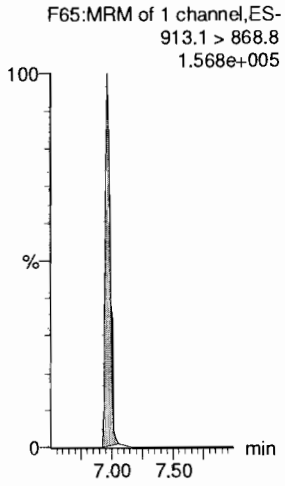
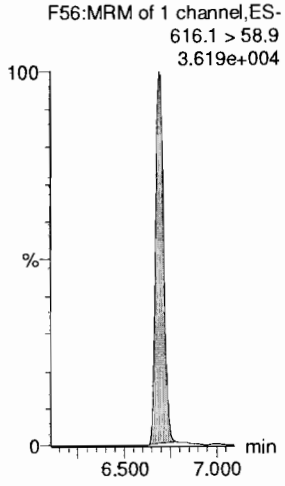
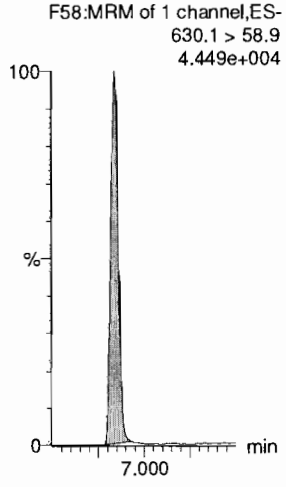


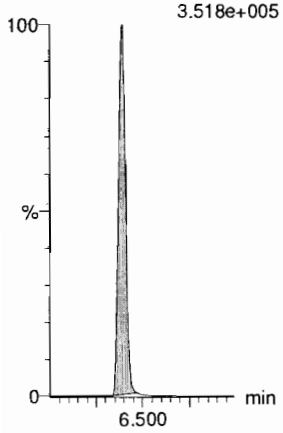
N-MeFOSE



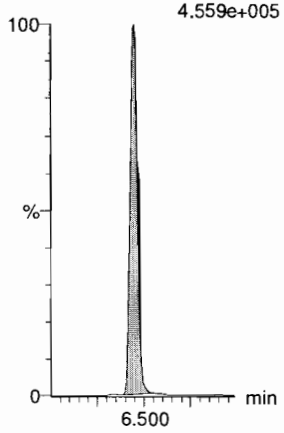
N-EtFOSE



13C2-PFTeDA



d5-N-ETFOSA



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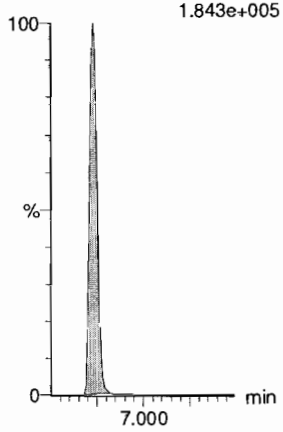

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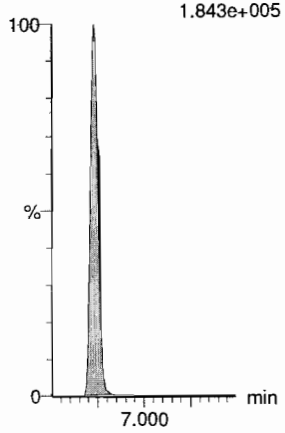
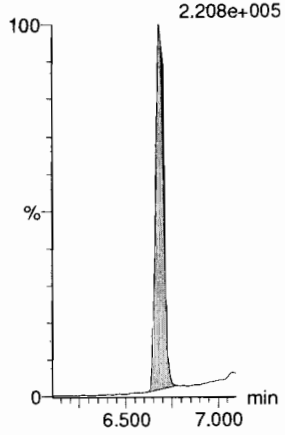


d7-N-MeFOSE



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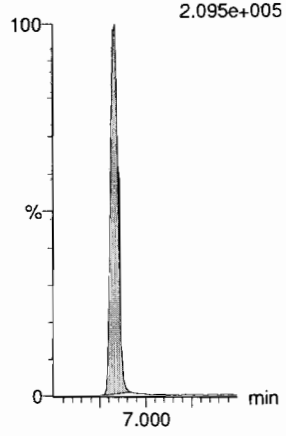

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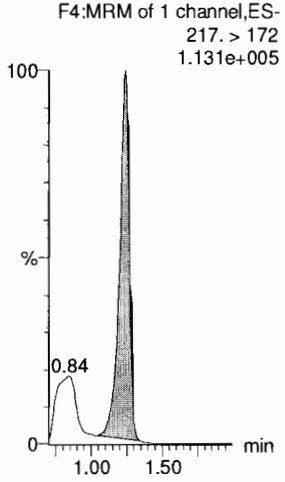
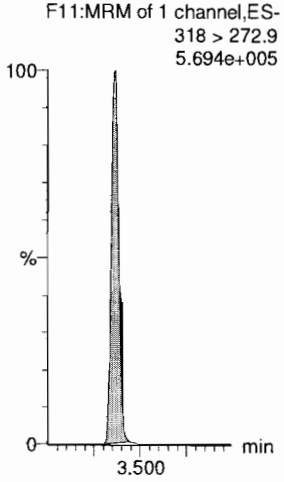
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_6, Date: 26-Nov-2018, Time: 12:28:21, ID: ST181126M2-5 PFC CS2 18K1905, Description: PFC CS2 18K1905

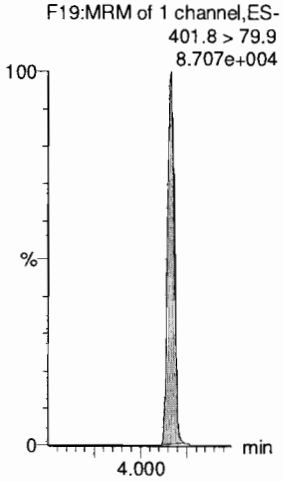
13C4-PFBA



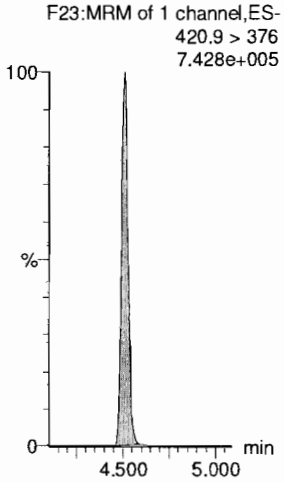
13C5-PFHxA



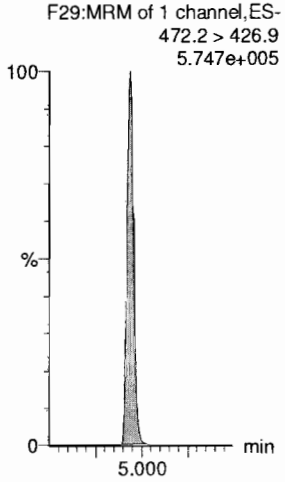
13C3-PFHxS



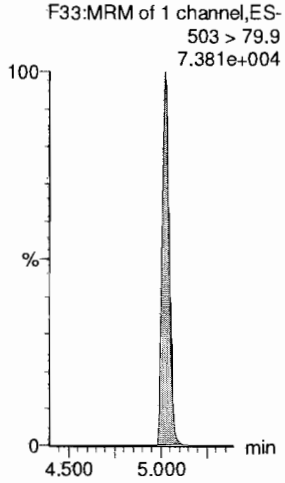
13C8-PFOA



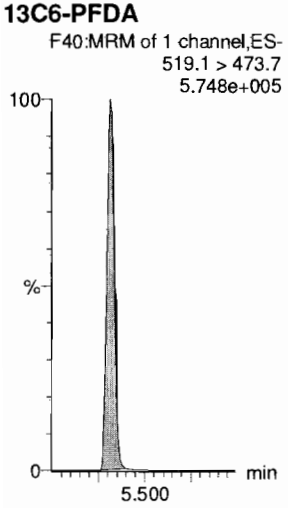
13C9-PFNA



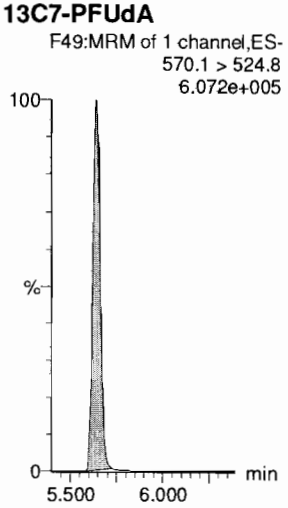
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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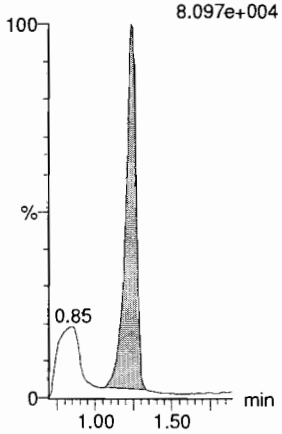
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

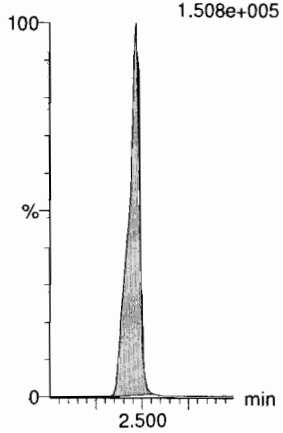
1 AD 11/27/18

Name: 181126M1_7, Date: 26-Nov-2018, Time: 12:38:59, ID: ST181126M1-6 PFC CS3 18K1906, Description: PFC CS3 18K1906

PFBA



PFPeA



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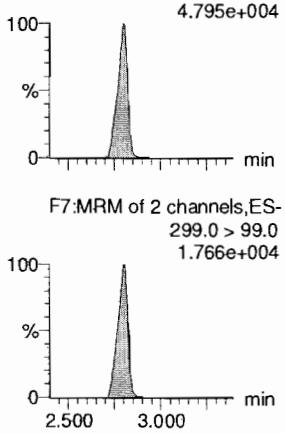
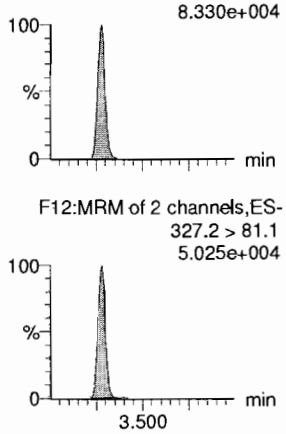
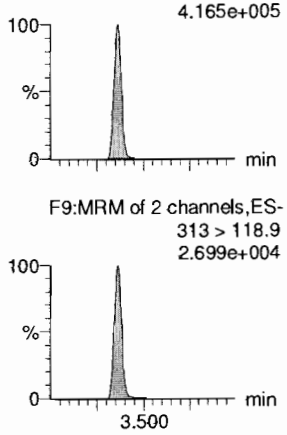


4:2 FTS



PFHxA



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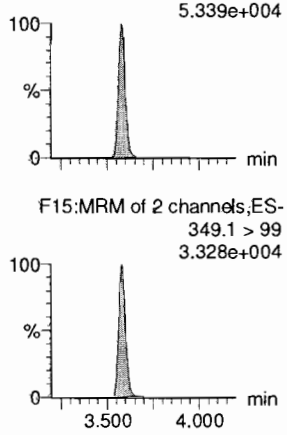
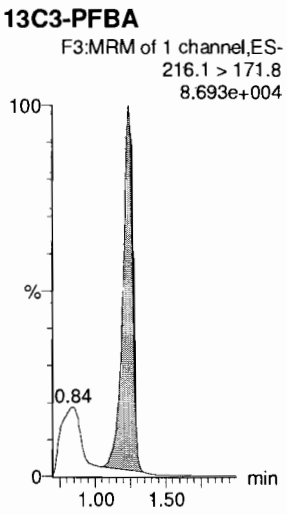


13C3-PFBA



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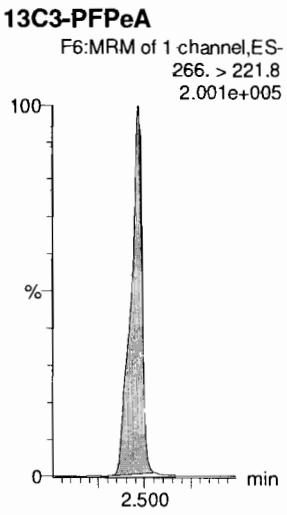

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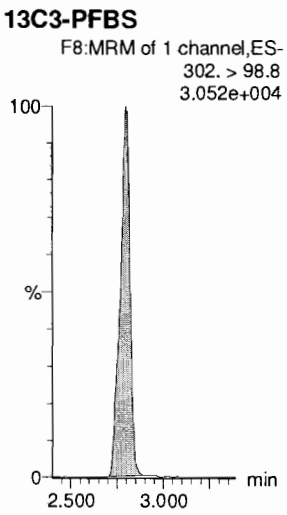
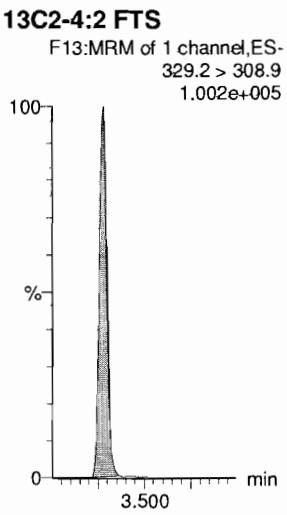
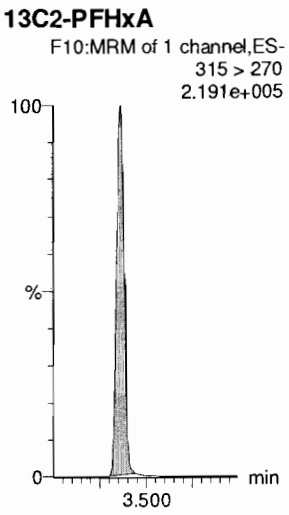


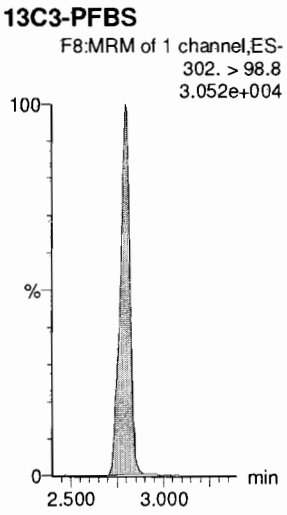
13C2-4:2 FTS



13C2-PFHxA



13C3-PFBS



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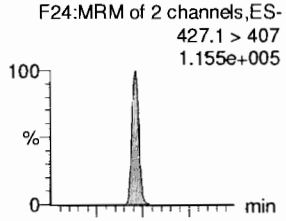
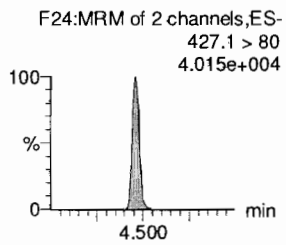
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

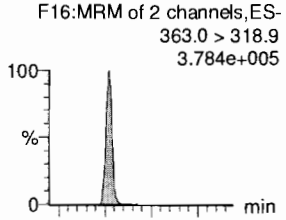
Name: 181126M1_7, Date: 26-Nov-2018, Time: 12:38:59, ID: ST181126M2-6 PFC CS3 18K1906, Description: PFC CS3 18K1906

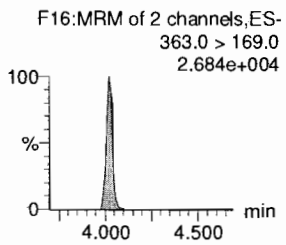
6:2 FTS



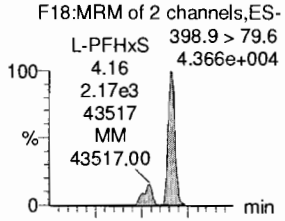


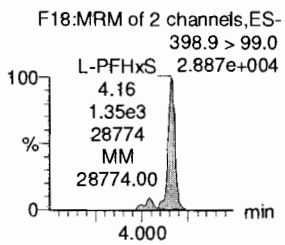
PFHpA



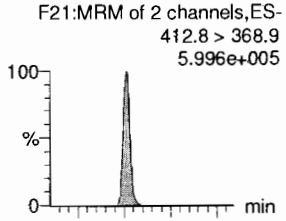


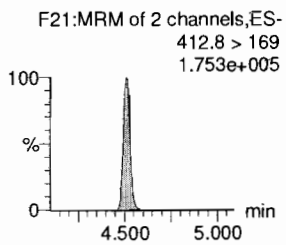
L-PFHxS



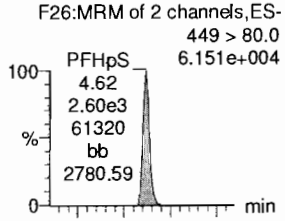


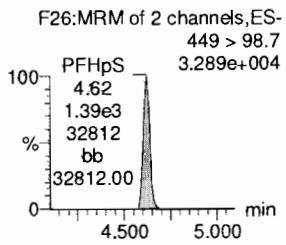
L-PFOA



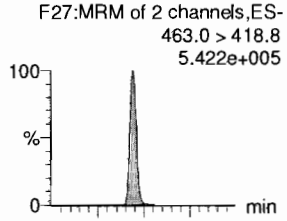


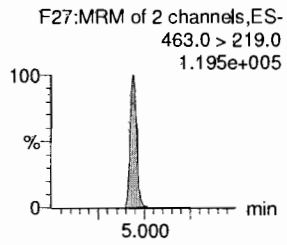
PFHpS



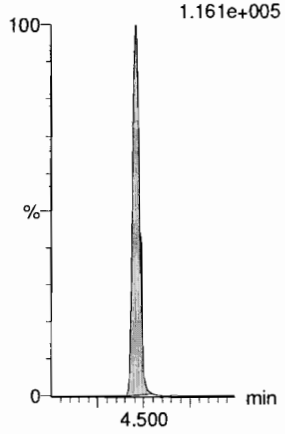


PFNA

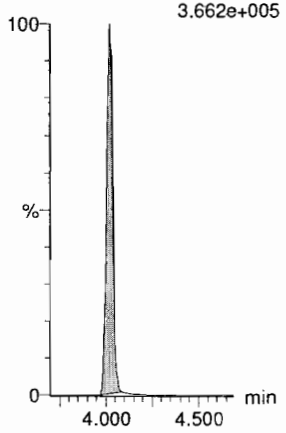




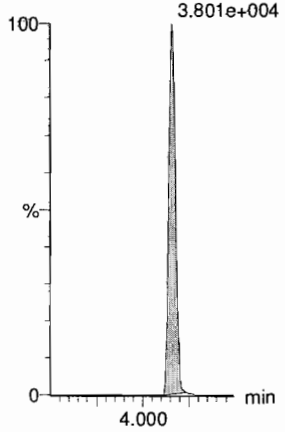
13C2-6:2 FTS



13C4-PFHpA



18O2-PFHxS



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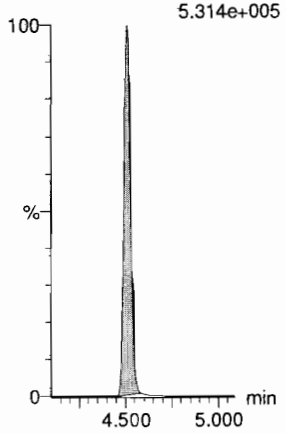
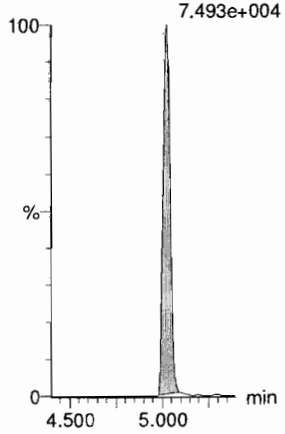
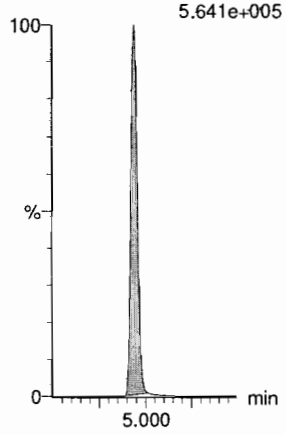


13C8-PFOS



13C5-PFNA



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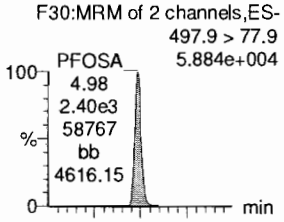
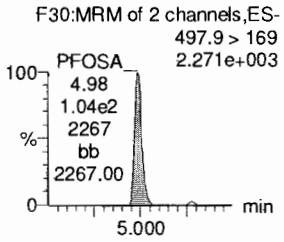
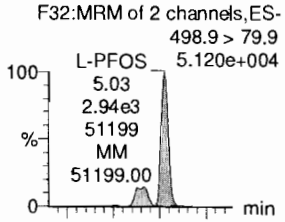
Name: 181126M1_7, Date: 26-Nov-2018, Time: 12:38:59, ID: ST181126M2-6 PFC CS3 18K1906, Description: PFC CS3 18K1906

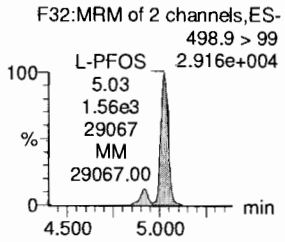
PFOSA



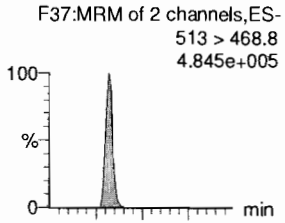


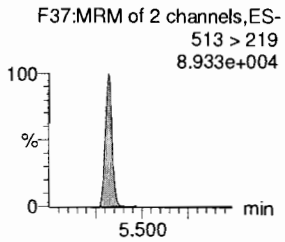
L-PFOS



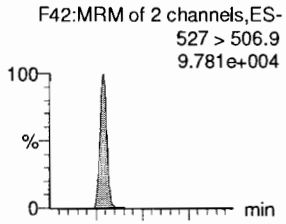


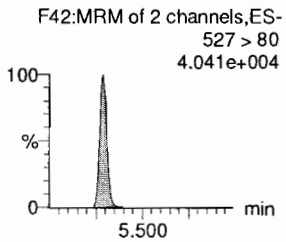
PFDA





8:2 FTS





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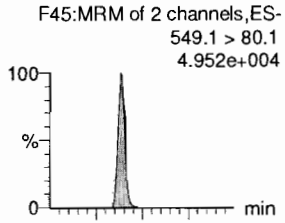
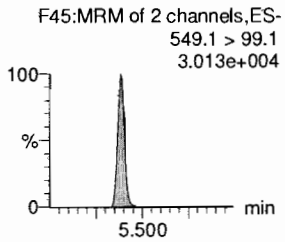
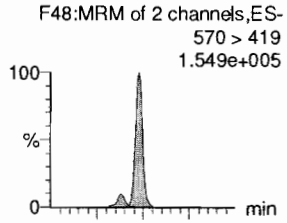
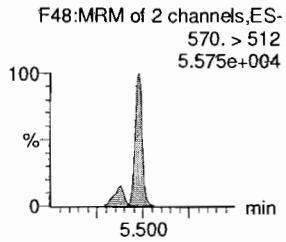


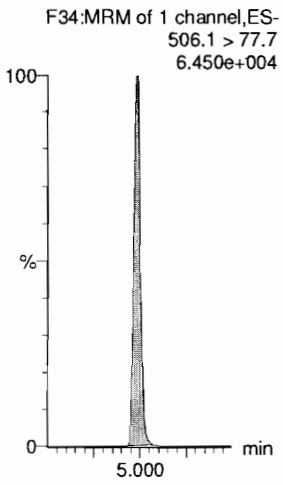


L-MeFOSAA





13C8-PFOSA



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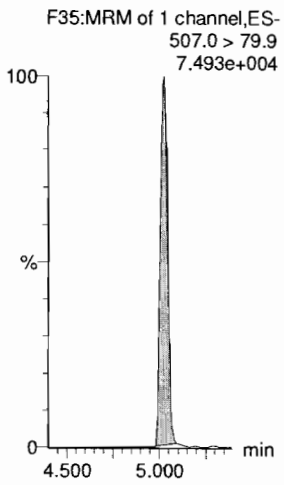
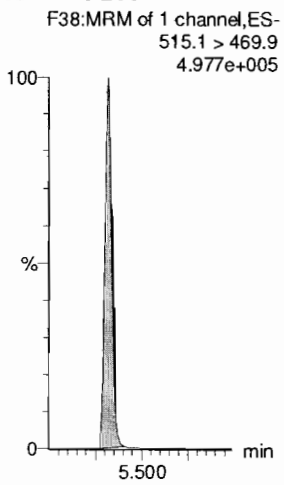
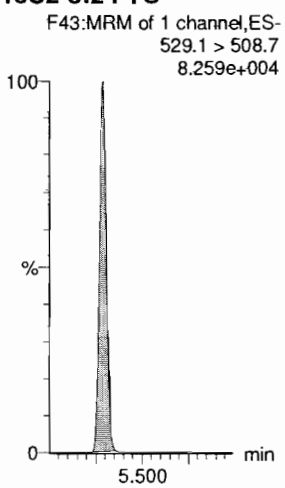


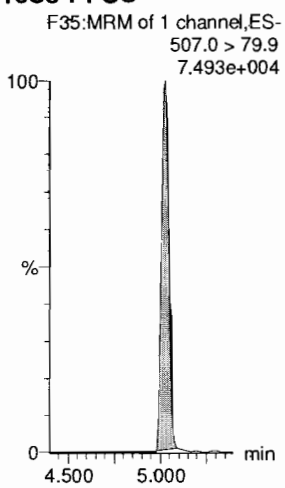
13C2-PFDA



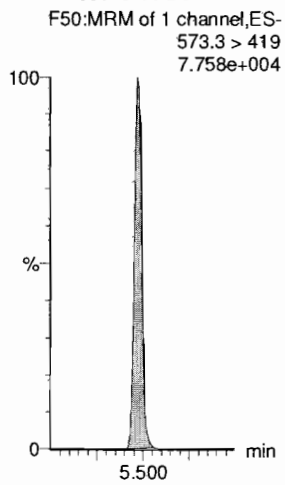
13C2-8:2 FTS



13C8-PFOS



d3-N-MeFOSAA



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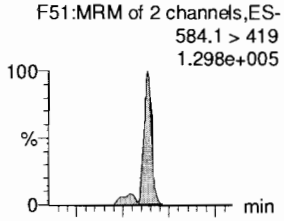
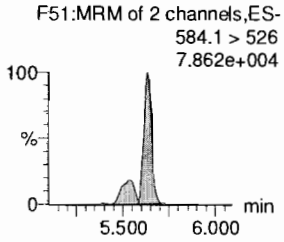
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

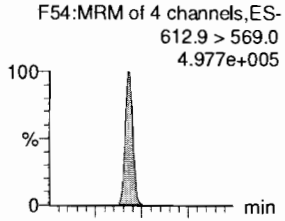
Name: 181126M1_7, Date: 26-Nov-2018, Time: 12:38:59, ID: ST181126M2-6 PFC CS3 18K1906, Description: PFC CS3 18K1906

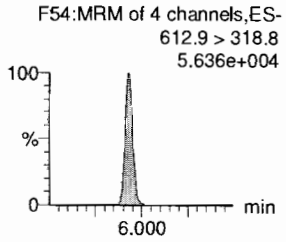
L-EtFOSAA



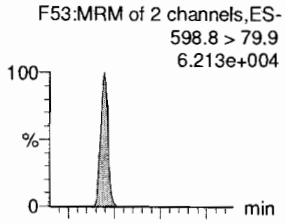


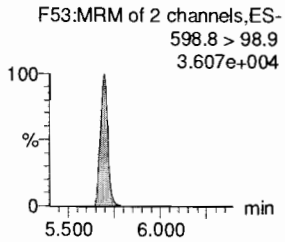
PFDoA



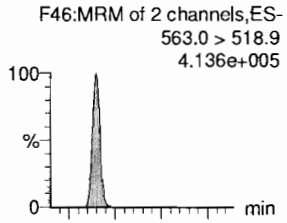


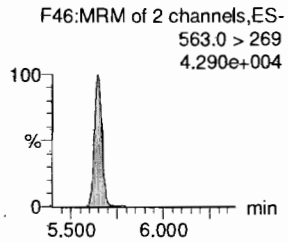
PFDS



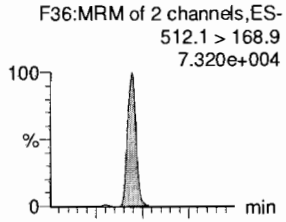


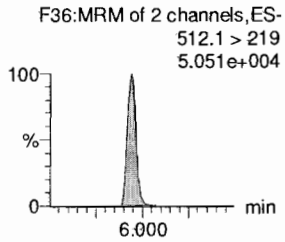
PFUdA



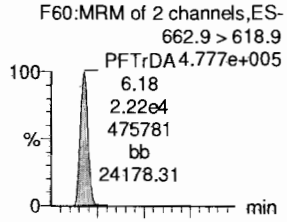


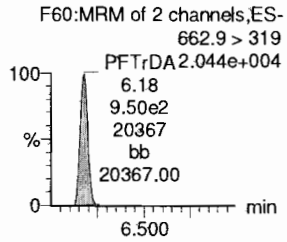
N-MeFOSA



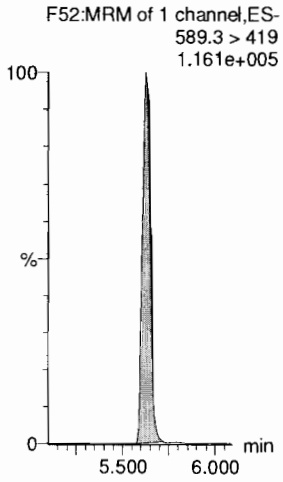


PFTrDA

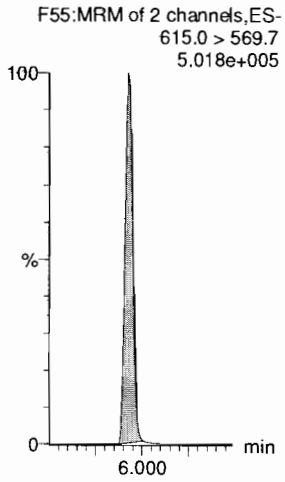




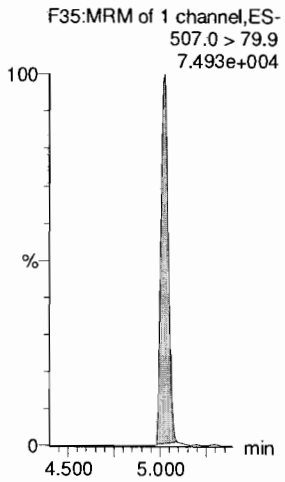
d5-N-EtFOSAA



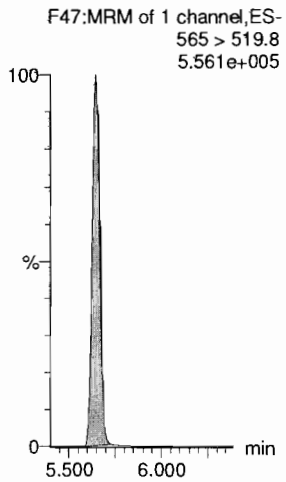
13C2-PFDoA



13C8-PFOS



13C2-PFUdA



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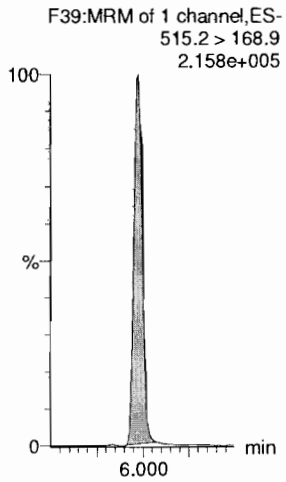

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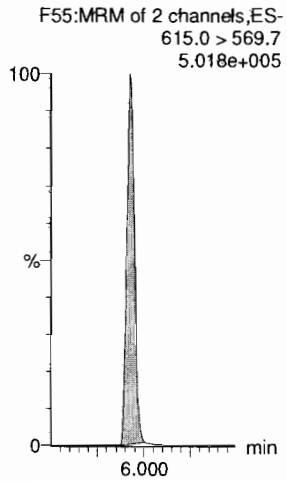

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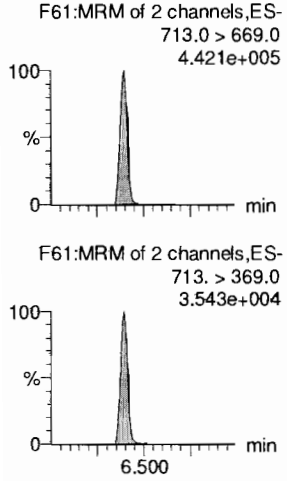
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_7, Date: 26-Nov-2018, Time: 12:38:59, ID: ST181126M2-6 PFC CS3 18K1906, Description: PFC CS3 18K1906

PFTeDA



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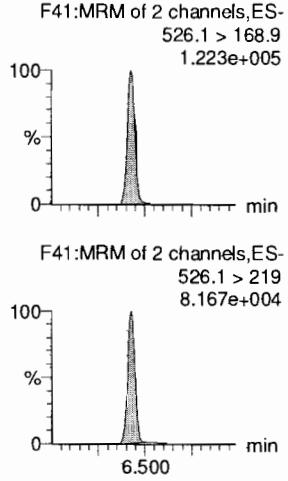
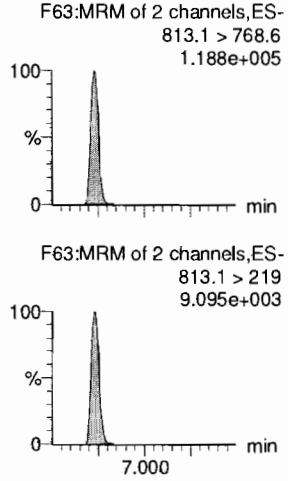
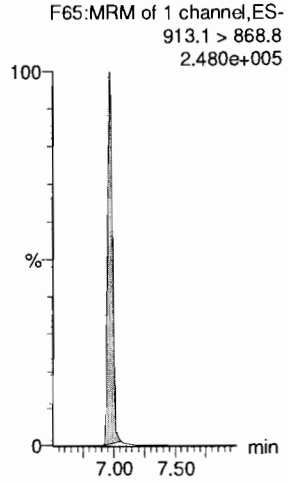


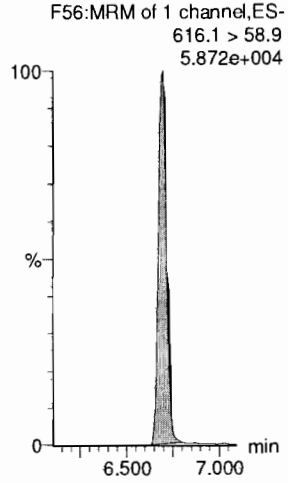
PFHxDA



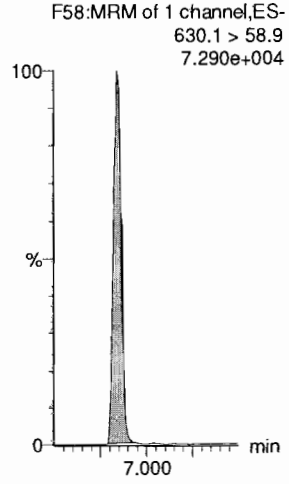
PFODA



N-MeFOSE



N-EtFOSE



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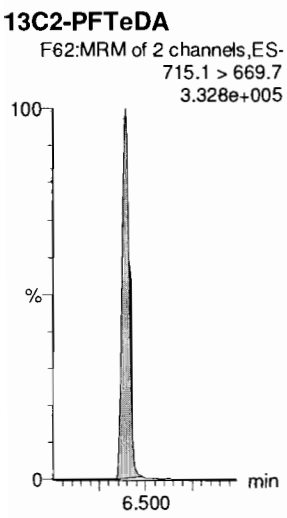
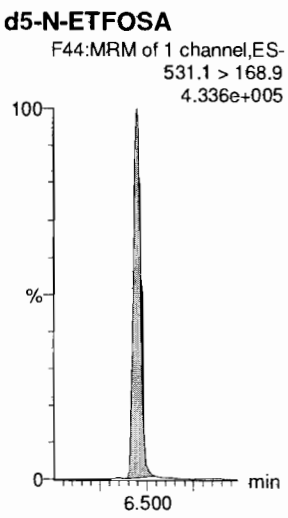


d5-N-ETFOSA



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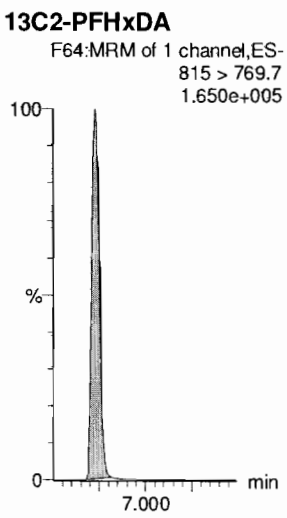
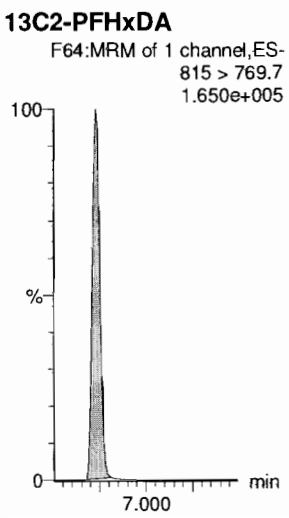
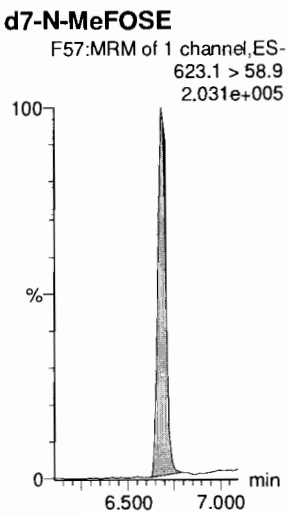


13C2-PFHxDA



d7-N-MeFOSE



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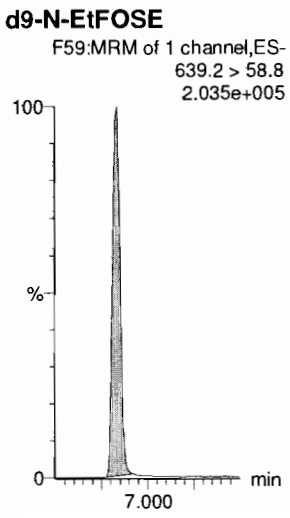

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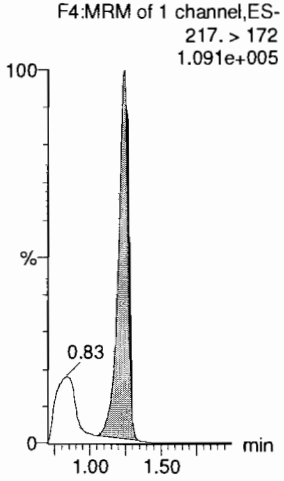
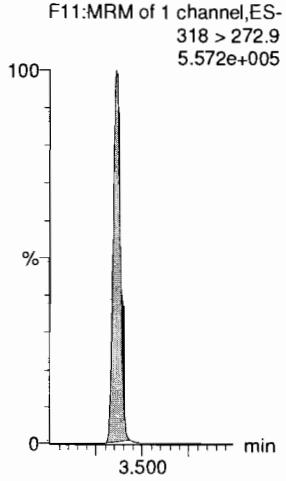
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_7, Date: 26-Nov-2018, Time: 12:38:59, ID: ST181126M2-6 PFC CS3 18K1906, Description: PFC CS3 18K1906

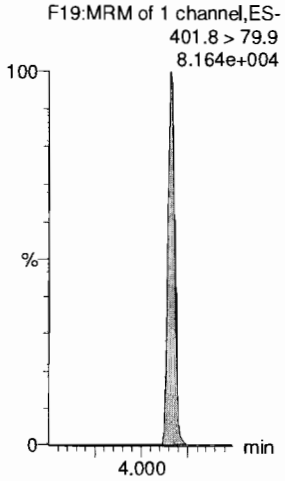
13C4-PFBA



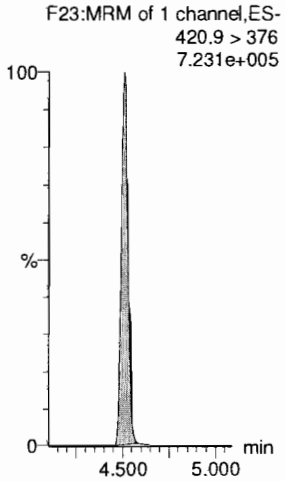
13C5-PFHxA



13C3-PFHxS



13C8-PFOA



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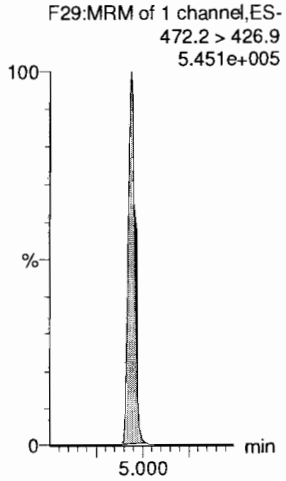

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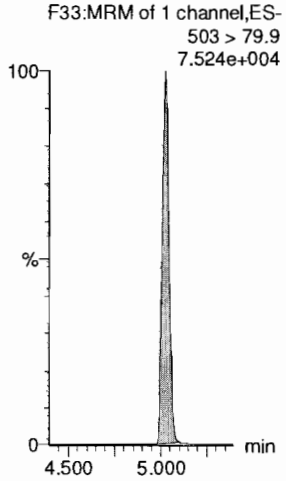
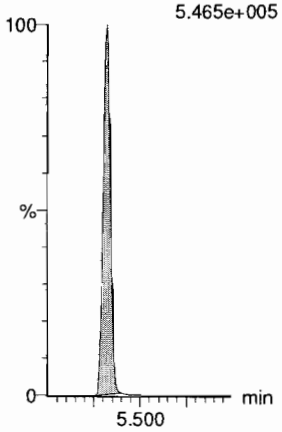
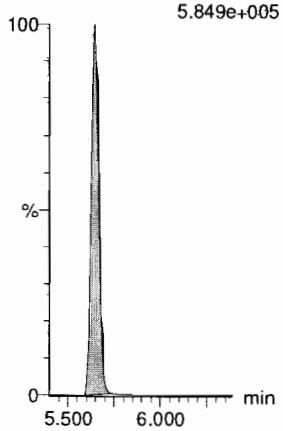


13C6-PFDA



13C7-PFUdA



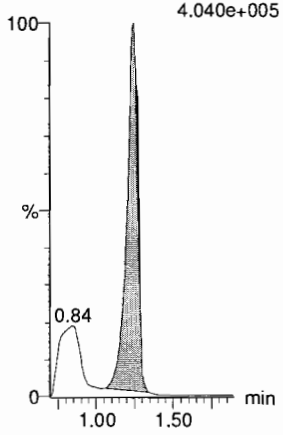
Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

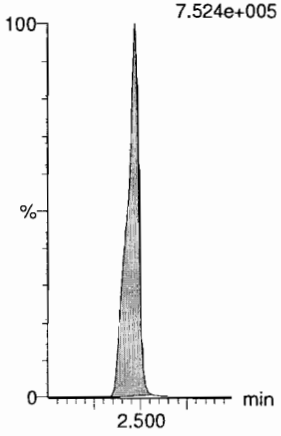
1 AD 11/27/18

Name: 181126M1_8, Date: 26-Nov-2018, Time: 12:49:38, ID: ST181126M7-7 PFC CS4 1810907, Description: PFC CS4 18K1907

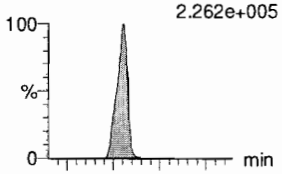
PFBA
F2:MRM of 1 channel,ES-
213.0 > 168.8
4.040e+005



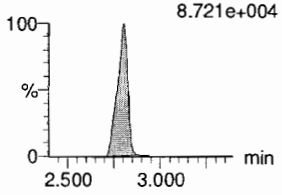
PFPeA
F5:MRM of 1 channel,ES-
263.1 > 218.9
7.524e+005



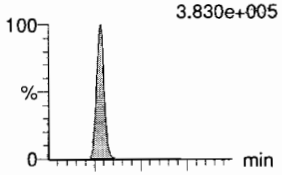
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
2.262e+005



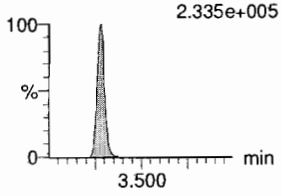
F7:MRM of 2 channels,ES-
299.0 > 99.0
8.721e+004



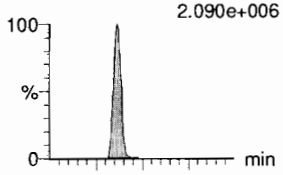
4:2 FTS
F12:MRM of 2 channels,ES-
327.2 > 307.2
3.830e+005



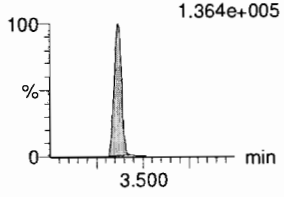
F12:MRM of 2 channels,ES-
327.2 > 81.1
2.335e+005



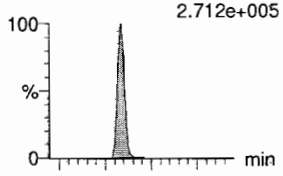
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
2.090e+006



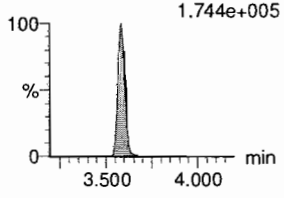
F9:MRM of 2 channels,ES-
313 > 118.9
1.364e+005



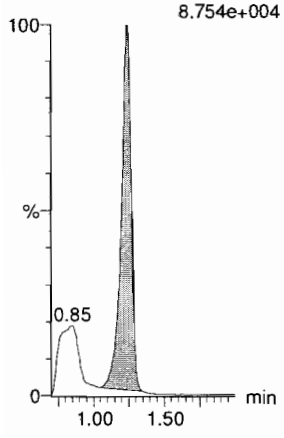
PFPeS
F15:MRM of 2 channels,ES-
349.1 > 80.1
2.712e+005



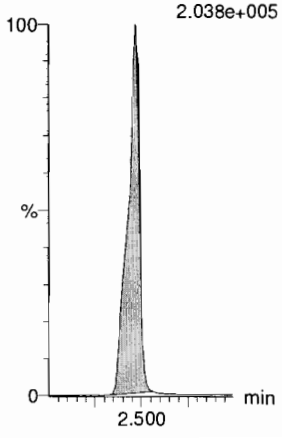
F15:MRM of 2 channels,ES-
349.1 > 99
1.744e+005



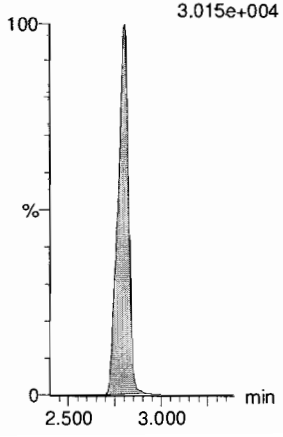
13C3-PFBA
F3:MRM of 1 channel,ES-
216.1 > 171.8
8.754e+004



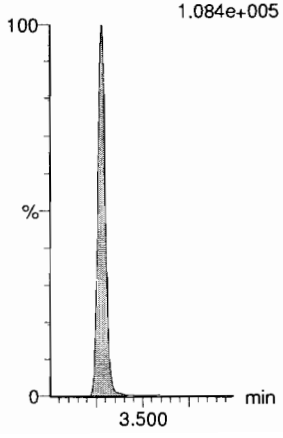
13C3-PFPeA
F6:MRM of 1 channel,ES-
266. > 221.8
2.038e+005



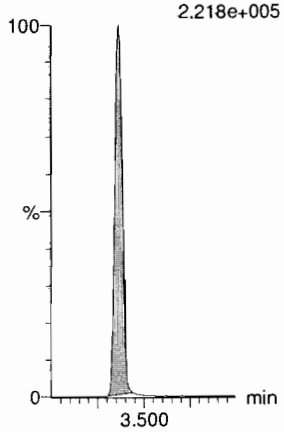
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.015e+004



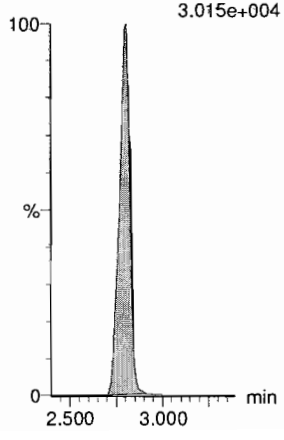
13C2-4:2 FTS
F13:MRM of 1 channel,ES-
329.2 > 308.9
1.084e+005



13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
2.218e+005



13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.015e+004



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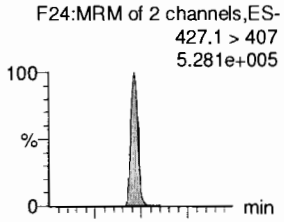
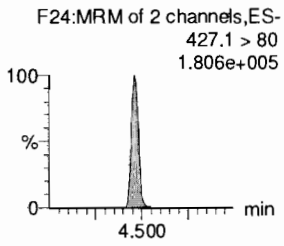
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

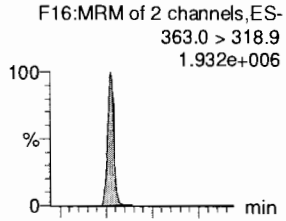
Name: 181126M1_8, Date: 26-Nov-2018, Time: 12:49:38, ID: ST181126M2-7 PFC CS4 1810907, Description: PFC CS4 18K1907

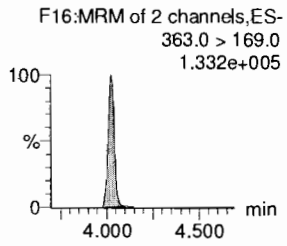
6:2 FTS



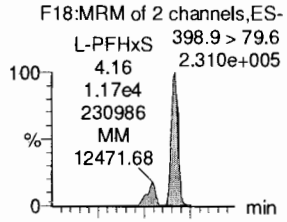


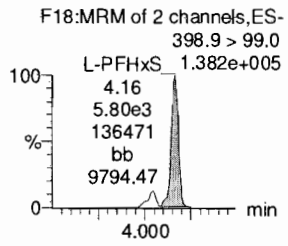
PFHpA



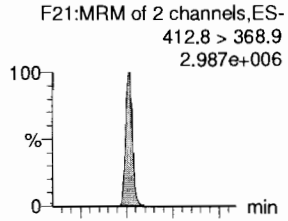


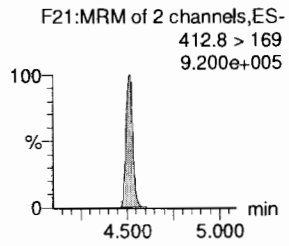
L-PFHxS





L-PFOA





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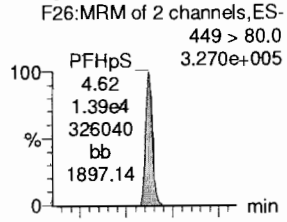

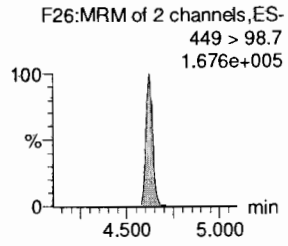

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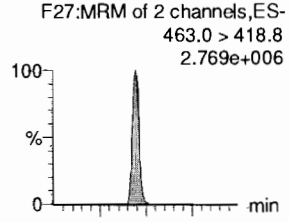
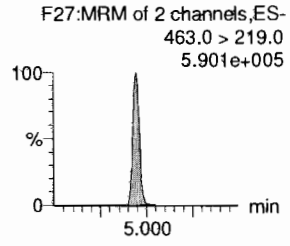
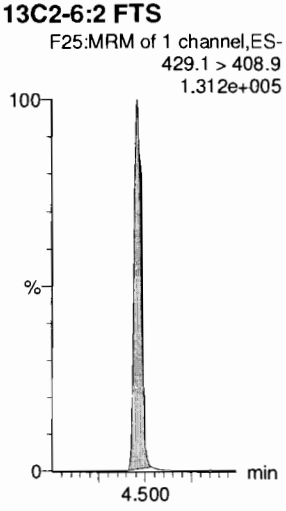
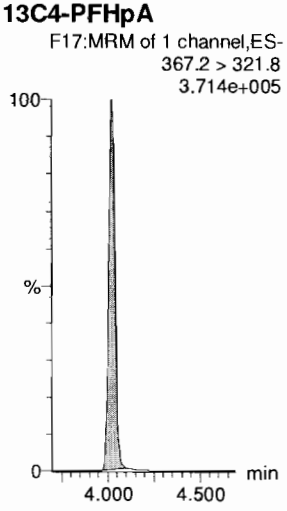




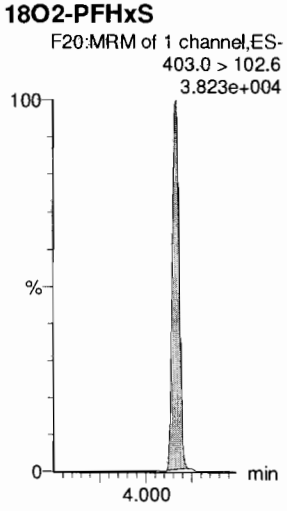
13C2-6:2 FTS



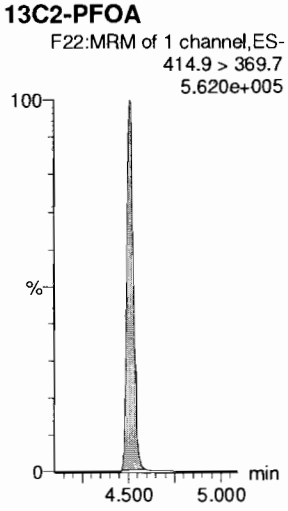
13C4-PFHpA



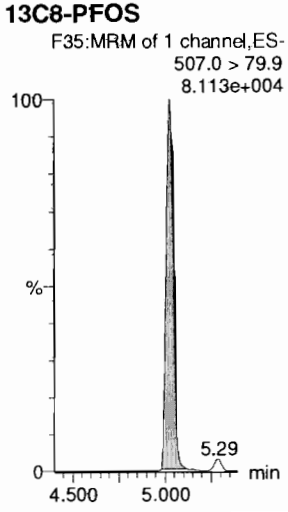
18O2-PFHxS



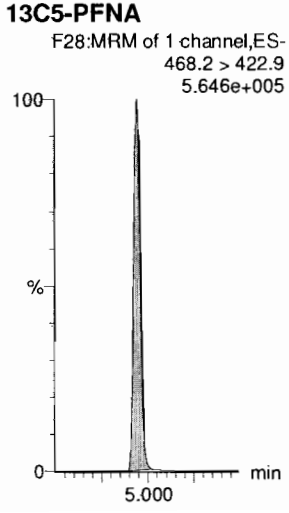
13C2-PFOA



13C8-PFOS



13C5-PFNA



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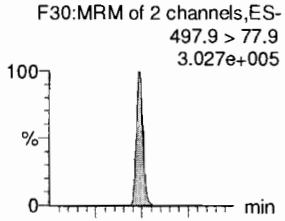
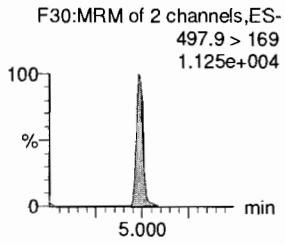
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

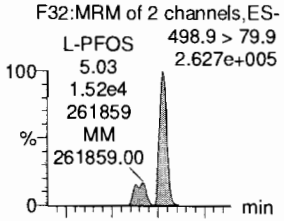
Name: 181126M1_8, Date: 26-Nov-2018, Time: 12:49:38, ID: ST181126M2-7 PFC CS4 1810907, Description: PFC CS4 18K1907

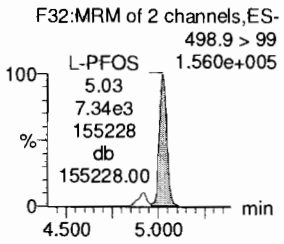
PFOSA





L-PFOS





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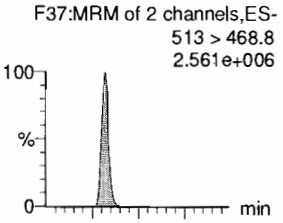
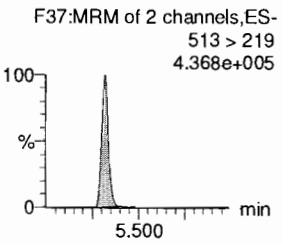
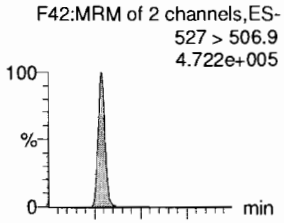
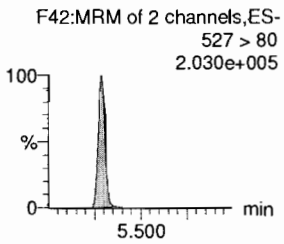


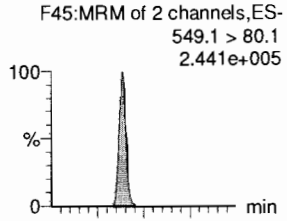


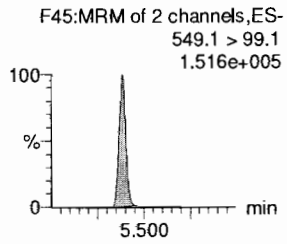
8:2 FTS





PFNS





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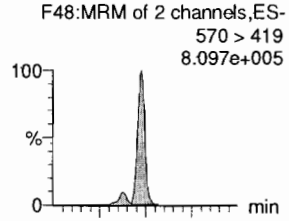
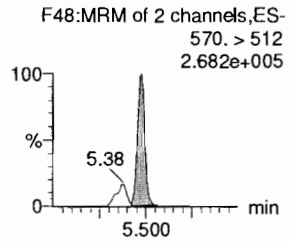
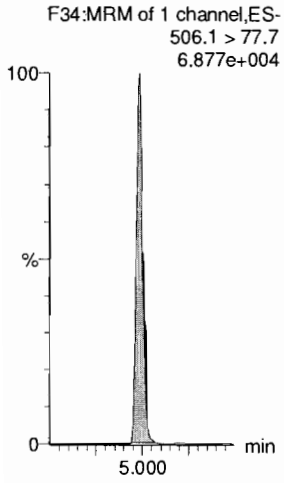




13C8-PFOSA



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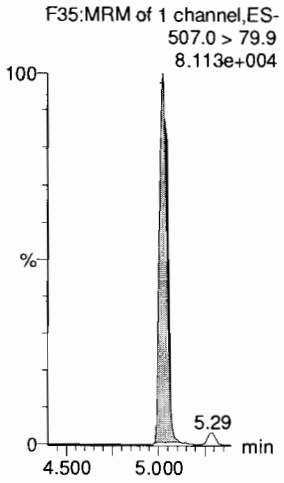

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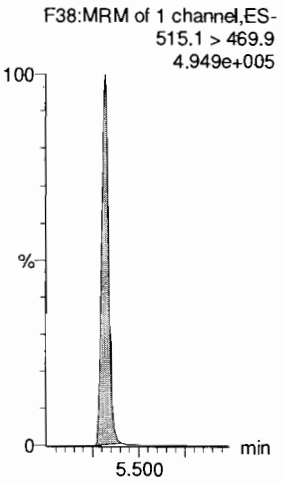
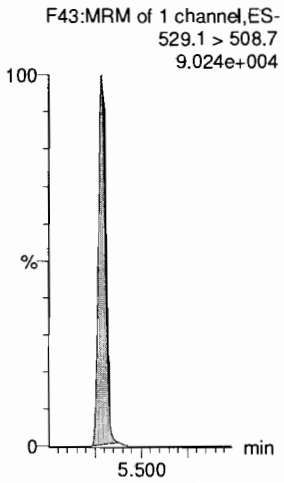


13C2-8:2 FTS



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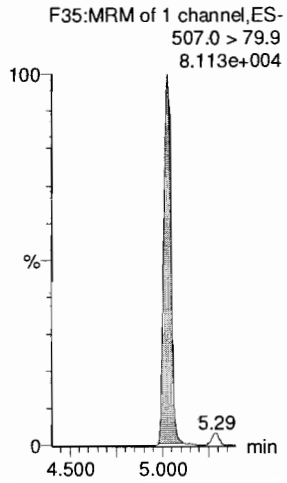

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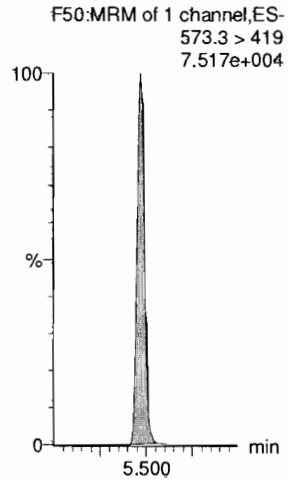

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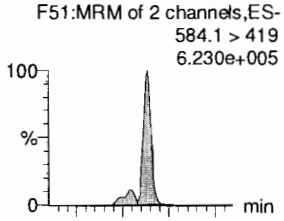
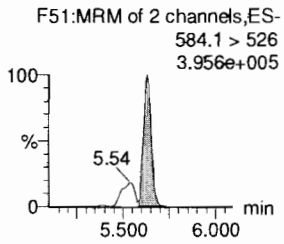
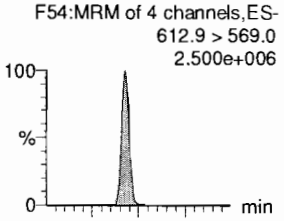
Name: 181126M1_8, Date: 26-Nov-2018, Time: 12:49:38, ID: ST181126M2-7 PFC CS4 1810907, Description: PFC CS4 18K1907

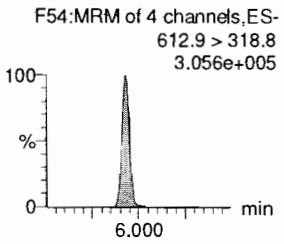
L-EtFOSAA





PFDoA





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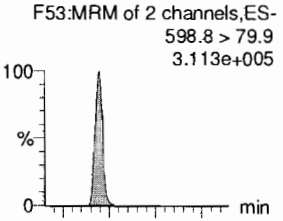
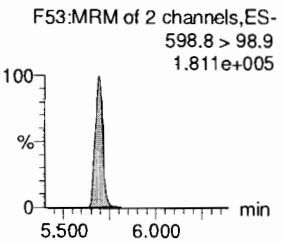
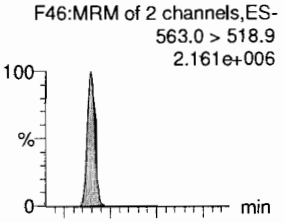
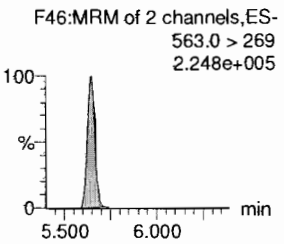


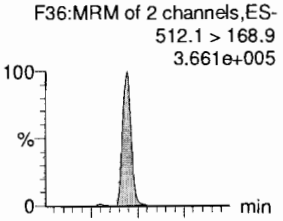


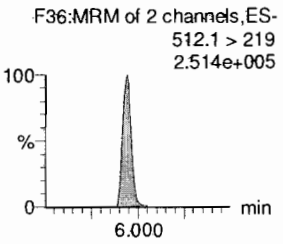
PFUdA



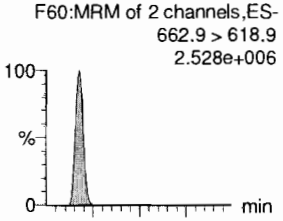


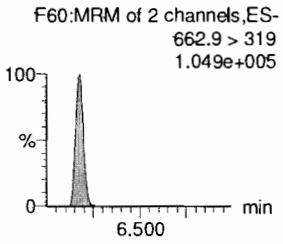
N-MeFOSA



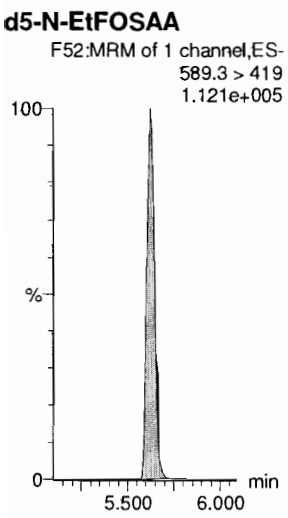


PFTrDA

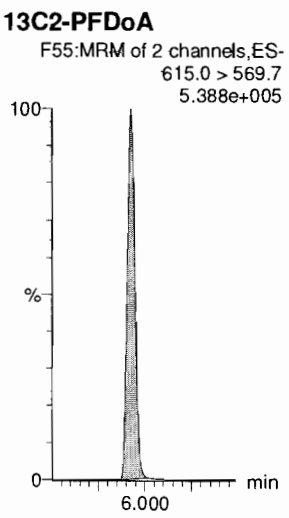




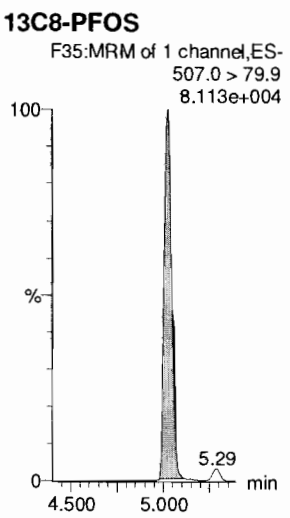
d5-N-EtFOSAA



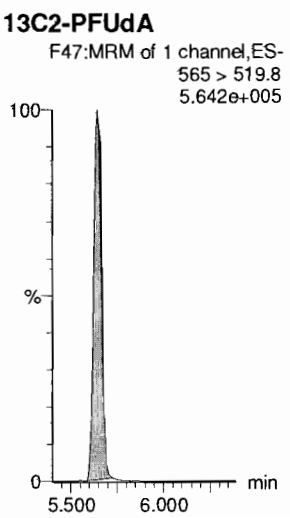
13C2-PFDoA



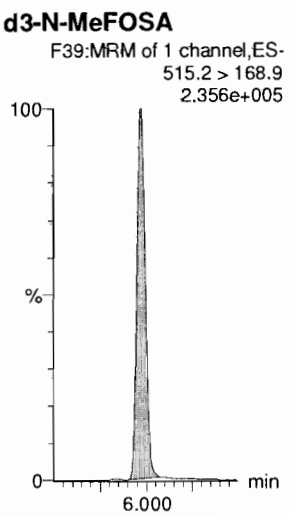
13C8-PFOS



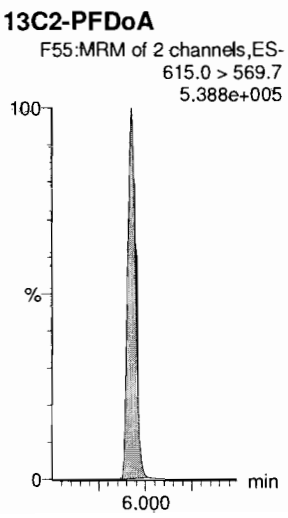
13C2-PFUdA



d3-N-MeFOSA



13C2-PFDoA



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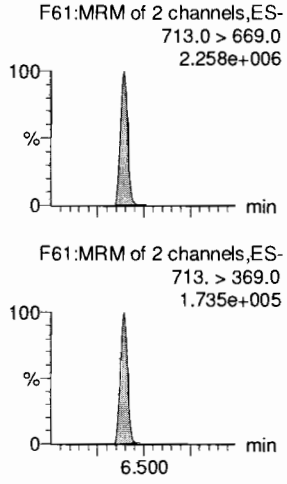
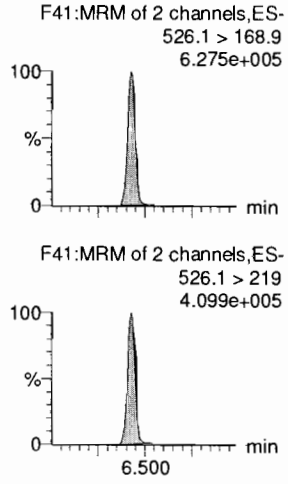
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_8, Date: 26-Nov-2018, Time: 12:49:38, ID: ST181126M2-7 PFC CS4 1810907, Description: PFC CS4 18K1907

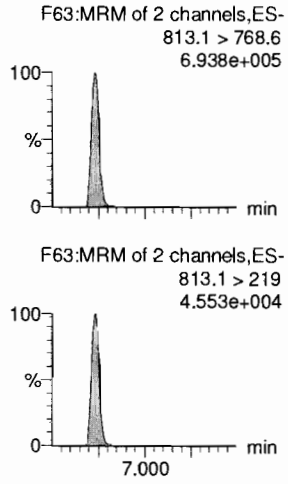
PFTeDA



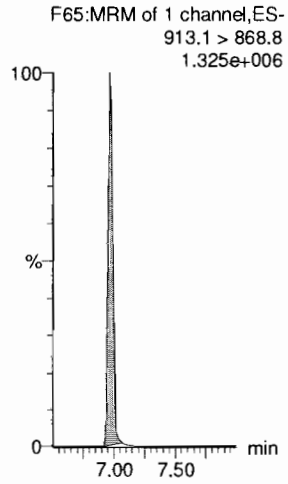
N-EtFOSA



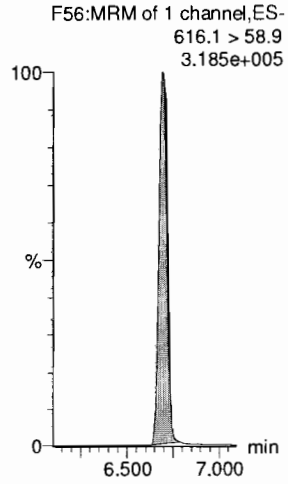
PFHxDA



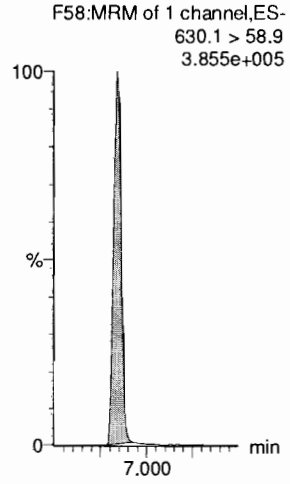
PFODA



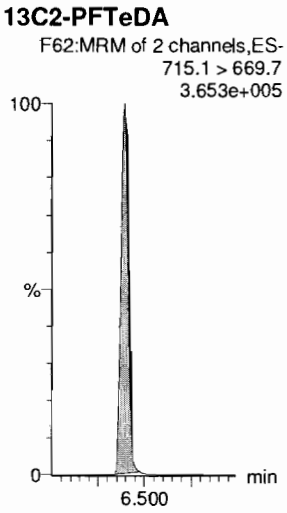
N-MeFOSE



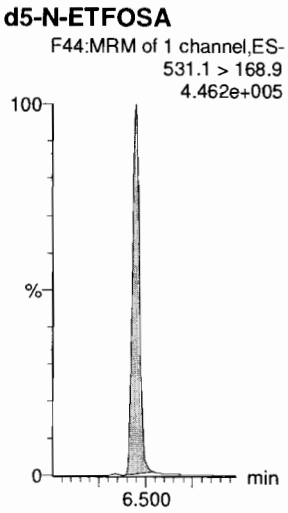
N-EtFOSE



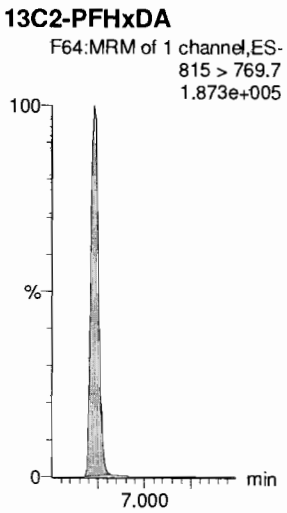
13C2-PFTeDA



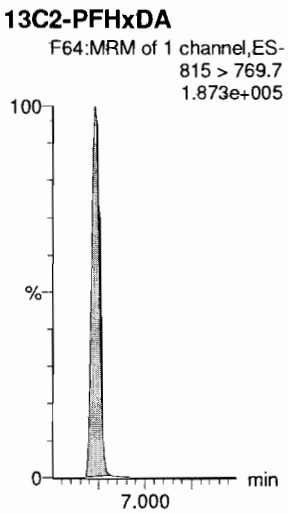
d5-N-ETFOSA



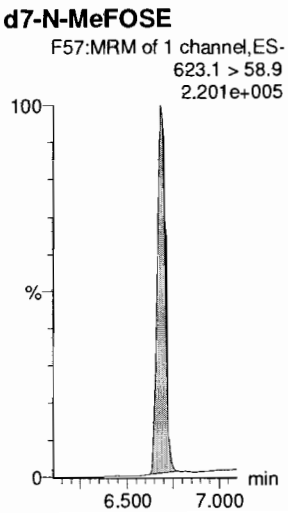
13C2-PFHxDA



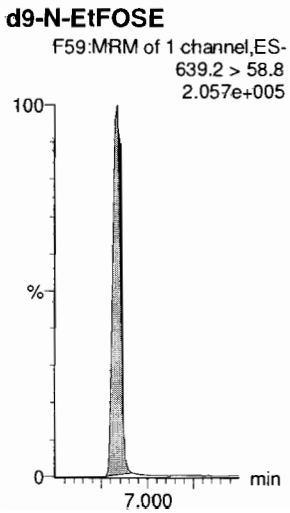
13C2-PFHxDA



d7-N-MeFOSE



d9-N-EtFOSE



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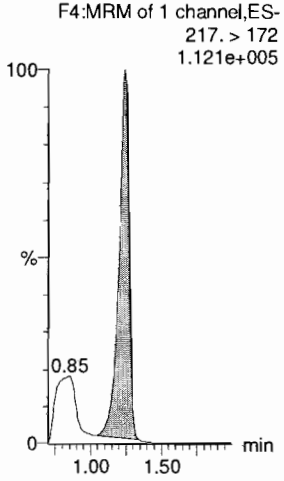
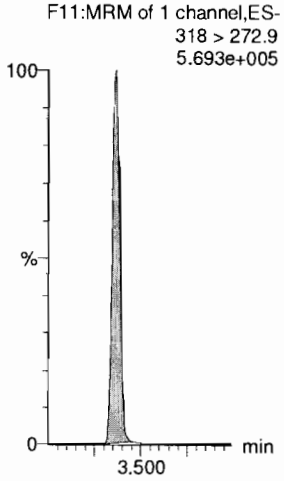
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_8, Date: 26-Nov-2018, Time: 12:49:38, ID: ST181126M2-7 PFC CS4 1810907, Description: PFC CS4 18K1907

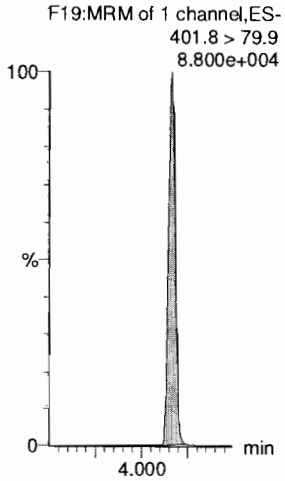
13C4-PFBA



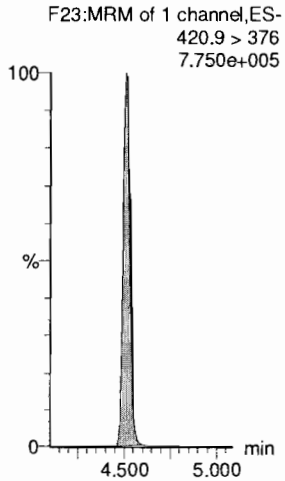
13C5-PFHxA



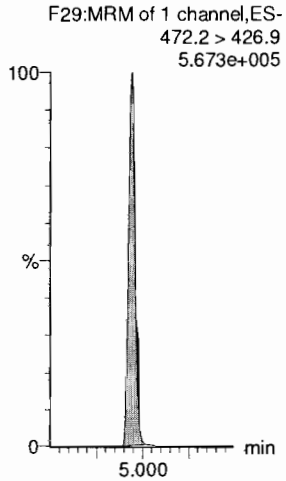
13C3-PFHxS



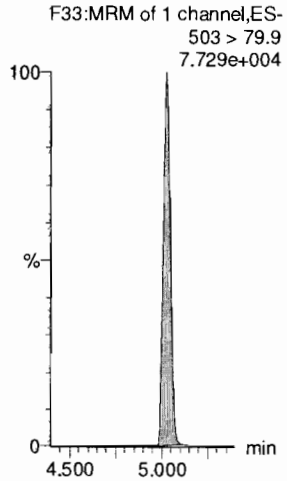
13C8-PFOA



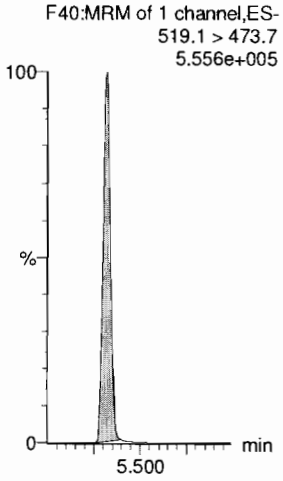
13C9-PFNA



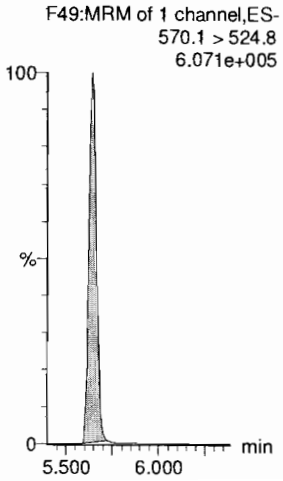
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
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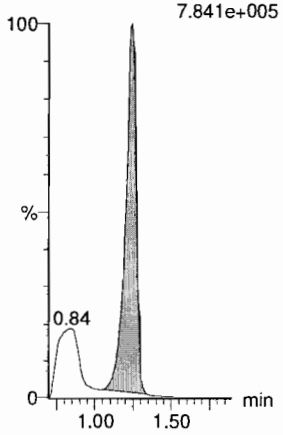
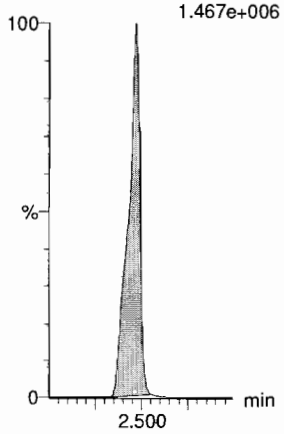
1 AD 11/27/18

Name: 181126M1_9, Date: 26-Nov-2018, Time: 13:00:11, ID: ST181126M1-8 PFC CS5 18K1908, Description: PFC CS5 18K1908

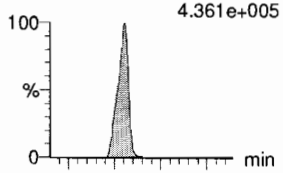
PFBA
F2:MRM of 1 channel,ES-
213.0 > 168.8
7.841e+005



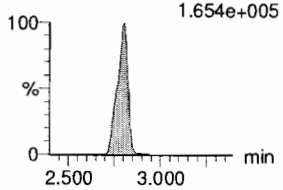
PFPeA
F5:MRM of 1 channel,ES-
263.1 > 218.9
1.467e+006



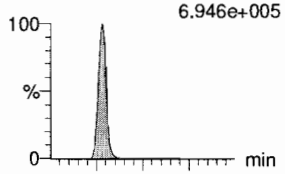
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
4.361e+005



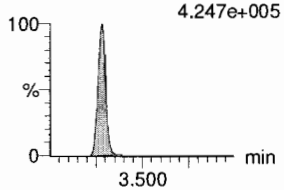
F7:MRM of 2 channels,ES-
299.0 > 99.0
1.654e+005



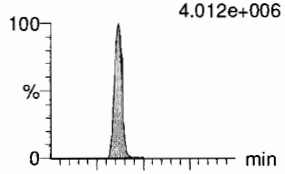
4:2 FTS
F12:MRM of 2 channels,ES-
327.2 > 307.2
6.946e+005



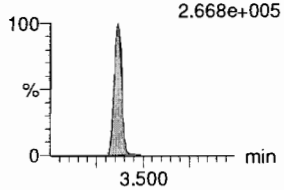
F12:MRM of 2 channels,ES-
327.2 > 81.1
4.247e+005



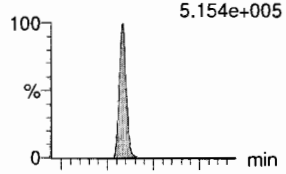
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
4.012e+006



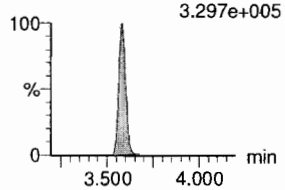
F9:MRM of 2 channels,ES-
313 > 118.9
2.668e+005



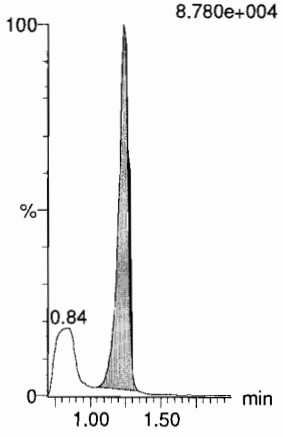
PFPeS
F15:MRM of 2 channels,ES-
349.1 > 80.1
5.154e+005



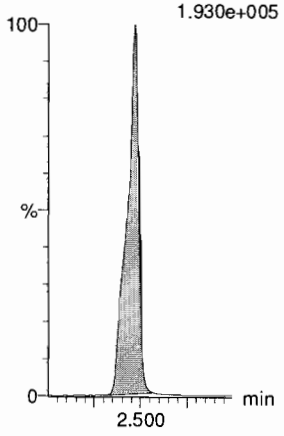
F15:MRM of 2 channels,ES-
349.1 > 99
3.297e+005



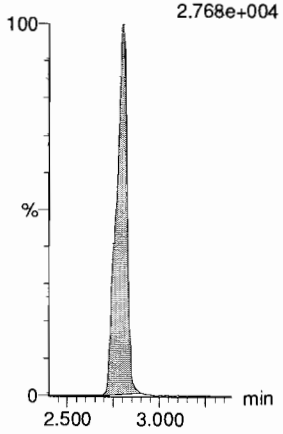
13C3-PFBA
F3:MRM of 1 channel,ES-
216.1 > 171.8
8.780e+004



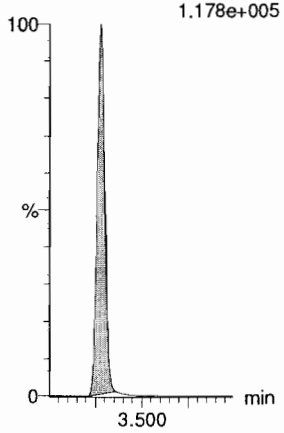
13C3-PFPeA
F6:MRM of 1 channel,ES-
266. > 221.8
1.930e+005



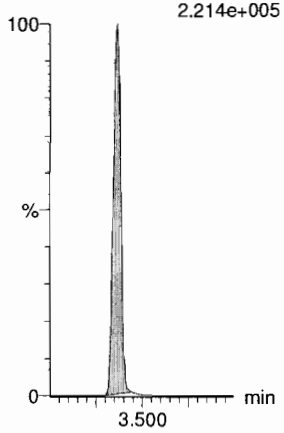
13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
2.768e+004



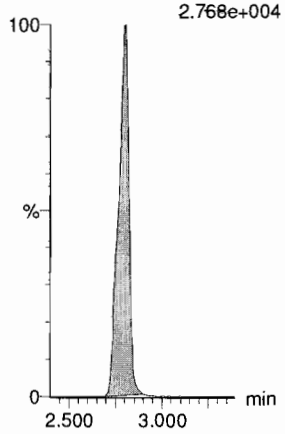
13C2-4:2 FTS
F13:MRM of 1 channel,ES-
329.2 > 308.9
1.178e+005



13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
2.214e+005



13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
2.768e+004



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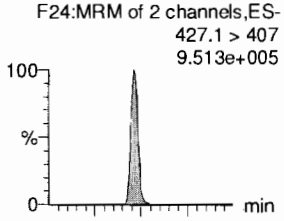
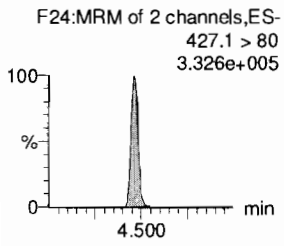
Name: 181126M1_9, Date: 26-Nov-2018, Time: 13:00:11, ID: ST181126M2-8 PFC CS5 18K1908, Description: PFC CS5 18K1908

6:2 FTS





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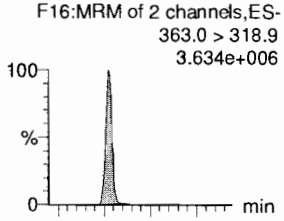
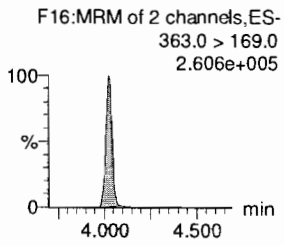
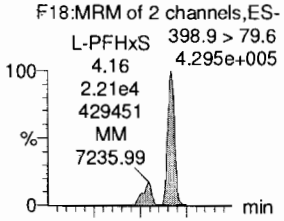
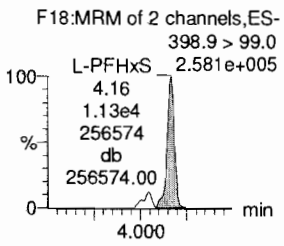




L-PFHxS





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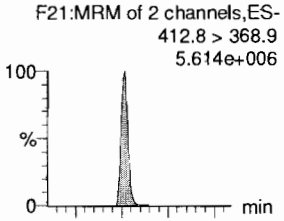

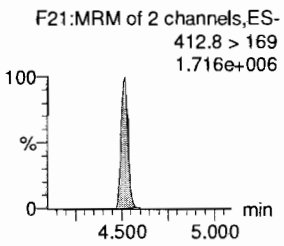

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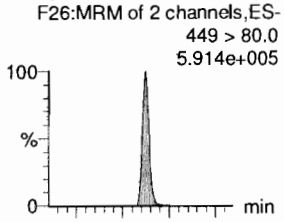

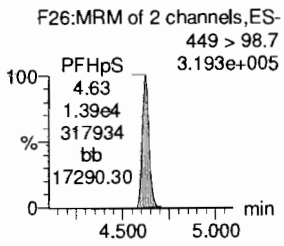

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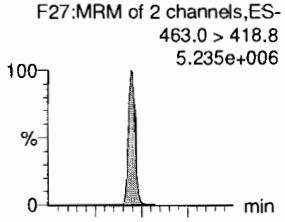
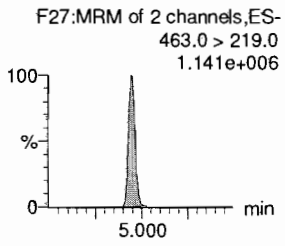
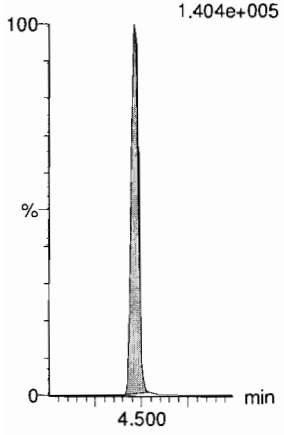




13C2-6:2 FTS



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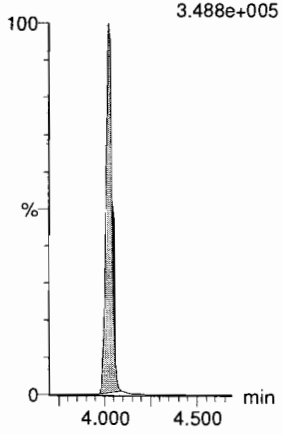
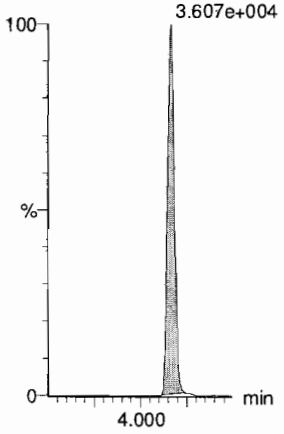
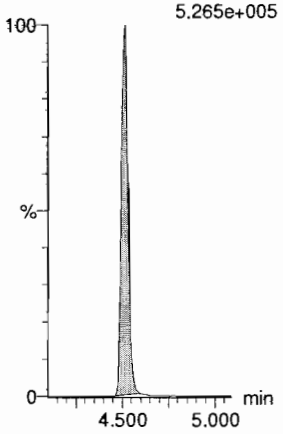


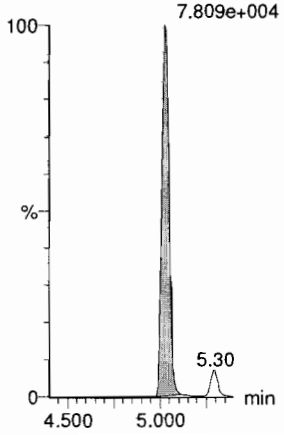
18O2-PFHxS



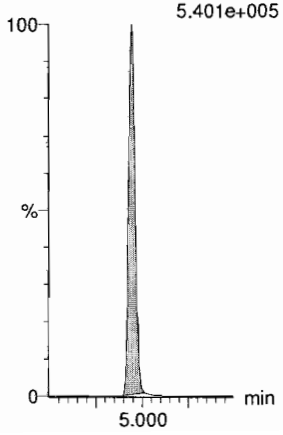
13C2-PFOA



13C8-PFOS



13C5-PFNA



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Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_9, Date: 26-Nov-2018, Time: 13:00:11, ID: ST181126M2-8 PFC CS5 18K1908, Description: PFC CS5 18K1908

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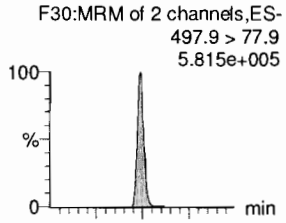

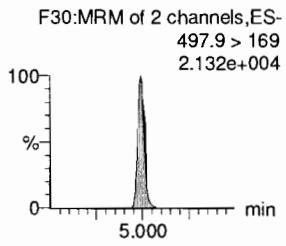

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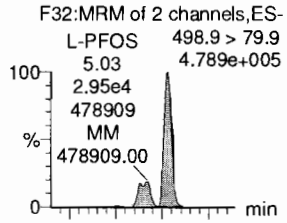
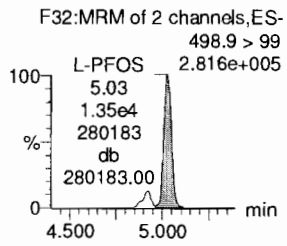
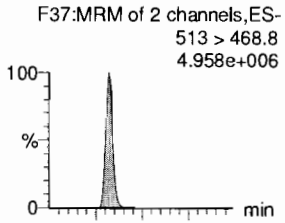
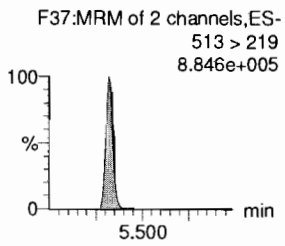


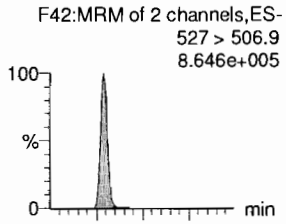


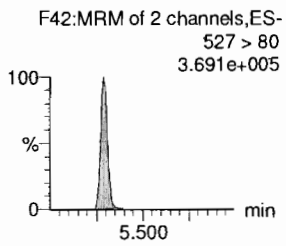
PFDA





8:2 FTS





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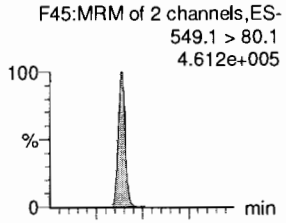

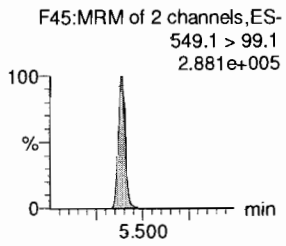

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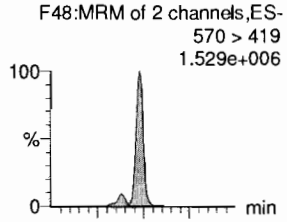

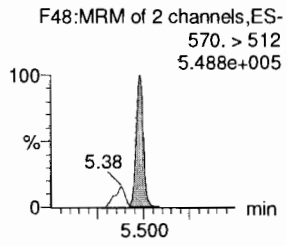

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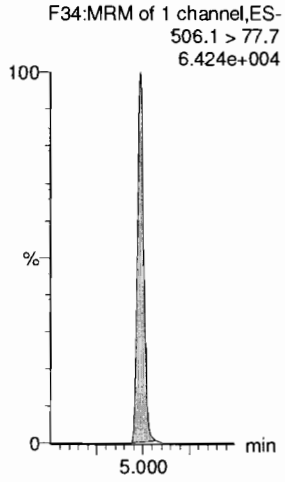
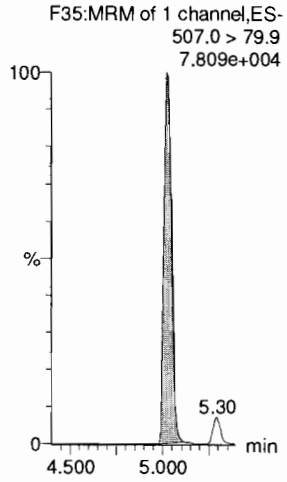


13C8-PFOS



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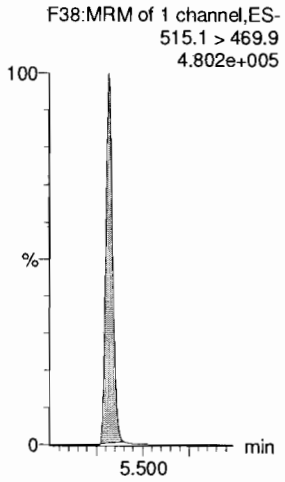
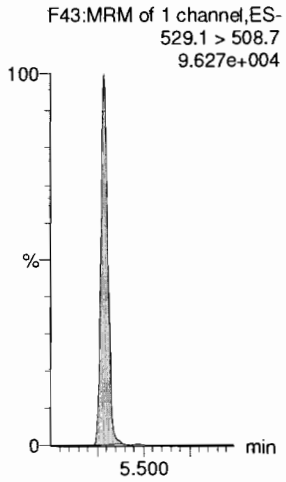
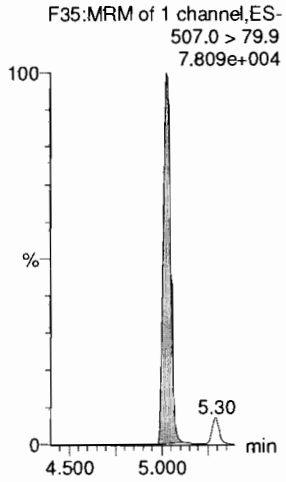


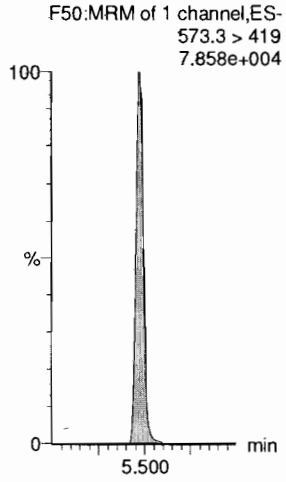
13C2-8:2 FTS



13C8-PFOS



d3-N-MeFOSAA



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Name: 181126M1_9, Date: 26-Nov-2018, Time: 13:00:11, ID: ST181126M2-8 PFC CS5 18K1908, Description: PFC CS5 18K1908

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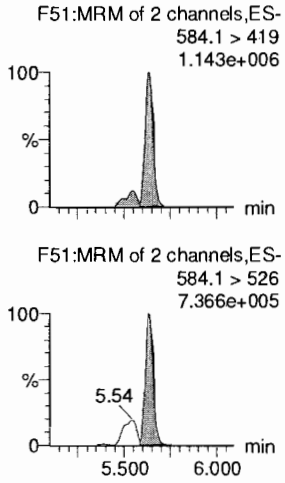
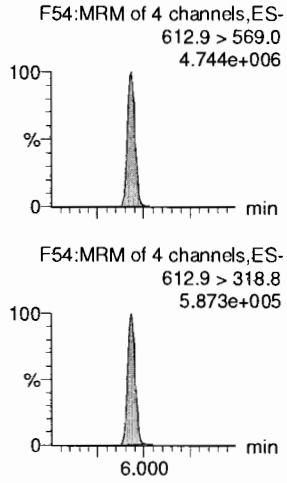


PFDoA



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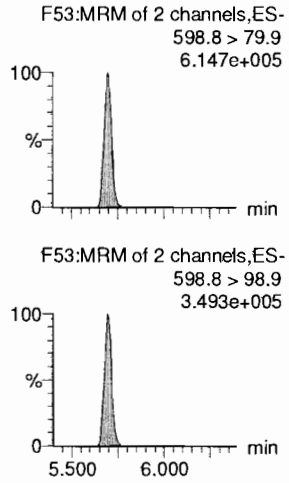

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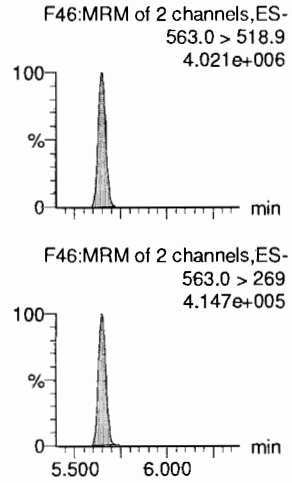

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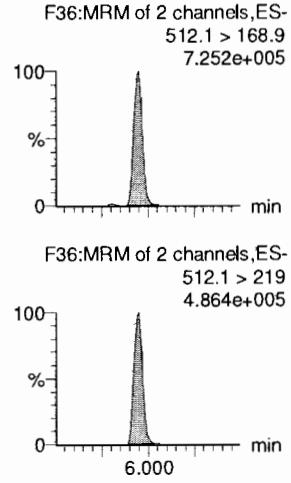

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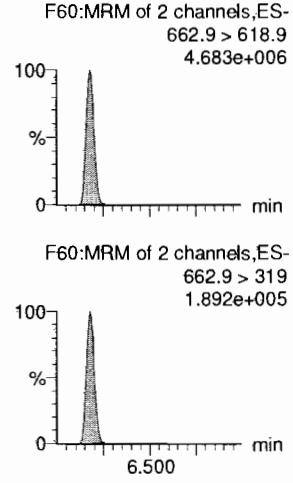

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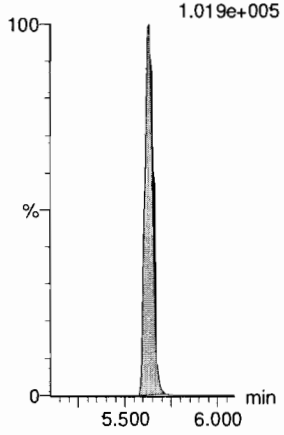
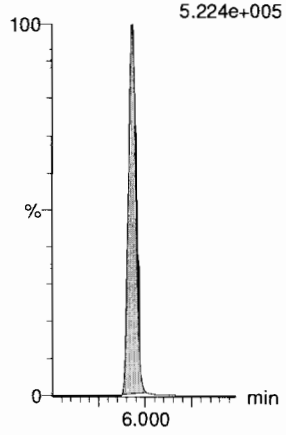


13C2-PFDoA



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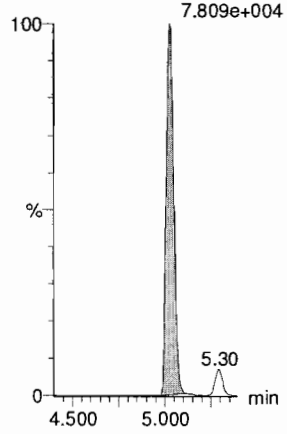
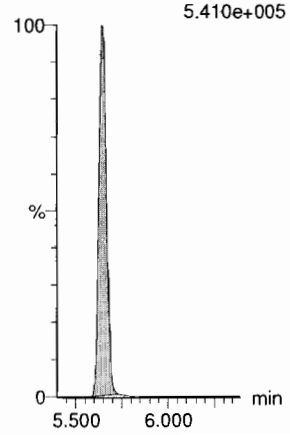


13C2-PFUdA



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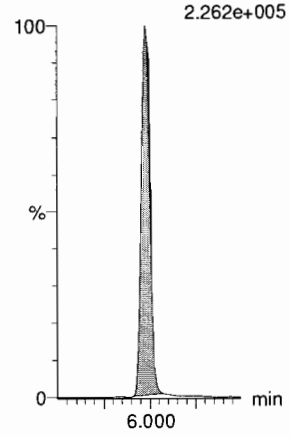

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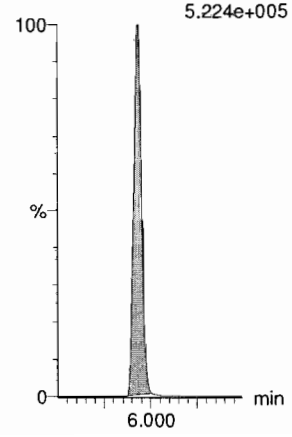

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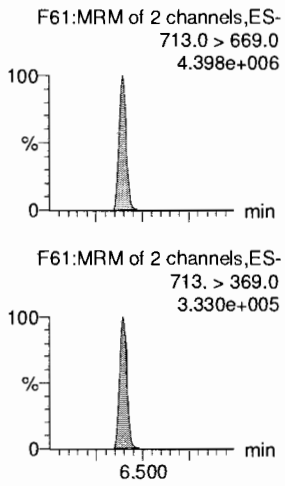
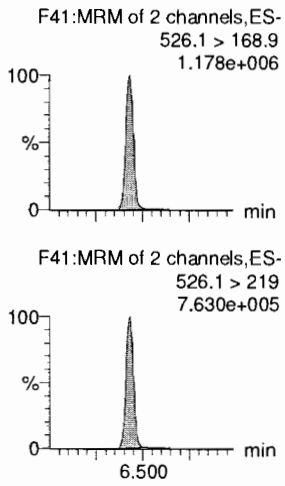
Name: 181126M1_9, Date: 26-Nov-2018, Time: 13:00:11, ID: ST181126M2-8 PFC CS5 18K1908, Description: PFC CS5 18K1908

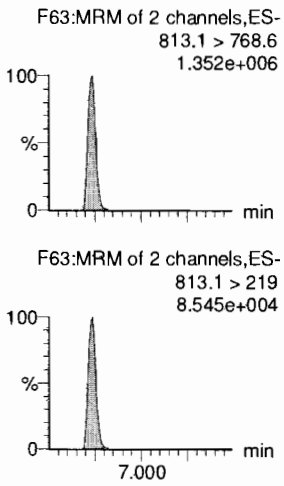
PFTeDA



N-EtFOSA



PFHxDA



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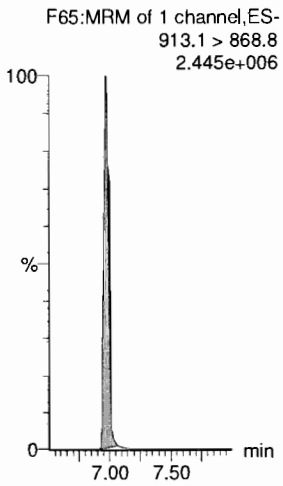

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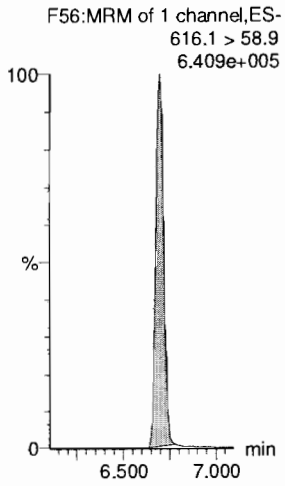

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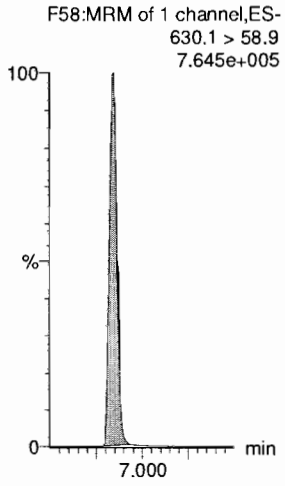
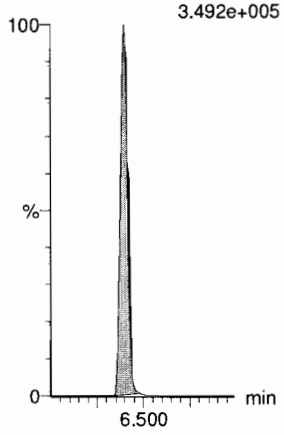
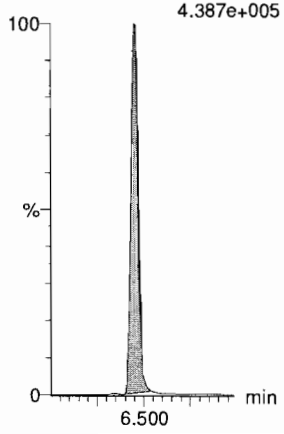


13C2-PFTeDA



d5-N-ETFOSA



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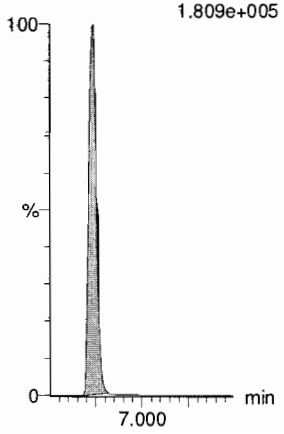

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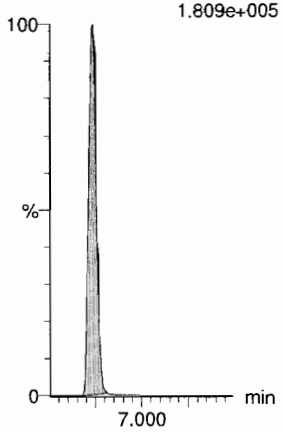
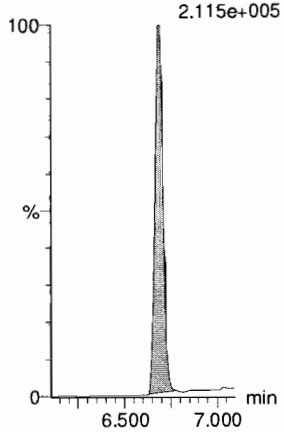
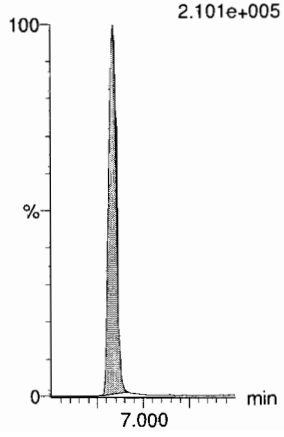


d7-N-MeFOSE



d9-N-EtFOSE



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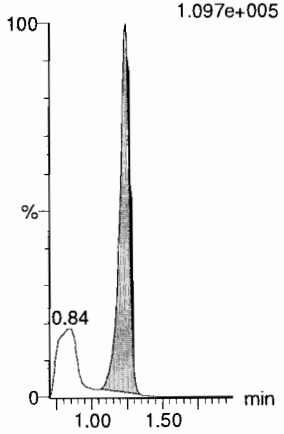
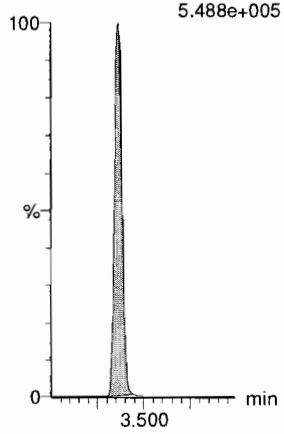
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_9, Date: 26-Nov-2018, Time: 13:00:11, ID: ST181126M2-8 PFC CS5 18K1908, Description: PFC CS5 18K1908

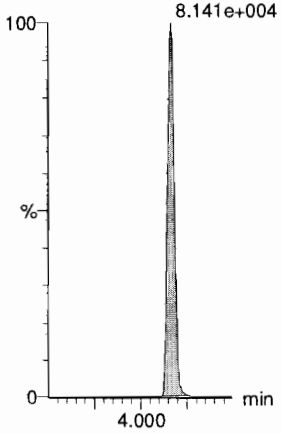
13C4-PFBA



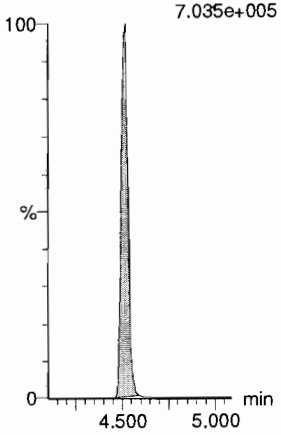
13C5-PFHxA



13C3-PFHxS



13C8-PFOA



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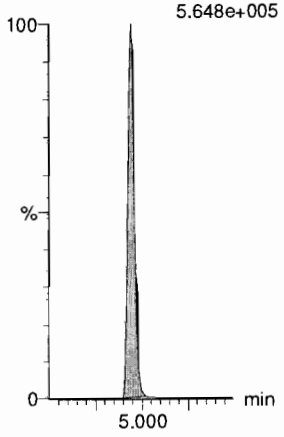
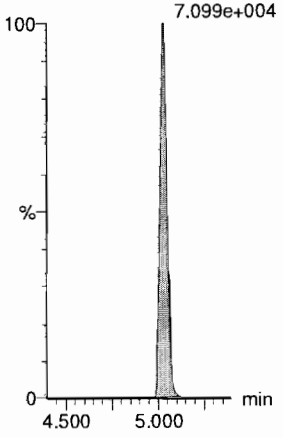
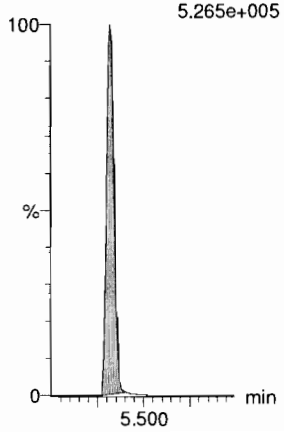


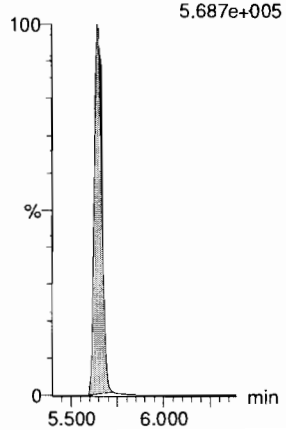
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
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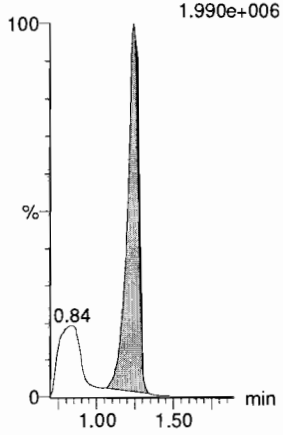
1 AD 11/27/18

Name: 181126M1_10, Date: 26-Nov-2018, Time: 13:10:49, ID: ST181126M2-9 PFC CS6 18K1909, Description: PFC CS6 18K1909

PFBA



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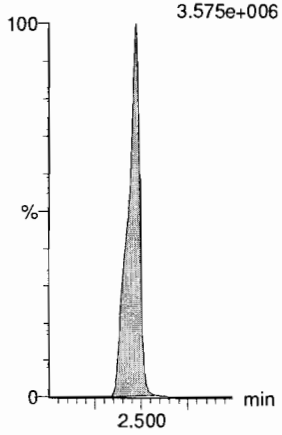
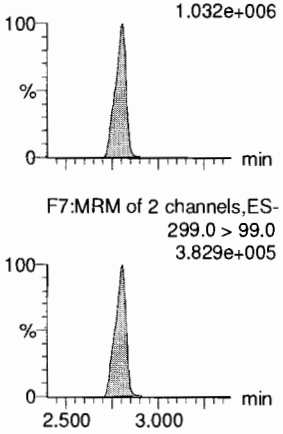
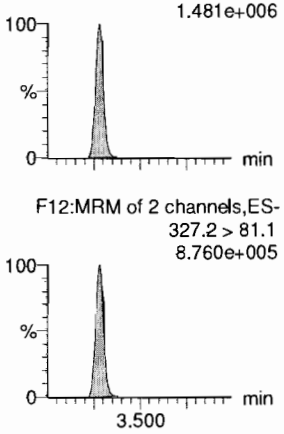


PFBS



4:2 FTS



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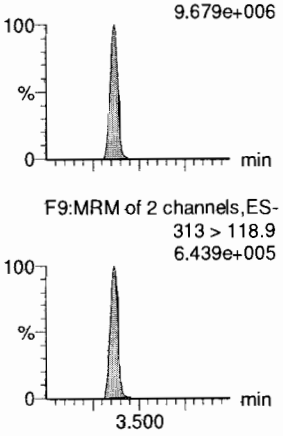
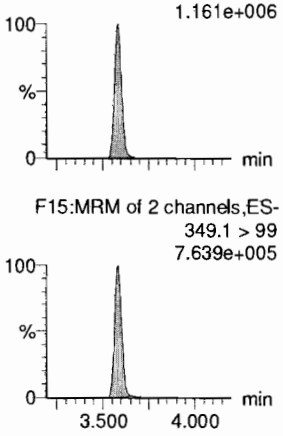
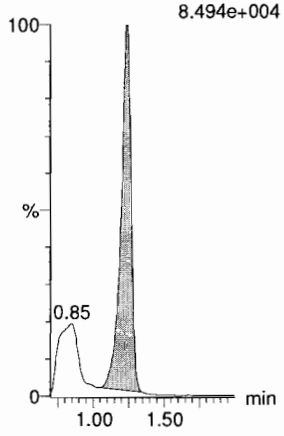


PFPeS



13C3-PFBA



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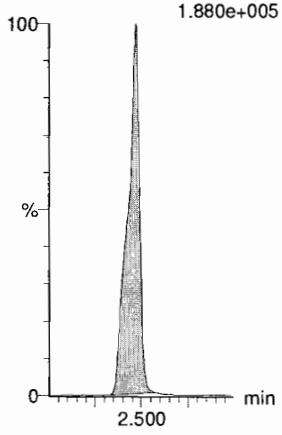

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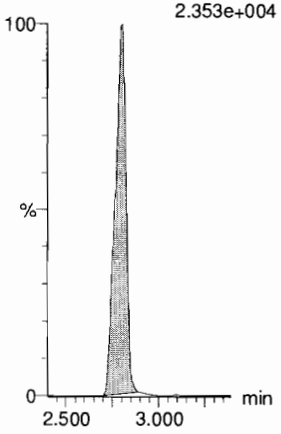
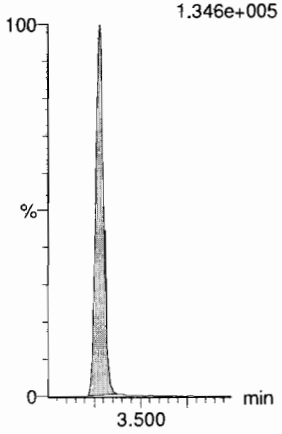


13C2-4:2 FTS



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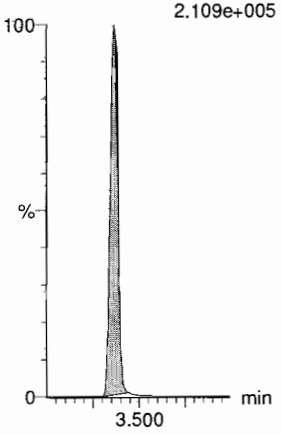

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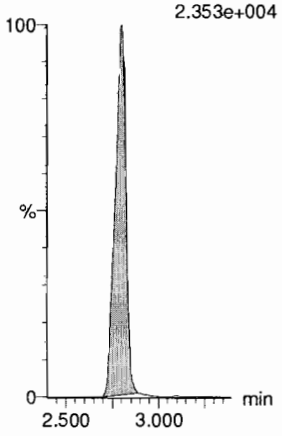

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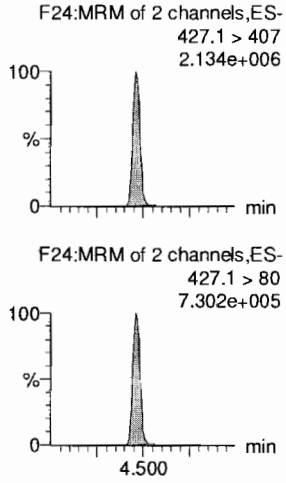
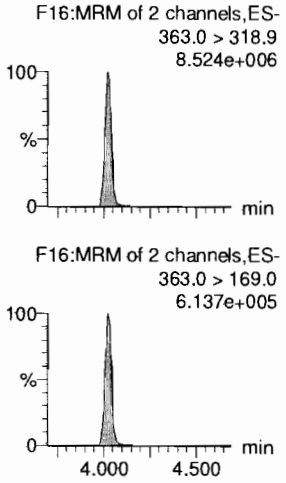
Name: 181126M1_10, Date: 26-Nov-2018, Time: 13:10:49, ID: ST181126M2-9 PFC CS6 18K1909, Description: PFC CS6 18K1909

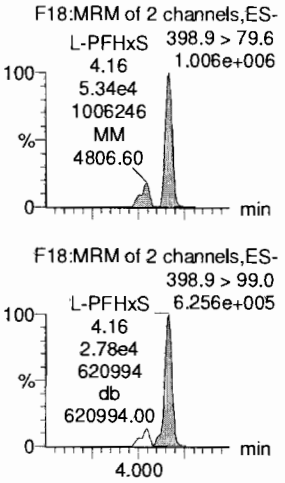
6:2 FTS



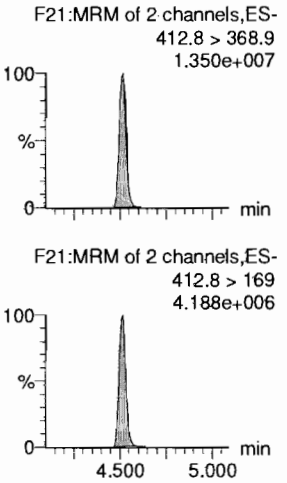
PFHpA



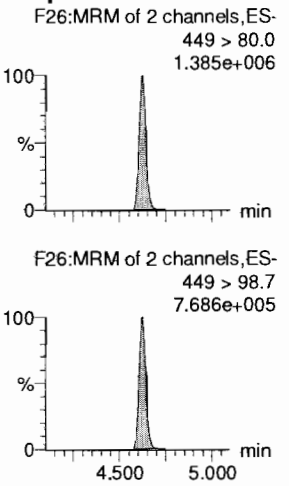
L-PFHxS



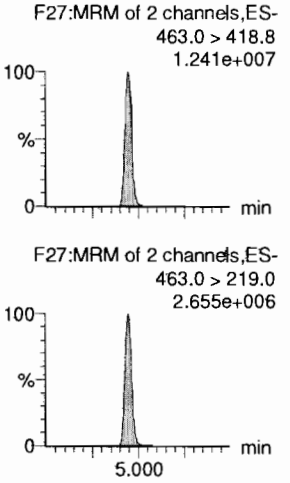
L-PFOA



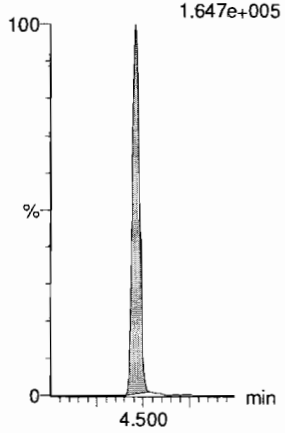
PFHpS



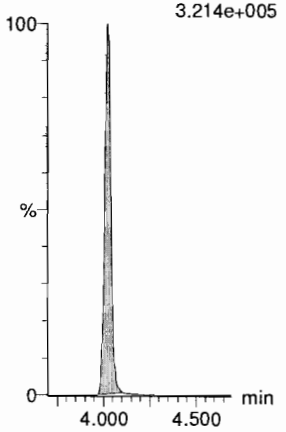
PFNA



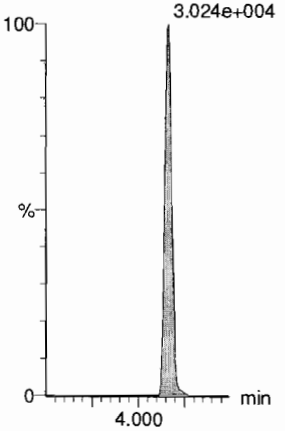
13C2-6:2 FTS



13C4-PFHpA



18O2-PFHxS



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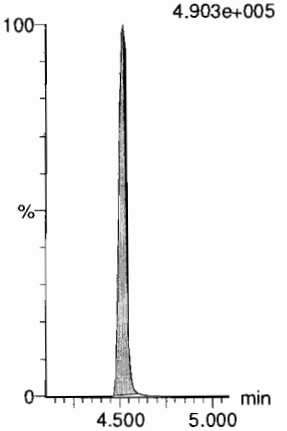
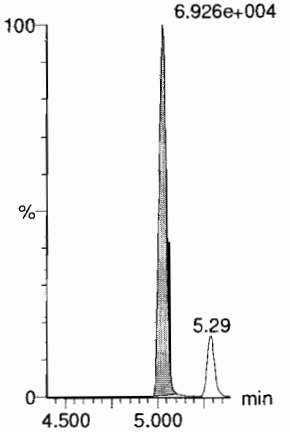
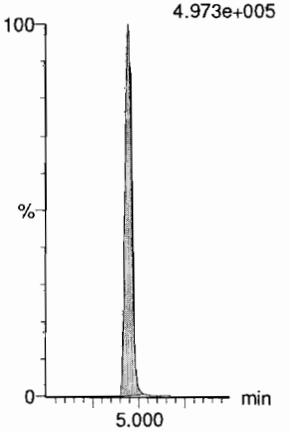


13C8-PFOS



13C5-PFNA



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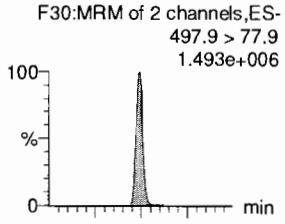
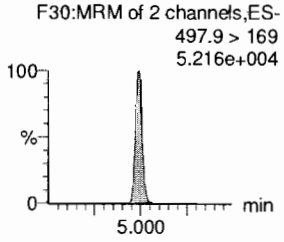
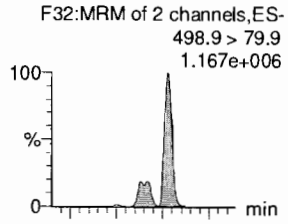
Name: 181126M1_10, Date: 26-Nov-2018, Time: 13:10:49, ID: ST181126M2-9 PFC CS6 18K1909, Description: PFC CS6 18K1909

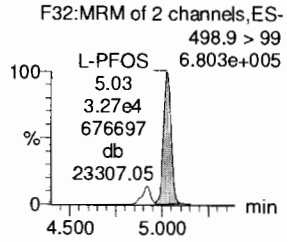
PFOSA



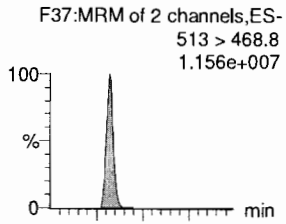


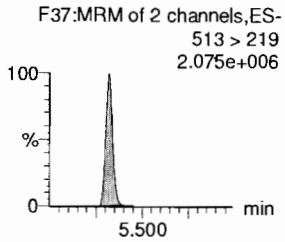
L-PFOS



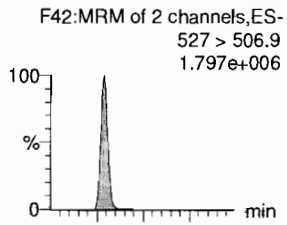


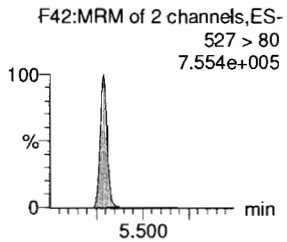
PFDA





8:2 FTS





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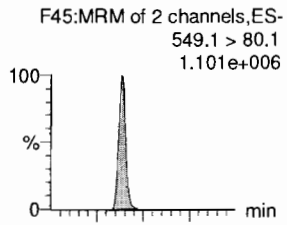

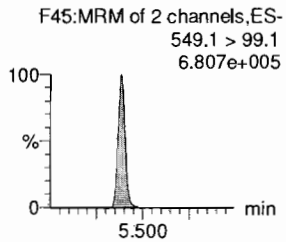

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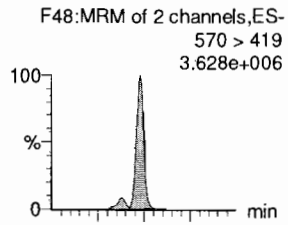
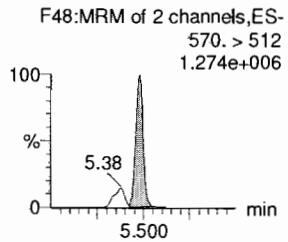
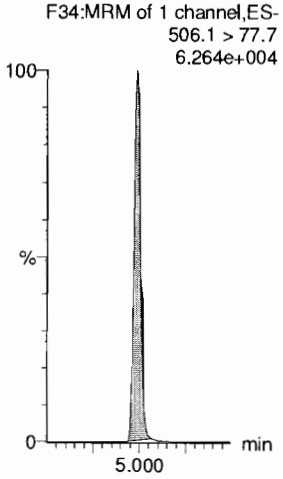
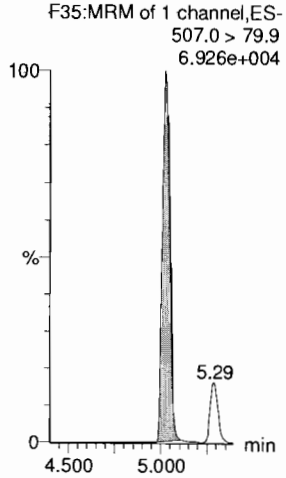




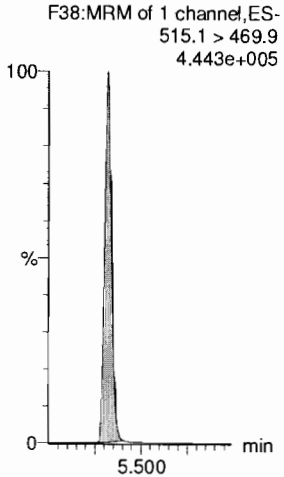
13C8-PFOSA



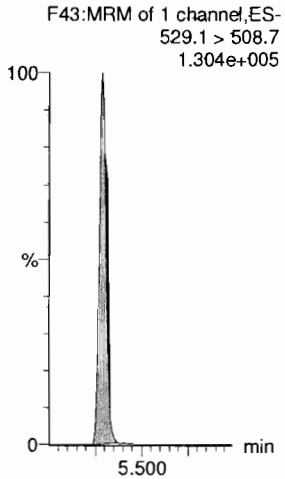
13C8-PFOS



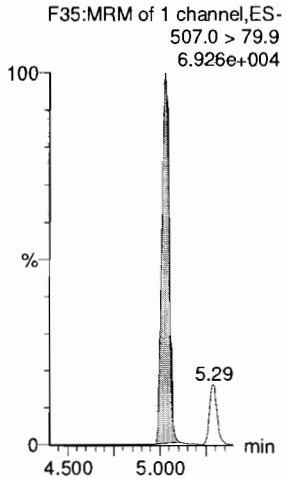
13C2-PFDA



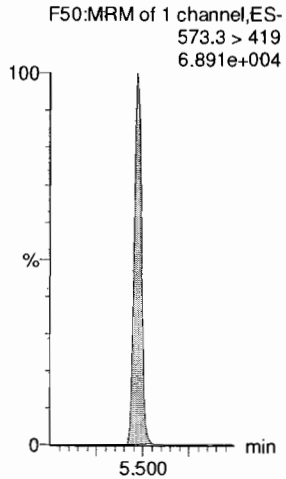
13C2-8:2 FTS



13C8-PFOS



d3-N-MeFOSAA



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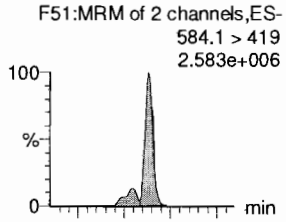
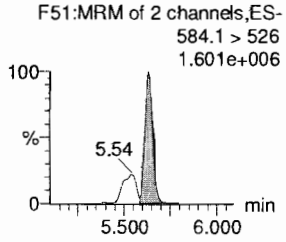
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

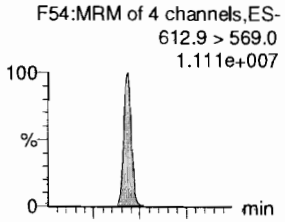
Name: 181126M1_10, Date: 26-Nov-2018, Time: 13:10:49, ID: ST181126M2-9 PFC CS6 18K1909, Description: PFC CS6 18K1909

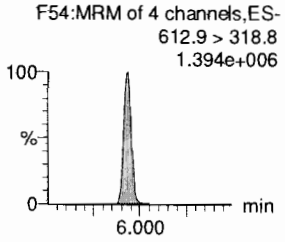
L-EtFOSAA





PFDoA





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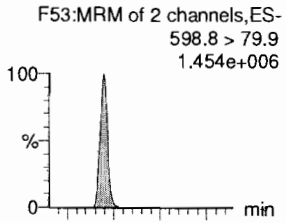
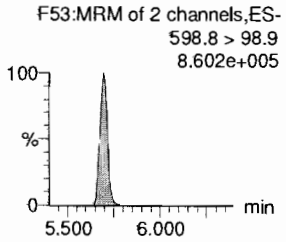
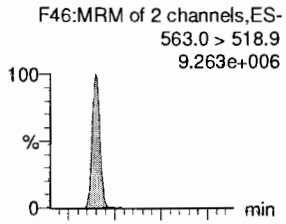
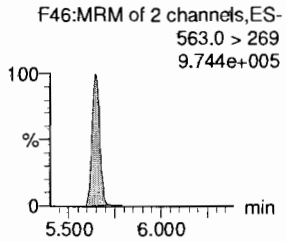


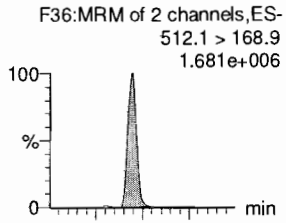


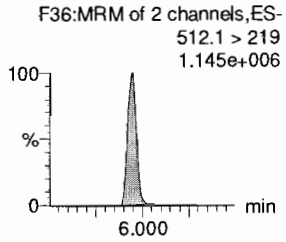
PFUdA





N-MeFOSA





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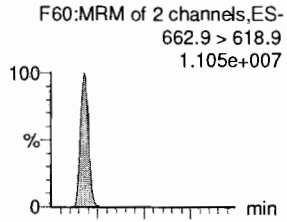
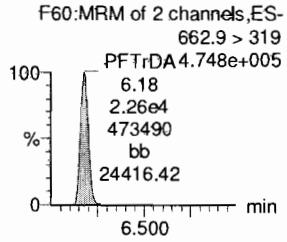
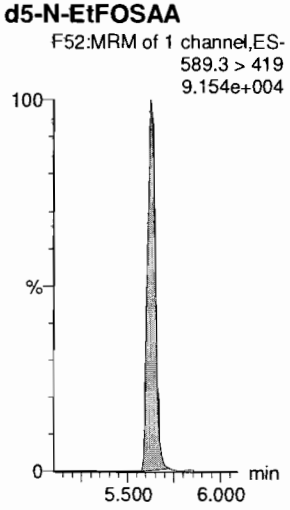
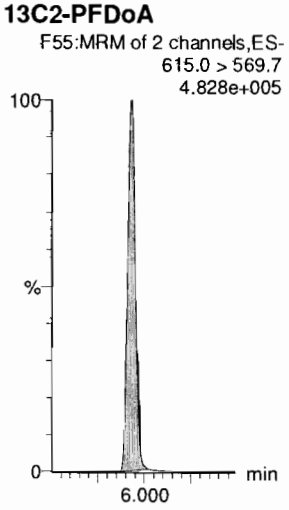




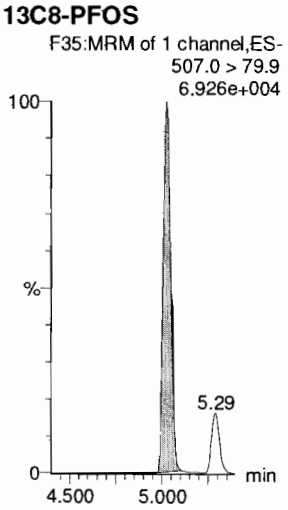
d5-N-EtFOSAA



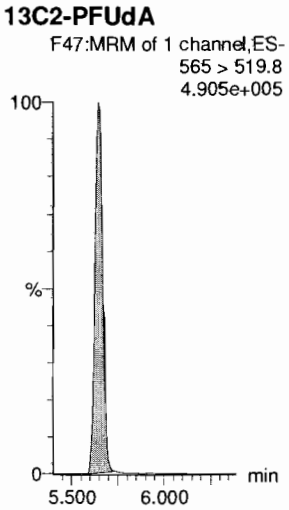
13C2-PFDoA



13C8-PFOS



13C2-PFUdA



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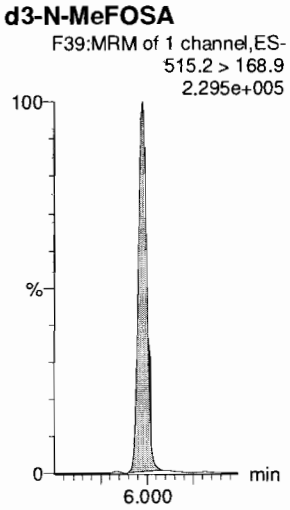

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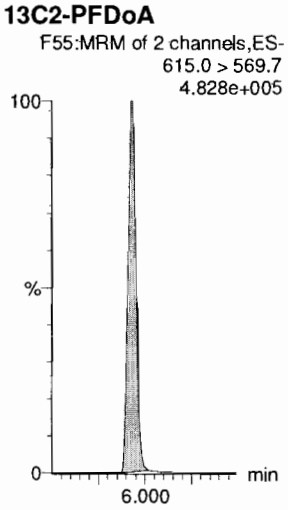
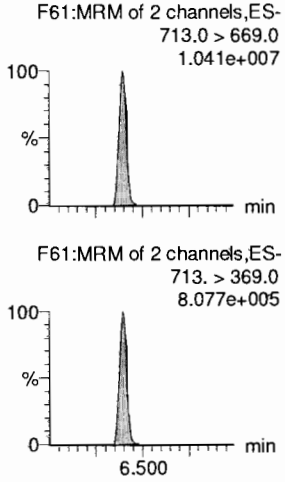


Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

Last Altered: Monday, November 26, 2018 14:29:06 Pacific Standard Time
Printed: Monday, November 26, 2018 14:29:38 Pacific Standard Time

Name: 181126M1_10, Date: 26-Nov-2018, Time: 13:10:49, ID: ST181126M2-9 PFC CS6 18K1909, Description: PFC CS6 18K1909

PFTeDA



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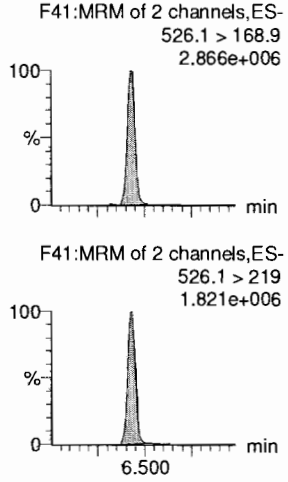
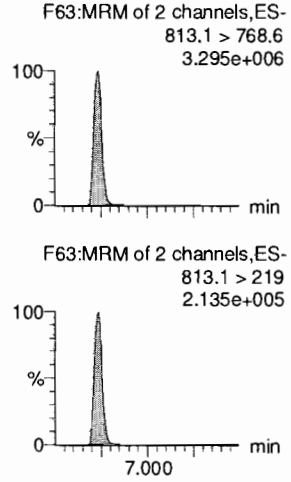
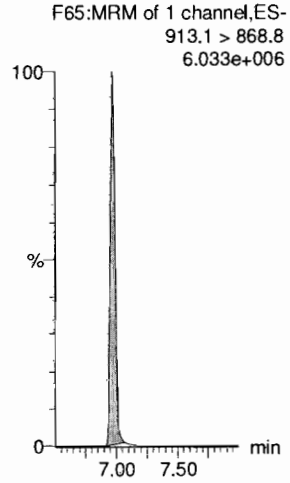


PFHxDA



PFODA



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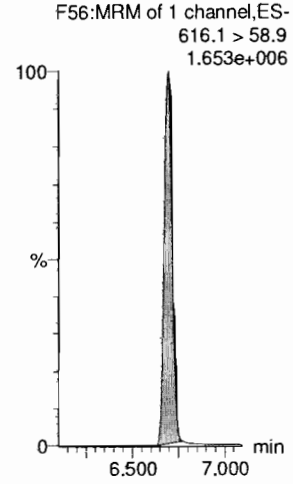
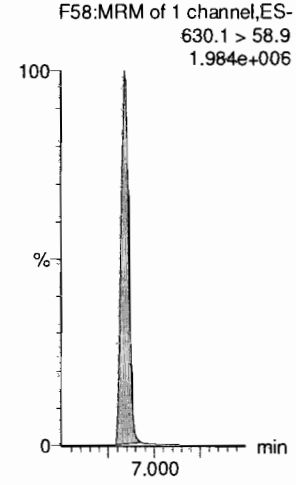


N-EtFOSE



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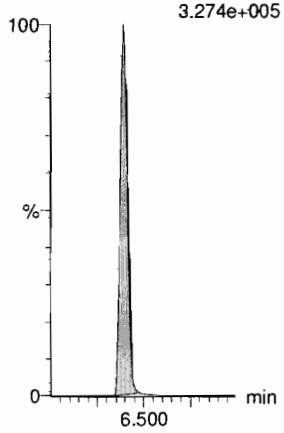
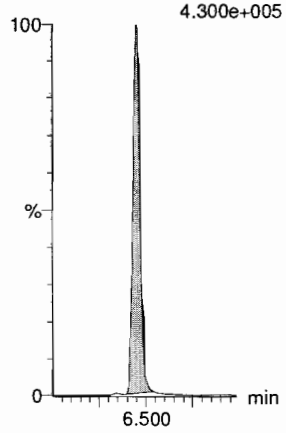
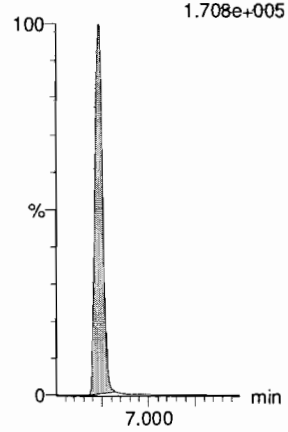


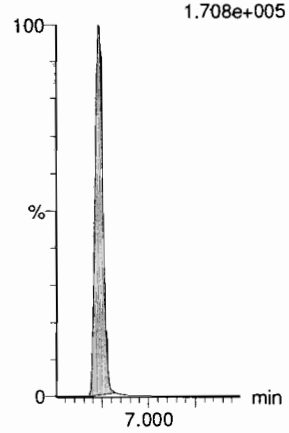
d5-N-ETFOSA



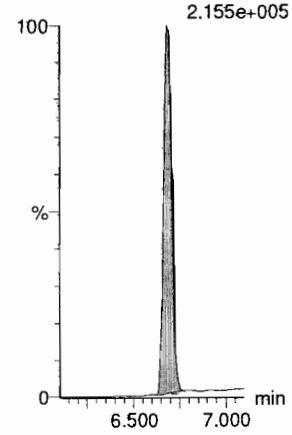
13C2-PFHxDA



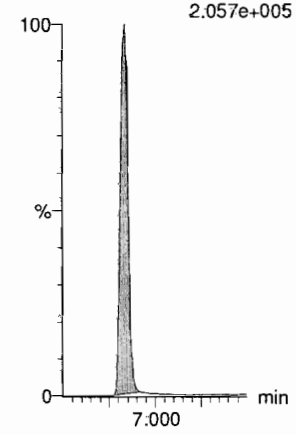
13C2-PFHxDA



d7-N-MeFOSE



d9-N-EtFOSE



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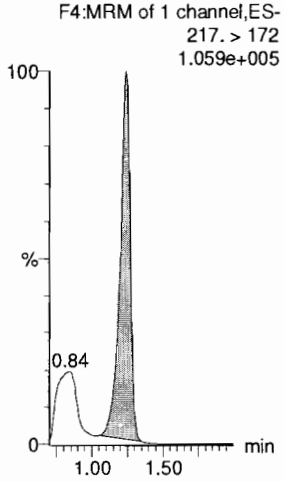
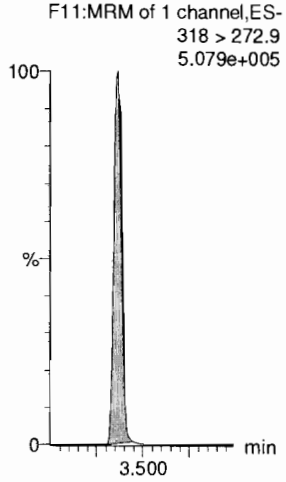
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_10, Date: 26-Nov-2018, Time: 13:10:49, ID: ST181126M2-9 PFC CS6 18K1909, Description: PFC CS6 18K1909

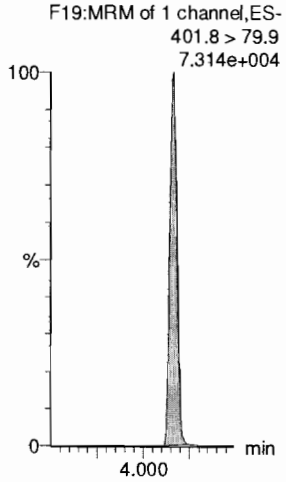
13C4-PFBA



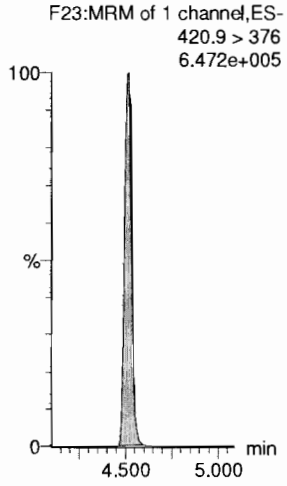
13C5-PFHxA



13C3-PFHxS



13C8-PFOA



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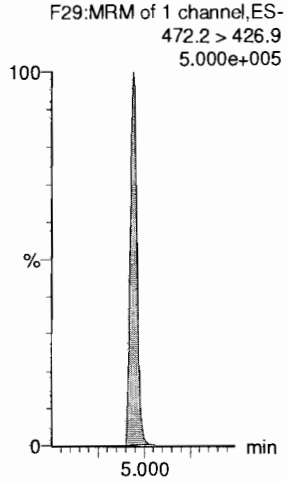
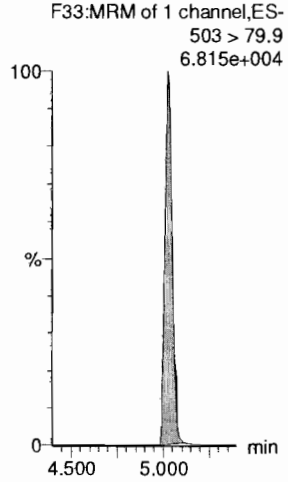
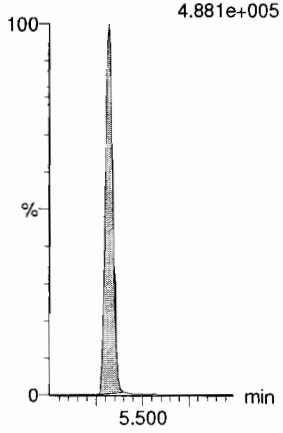


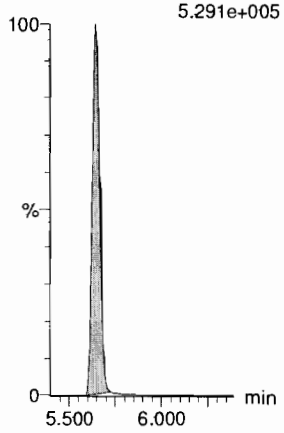
13C4-PFOS



13C6-PFDA



13C7-PFUdA



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Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
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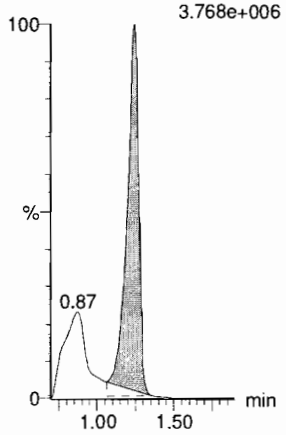
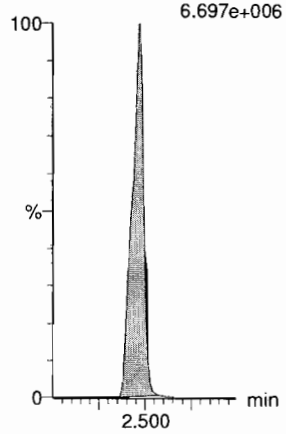
1 AD 11/27/18

Name: 181126M1_11, Date: 26-Nov-2018, Time: 13:21:23, ID: ST181126M1-10 PFC CS7 18K1910, Description: PFC CS7 18K1910

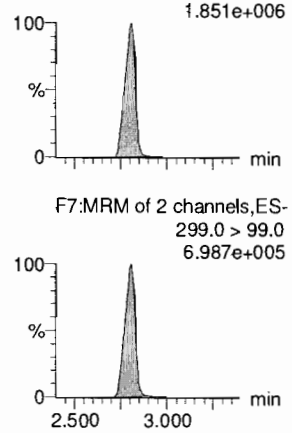
PFBA



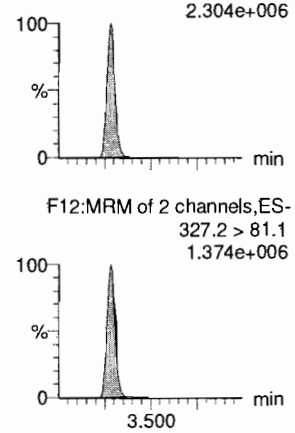
PFPeA



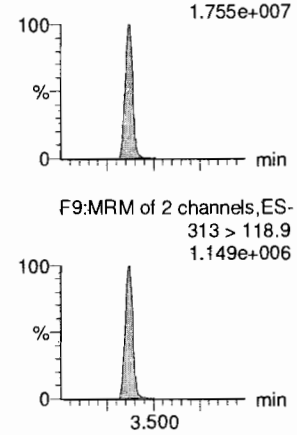
PFBS



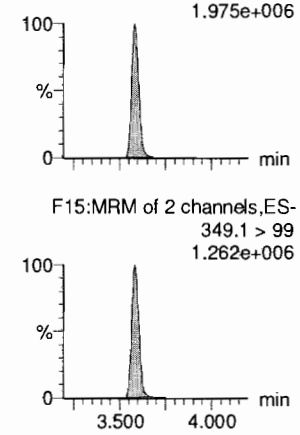
4:2 FTS



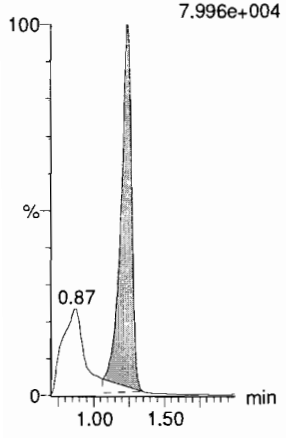
PFHxA



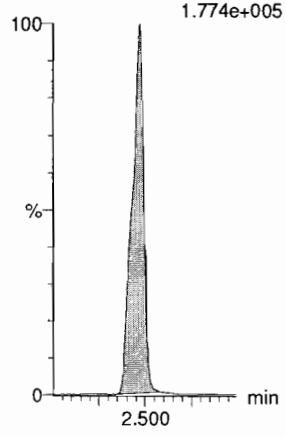
PFPeS



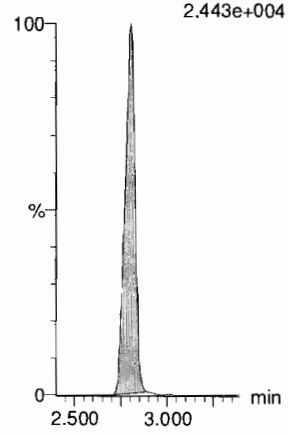
13C3-PFBA



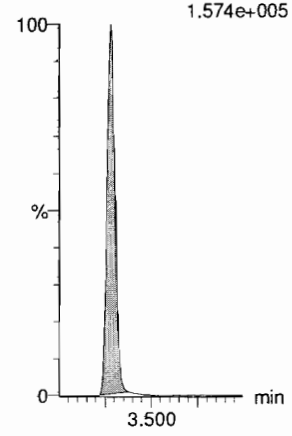
13C3-PFPeA



13C3-PFBS



13C2-4:2 FTS



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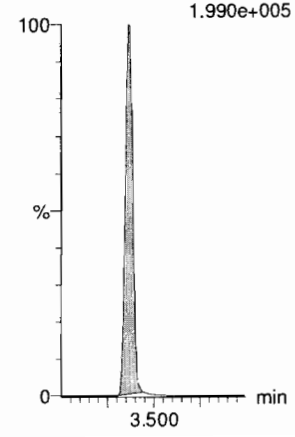

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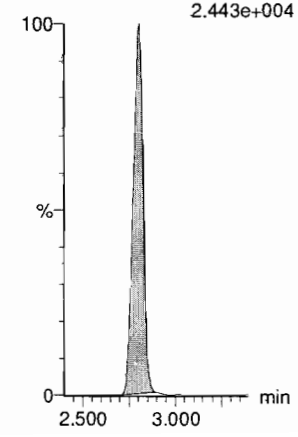

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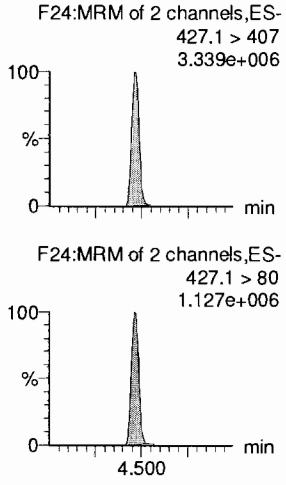
Name: 181126M1_11, Date: 26-Nov-2018, Time: 13:21:23, ID: ST181126M2-10 PFC CS7 18K1910, Description: PFC CS7 18K1910

6:2 FTS



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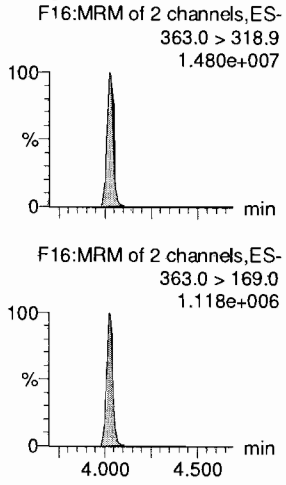

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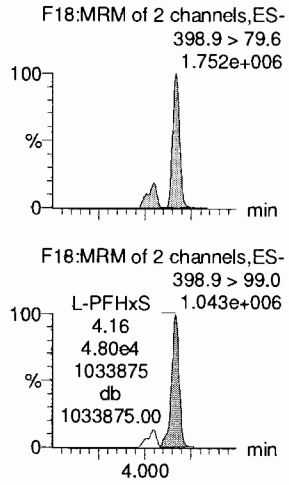

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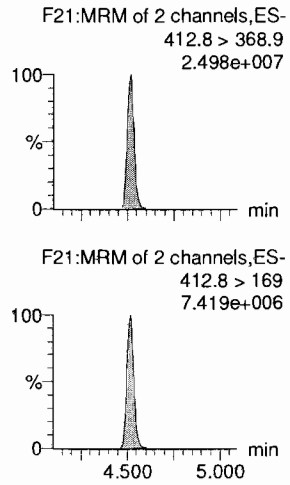

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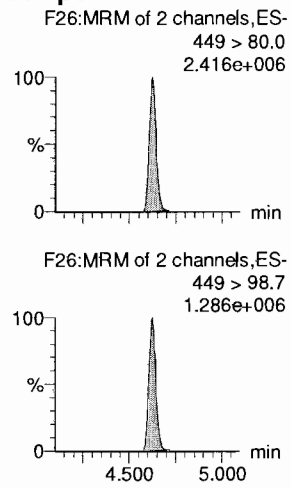

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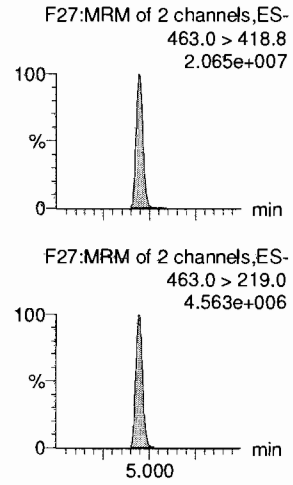
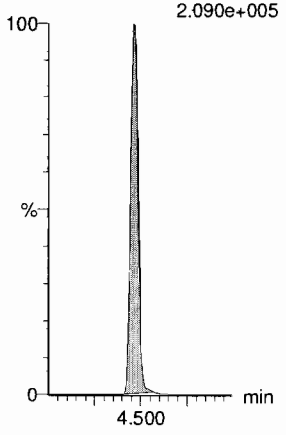
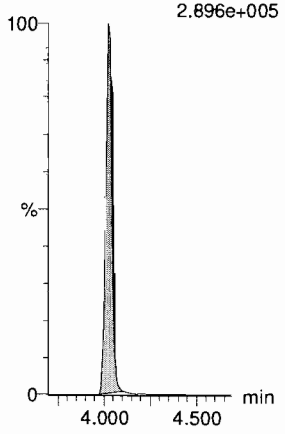


13C2-6:2 FTS



13C4-PFHpA



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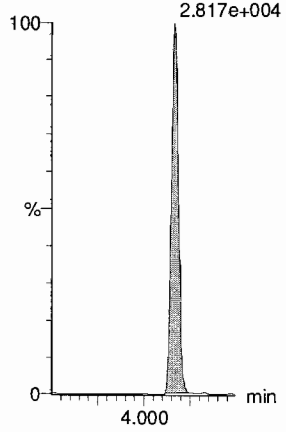

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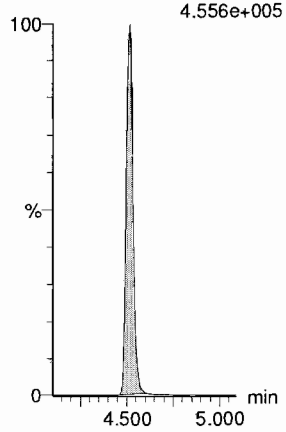
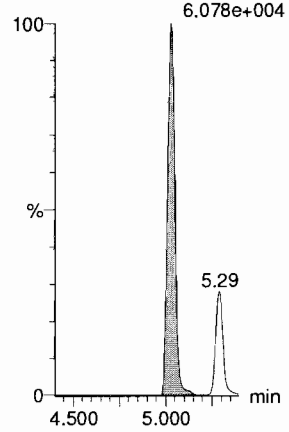


13C8-PFOS



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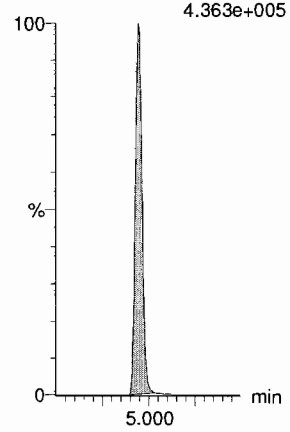

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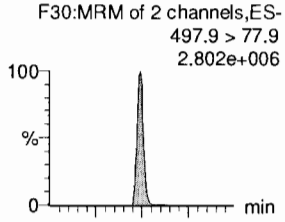
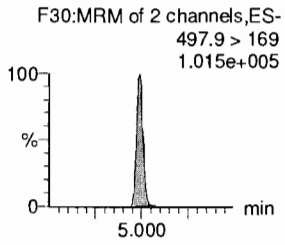
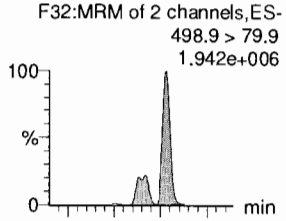
Name: 181126M1_11, Date: 26-Nov-2018, Time: 13:21:23, ID: ST181126M2-10 PFC CS7 18K1910, Description: PFC CS7 18K1910

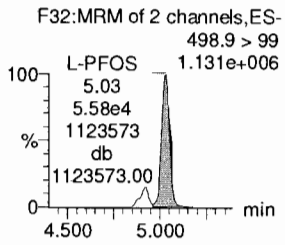
PFOSA





L-PFOS





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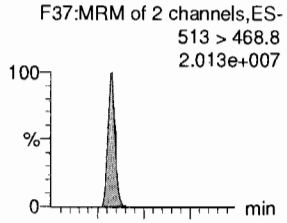
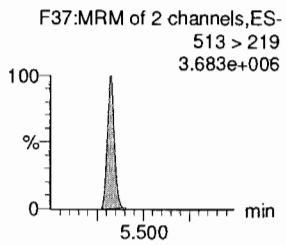
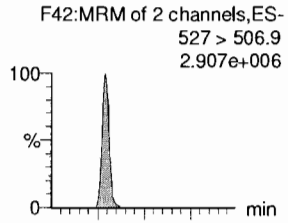
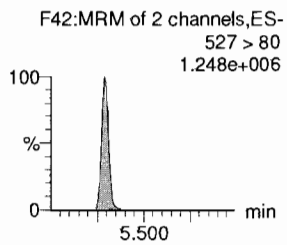




8:2 FTS





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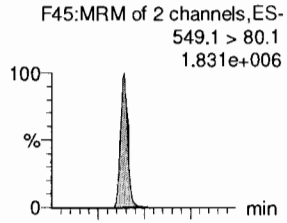

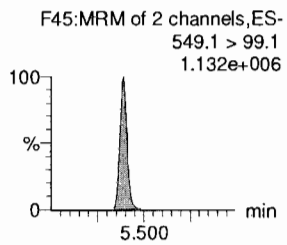

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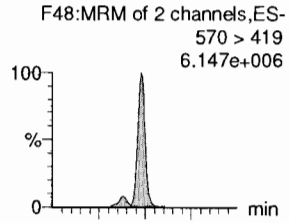

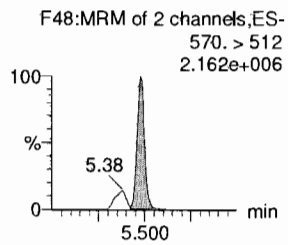

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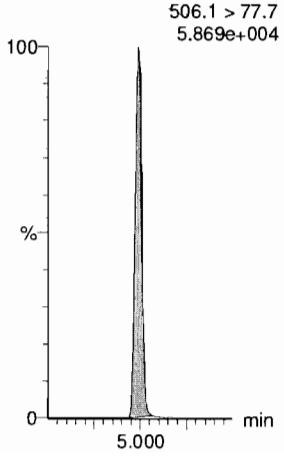

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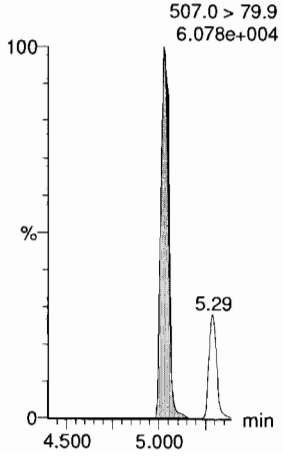

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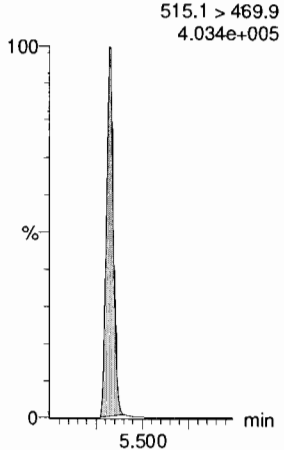
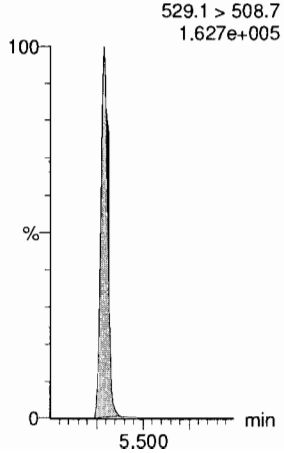


13C2-8:2 FTS



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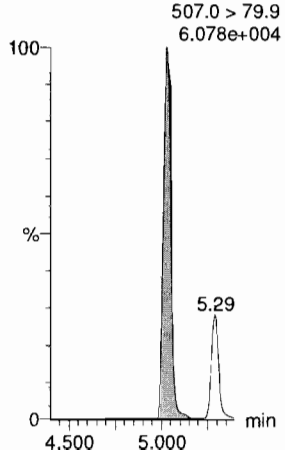
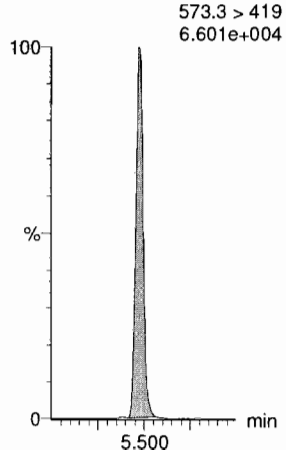


d3-N-MeFOSAA



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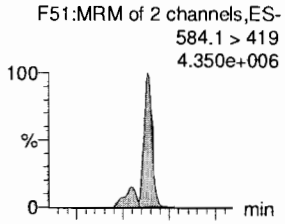
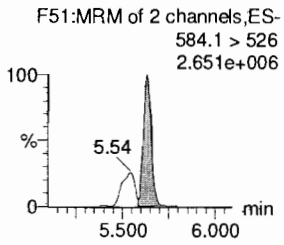
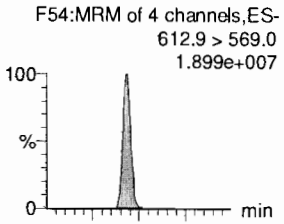
Name: 181126M1_11, Date: 26-Nov-2018, Time: 13:21:23, ID: ST181126M2-10 PFC CS7 18K1910, Description: PFC CS7 18K1910

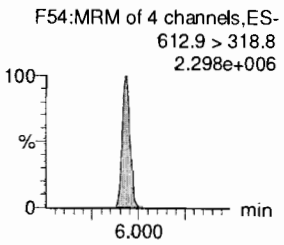
L-EtFOSAA





PFDoA





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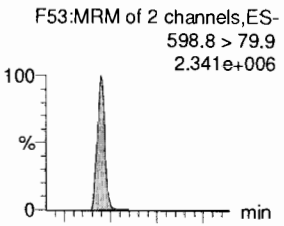

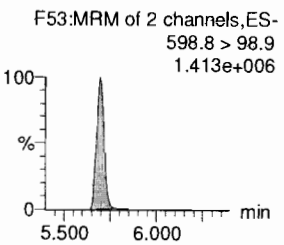

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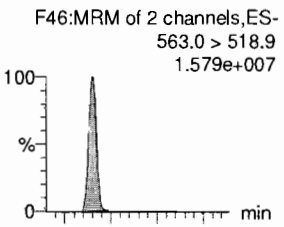

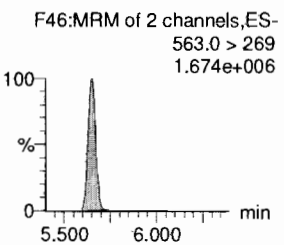

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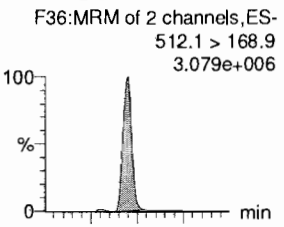

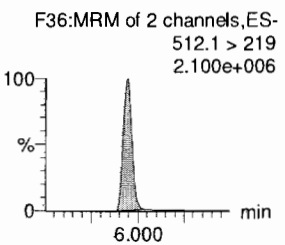

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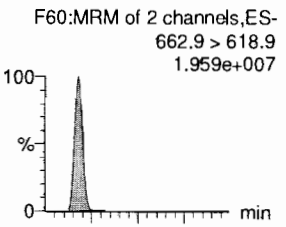

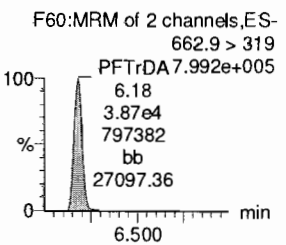

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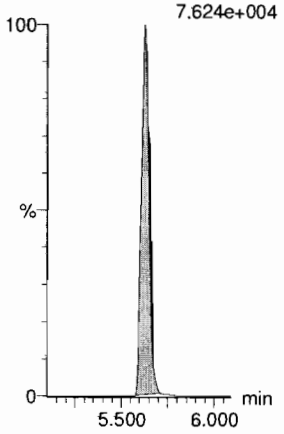

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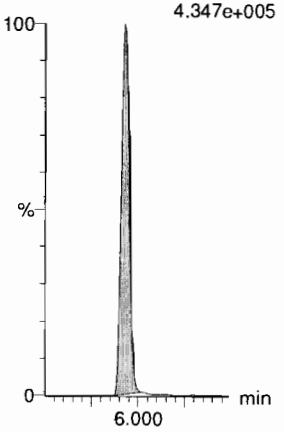

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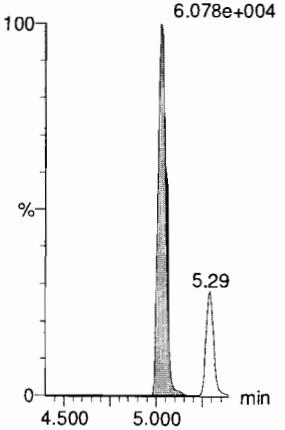

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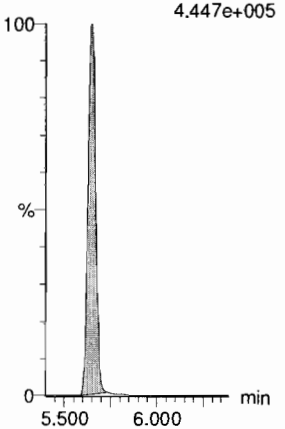

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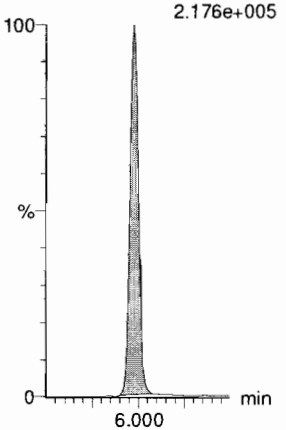

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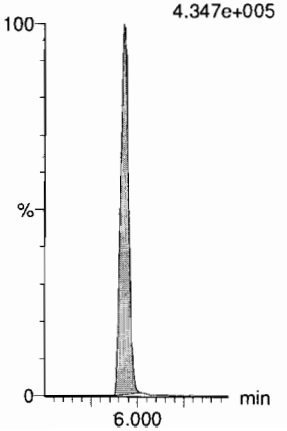

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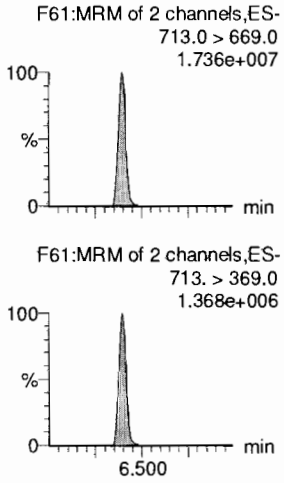
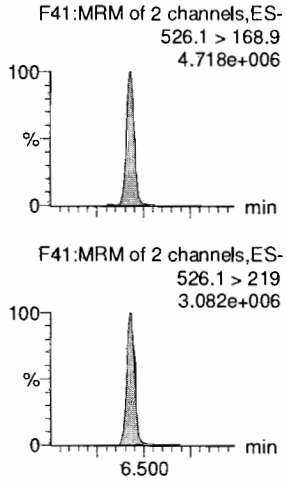
Name: 181126M1_11, Date: 26-Nov-2018, Time: 13:21:23, ID: ST181126M2-10 PFC CS7 18K1910, Description: PFC CS7 18K1910

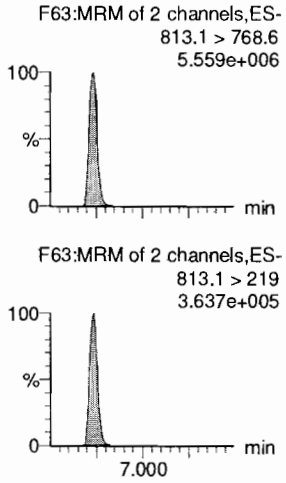
PFTeDA



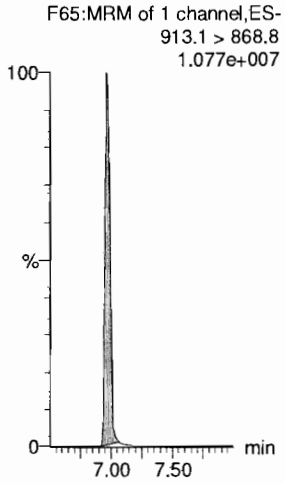
N-EtFOSA



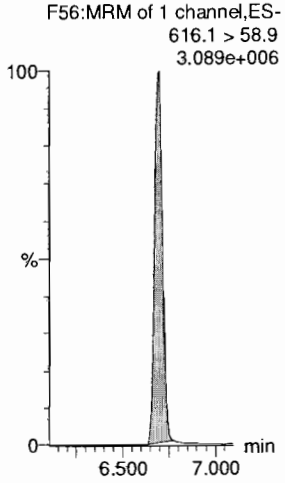
PFHxDA



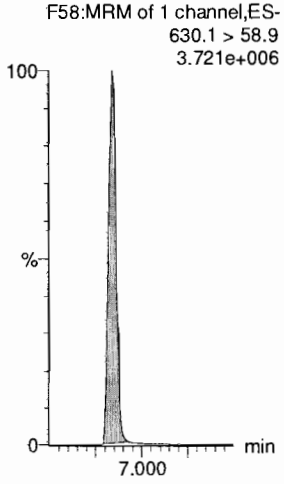
PFODA



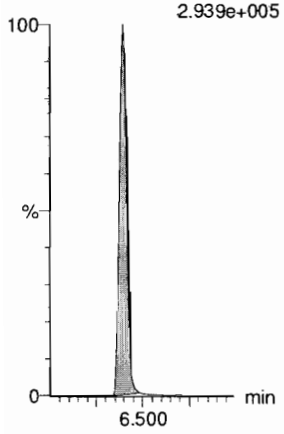
N-MeFOSE



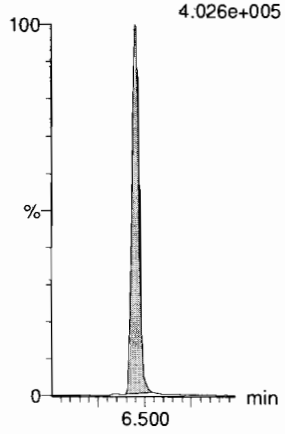
N-EtFOSE



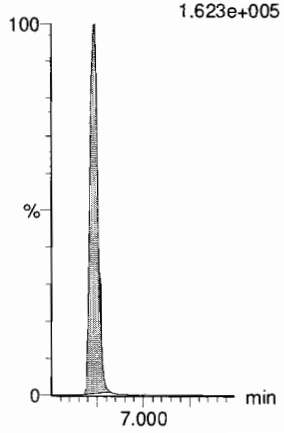
13C2-PFTeDA



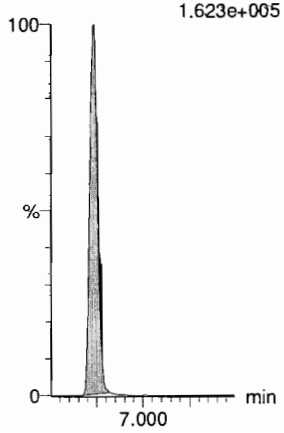
d5-N-ETFOSA



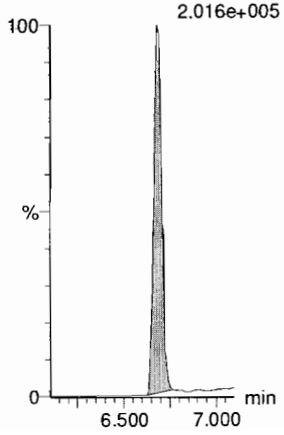
13C2-PFHxDA



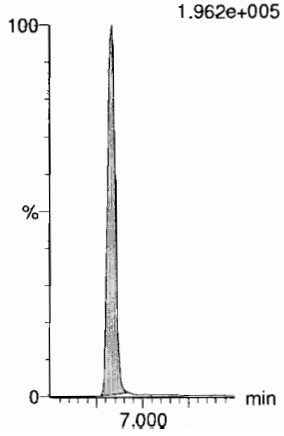
13C2-PFHxDA



d7-N-MeFOSE



d9-N-EtFOSE

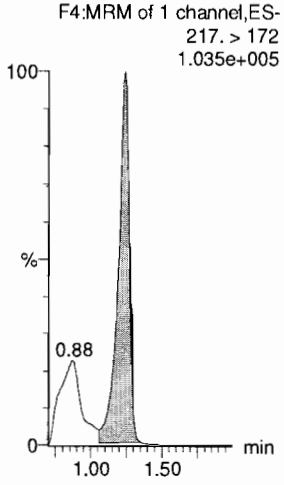


Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-CRV.qld

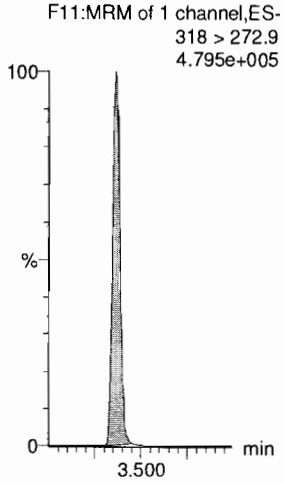
Last Altered: Monday, November 26, 2018 14:09:42 Pacific Standard Time
Printed: Monday, November 26, 2018 14:14:21 Pacific Standard Time

Name: 181126M1_11, Date: 26-Nov-2018, Time: 13:21:23, ID: ST181126M2-10 PFC CS7 18K1910, Description: PFC CS7 18K1910

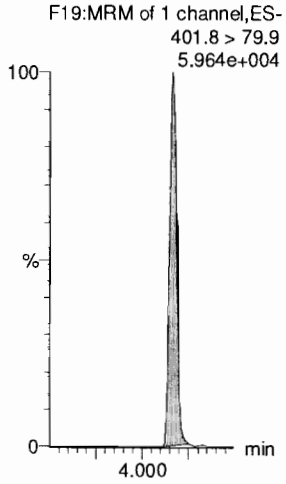
13C4-PFBA



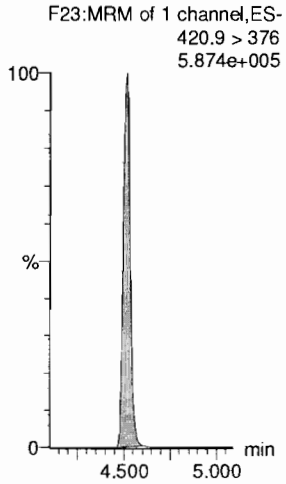
13C5-PFHxA



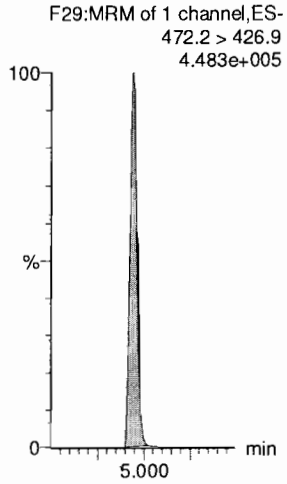
13C3-PFHxS



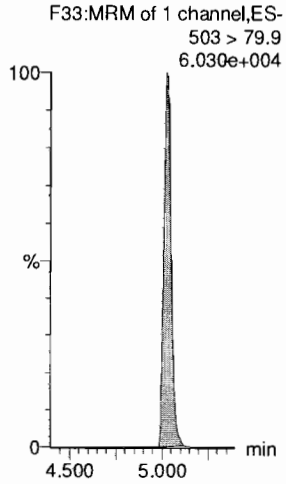
13C8-PFOA



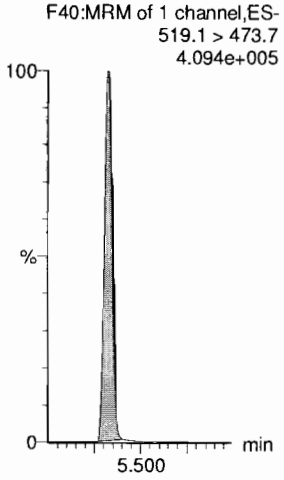
13C9-PFNA



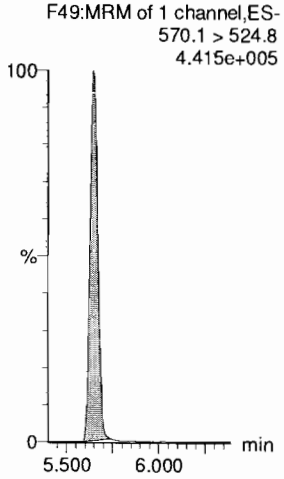
13C4-PFOS



13C6-PFDA



13C7-PFUdA



Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-ICV.qld

Last Altered: Monday, November 26, 2018 14:55:41 Pacific Standard Time
Printed: Monday, November 26, 2018 14:56:11 Pacific Standard Time

1 AD 11/27/18

Name: 181126M1_13, Date: 26-Nov-2018, Time: 13:42:34, ID: ICV181126M2-1 PFC ICV 18K1911, Description: PFC ICV 18K1911

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
1	1	PFBA	213.0 > 168.8	6577.573	6755.113	1.00	1.25	12.171	10.4	103.9	NO		
2	2	PFPeA	263.1 > 218.9	10646.053	13565.366	1.00	2.47	9.810	10.3	103.0	NO		
3	3	PFBS	299.0 > 79.7	2508.497	1757.272	1.00	2.81	17.844	8.6	86.4	NO	2.659	NO
4	4	4:2 FTS	327.2>307.2	3703.077	4459.432	1.00	3.28	10.380	9.9	99.3	NO	1.683	NO
5	5	PFHxA	313 > 269	19380.766	9400.432	1.00	3.37	10.308	10.9	108.9	NO	15.956	NO
6	6	PFPeS	349.1>80.1	2114.221	1757.272	1.00	3.59	15.039	9.0	90.0	NO	1.469	NO
7	36	13C3-PFBA	216.1 > 171.8	6755.113	8527.464	1.00	1.25	9.902	12.6	100.6	NO		
8	37	13C3-PFPeA	266. > 221.8	13565.366	25112.967	1.00	2.47	6.752	12.1	97.2	NO		
9	38	13C3-PFBS	302. > 98.8	1757.272	3191.469	1.00	2.81	6.883	12.8	102.5	NO		
10	39	13C2-4:2 FTS	329.2>308.9	4459.432	3191.469	1.00	3.28	17.466	11.8	94.5	NO		
11	40	13C2-PFHxA	315 > 270	9400.432	25112.967	1.00	3.37	4.679	4.7	94.7	NO		
12	38	13C3-PFBS	302. > 98.8	1757.272	3191.469	1.00	2.81	6.883	12.8	102.5	NO		
13	-1												
14	10	6:2 FTS	427.1 > 407	4605.992	4866.180	1.00	4.47	11.832	9.5	94.9	NO	2.889	NO
15	7	PFHpA	363.0 > 318.9	14161.893	13335.422	1.00	4.03	13.275	10.1	100.8	NO	13.955	NO
16	8	L-PFHxS	398.9 > 79.6	2162.868	1387.085	1.00	4.17	19.491	10.0	100.2	NO	1.736	NO
17	11	L-PFOA	412.8 > 368.9	26048.725	21999.895	1.00	4.52	14.800	10.8	107.9	NO	3.312	NO
18	13	PFHpS	449 > 80.0	2484.088	3481.192	1.00	4.63	8.920	9.5	95.1	NO	1.889	NO
19	14	PFNA	463.0 > 418.8	21775.484	21647.838	1.00	4.95	12.574	10.0	100.3	NO	4.687	NO
20	43	13C2-6:2 FTS	429.1 > 408.9	4866.180	3201.922	1.00	4.47	18.997	12.2	97.2	NO		
21	41	13C4-PFHpA	367.2 > 321.8	13335.422	25112.967	1.00	4.03	6.638	12.4	99.0	NO		
22	42	18O2-PFHxS	403.0 > 102.6	1387.085	3191.469	1.00	4.17	5.433	12.1	97.0	NO		
23	44	13C2-PFOA	414.9 > 369.7	21999.895	29368.645	1.00	4.52	9.364	12.4	99.2	NO		
24	47	13C8-PFOS	507.0 > 79.9	3481.192	3201.922	1.00	5.03	13.590	13.0	104.4	NO		
25	45	13C5-PFNA	468.2 > 422.9	21647.838	21297.207	1.00	4.95	12.706	12.8	102.6	NO		
26	-1												
27	15	PFOSA	497.9 > 77.9	2450.302	2482.326	1.00	4.99	12.339	10.8	108.4	NO	22.816	NO
28	16	L-PFOS	498.9 > 79.9	2884.358	3481.192	1.00	5.03	10.357	9.4	94.2	NO	1.878	NO
29	18	PFDA	513 > 468.8	22482.363	20471.270	1.00	5.33	13.728	10.4	104.4	NO	5.453	NO
30	19	8:2 FTS	527 > 506.9	4350.170	3537.528	1.00	5.29	15.372	10.2	101.7	NO	2.420	NO
31	20	PFNS	549.1 > 80.1	2061.916	3481.192	1.00	5.39	7.404	9.7	96.5	NO	1.686	NO
32	21	L-MeFOSAA	570 > 419	9799.923	3489.177	1.00	5.48	35.108	12.1	120.8	NO	2.899	NO
33	46	13C8-PFOSA	506.1 > 77.7	2482.326	27217.928	1.00	4.99	1.140	11.7	93.9	NO		
34	47	13C8-PFOS	507.0 > 79.9	3481.192	3201.922	1.00	5.03	13.590	13.0	104.4	NO		
35	48	13C2-PFDA	515.1 > 469.9	20471.270	22865.025	1.00	5.33	11.191	12.4	99.2	NO		
36	49	13C2-8:2 FTS	529.1 > 508.7	3537.528	3201.922	1.00	5.29	13.810	11.7	93.8	NO		

J Cell 11/26/18

AD 11/26/18

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-ICV.qld

Last Altered: Monday, November 26, 2018 14:55:41 Pacific Standard Time
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(A) Not present in ICV -AD 11/26/18

Name: 181126M1_13, Date: 26-Nov-2018, Time: 13:42:34, ID: ICV181126M2-1 PFC ICV 18K1911, Description: PFC ICV 18K1911

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
37	47	13C8-PFOS	507.0 > 79.9	3481.192	3201.922	1.00	5.03	13.590	13.0	104.4	NO		
38	50	d3-N-MeFOSAA	573.3 > 419	3489.177	27217.928	1.00	5.48	1.602	11.9	95.2	NO		
39	-1												
40	23	L-EtFOSAA	584.1 > 419	8204.304	4919.687	1.00	5.64	20.846	12.9	128.6	NO	1.609	NO
41	27	PFDoA	612.9 > 569.0	22903.582	24200.867	1.00	5.93	11.830	10.1	101.4	NO	8.422	NO
42	26	PFDS	598.8 > 79.9	2813.984	3481.192	1.00	5.70	10.104	9.6	96.3	NO	1.635	NO
43	25	PFUdA	563.0 > 518.9	19763.930	25231.500	1.00	5.65	9.791	10.0	100.4	NO	9.299	NO
44	28	N-MeFOSA	512.1 > 168.9		10839.260	1.00				(A)	NO		
45	29	PFTrDA	662.9 > 618.9	22992.322	24200.867	1.00	6.18	11.876	10.2	102.2	NO	24.625	NO
46	52	d5-N-EtFOSAA	589.3 > 419	4919.687	27217.928	1.00	5.63	2.259	12.2	97.6	NO		
47	53	13C2-PFDoA	615.0 > 569.7	24200.867	22865.025	1.00	5.93	13.230	12.6	101.1	NO		
48	47	13C8-PFOS	507.0 > 79.9	3481.192	3201.922	1.00	5.03	13.590	13.0	104.4	NO		
49	51	13C2-PFUdA	565 > 519.8	25231.500	27217.928	1.00	5.65	11.588	12.1	96.8	NO		
50	54	d3-N-MeFOSA	515.2 > 168.9	10839.260	27217.928	1.00	5.98	4.978	135.6	90.4	NO		
51	53	13C2-PFDoA	615.0 > 569.7	24200.867	22865.025	1.00	5.93	13.230	12.6	101.1	NO		
52	-1												
53	30	PFTeDA	713.0 > 669.0	20084.904	14715.695	1.00	6.40	17.061	10.4	104.4	NO	13.106	NO
54	31	N-EtFOSA	526.1 > 168.9		18693.453	1.00				(A)	NO		
55	32	PFHxDA	813.1 > 768.6		7897.161	1.00					NO		
56	33	PFODA	913.1 > 868.8		7897.161	1.00					NO		
57	34	N-MeFOSE	616.1 > 58.9		9061.089	1.00					NO		
58	35	N-EtFOSE	630.1 > 58.9		8726.196	1.00					NO		
59	55	13C2-PFTeDA	715.1 > 669.7	14715.695	27217.928	1.00	6.40	6.758	11.9	95.4	NO		
60	56	d5-N-ETFOSA	531.1 > 168.9	18693.453	27217.928	1.00	6.45	8.585	147.2	98.1	NO		
61	57	13C2-PFHxDA	815 > 769.7	7897.161	27217.928	1.00	6.74	3.627	4.9	97.3	NO		
62	57	13C2-PFHxDA	815 > 769.7	7897.161	27217.928	1.00	6.74	3.627	4.9	97.3	NO		
63	58	d7-N-MeFOSE	623.1 > 58.9	9061.089	27217.928	1.00	6.68	4.161	131.5	87.7	NO		
64	59	d9-N-EtFOSE	639.2 > 58.8	8726.196	27217.928	1.00	6.83	4.008	134.4	89.6	NO		
65	-1												
66	60	13C4-PFBA	217. > 172	8527.464	8527.464	1.00	1.24	12.500	12.5	100.0	NO		
67	61	13C5-PFHxA	318 > 272.9	25112.967	25112.967	1.00	3.37	12.500	12.5	100.0	NO		
68	62	13C3-PFHxS	401.8 > 79.9	3191.469	3191.469	1.00	4.17	12.500	12.5	100.0	NO		
69	63	13C8-PFOA	420.9 > 376	29368.645	29368.645	1.00	4.52	12.500	12.5	100.0	NO		
70	64	13C9-PFNA	472.2 > 426.9	21297.207	21297.207	1.00	4.95	12.500	12.5	100.0	NO		
71	65	13C4-PFOS	503 > 79.9	3201.922	3201.922	1.00	5.03	12.500	12.5	100.0	NO		
72	66	13C6-PFDA	519.1 > 473.7	22865.025	22865.025	1.00	5.33	12.500	12.5	100.0	NO		

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-ICV.qld

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Name: 181126M1_13, Date: 26-Nov-2018, Time: 13:42:34, ID: ICV181126M2-1 PFC ICV 18K1911, Description: PFC ICV 18K1911

	#	Name	Trace	Area	IS Area	wt/vol	RT	Response	Conc.	%Rec	Recovery ...	Ion Ratio	Ratio Out?
73	67	13C7-PFUdA	570.1 > 524.8	27217.928	27217.928	1.00	5.65	12.500	12.5	100.0	NO		

Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-ICV.qld

Last Altered: Monday, November 26, 2018 14:55:41 Pacific Standard Time
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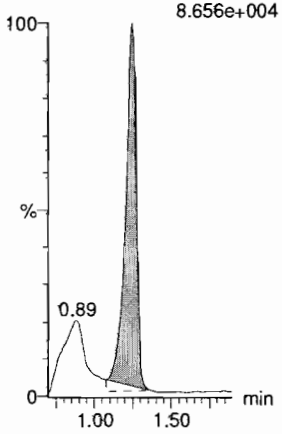
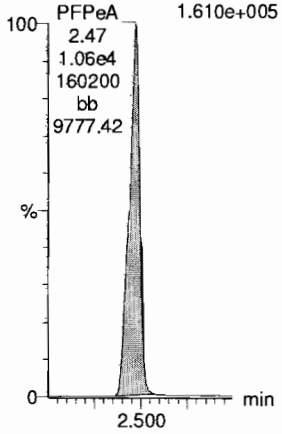
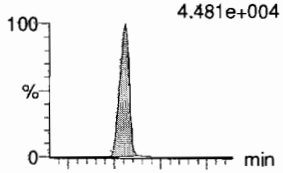
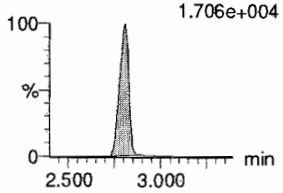
Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

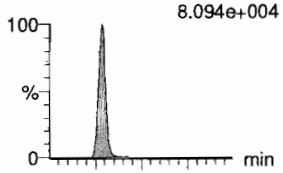
Name: 181126M1_13, Date: 26-Nov-2018, Time: 13:42:34, ID: ICV181126M2-1 PFC ICV 18K1911, Description: PFC ICV 18K1911

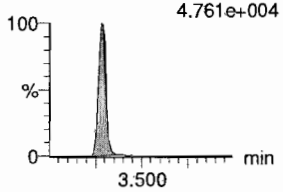
PFBA
F2:MRM of 1 channel,ES-
213.0 > 168.8
8.656e+004


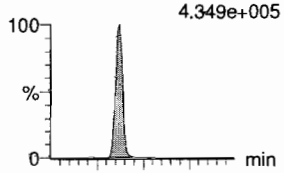
PFPeA
F5:MRM of 1 channel,ES-
263.1 > 218.9
1.610e+005


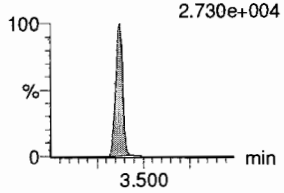
PFBS
F7:MRM of 2 channels,ES-
299.0 > 79.7
4.481e+004


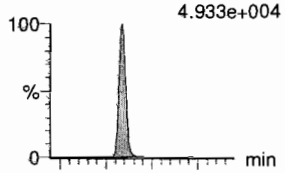
F7:MRM of 2 channels,ES-
299.0 > 99.0
1.706e+004


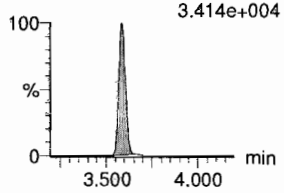
4:2 FTS
F12:MRM of 2 channels,ES-
327.2 > 307.2
8.094e+004


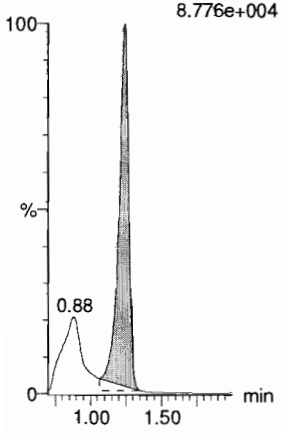
F12:MRM of 2 channels,ES-
327.2 > 81.1
4.761e+004


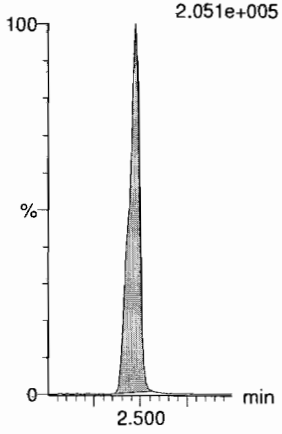
PFHxA
F9:MRM of 2 channels,ES-
313 > 269
4.349e+005


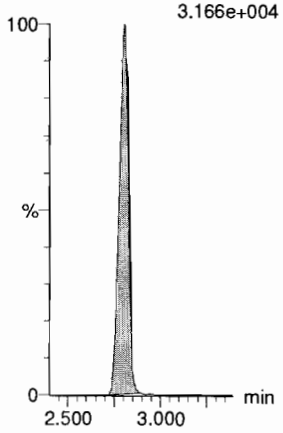
F9:MRM of 2 channels,ES-
313 > 118.9
2.730e+004


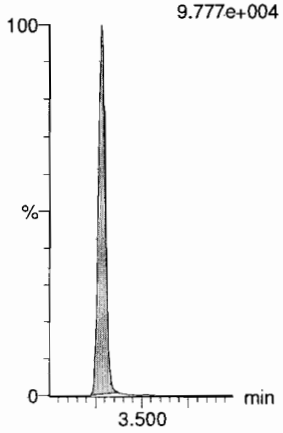
PFPeS
F15:MRM of 2 channels,ES-
349.1 > 80.1
4.933e+004


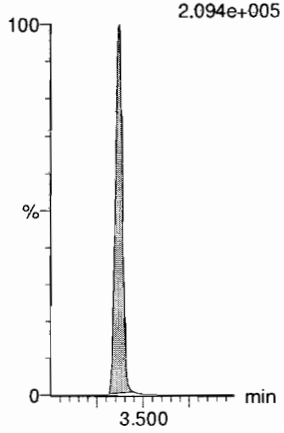
F15:MRM of 2 channels,ES-
349.1 > 99
3.414e+004


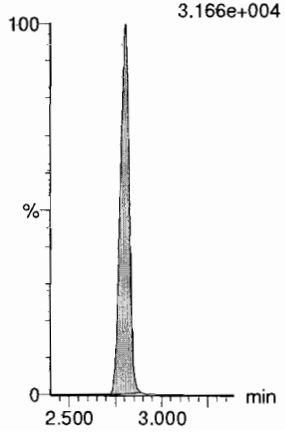
13C3-PFBA
F3:MRM of 1 channel,ES-
216.1 > 171.8
8.776e+004


13C3-PFPeA
F6:MRM of 1 channel,ES-
266. > 221.8
2.051e+005


13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.166e+004


13C2-4:2 FTS
F13:MRM of 1 channel,ES-
329.2 > 308.9
9.777e+004


13C2-PFHxA
F10:MRM of 1 channel,ES-
315 > 270
2.094e+005


13C3-PFBS
F8:MRM of 1 channel,ES-
302. > 98.8
3.166e+004


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Last Altered: Monday, November 26, 2018 14:55:41 Pacific Standard Time
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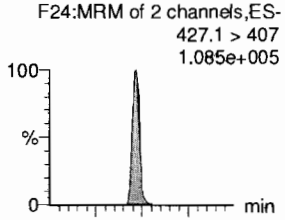
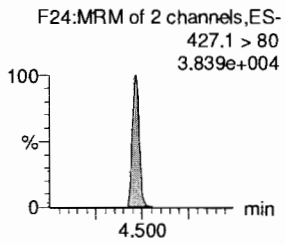
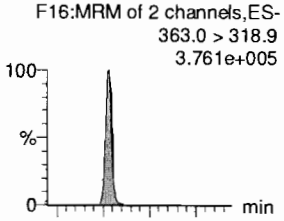
Name: 181126M1_13, Date: 26-Nov-2018, Time: 13:42:34, ID: ICV181126M2-1 PFC ICV 18K1911, Description: PFC ICV 18K1911

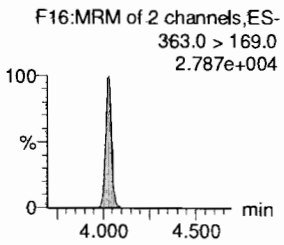
6:2 FTS



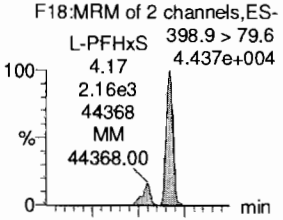


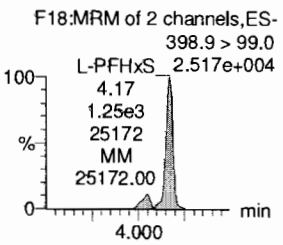
PFHpA



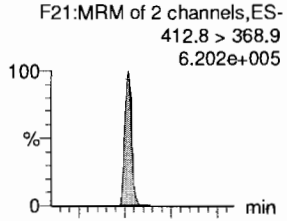


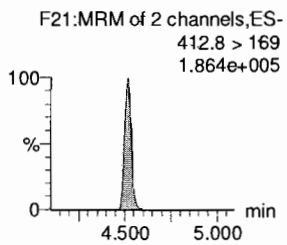
L-PFHxS



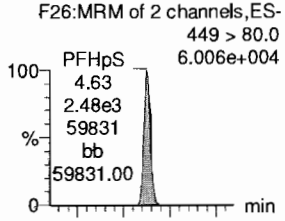


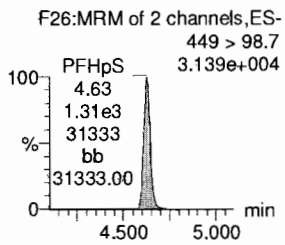
L-PFOA





PFHpS





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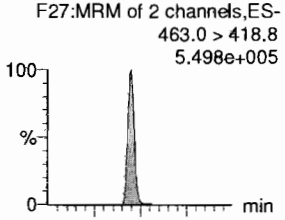
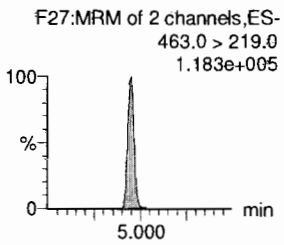
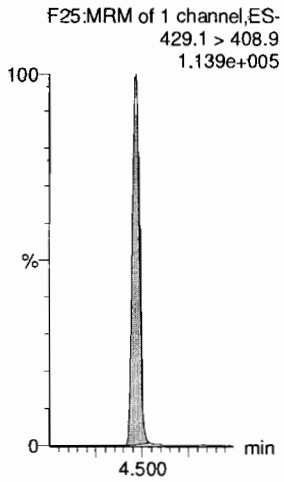
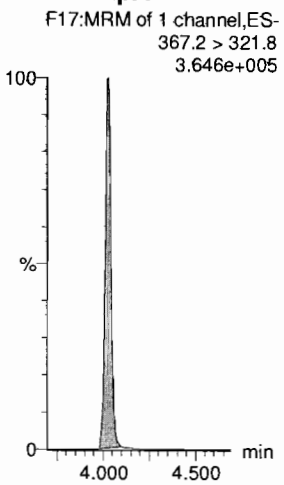




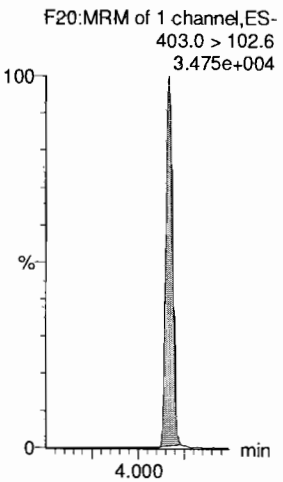
13C2-6:2 FTS



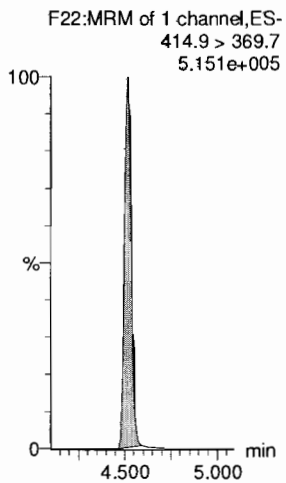
13C4-PFHpA



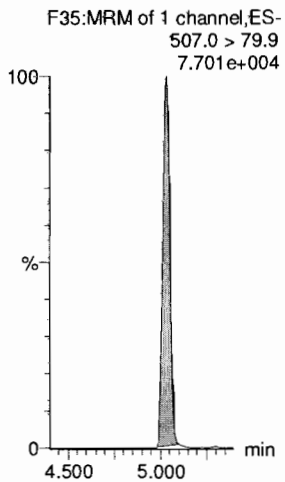
18O2-PFHxS



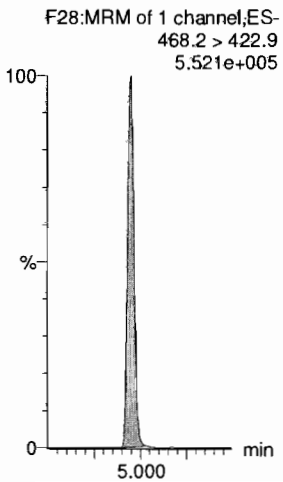
13C2-PFOA



13C8-PFOS



13C5-PFNA



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Last Altered: Monday, November 26, 2018 14:55:41 Pacific Standard Time
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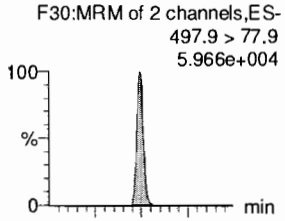
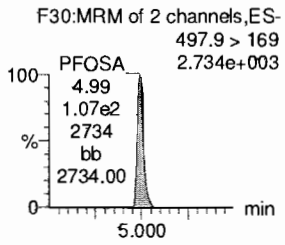
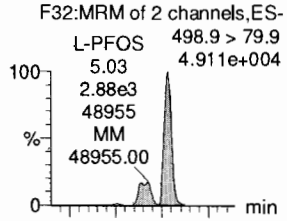
Name: 181126M1_13, Date: 26-Nov-2018, Time: 13:42:34, ID: ICV181126M2-1 PFC ICV 18K1911, Description: PFC ICV 18K1911

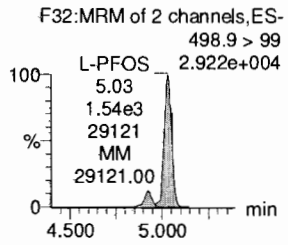
PFOSA



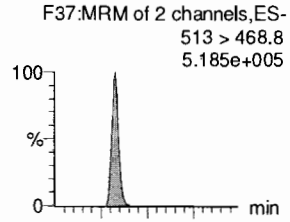


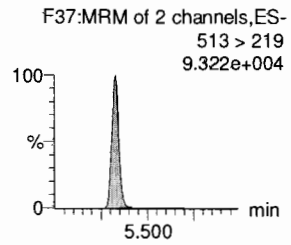
L-PFOS



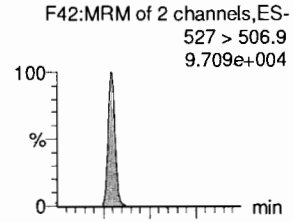


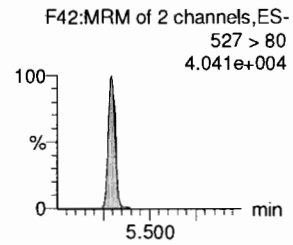
PFDA



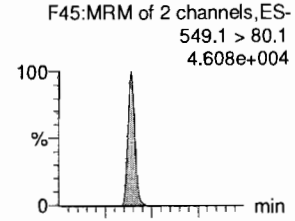


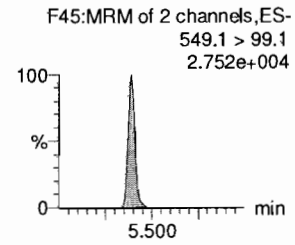
8:2 FTS



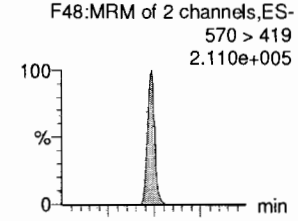


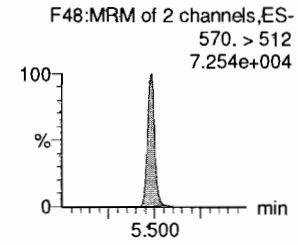
PFNS



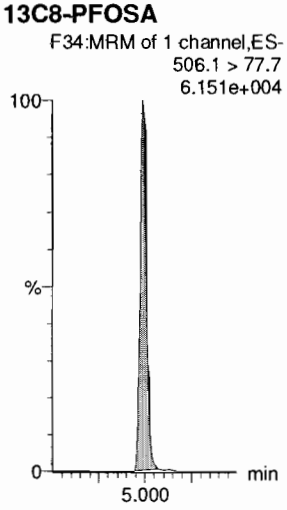


L-MeFOSAA

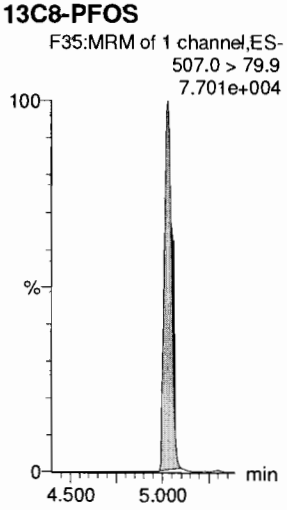




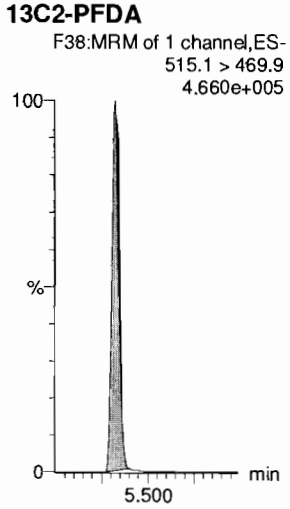
13C8-PFOSA



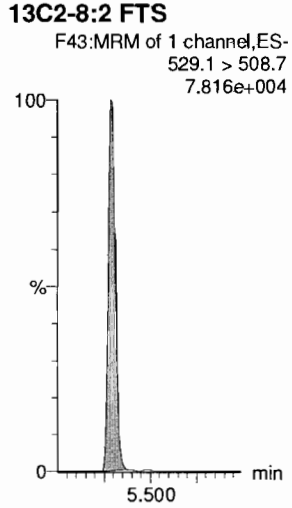
13C8-PFOS



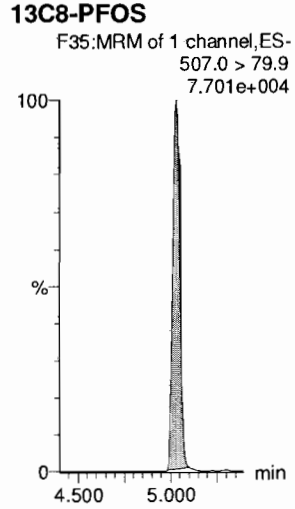
13C2-PFDA



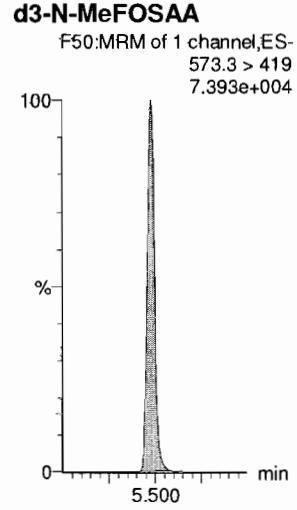
13C2-8:2 FTS



13C8-PFOS



d3-N-MeFOSAA



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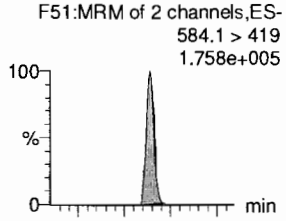
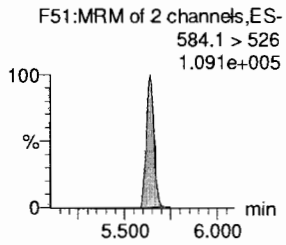
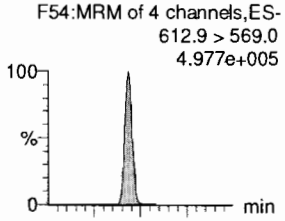
Name: 181126M1_13, Date: 26-Nov-2018, Time: 13:42:34, ID: ICV181126M2-1 PFC ICV 18K1911, Description: PFC ICV 18K1911

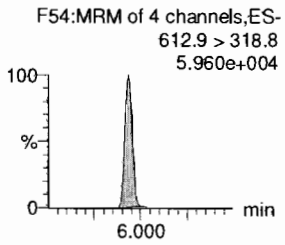
L-EtFOSAA



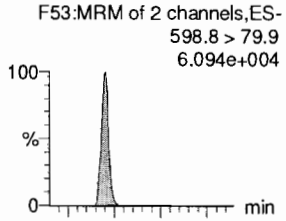


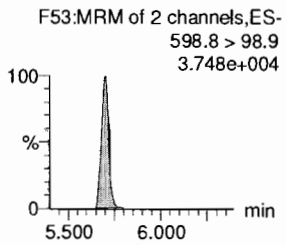
PFDoA





PFDS





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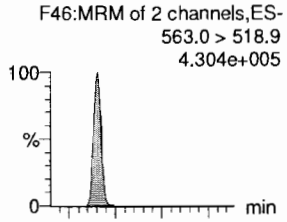
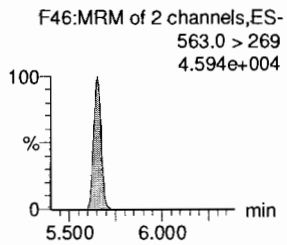
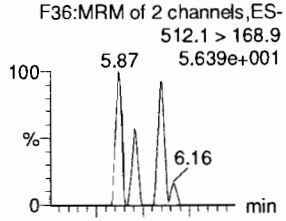
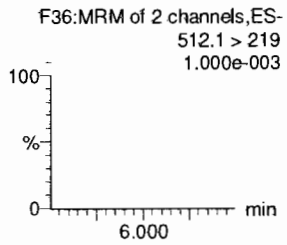


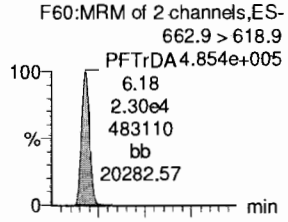


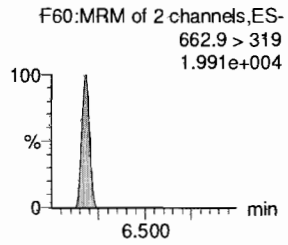
N-MeFOSA



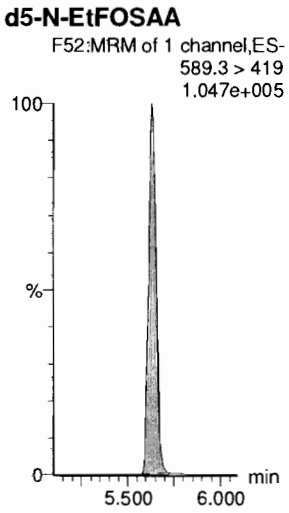


PFTrDA

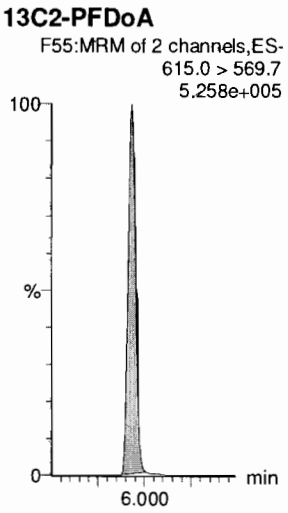




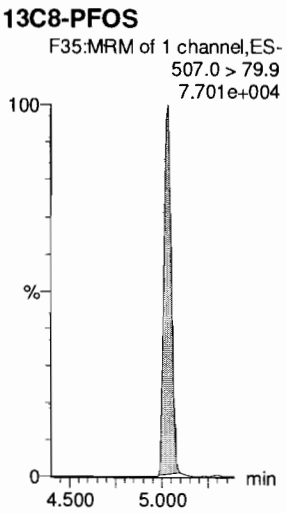
d5-N-EtFOSAA



13C2-PFDoA



13C8-PFOS



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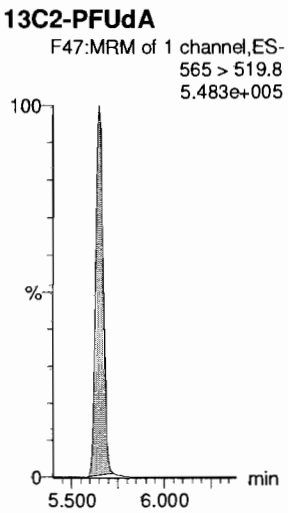

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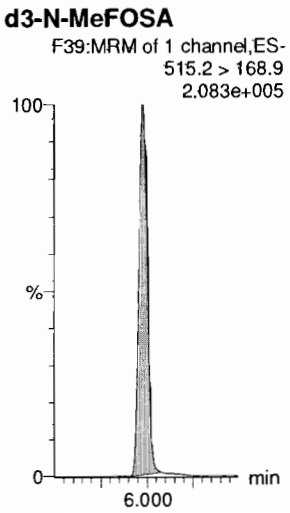
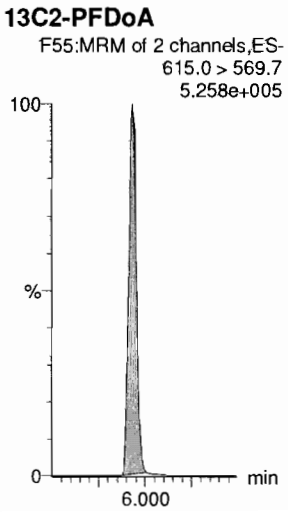


13C2-PFDoA



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Last Altered: Monday, November 26, 2018 14:55:41 Pacific Standard Time
Printed: Monday, November 26, 2018 14:56:11 Pacific Standard Time

Name: 181126M1_13, Date: 26-Nov-2018, Time: 13:42:34, ID: ICV181126M2-1 PFC ICV 18K1911, Description: PFC ICV 18K1911

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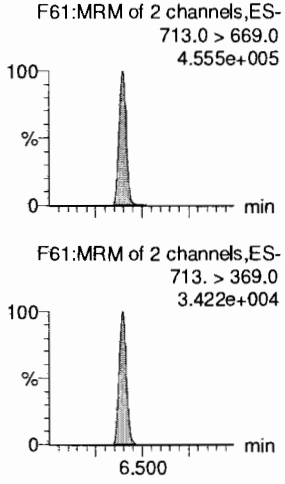

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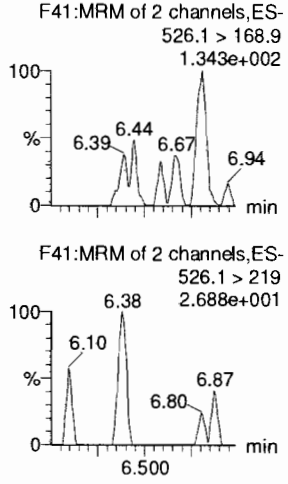

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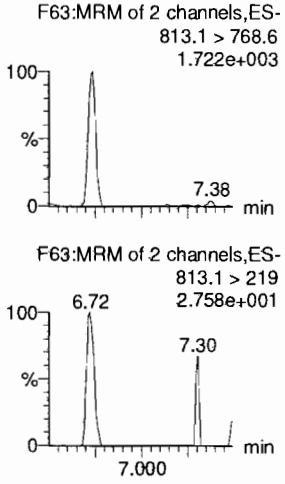
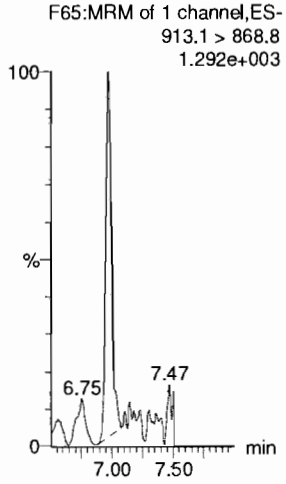


PFODA



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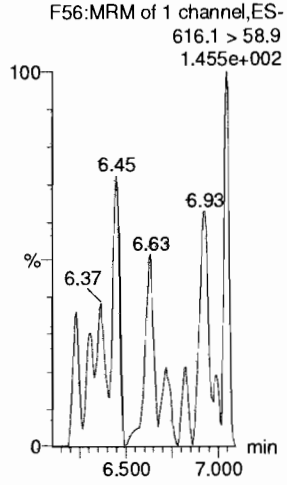

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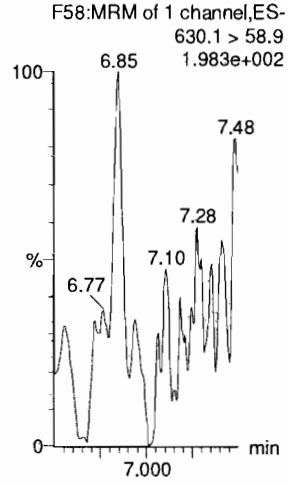

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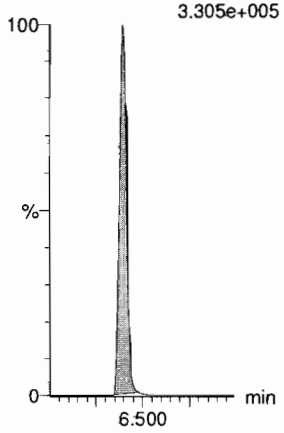
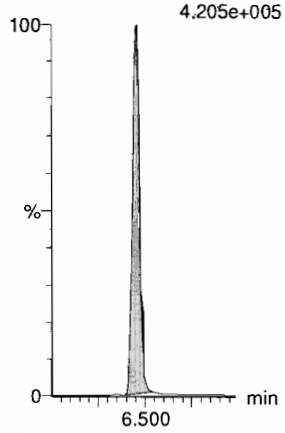


d5-N-ETFOSA



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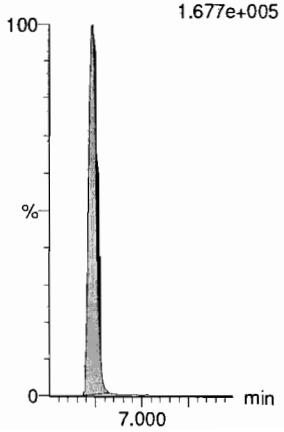

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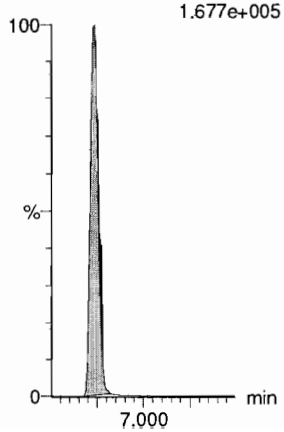

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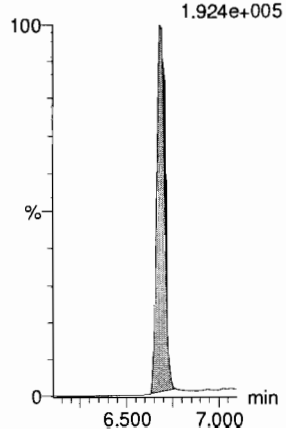

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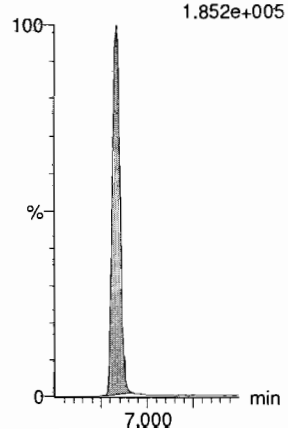
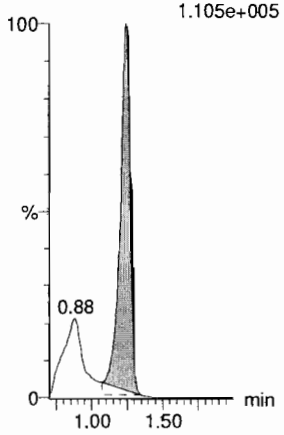


Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-ICV.qld

Last Altered: Monday, November 26, 2018 14:55:41 Pacific Standard Time
Printed: Monday, November 26, 2018 14:56:11 Pacific Standard Time

Name: 181126M1_13, Date: 26-Nov-2018, Time: 13:42:34, ID: ICV181126M2-1 PFC ICV 18K1911, Description: PFC ICV 18K1911

13C4-PFBA



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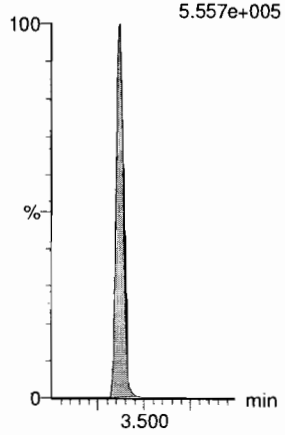
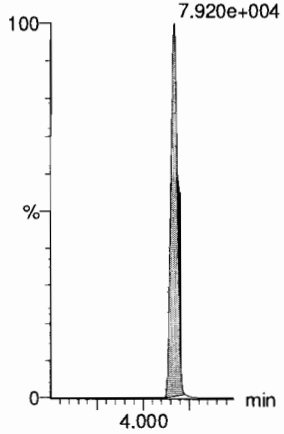


13C3-PFHxS



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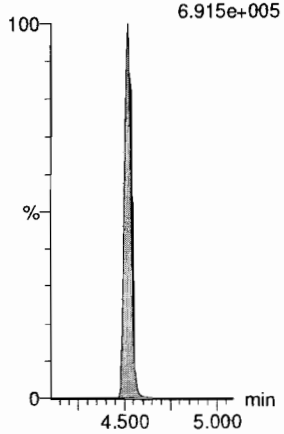
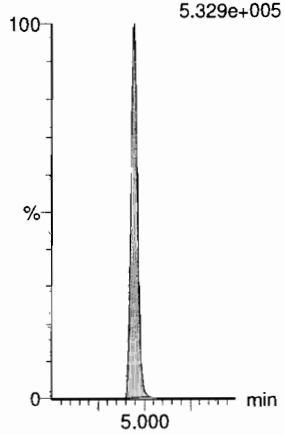
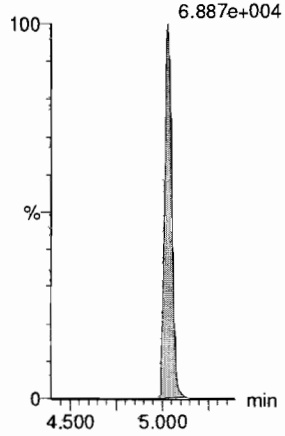


13C9-PFNA



13C4-PFOS



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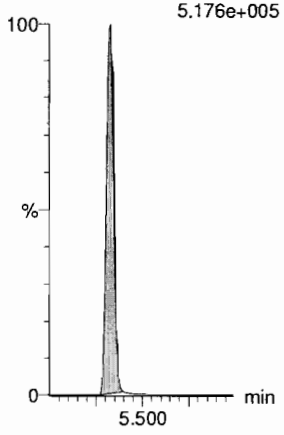
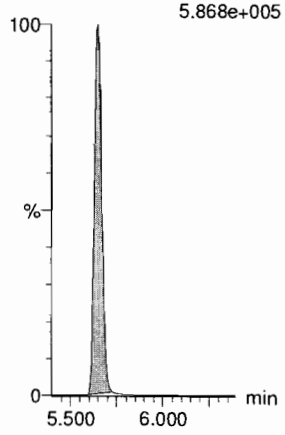


13C7-PFUdA



Vista Analytical Laboratory

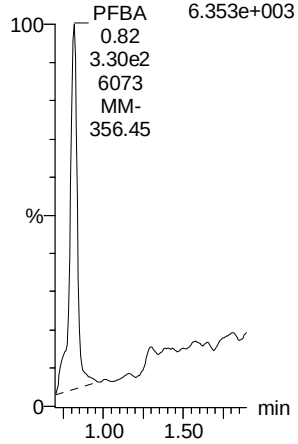
Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-IB.qld

Last Altered: Monday, November 26, 2018 14:38:52 Pacific Standard Time
Printed: Monday, November 26, 2018 14:39:16 Pacific Standard Time

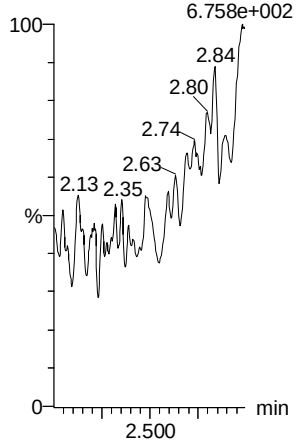
Method: F:\Projects\PFAS.PRO\MethDB\PFAS_FULL_80C_112618.mdb 26 Nov 2018 13:53:04
Calibration: F:\Projects\PFAS.PRO\CurveDB\C18_VAL-PFAS_Q4_11-26-18.cdb 26 Nov 2018 14:29:06

Name: 181126M1_12, Date: 26-Nov-2018, Time: 13:32:01, ID: IPA, Description: IPA

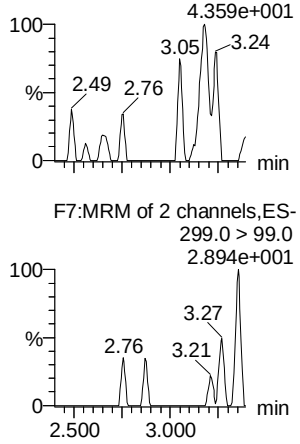
PFBA



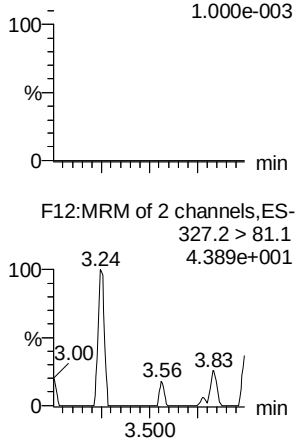
PFPeA



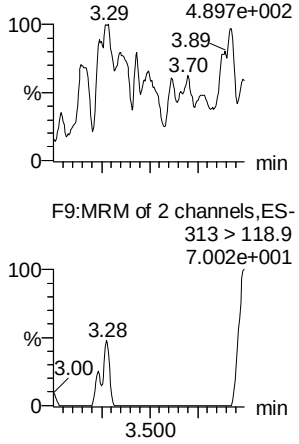
PFBS



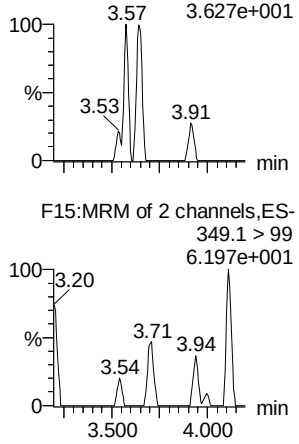
4:2 FTS



PFHxA



PFPeS



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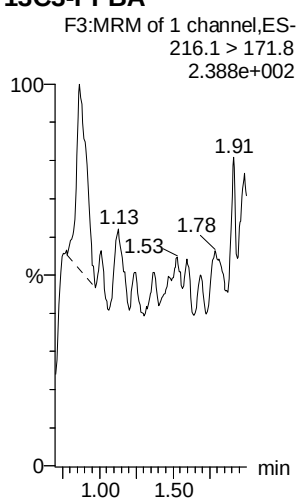

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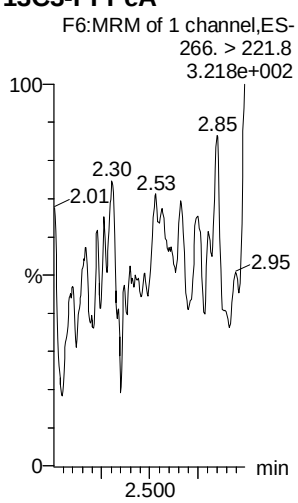
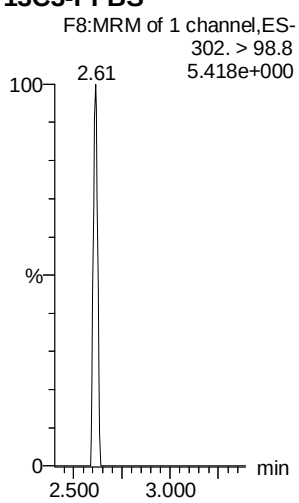
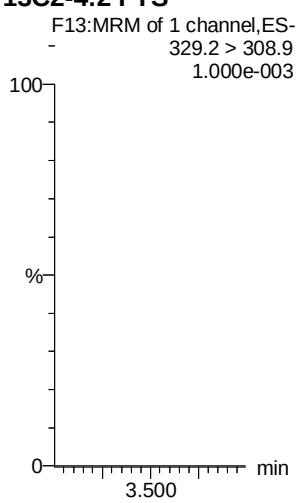


13C3-PFBS



13C2-4:2 FTS



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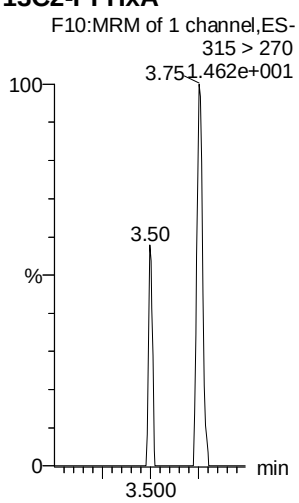
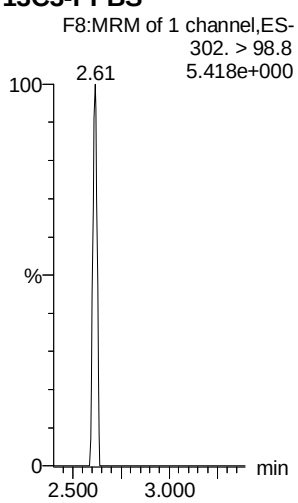


13C3-PFBS

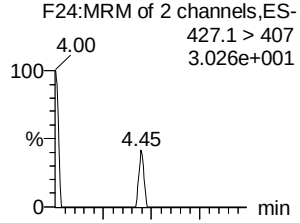


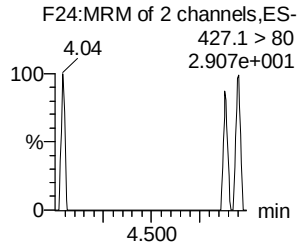
Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-IB.qld

Last Altered: Monday, November 26, 2018 14:38:52 Pacific Standard Time
Printed: Monday, November 26, 2018 14:39:16 Pacific Standard Time

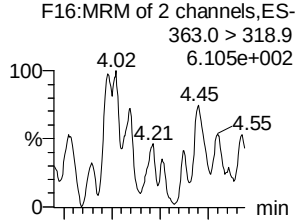
Name: 181126M1_12, Date: 26-Nov-2018, Time: 13:32:01, ID: IPA, Description: IPA

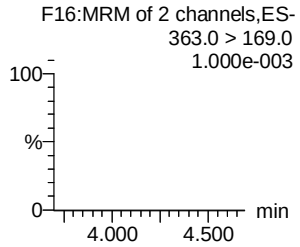
6:2 FTS



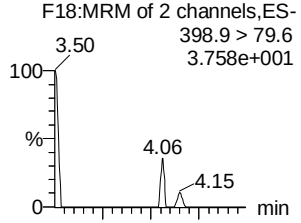


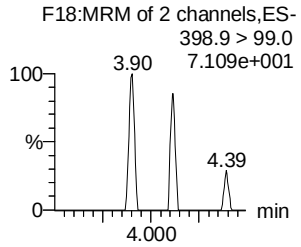
PFHpA





L-PFHxS





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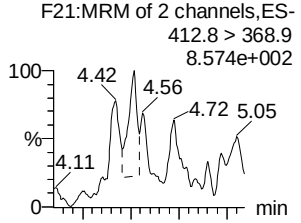

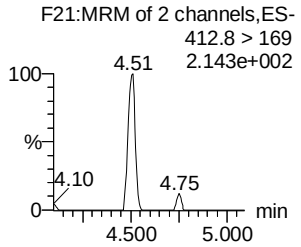

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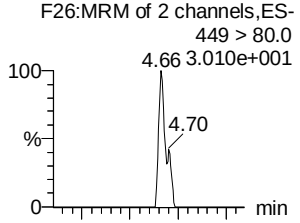

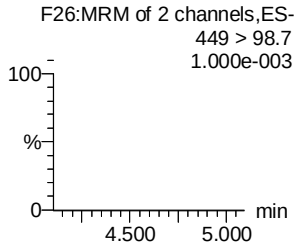

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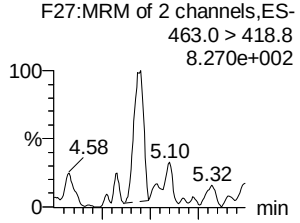
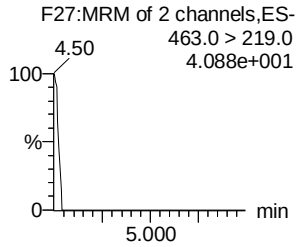
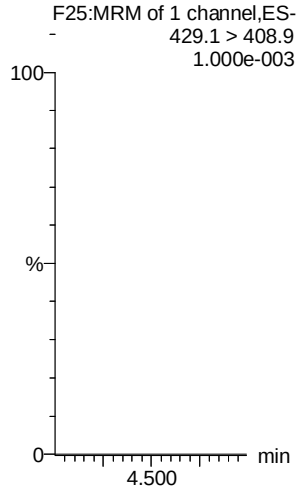




13C2-6:2 FTS



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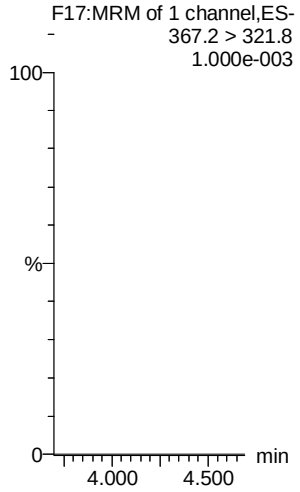

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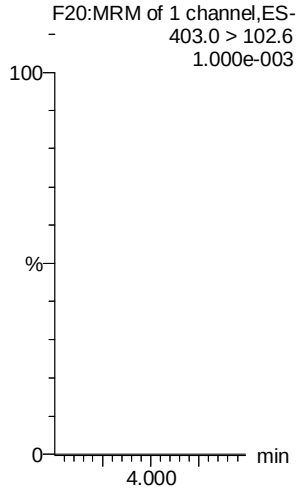

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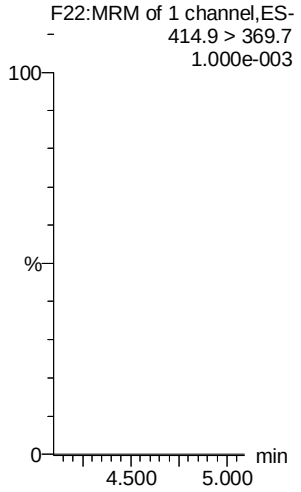

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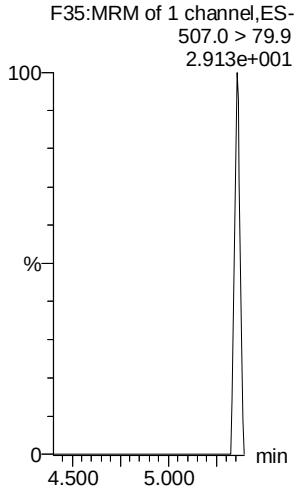

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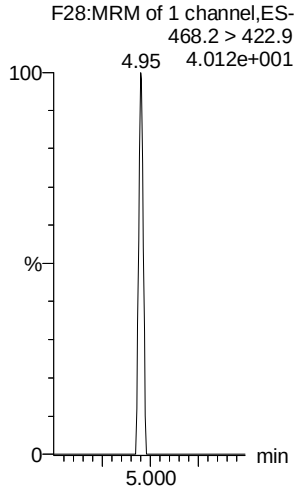

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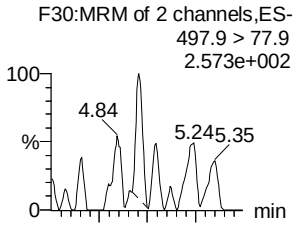

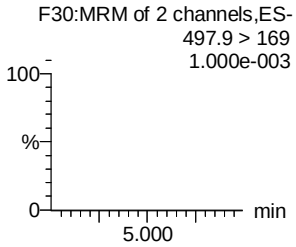

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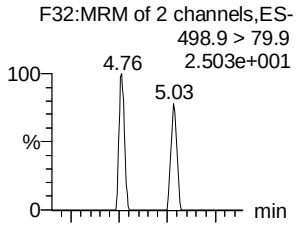

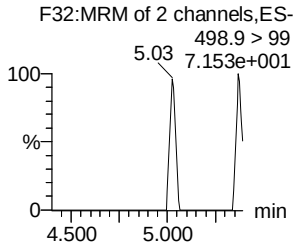

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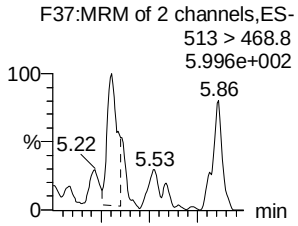

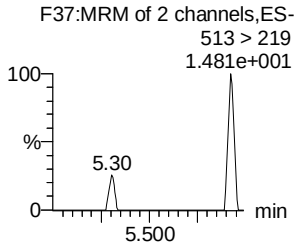

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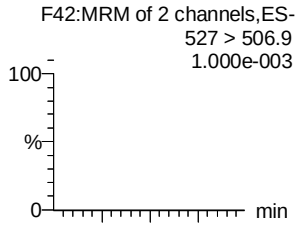

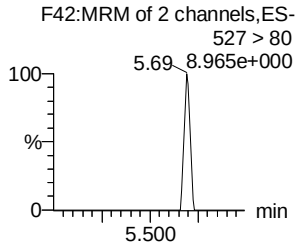

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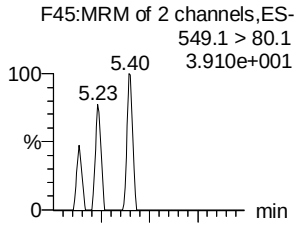

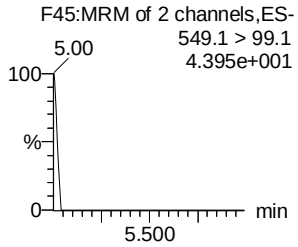

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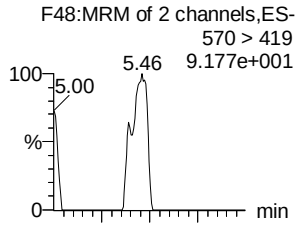

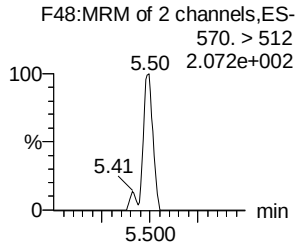

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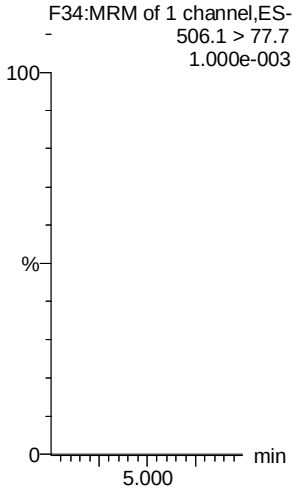

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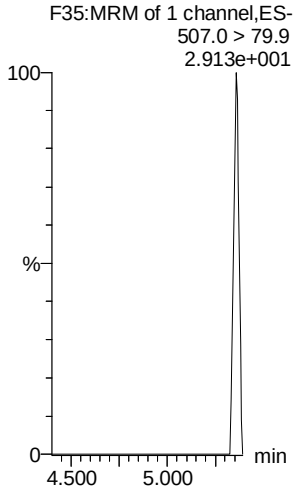

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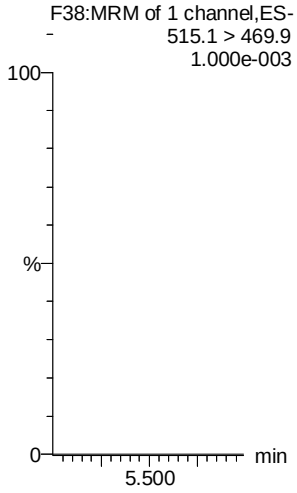
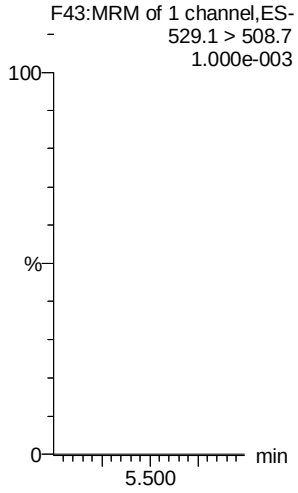


13C2-8:2 FTS



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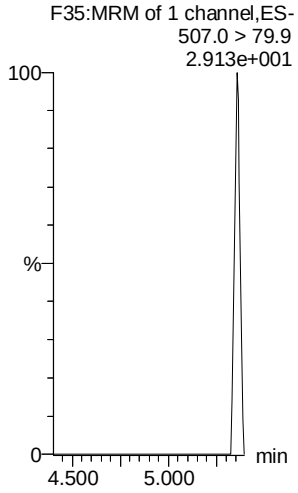

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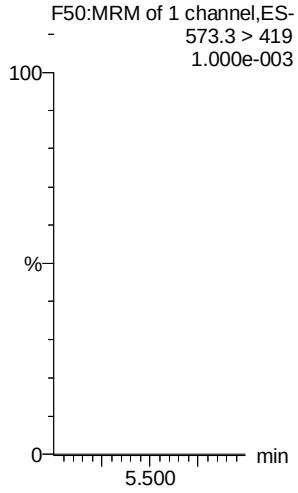

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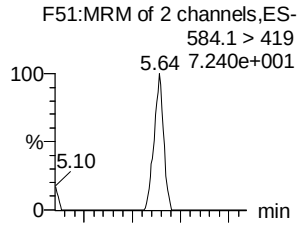

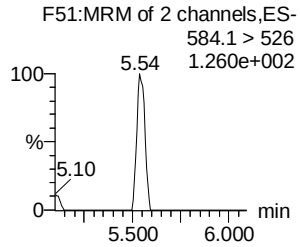

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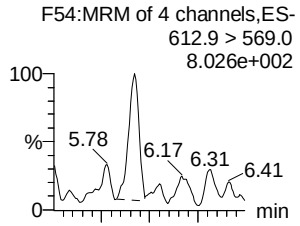

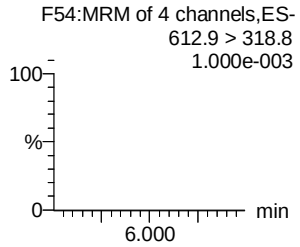

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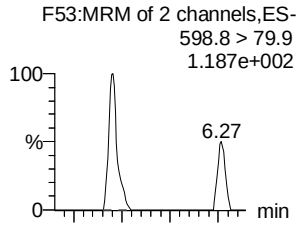

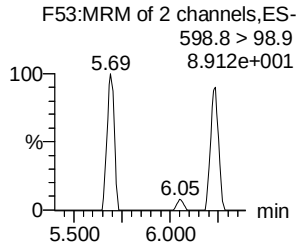

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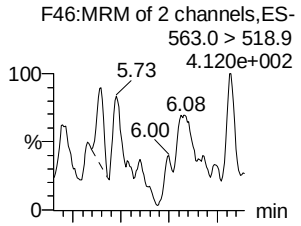

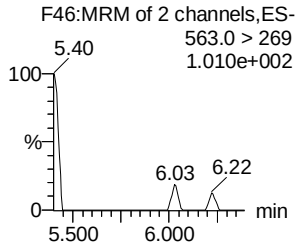

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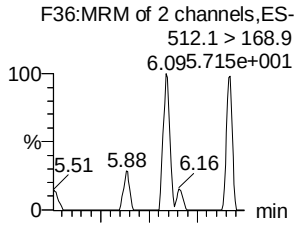

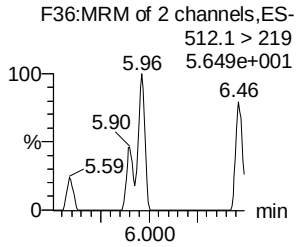

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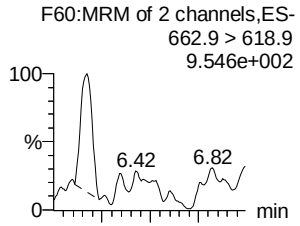

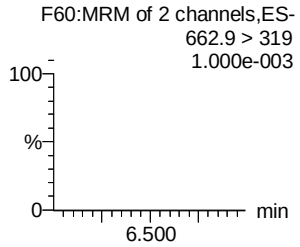

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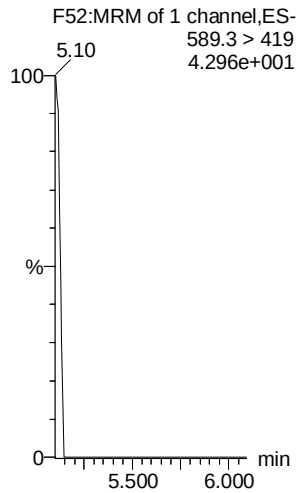

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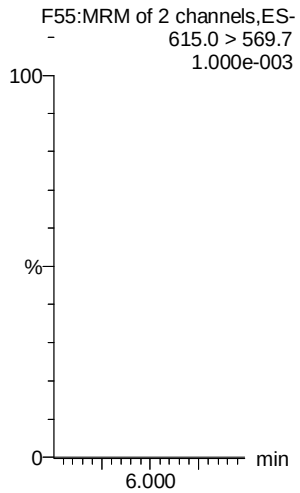

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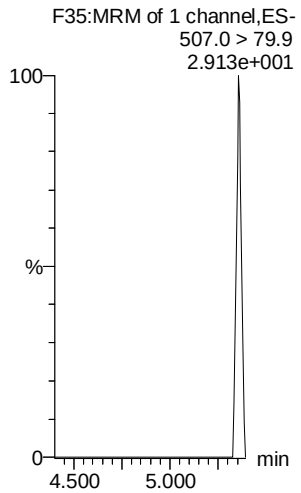

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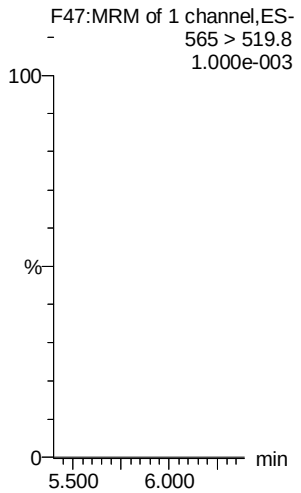

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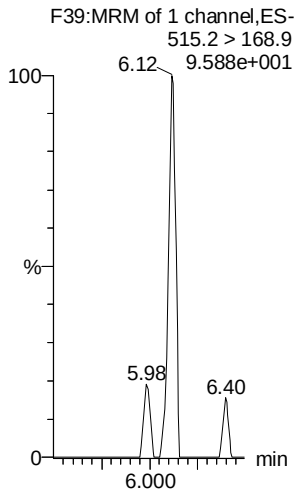

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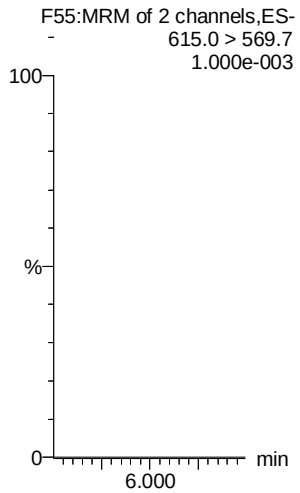

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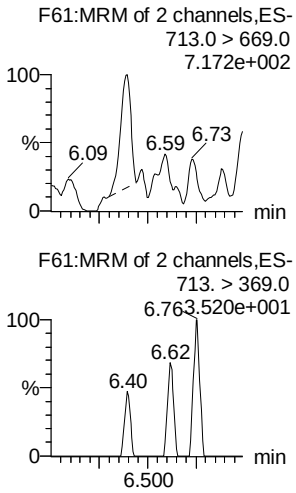

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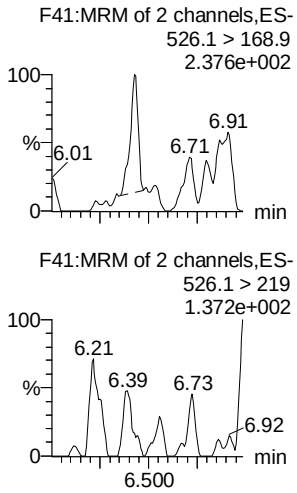

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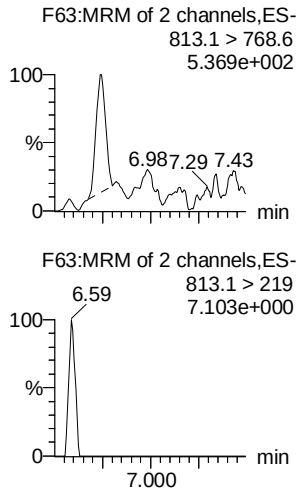
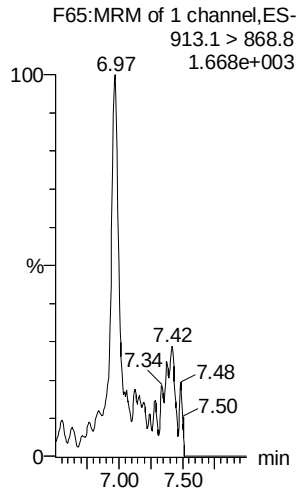
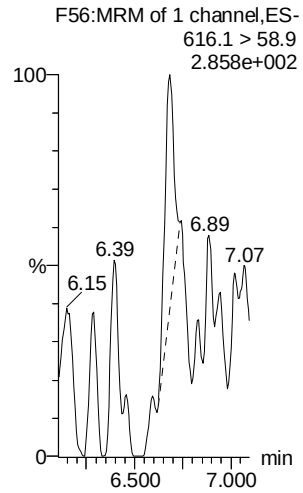


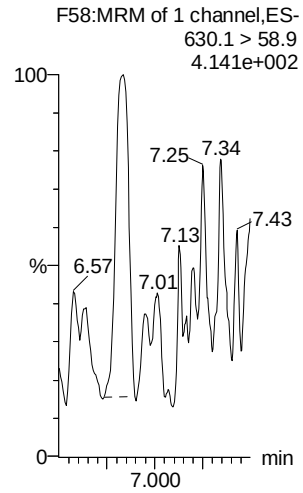
PFODA



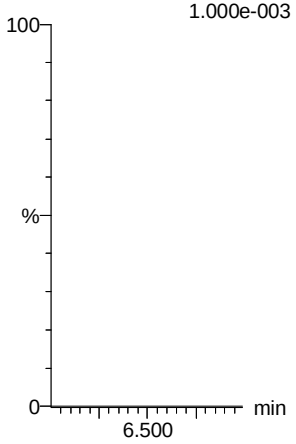
N-MeFOSE



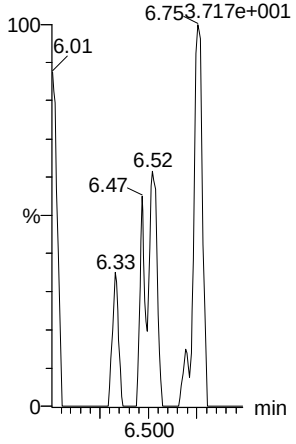
N-EtFOSE



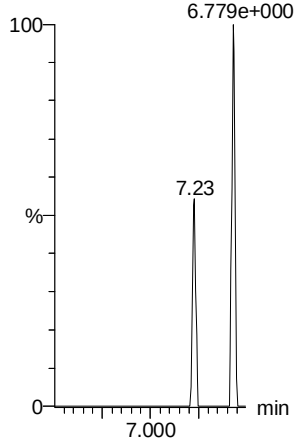
13C2-PFTeDA



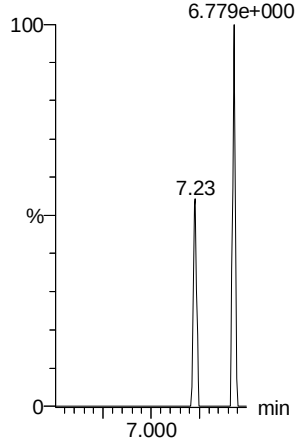
d5-N-ETFOSA



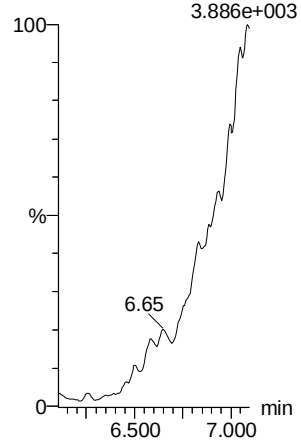
13C2-PFHxDA



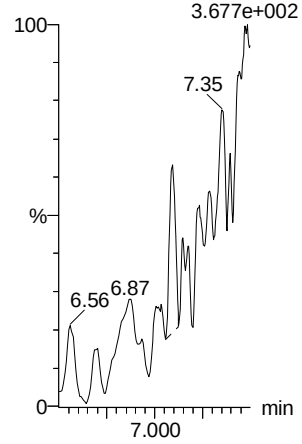
13C2-PFHxDA



d7-N-MeFOSE



d9-N-EtFOSE

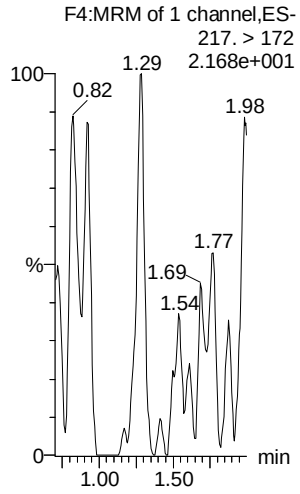


Dataset: F:\Projects\PFAS.PRO\Results\181126M1\181126M1-IB.qld

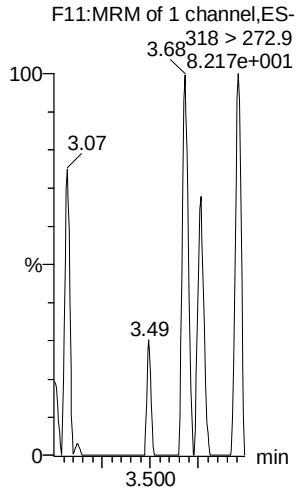
Last Altered: Monday, November 26, 2018 14:38:52 Pacific Standard Time
Printed: Monday, November 26, 2018 14:39:16 Pacific Standard Time

Name: 181126M1_12, Date: 26-Nov-2018, Time: 13:32:01, ID: IPA, Description: IPA

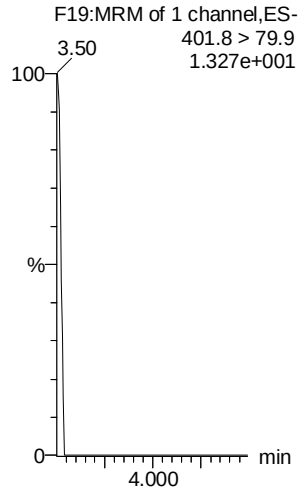
13C4-PFBA



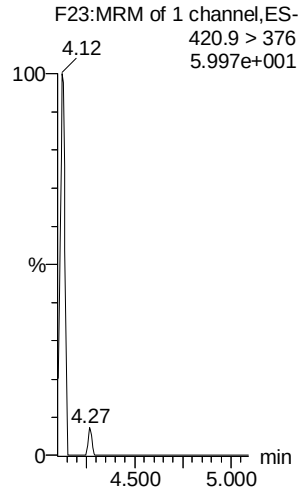
13C5-PFHxA



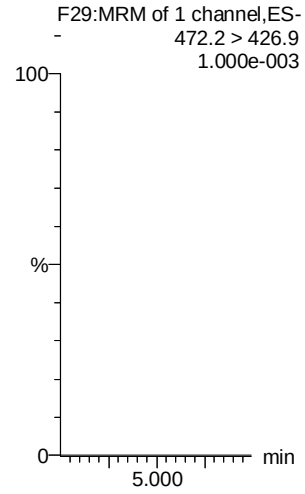
13C3-PFHxS



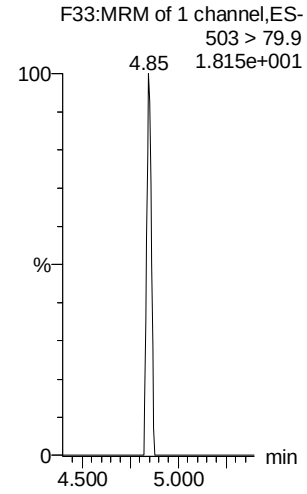
13C8-PFOA



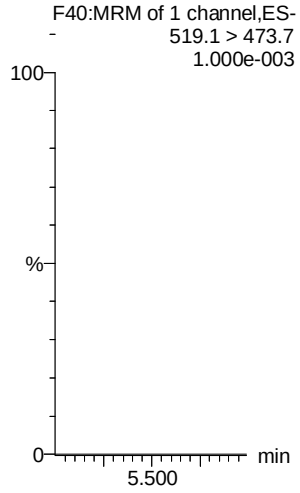
13C9-PFNA



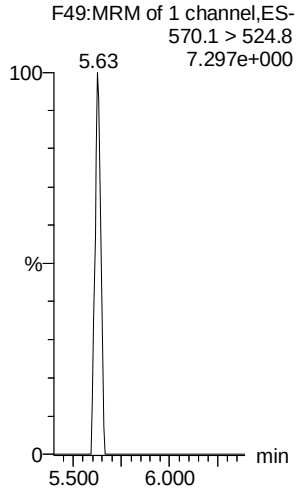
13C4-PFOS



13C6-PFDA



13C7-PFUdA



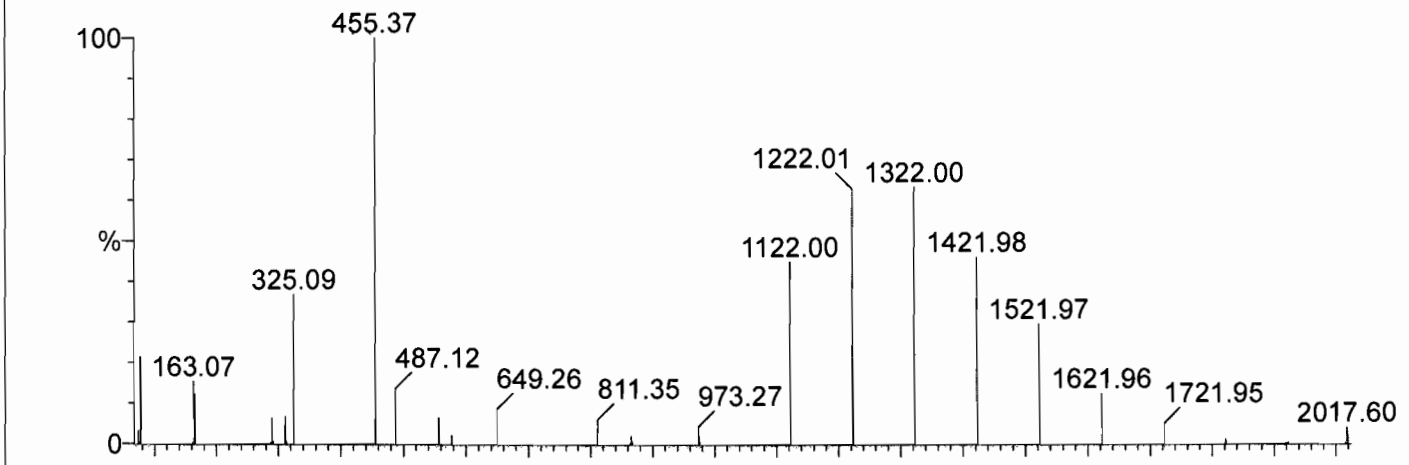
TUNE CHECKS

Tunecheck Q4 (M) 11-26-18

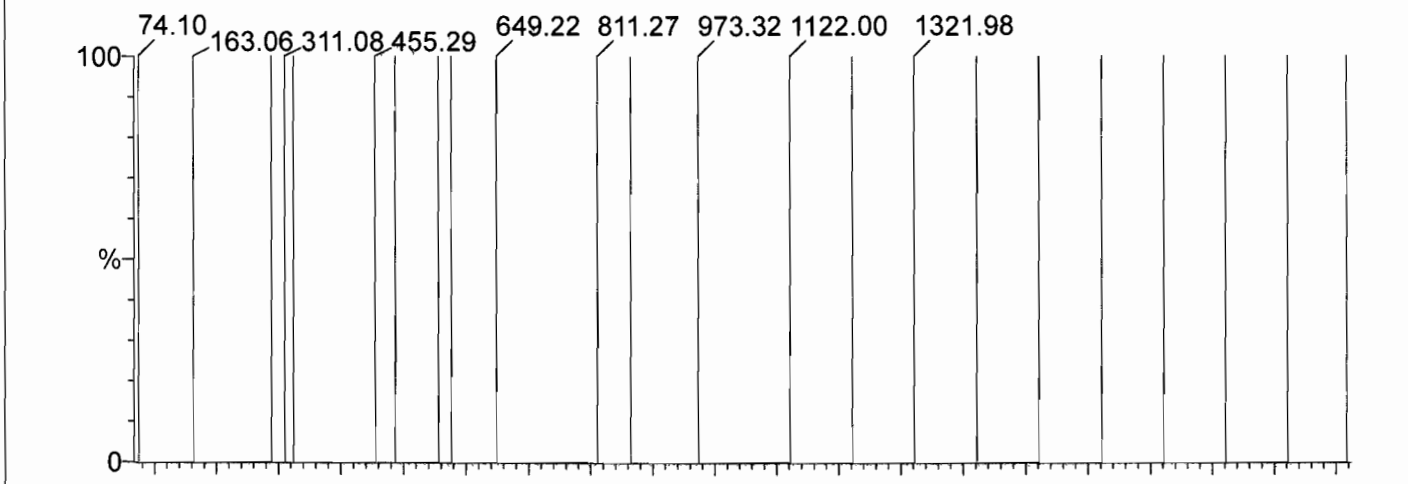
Calibration Report - MS1 Static 20181126-4

Printed: **Mon Nov 26 10:09:13 2018**

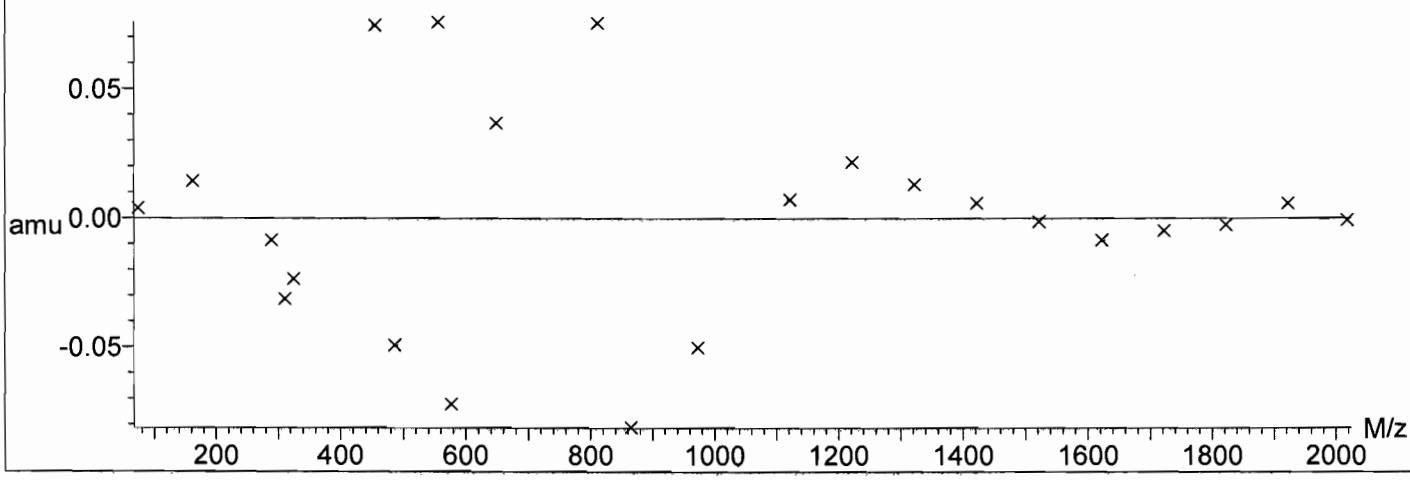
Data file: STATMS1 - Calibrated 23 matches of 23 tested references



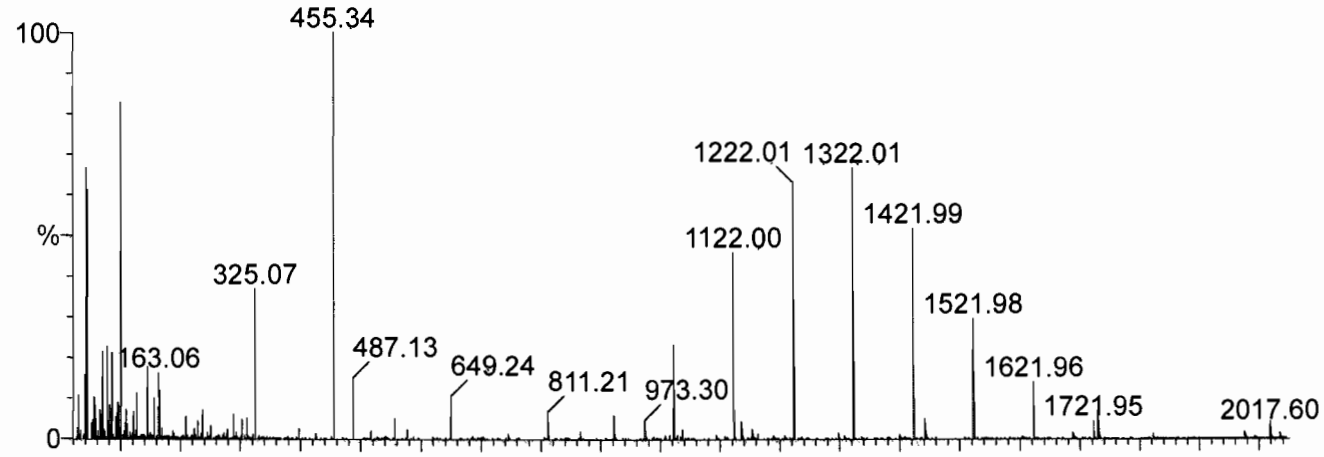
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0291 amu



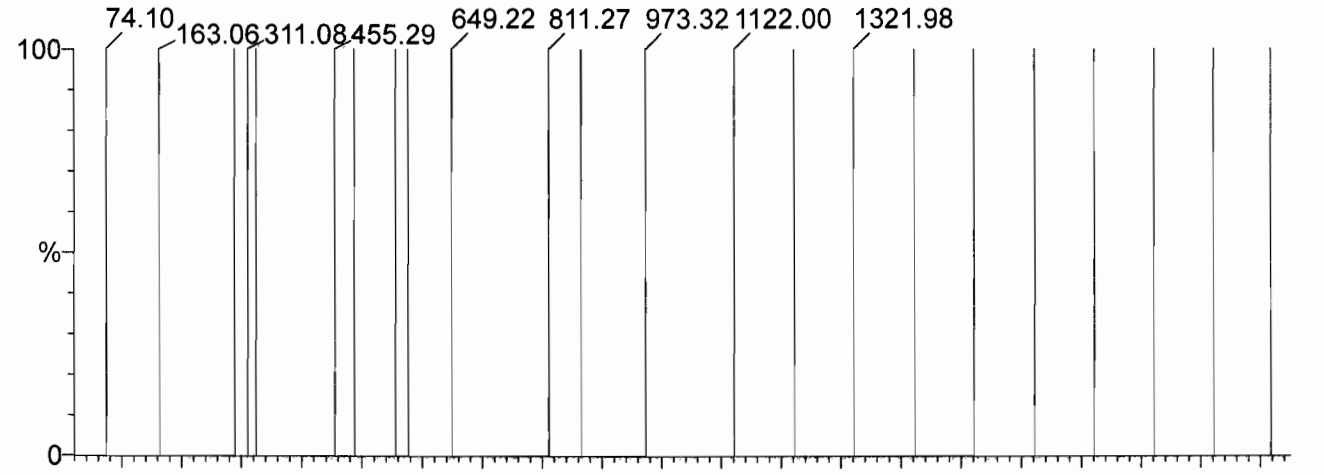
Residual Polynomial order = 4 RMS residual = 0.0405 amu



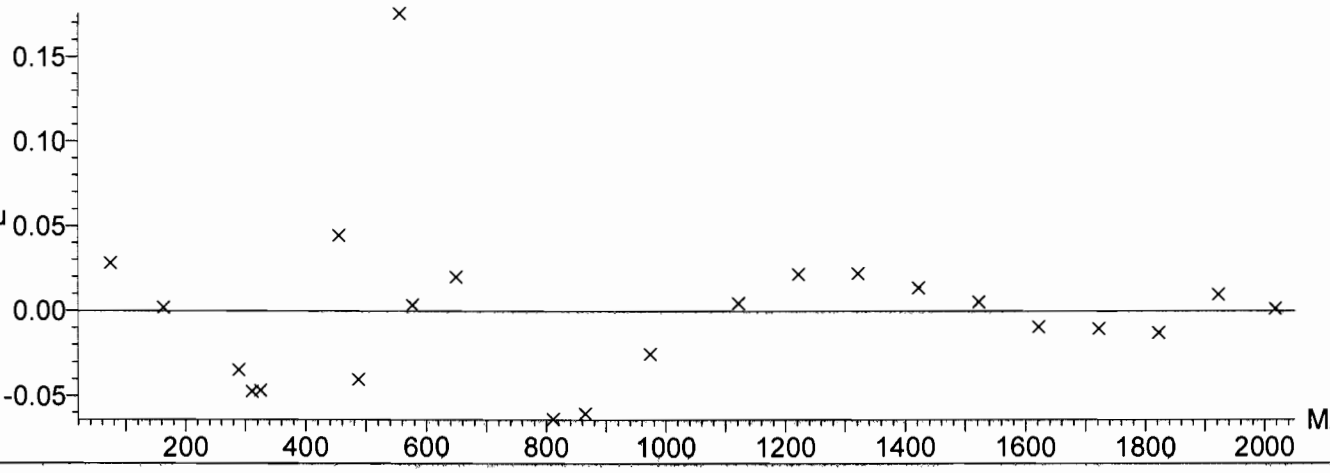
Data file: SCNMS1 - Calibrated 23 matches of 23 tested references



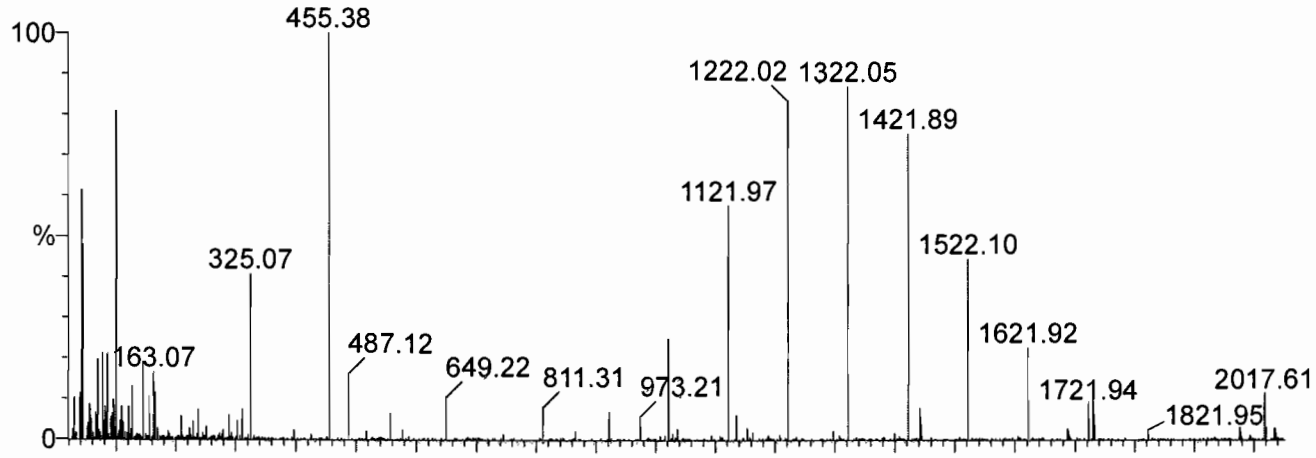
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0306 amu



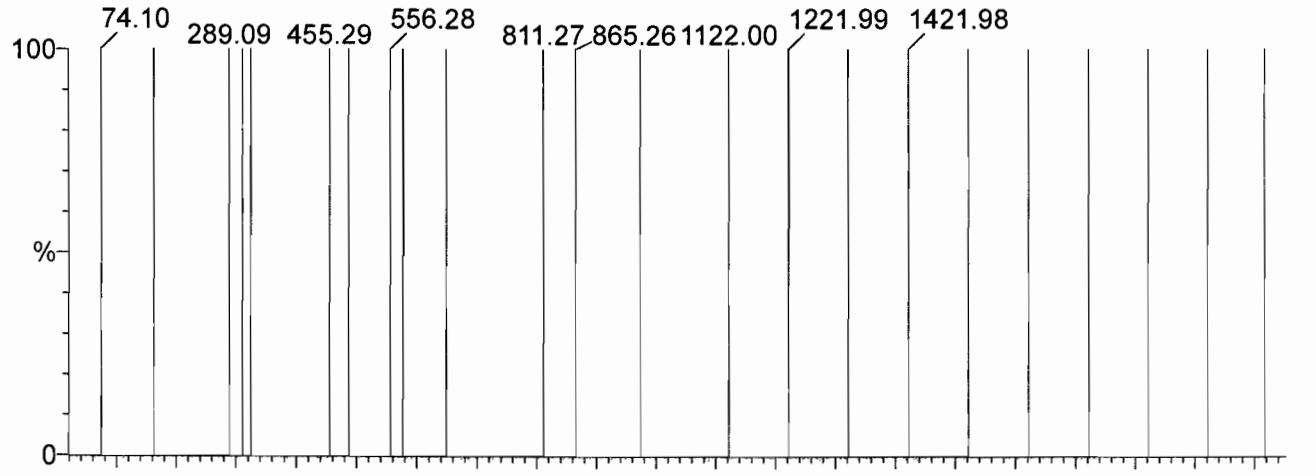
Residual Polynomial order = 4 RMS residual = 0.0472 amu



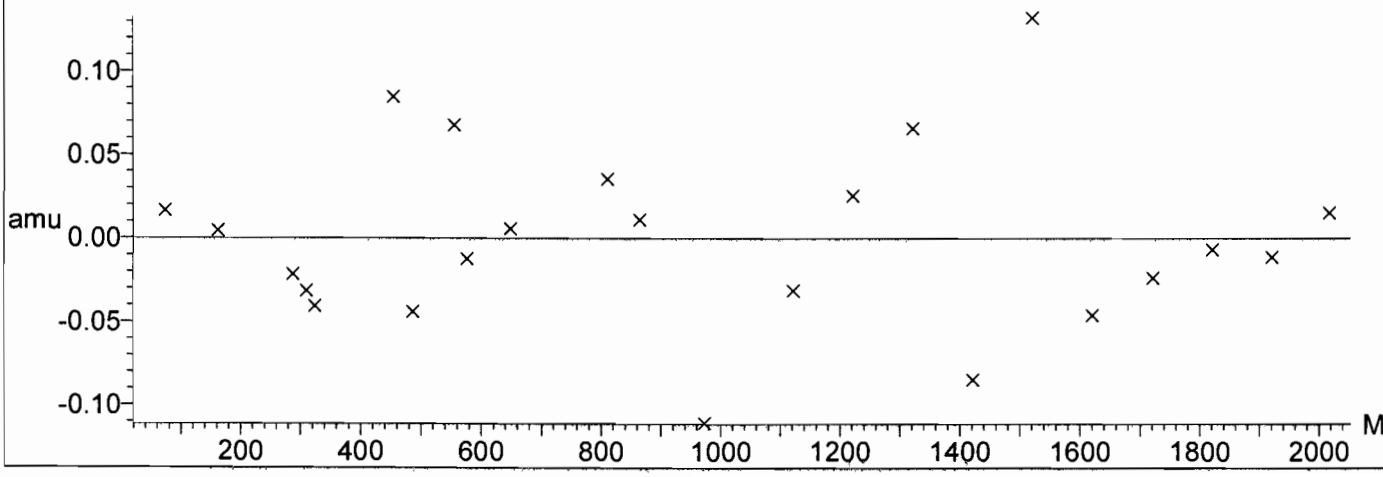
Data file: FASTMS1 - Calibrated 23 matches of 23 tested references



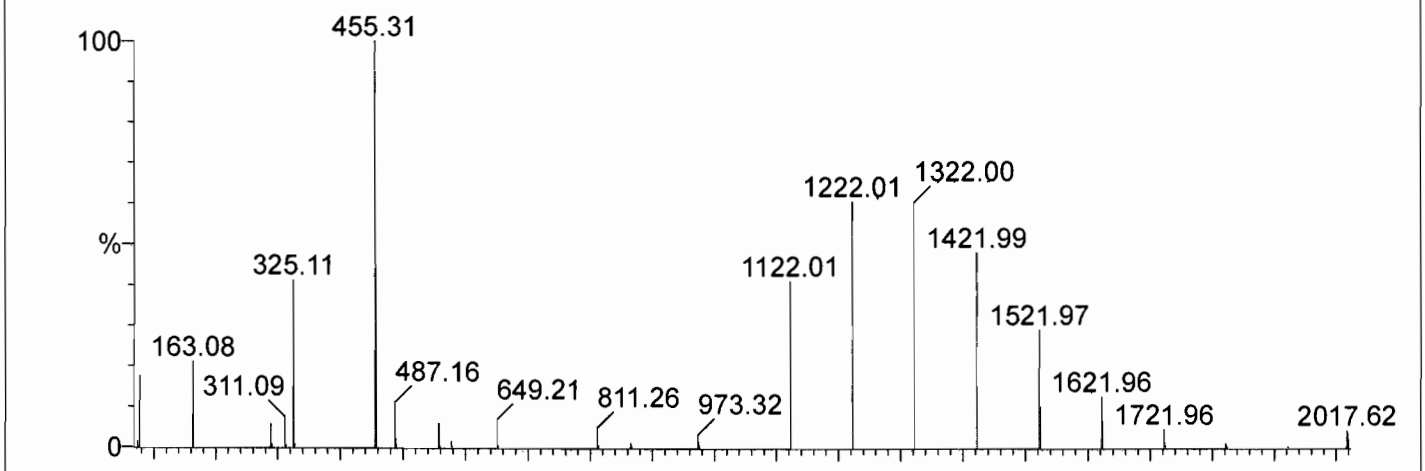
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0404 amu



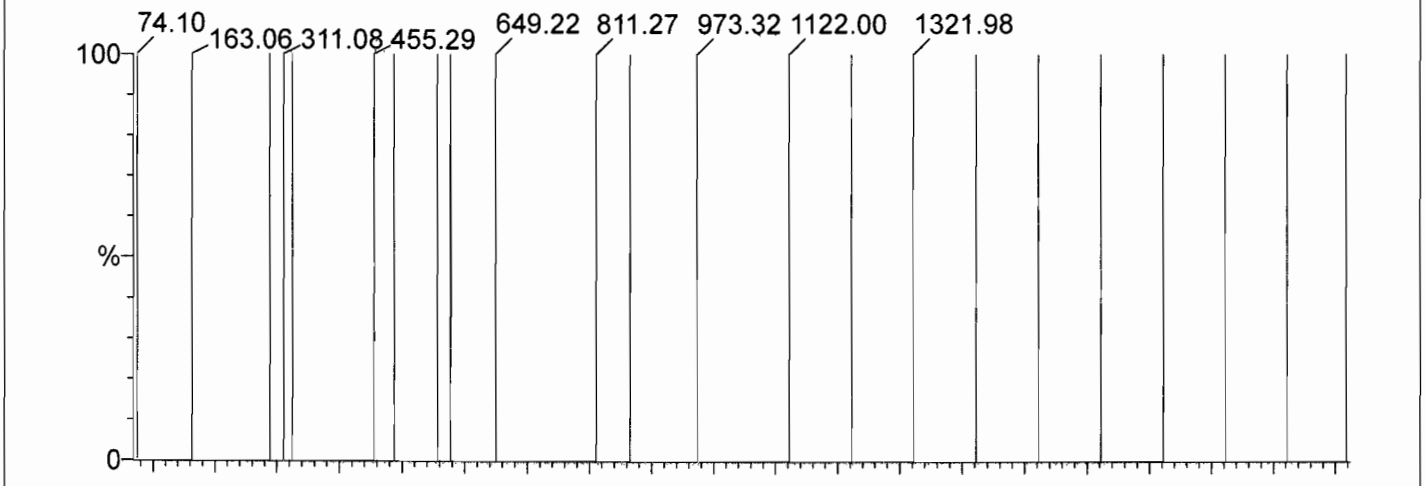
Residual Polynomial order = 4 RMS residual = 0.0531 amu



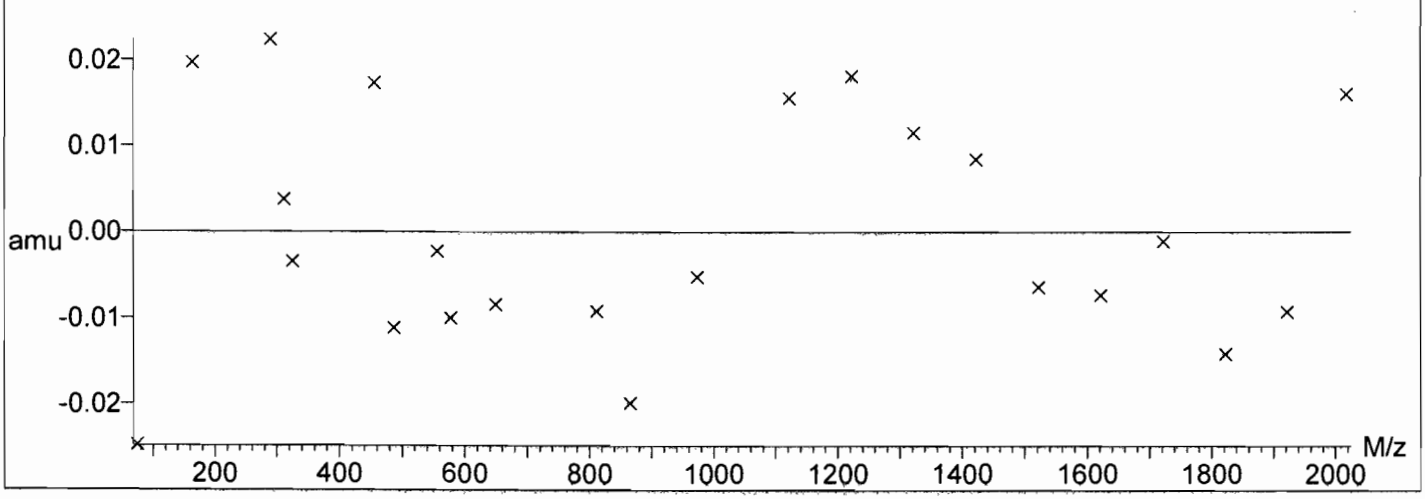
Data file: STATMS2 - Calibrated 23 matches of 23 tested references



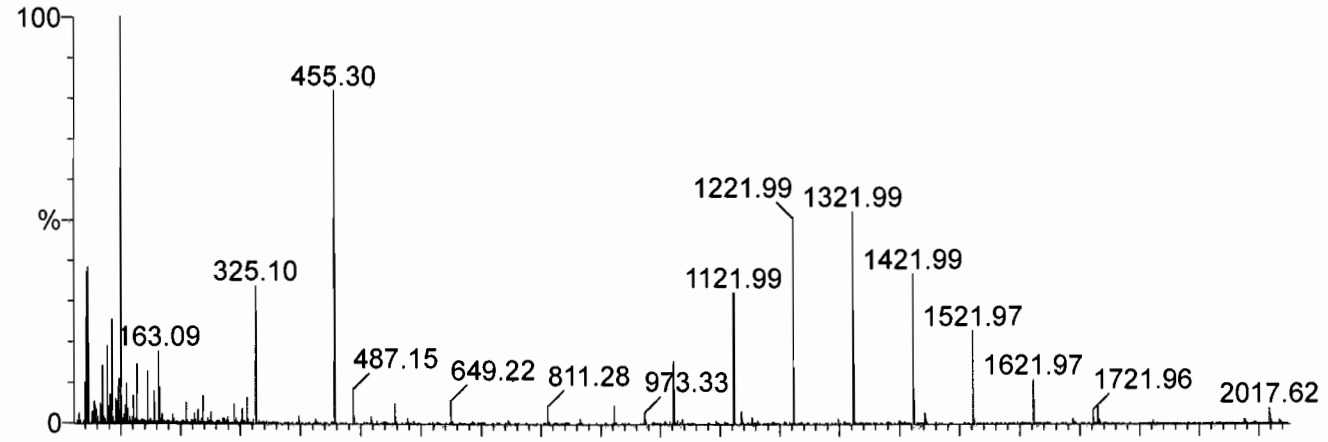
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0116 amu



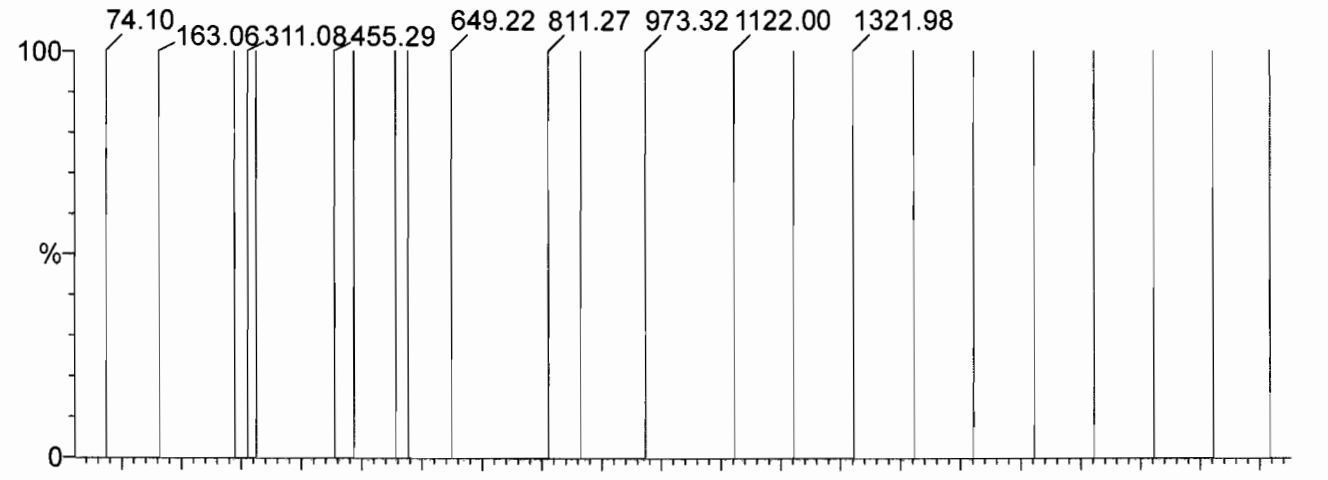
Residual Polynomial order = 4 RMS residual = 0.0133 amu



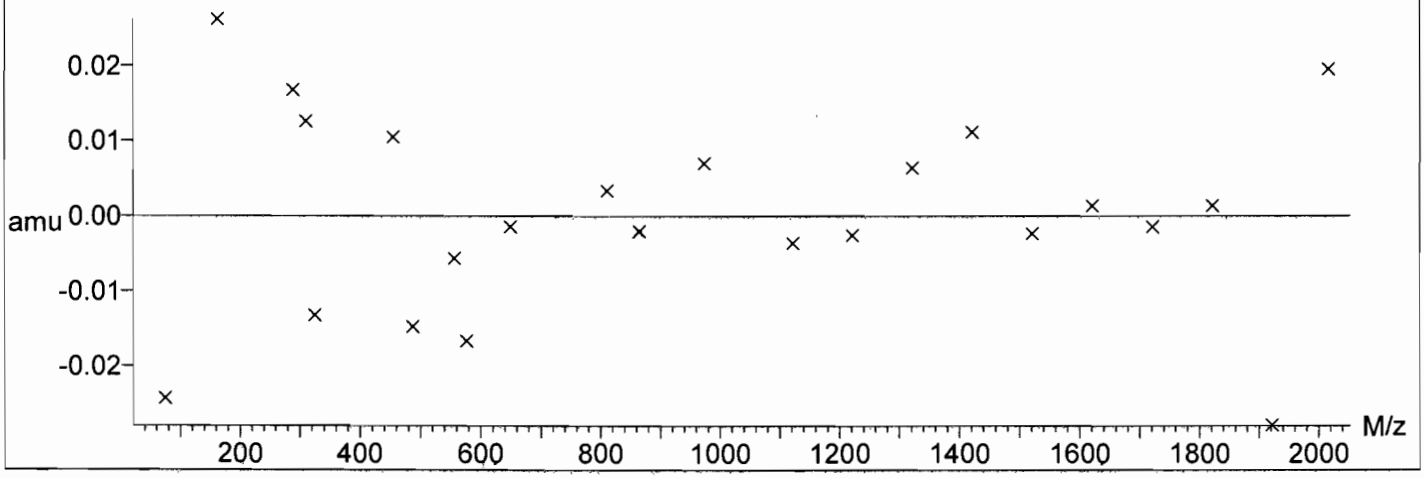
Data file: SCNMS2 - Calibrated 23 matches of 23 tested references



Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0101 amu

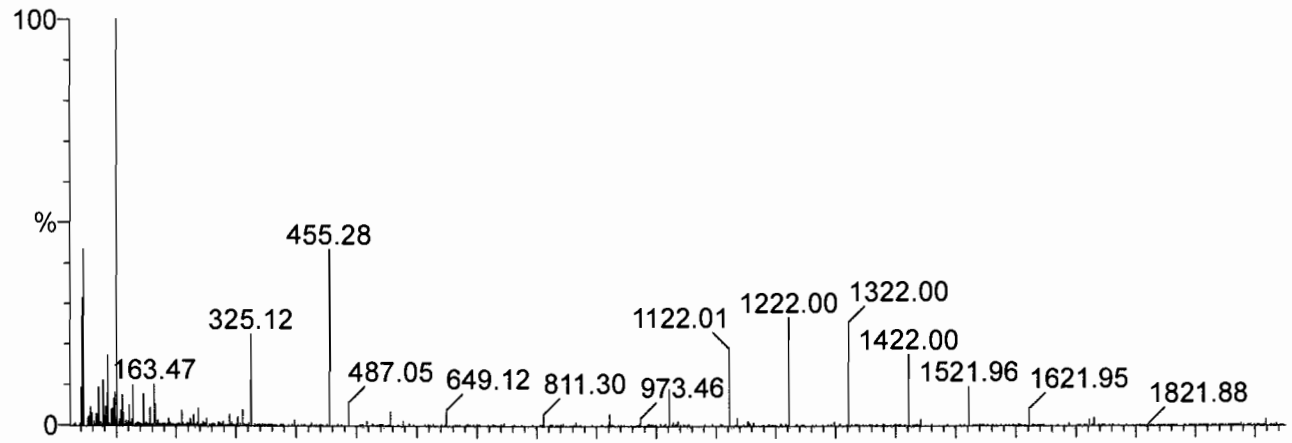


Residual Polynomial order = 4 RMS residual = 0.0131 amu

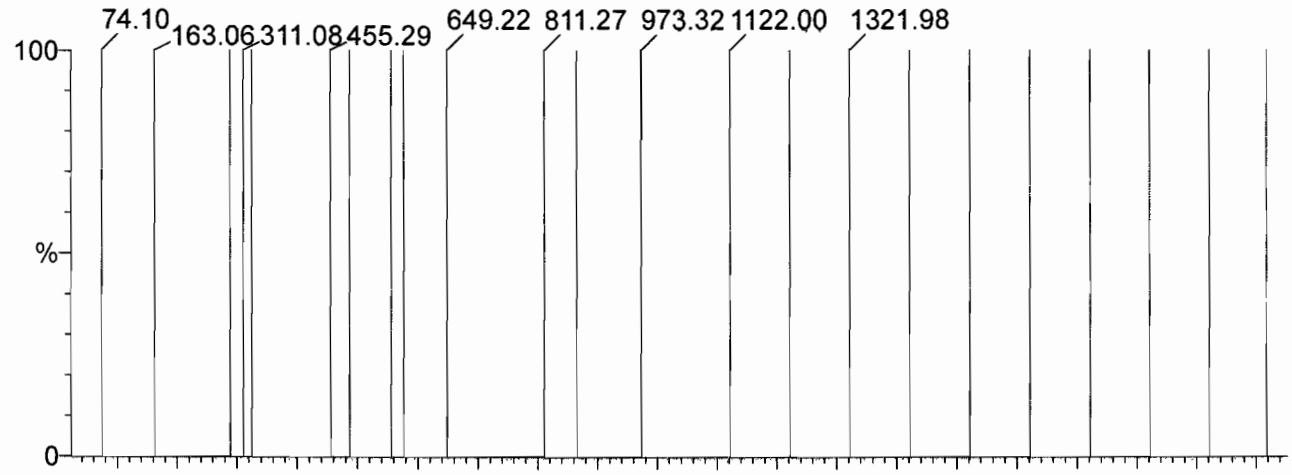


Printed: **Mon Nov 26 10:15:25 2018**

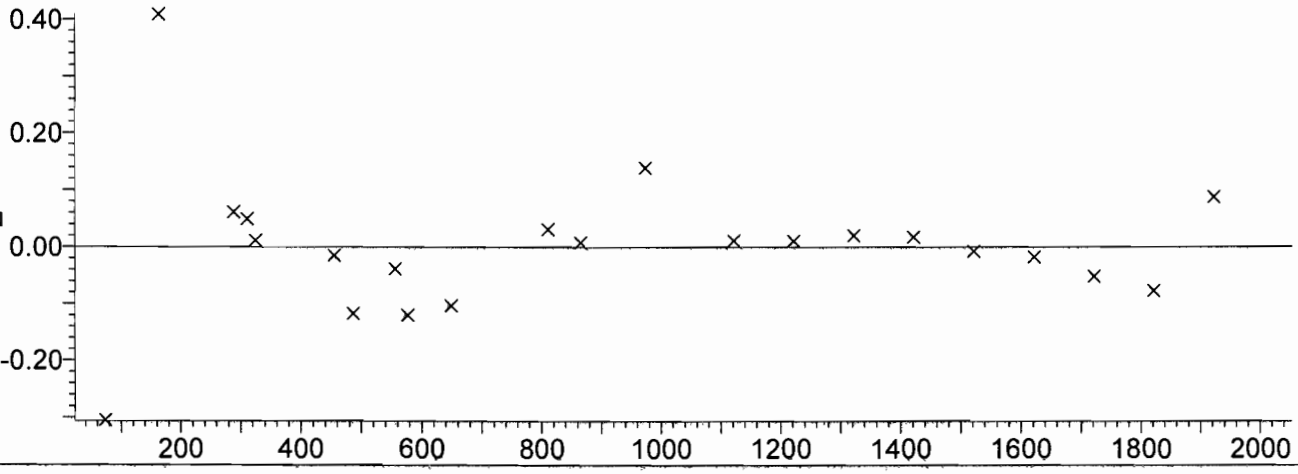
Data file: FASTMS2 - Calibrated 22 matches of 23 tested references



Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0777 amu



Residual Polynomial order = 4 RMS residual = 0.125 amu

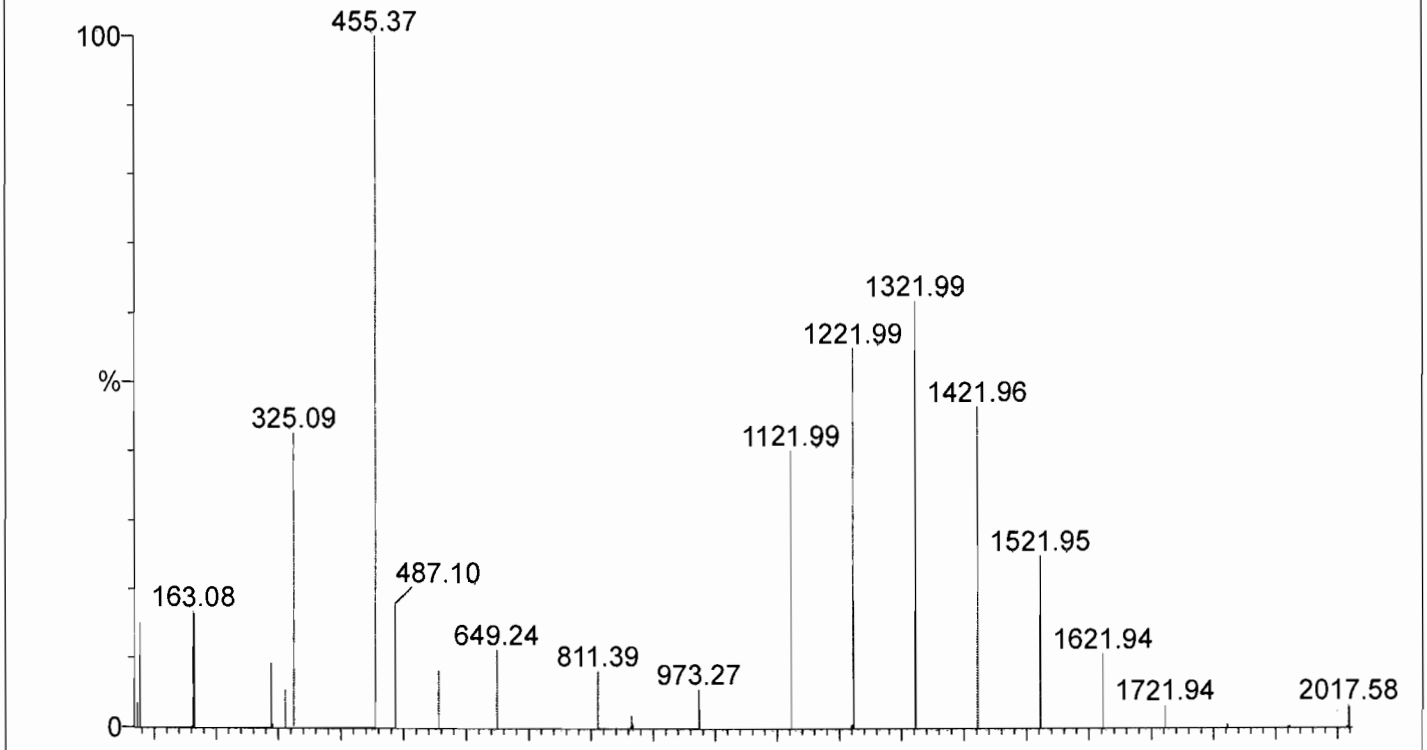


Tune check Q4(M) 11-27-18

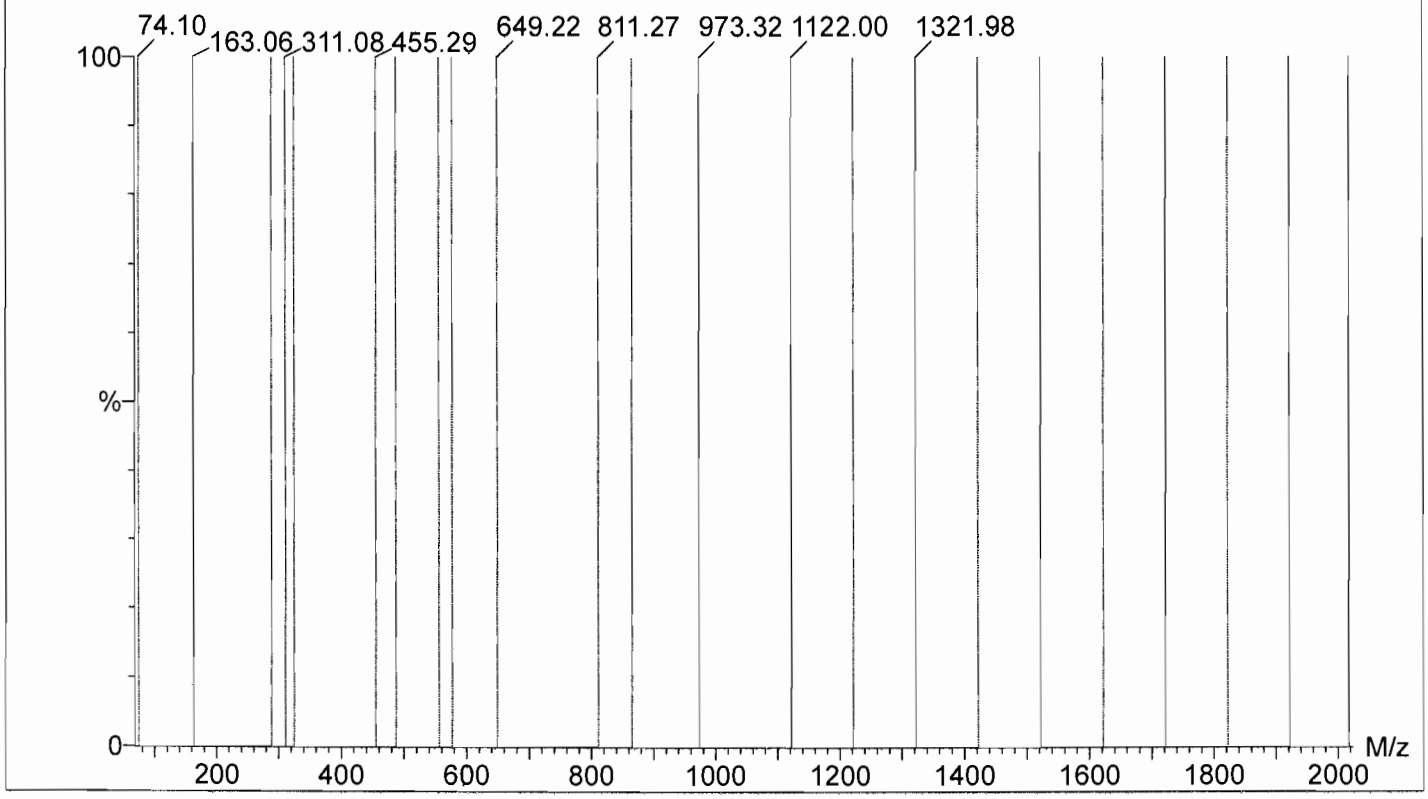
Calibration Verification Report - MS1 Static 20181126-4

Printed: **Tue Nov 27 11:40:17 2018**

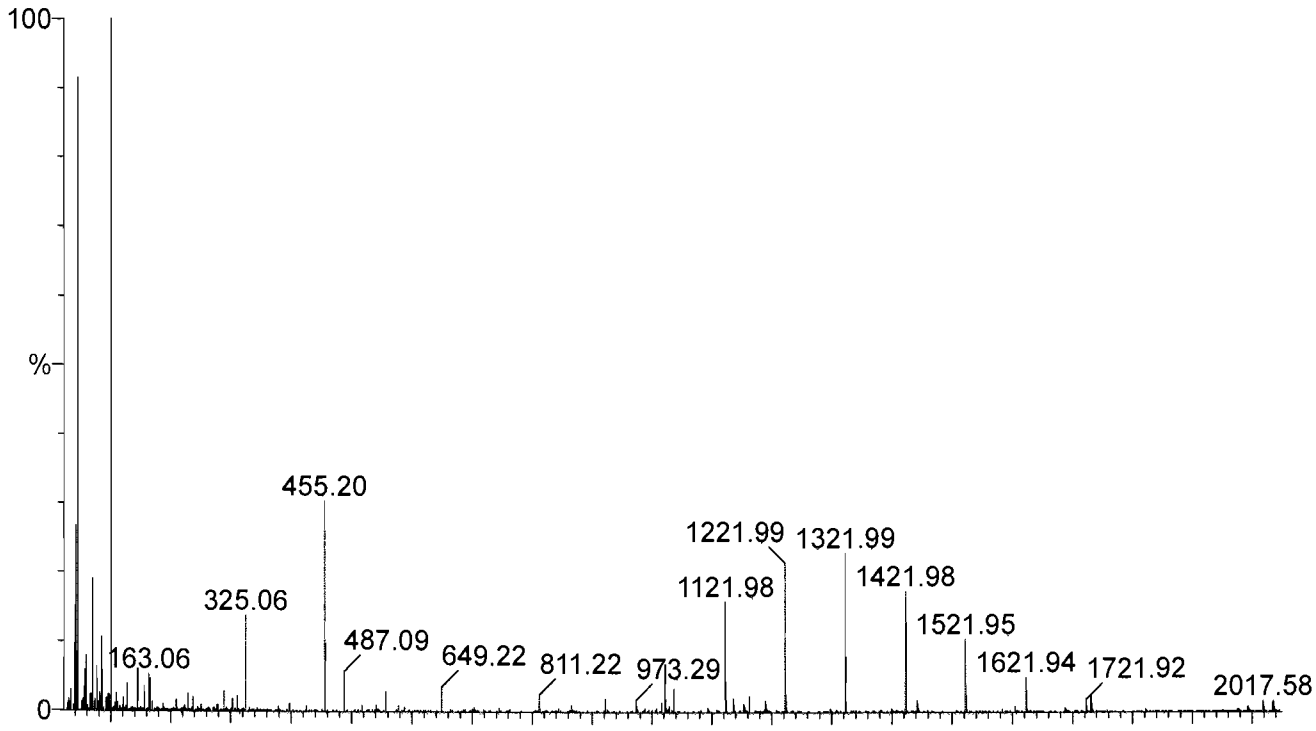
Data file: STATMS1V - Calibrated 21 matches of 23 tested references



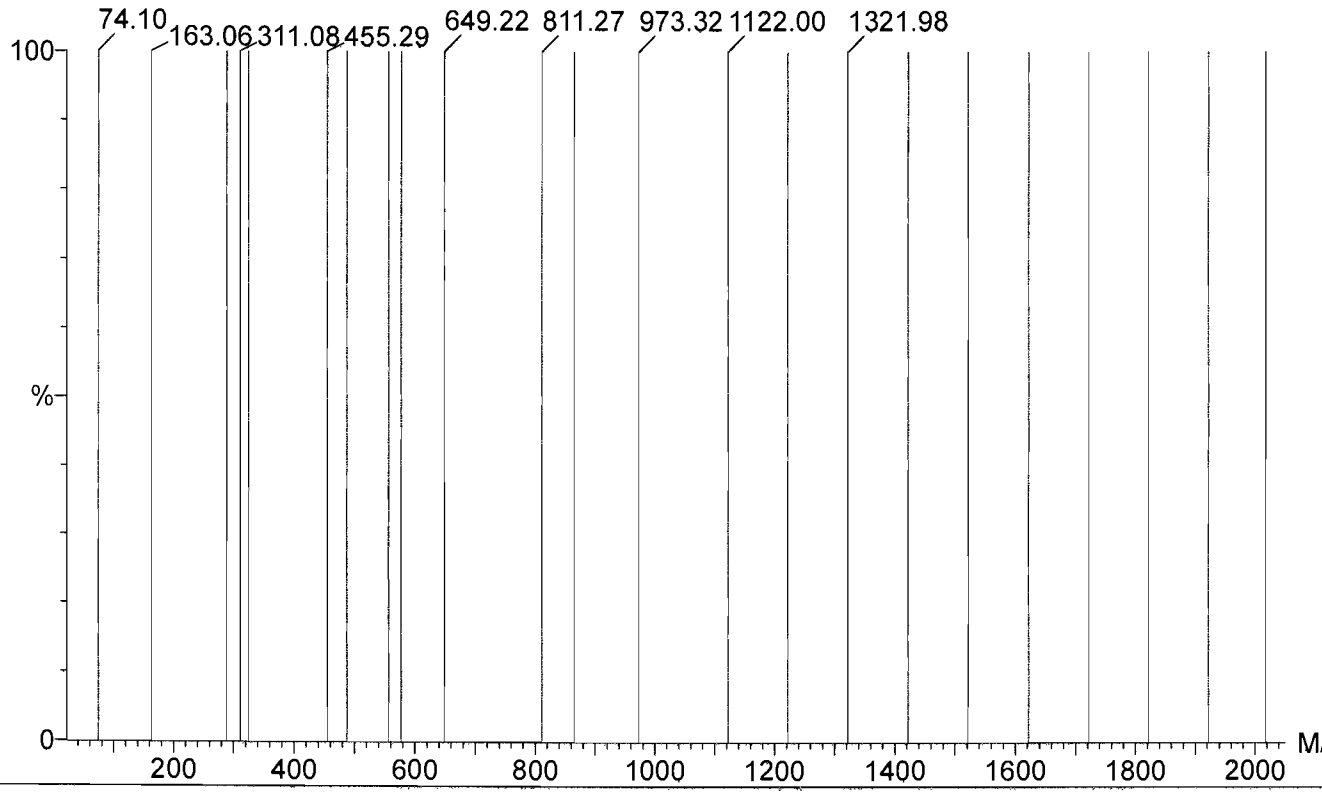
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0344 amu



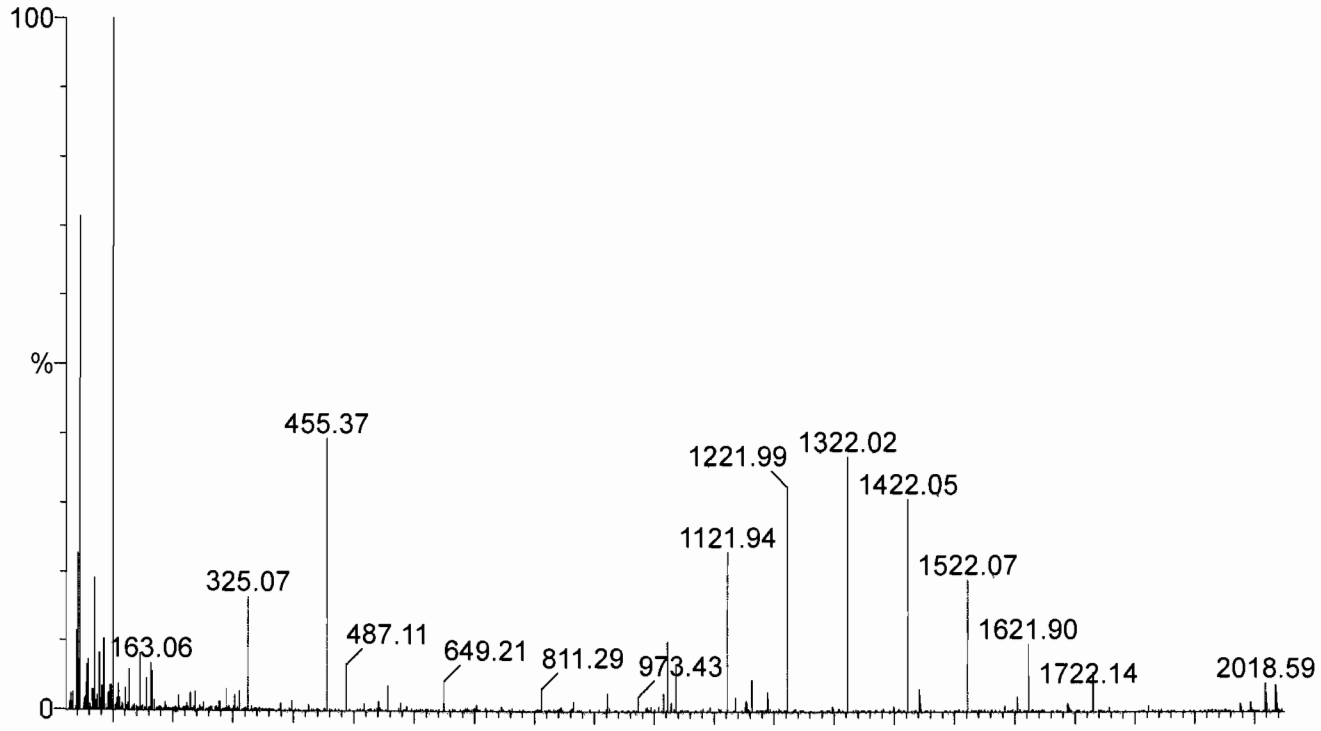
Data file: SCNMS1V - Calibrated 23 matches of 23 tested references



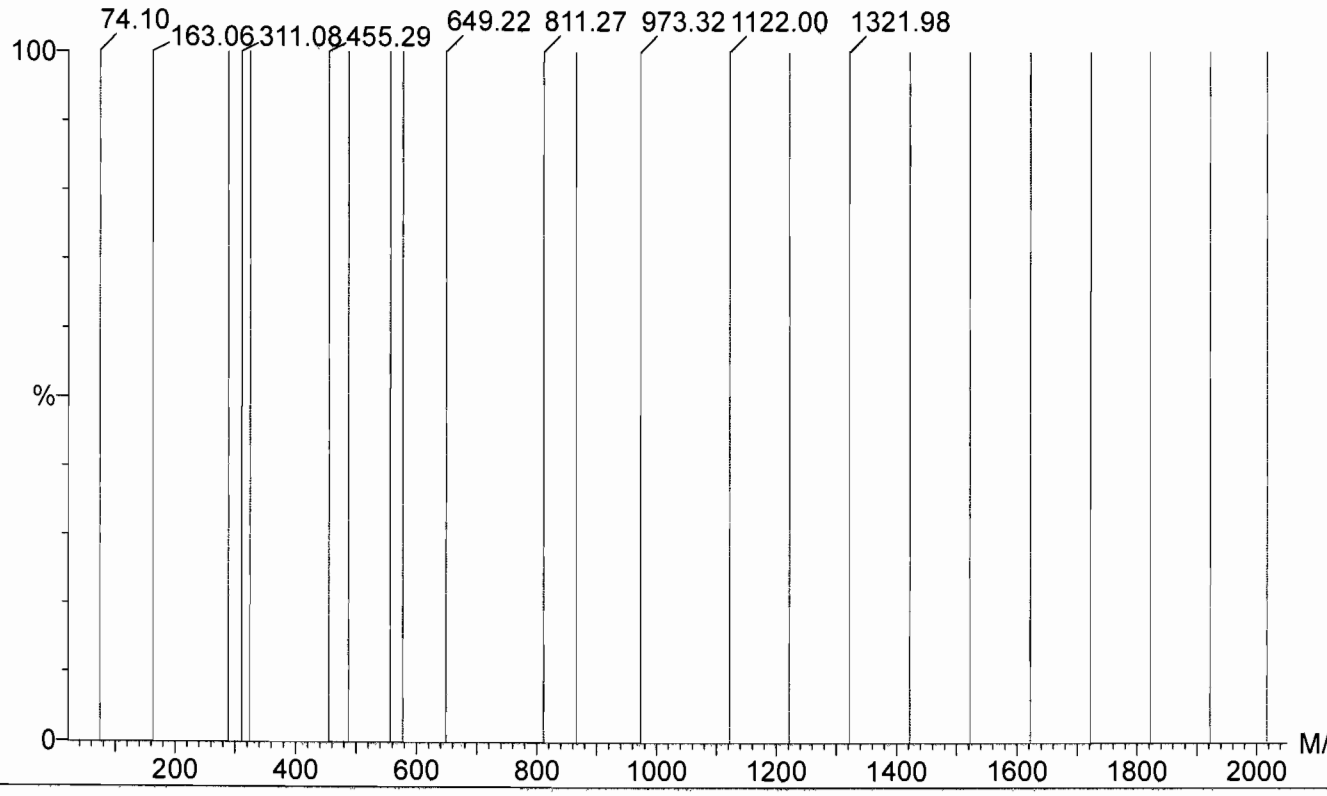
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0308 amu



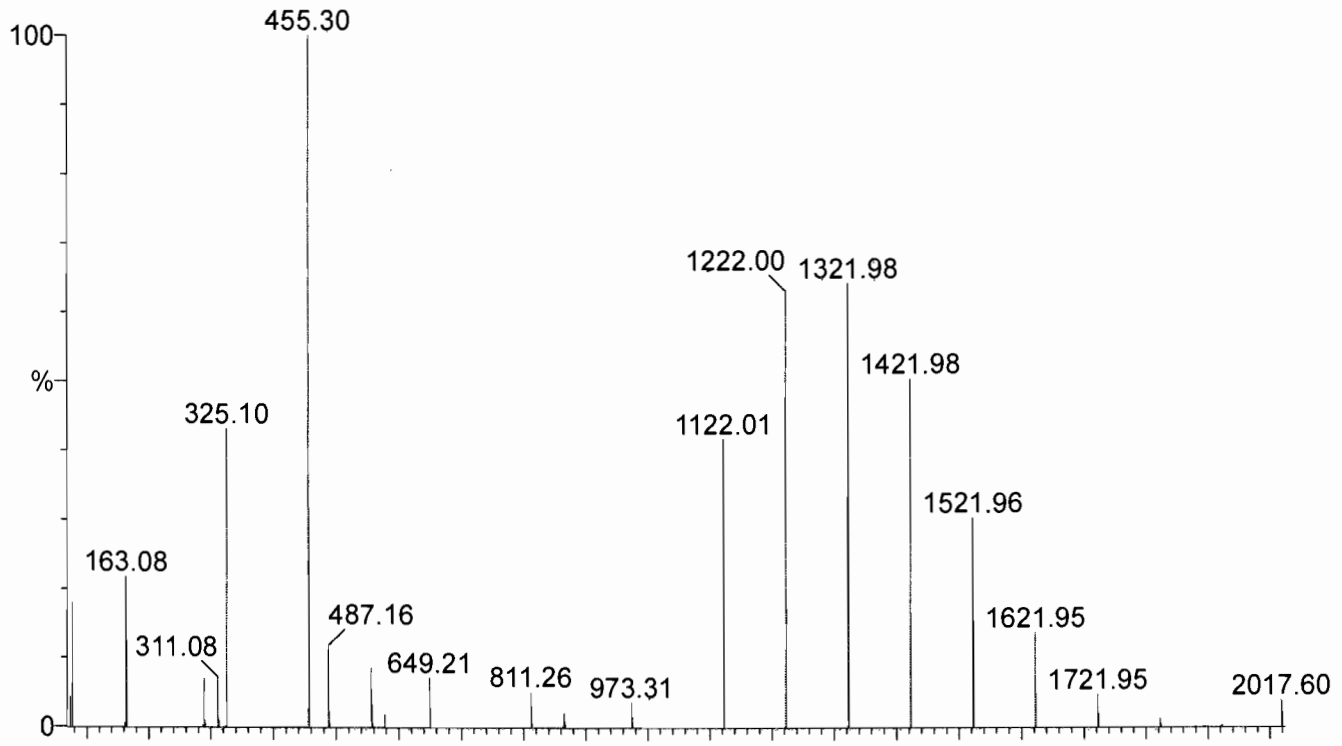
Data file: FASTMS1V - Calibrated 23 matches of 23 tested references



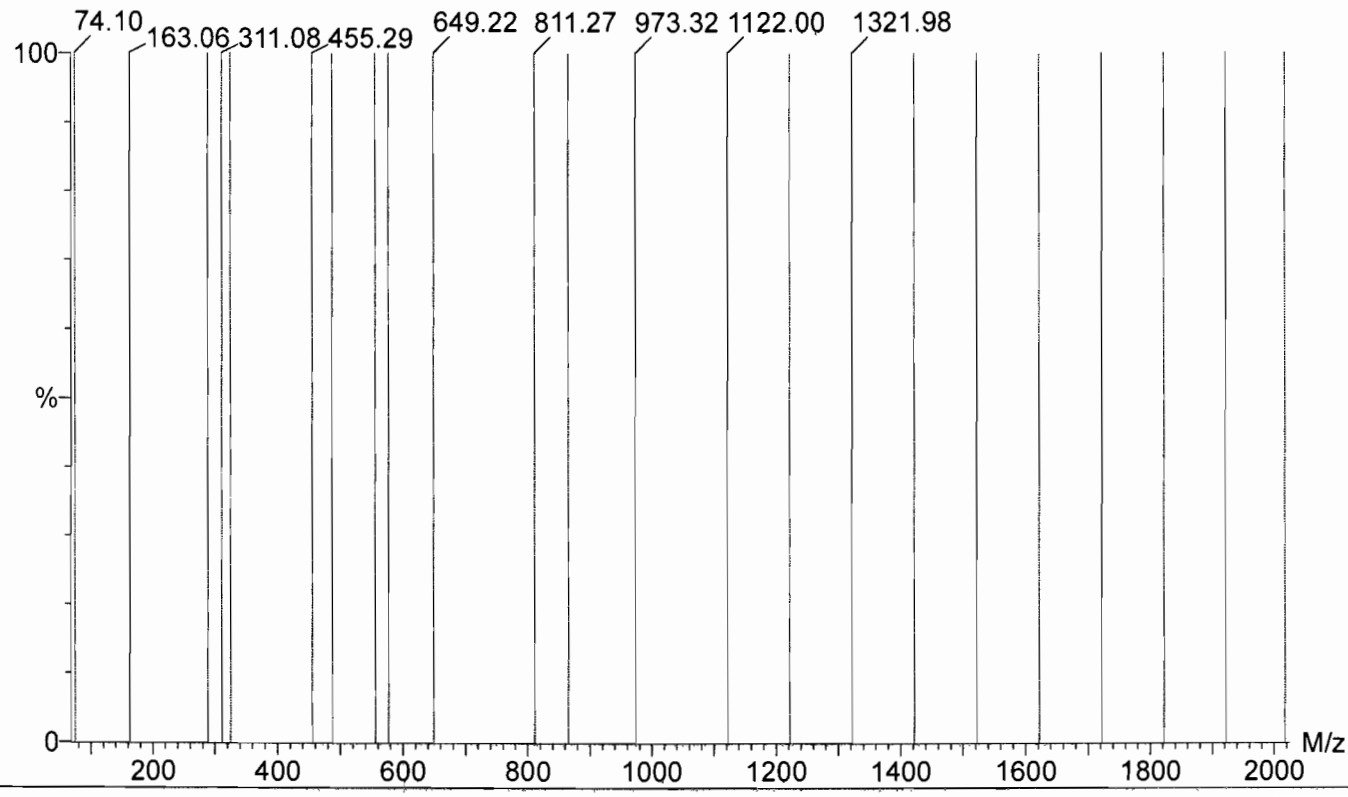
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.134 amu



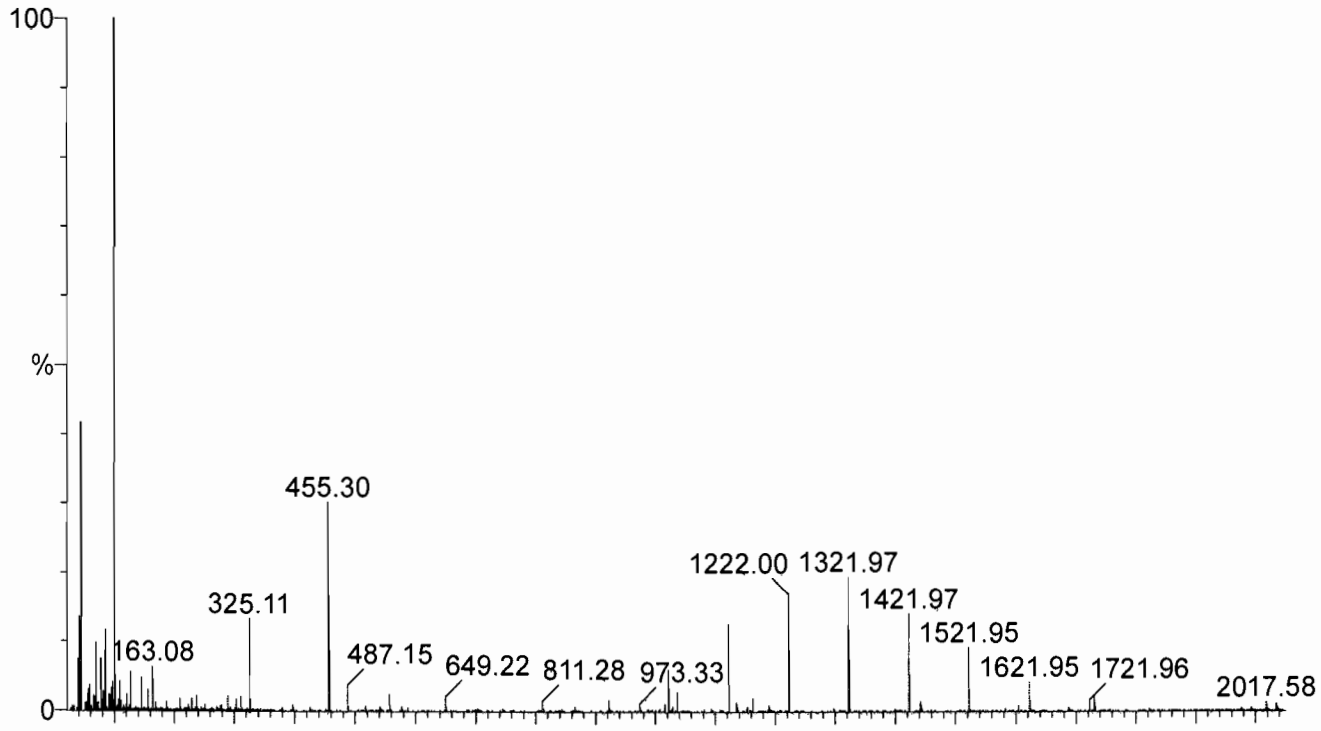
Data file: STATMS2V - Calibrated 22 matches of 23 tested references



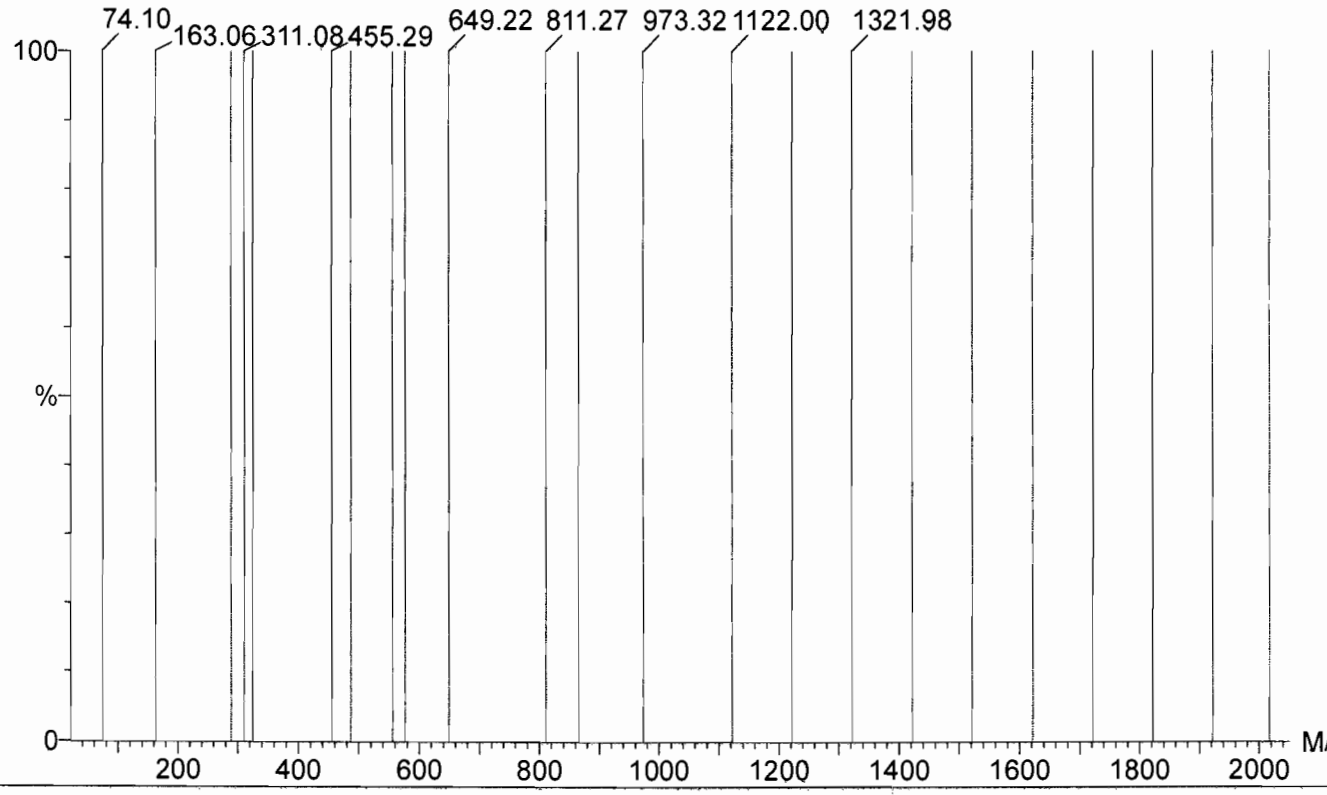
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0123 amu



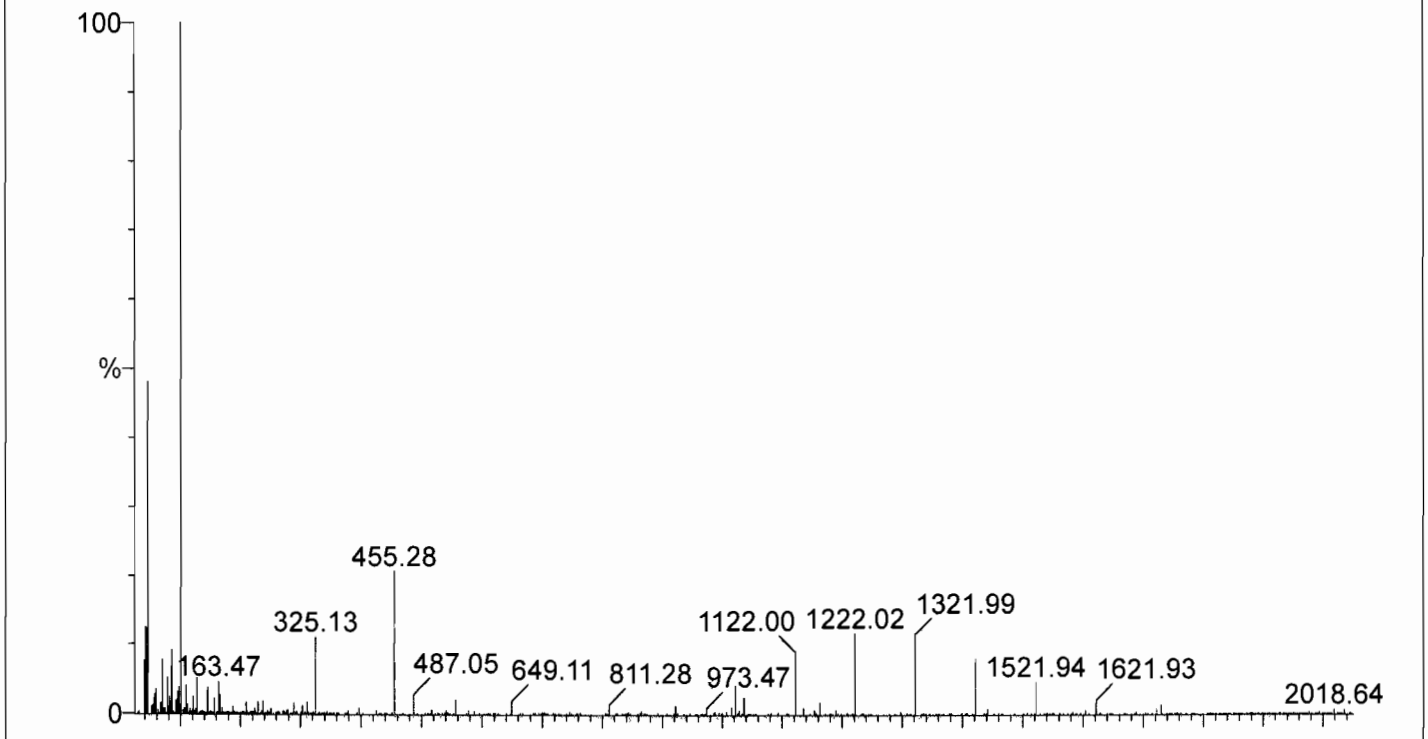
Data file: SCNMS2V - Calibrated 23 matches of 23 tested references



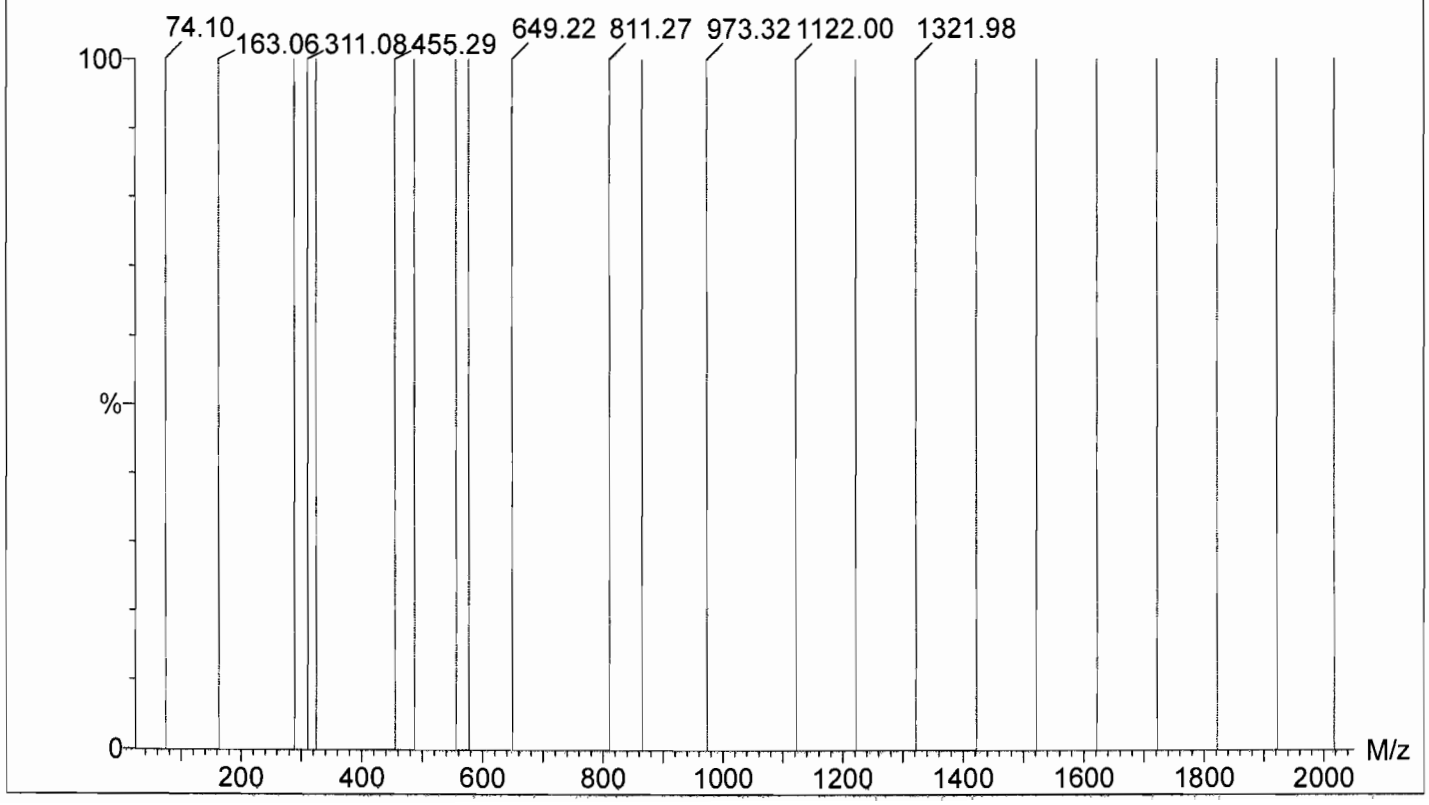
Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.0127 amu



Data file: FASTMS2V - Calibrated 23 matches of 23 tested references



Reference: c:\masslynx\ref\ESI Calibration TQ ResCal.ref Mean residual = 0.123 amu



STANDARDS

Analytical Standard Record

Vista Analytical Laboratory

18J1502

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	(mls)
18F2208	13C2-4:2 FTS	22-Jun-18	** Vendor **	01-Sep-22	1.07
18F2209	13C2-6:2 FTS	22-Jun-18	** Vendor **	16-Feb-23	1.05
18F2210	13C2-8:2 FTS	22-Jun-18	** Vendor **	24-Jan-23	1.04
18F2211	13C3-PFBA	22-Jun-18	** Vendor **	14-Dec-22	1
18F2212	13C2-PFDA	22-Jun-18	** Vendor **	16-Feb-23	1
18F2213	13C2-PFUdA	22-Jun-18	** Vendor **	22-Nov-21	1
18F2214	13C2-PFTeDA	22-Jun-18	** Vendor **	30-Nov-22	1
18F2215	13C5-PFNA	22-Jun-18	** Vendor **	14-Dec-22	1
18F2216	13C2-PFDoA	22-Jun-18	** Vendor **	16-Feb-23	1
18F2217	13C4-PFHpA	22-Jun-18	** Vendor **	03-May-22	1
18F2218	13C2-PFOA	22-Jun-18	** Vendor **	26-Oct-22	1
18F2219	13C3-PFPeA	22-Jun-18	** Vendor **	20-Mar-22	1
18F2220	13C8-FOSA-I	22-Jun-18	** Vendor **	11-Oct-22	1
18F2221	d3-N-Me-FOSAA	22-Jun-18	** Vendor **	08-Nov-22	1
18F2222	d5-N-EtFOSAA	22-Jun-18	** Vendor **	08-Nov-22	1
18F2223	13C3-PFBS	22-Jun-18	** Vendor **	15-Feb-23	1.076
18F2224	13C8-PFOS	22-Jun-18	** Vendor **	08-Nov-22	1.05
18F2225	18O2-PFHxS	22-Jun-18	** Vendor **	22-Mar-23	1.058
18F2226	13C2-PFHxDA	22-Jun-18	** Vendor **	13-Jul-22	0.4
18F2227	13C2-PFHxA	22-Jun-18	** Vendor **	27-Oct-22	0.4

Description:	PFC - IS	Expires:	15-Oct-20
Standard Type:	Reagent	Prepared:	15-Oct-18
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	40	Department:	LCMS
Vials:	1	Last Edit:	15-Oct-18 08:57 by GRB

Analyte	CAS Number	Concentration	Units
13C3-PFBA		1.25	ug/mL
13C2-6:2 FTS		1.25	ug/mL
13C2-8:2 FTS		1.25	ug/mL
13C2-PFDA		1.25	ug/mL
13C2-PFDoA		1.25	ug/mL
13C2-PFHxA		0.5	ug/mL
13C2-PFHxDA		0.5	ug/mL
13C2-PFOA		1.25	ug/mL
13C2-4:2 FTS		1.25	ug/mL
13C2-PFUnA		1.25	ug/mL
d5-EtFOSAA		1.25	ug/mL
13C3-PFBS		1.25	ug/mL
13C3-PFPeA		1.25	ug/mL

Analytical Standard Record

Vista Analytical Laboratory

18J1502

Description:	PFC - IS	Expires:	15-Oct-20
Standard Type:	Reagent	Prepared:	15-Oct-18
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	40	Department:	LCMS
Vials:	1	Last Edit:	15-Oct-18 08:57 by GRB

Analyte	CAS Number	Concentration	Units
13C4-PFHpA		1.25	ug/mL
13C5-PFNA		1.25	ug/mL
13C8-PFOS		1.25	ug/mL
13C8-PFOSA		1.25	ug/mL
18O2-PFHxS		1.25	ug/mL
d3-MeFOSAA		1.25	ug/mL
13C2-PFTeDA		1.25	ug/mL

~~18F2103~~ 18F2208

WELLINGTON LABORATORIES

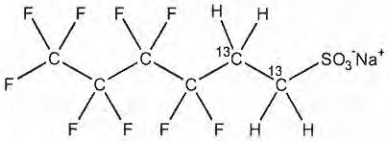
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-4:2FTS **LOT NUMBER:** M242FTS0817

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]hexane sulfonate

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4H_4F_9SO_3Na$	**MOLECULAR WEIGHT:**	352.12
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	46.7 ± 2.3 µg/ml (M2-4:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	09/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/01/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 4:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 4:2FTS and M2-4:2FTS will produce signals in the m/z 329 to m/z 309 channel during SRM analysis. We recommend using the m/z 329 to m/z 81 transition to monitor for M2-4:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/29/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2208

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

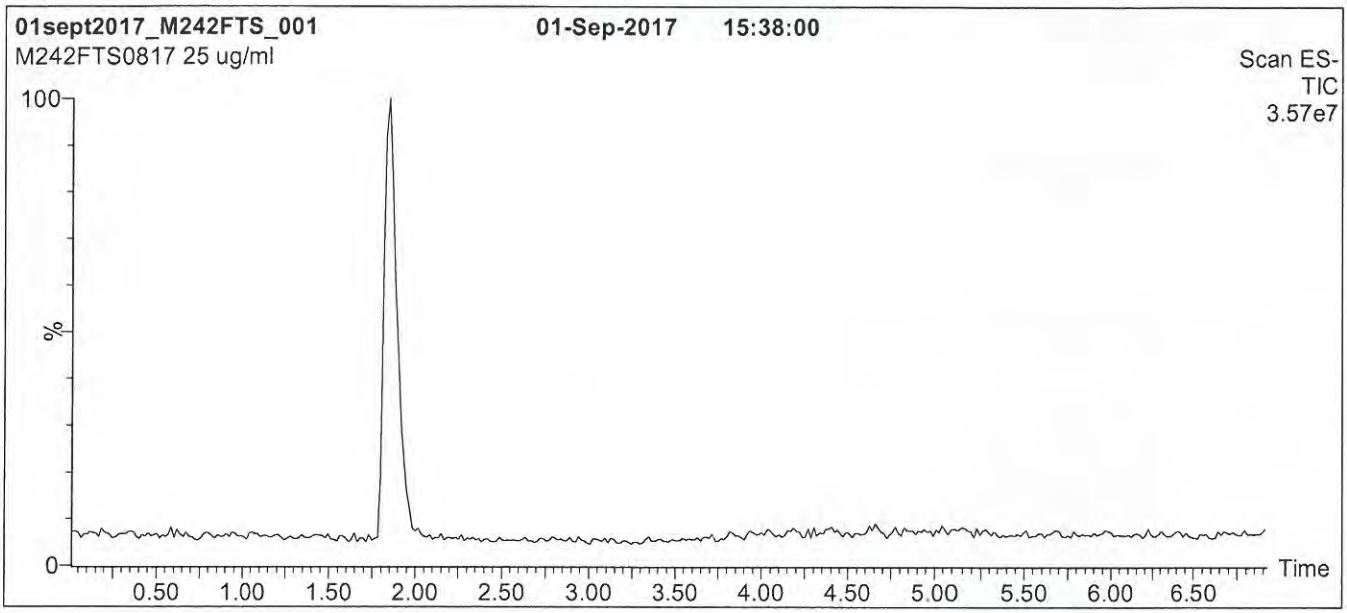
CALA

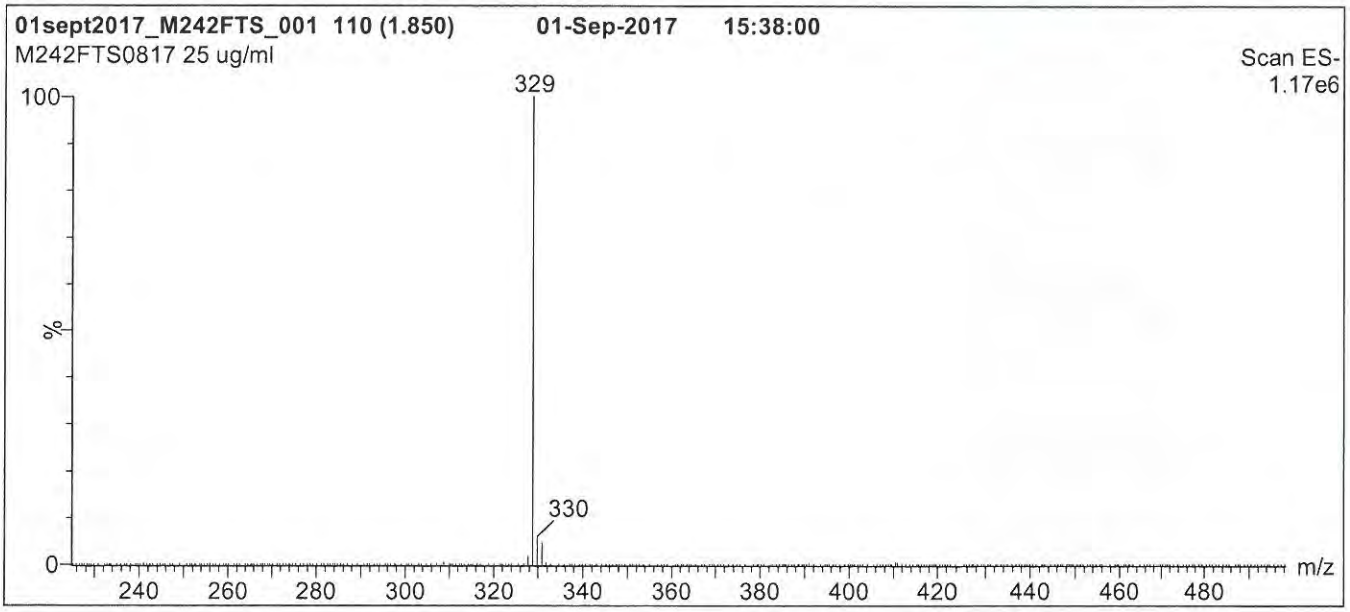
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2208

Figure 1: **M2-4:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min
and hold for 1 min before returning
to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

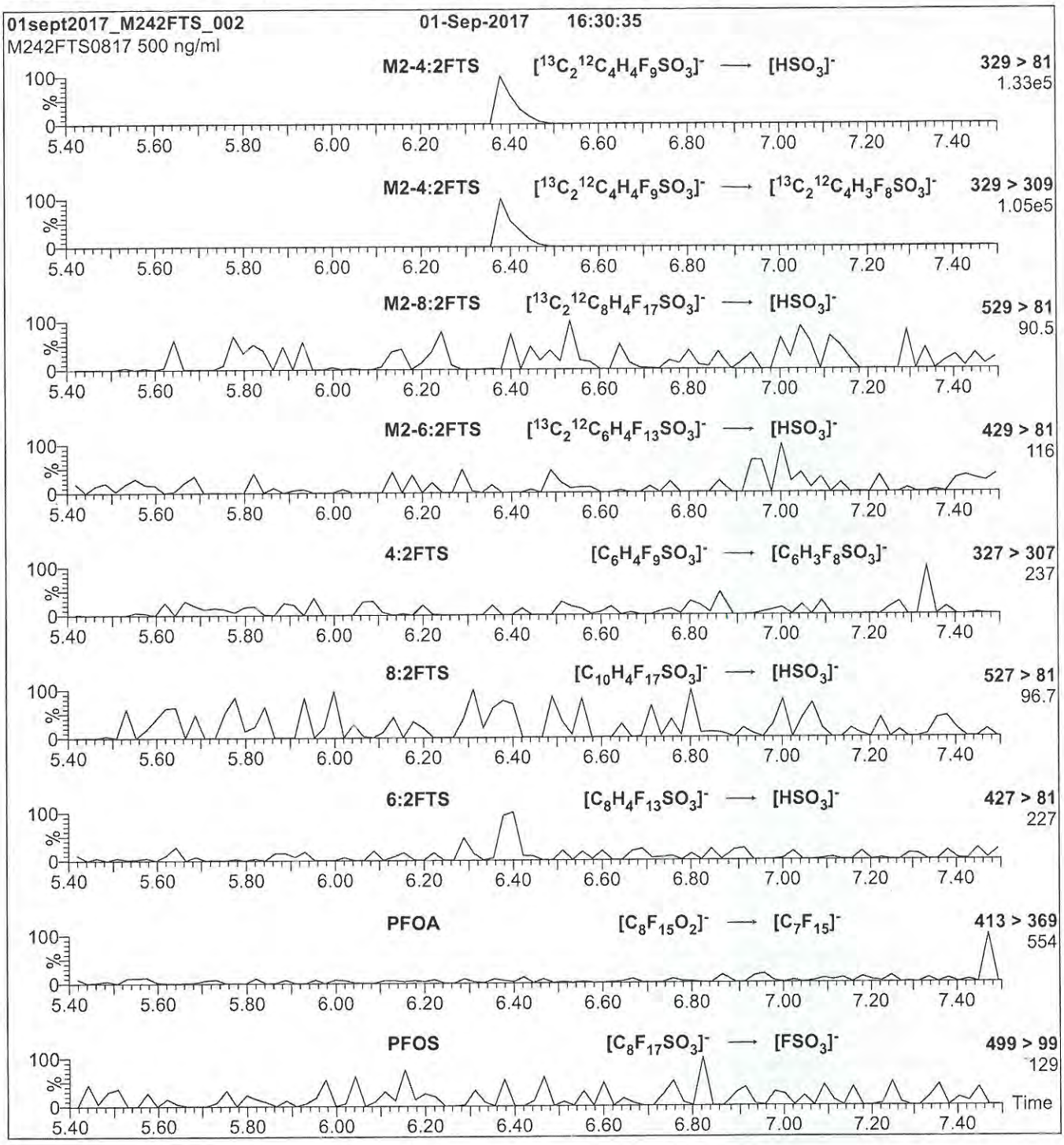
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18F2208

Figure 2: **M2-4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-4:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 25

~~18F2104~~ 18F2209

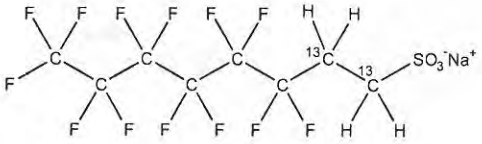
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2-6:2FTS **LOT NUMBER:** M262FTS0218

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]octane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_6H_4F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	452.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.5 ± 2.4 µg/ml (M2-6:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 6:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 6:2FTS and M2-6:2FTS will produce signals in the m/z 429 to m/z 409 channel during SRM analysis. We recommend using the m/z 429 to m/z 81 transition to monitor for M2-6:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2209

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

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ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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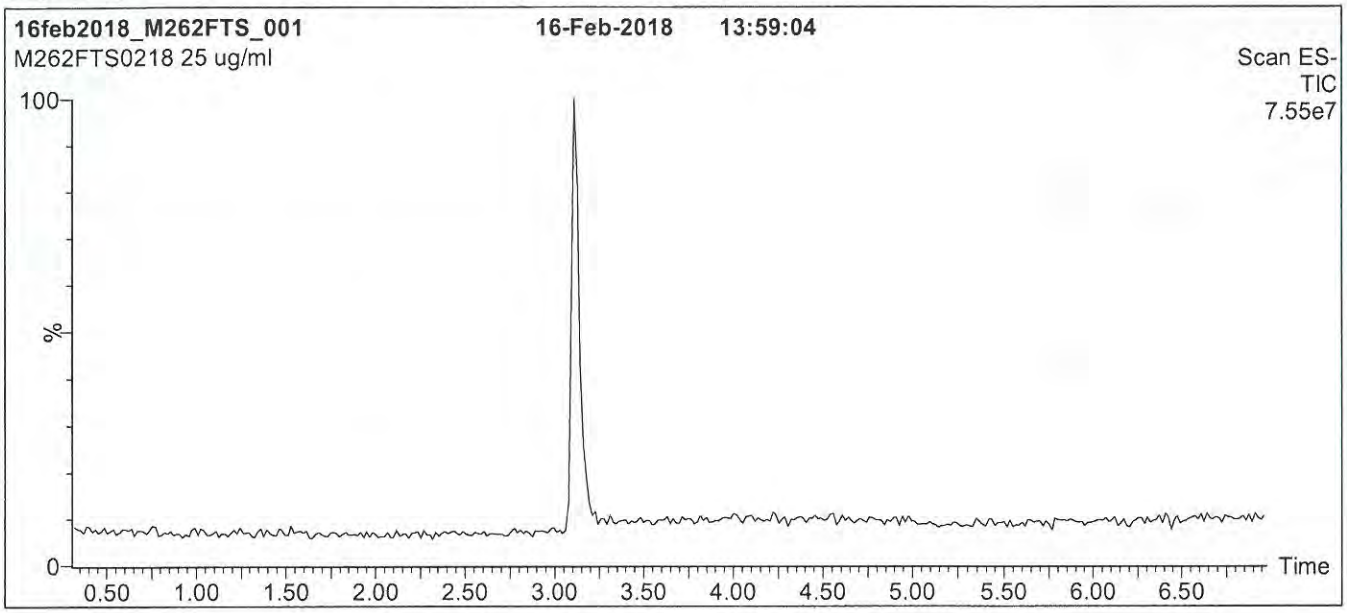
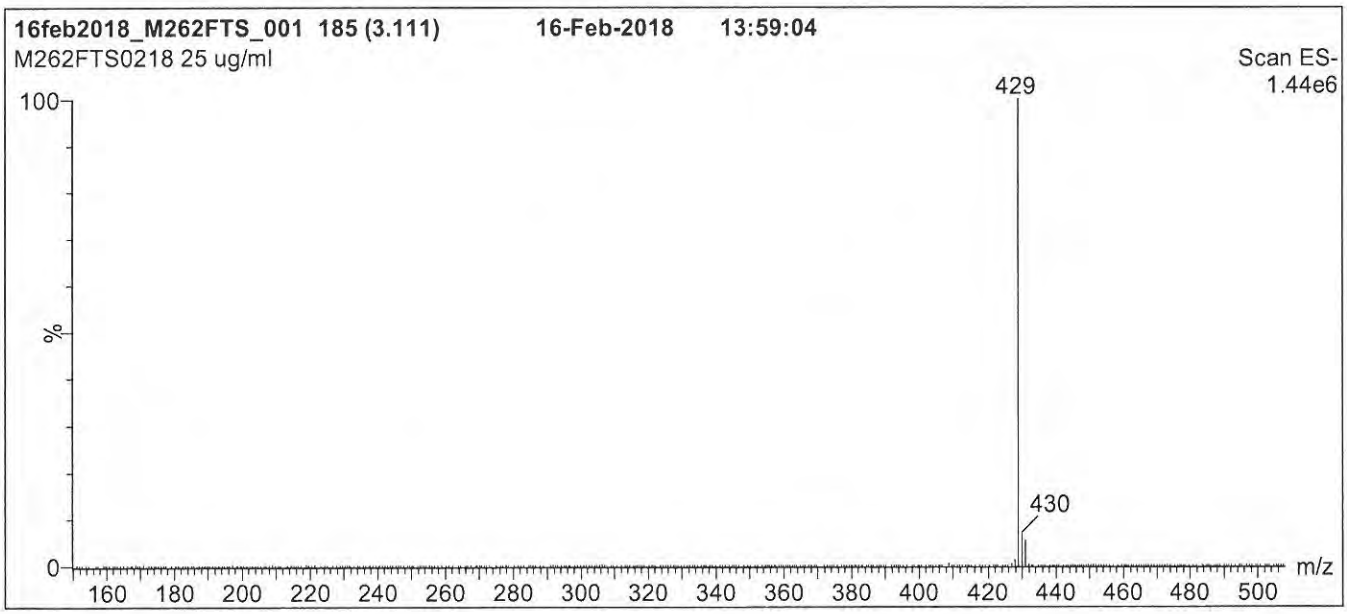
18F2209

Figure 1: **M2-6:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

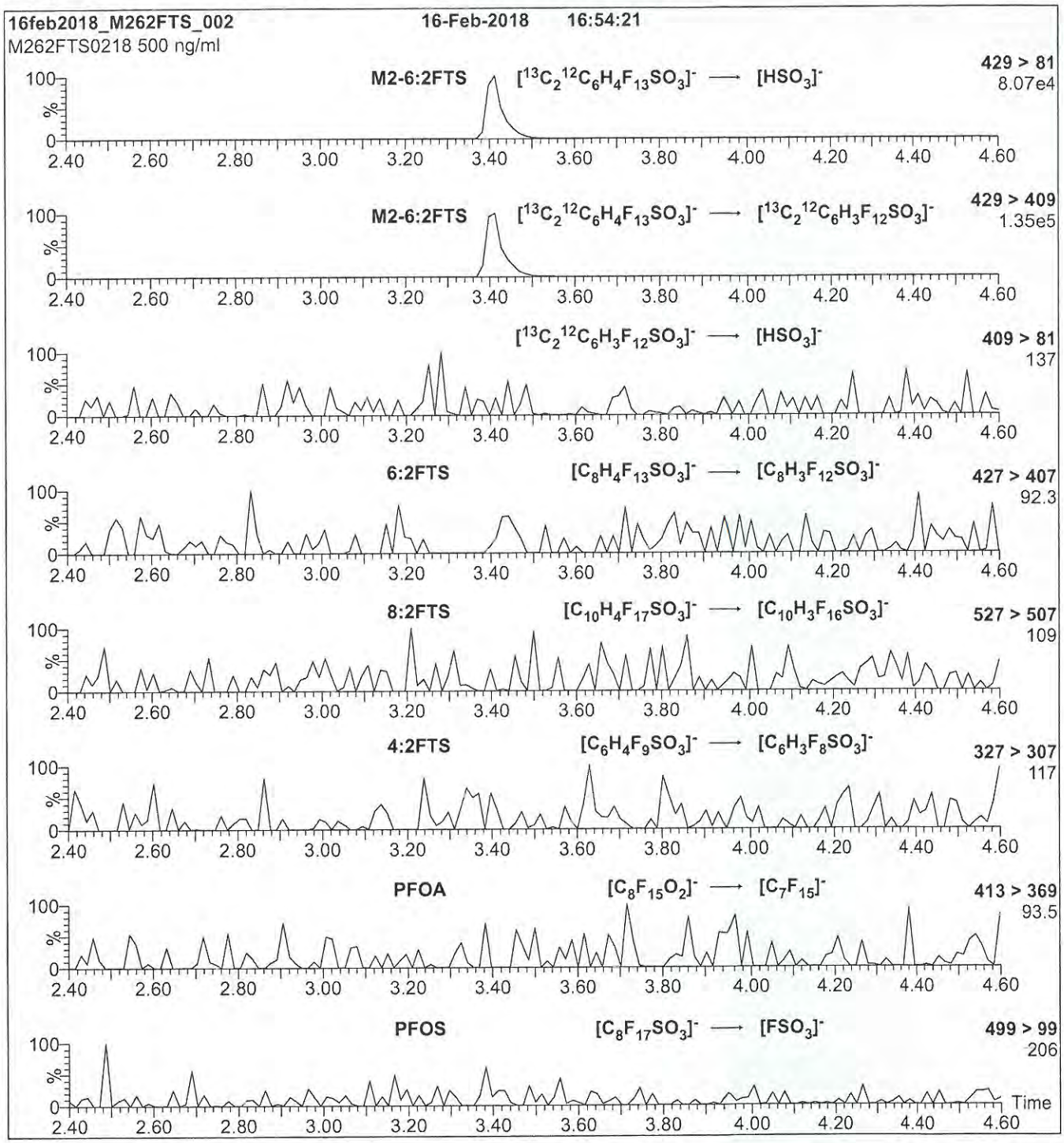
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2209

Figure 2: **M2-6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-6:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

18F2210

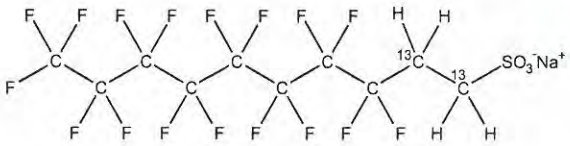
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M2-8:2FTS **LOT NUMBER:** M282FTS0118

COMPOUND: Sodium 1H,1H,2H,2H-perfluoro-[1,2-$^{13}C_2$]decane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	552.15
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml (M2-8:2FTS anion)		
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	01/24/2018		
EXPIRY DATE: (mm/dd/yyyy)	01/24/2023		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The native 8:2FTS contains 4.22% of ^{34}S (due to natural isotopic abundance) therefore both native 8:2FTS and M2-8:2FTS will produce signals in the m/z 529 to m/z 509 channel during SRM analysis. We recommend using the m/z 529 to m/z 81 transition to monitor for M2-8:2FTS during quantitative analysis as it will be free of any native contribution (see Figure 2).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/26/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2210

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where x is expressed as a relative standard uncertainty of the individual parameter.

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QUALITY MANAGEMENT:

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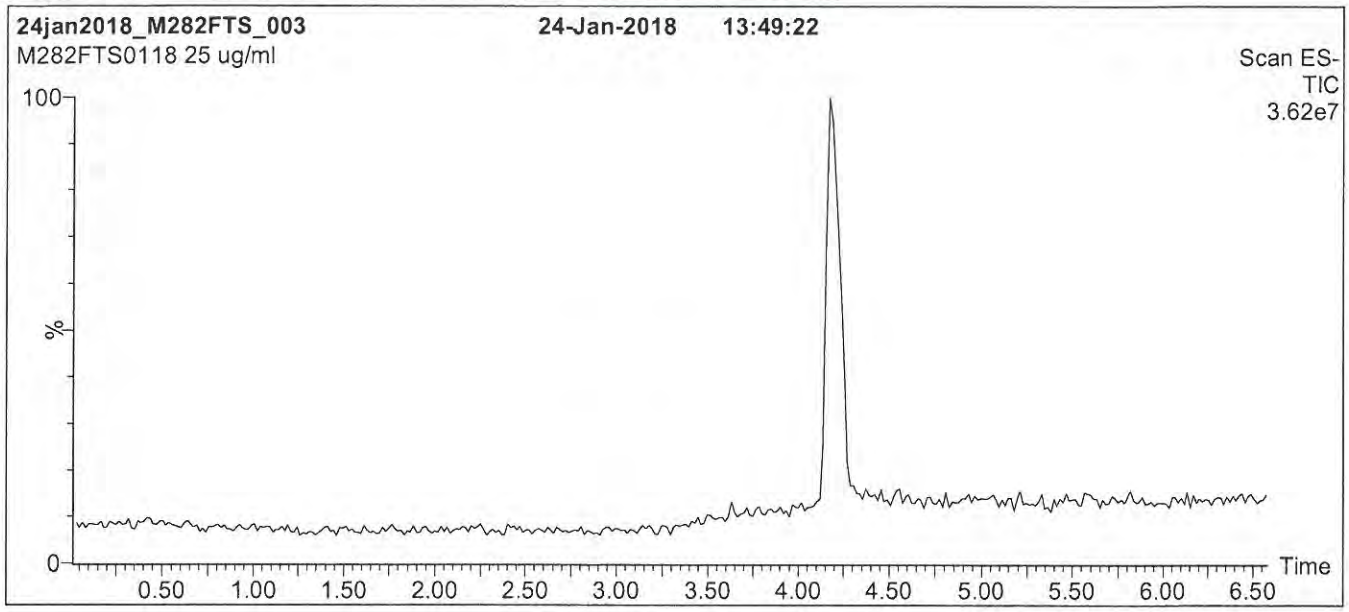
CALA

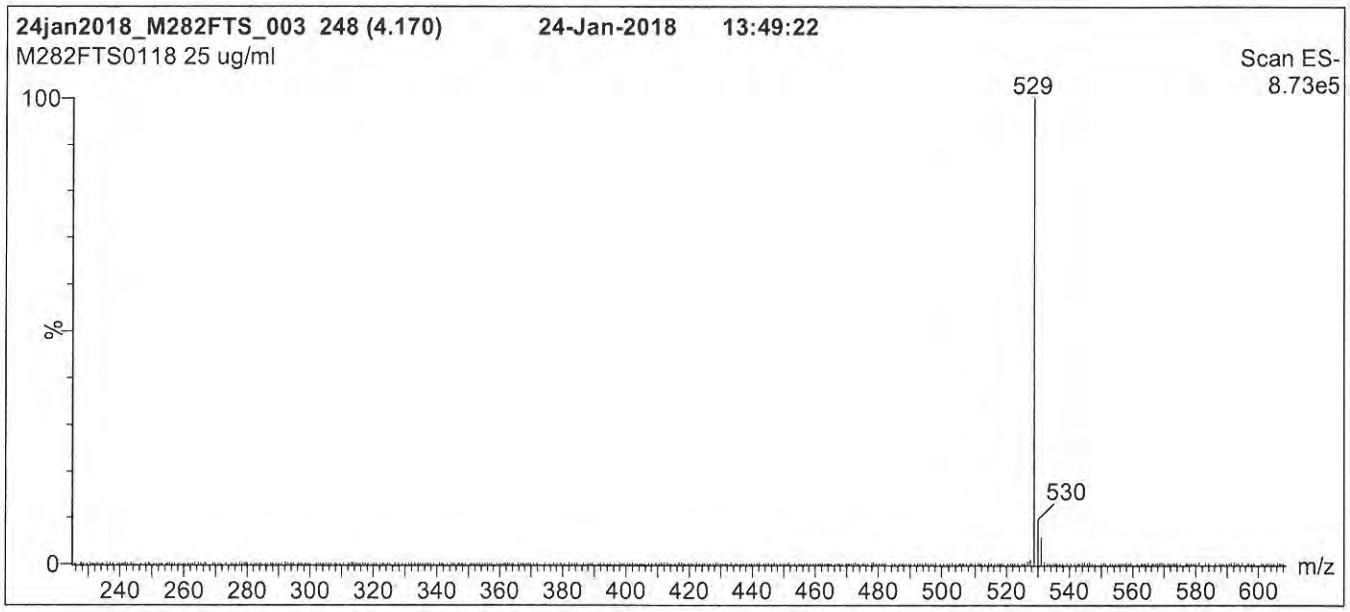
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2210

Figure 1: **M2-8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

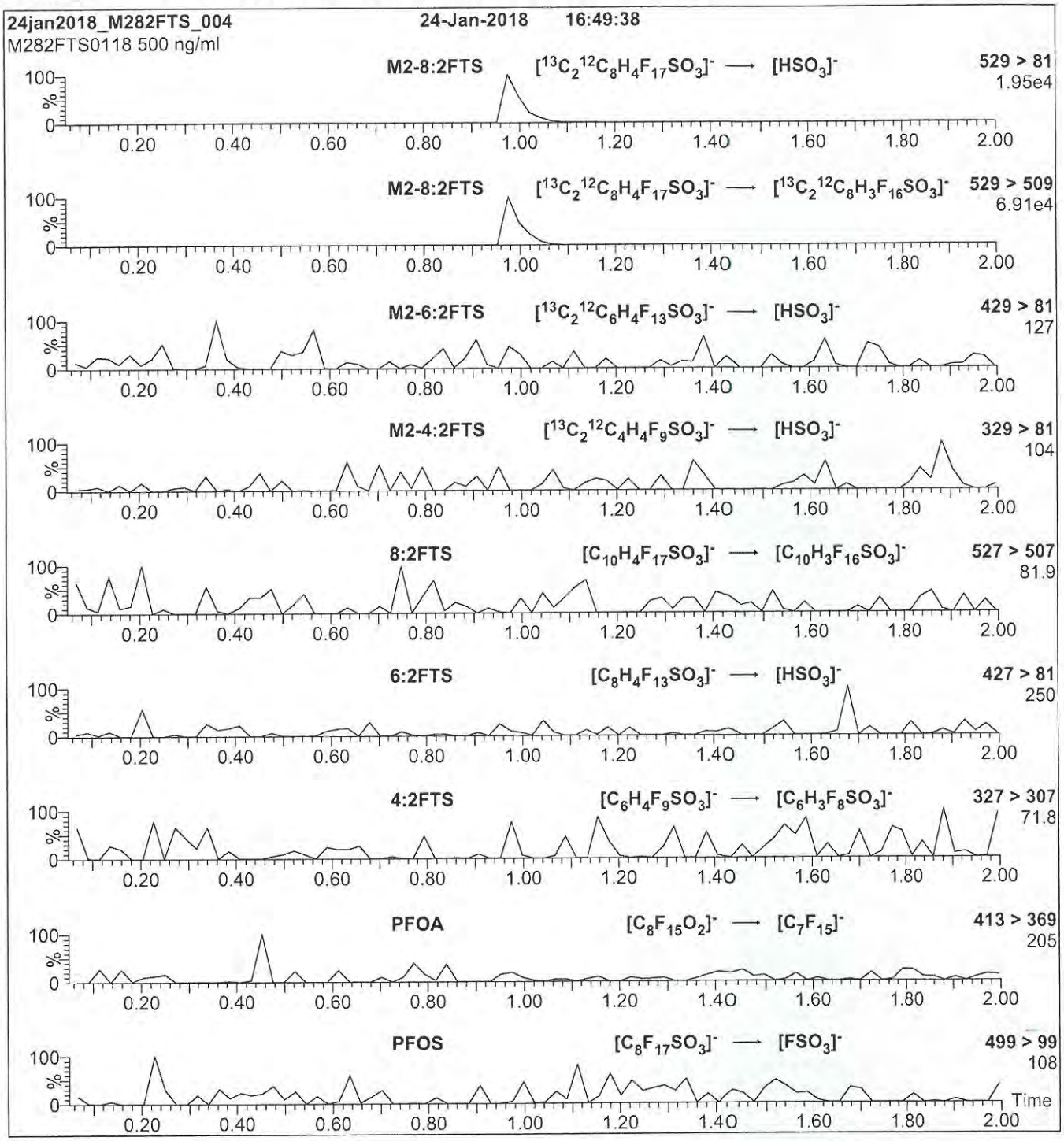
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source:Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18F2210

Figure 2: **M2-8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2-8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 25

18F2211

WELLINGTON LABORATORIES

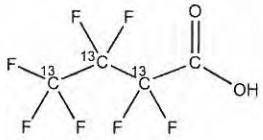
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFBA
COMPOUND: Perfluoro-n-[2,3,4-$^{13}C_3$]butanoic acid

LOT NUMBER: M3PFBA1217

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}CHF_7O_2$	**MOLECULAR WEIGHT:**	217.02
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($2,3,4\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	12/14/2017		
EXPIRY DATE: (mm/dd/yyyy)	12/14/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of perfluoro-n-[$^{13}C_3$]propanoic acid and also contains ~ 1.0% of perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid due to the naturally occurring isotopic abundance of ^{13}C in the unlabelled carbon atom.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/22/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2211

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

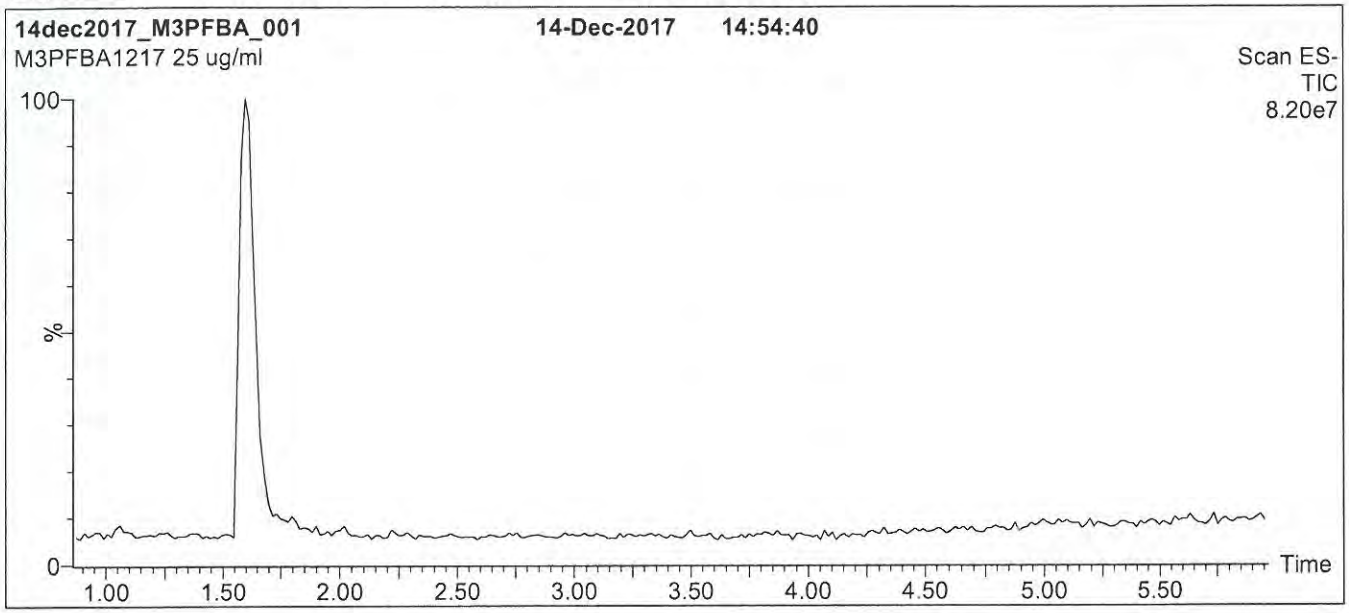
CALA

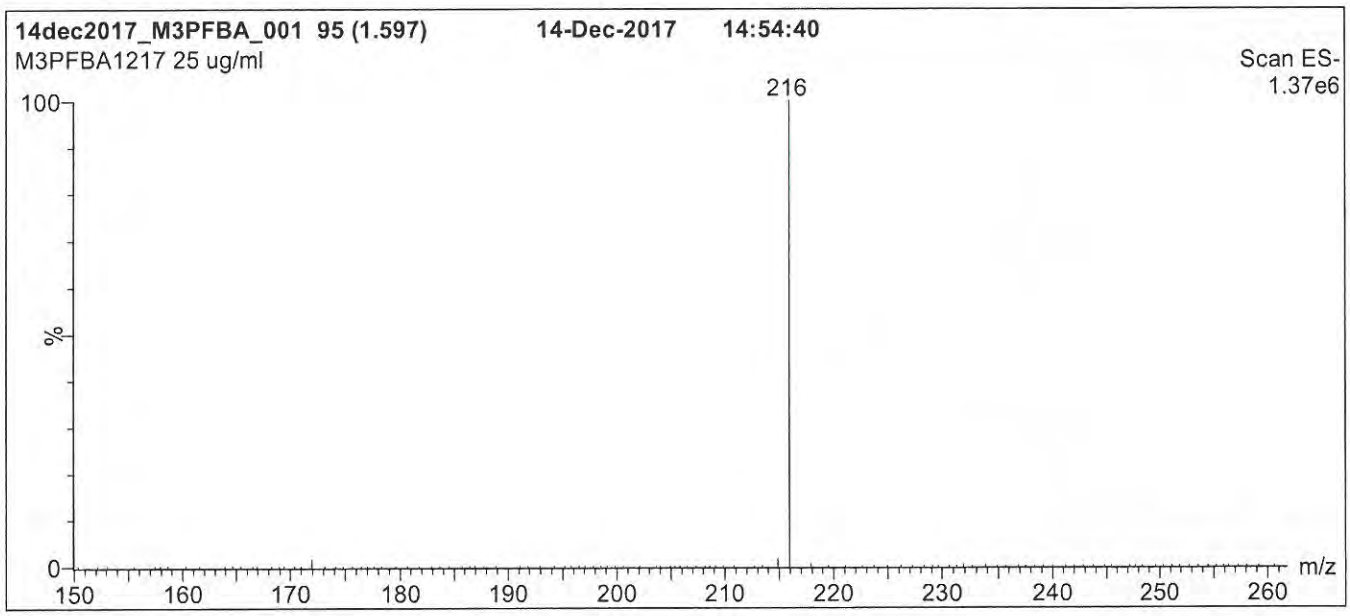
ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2211

Figure 1: **M3PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

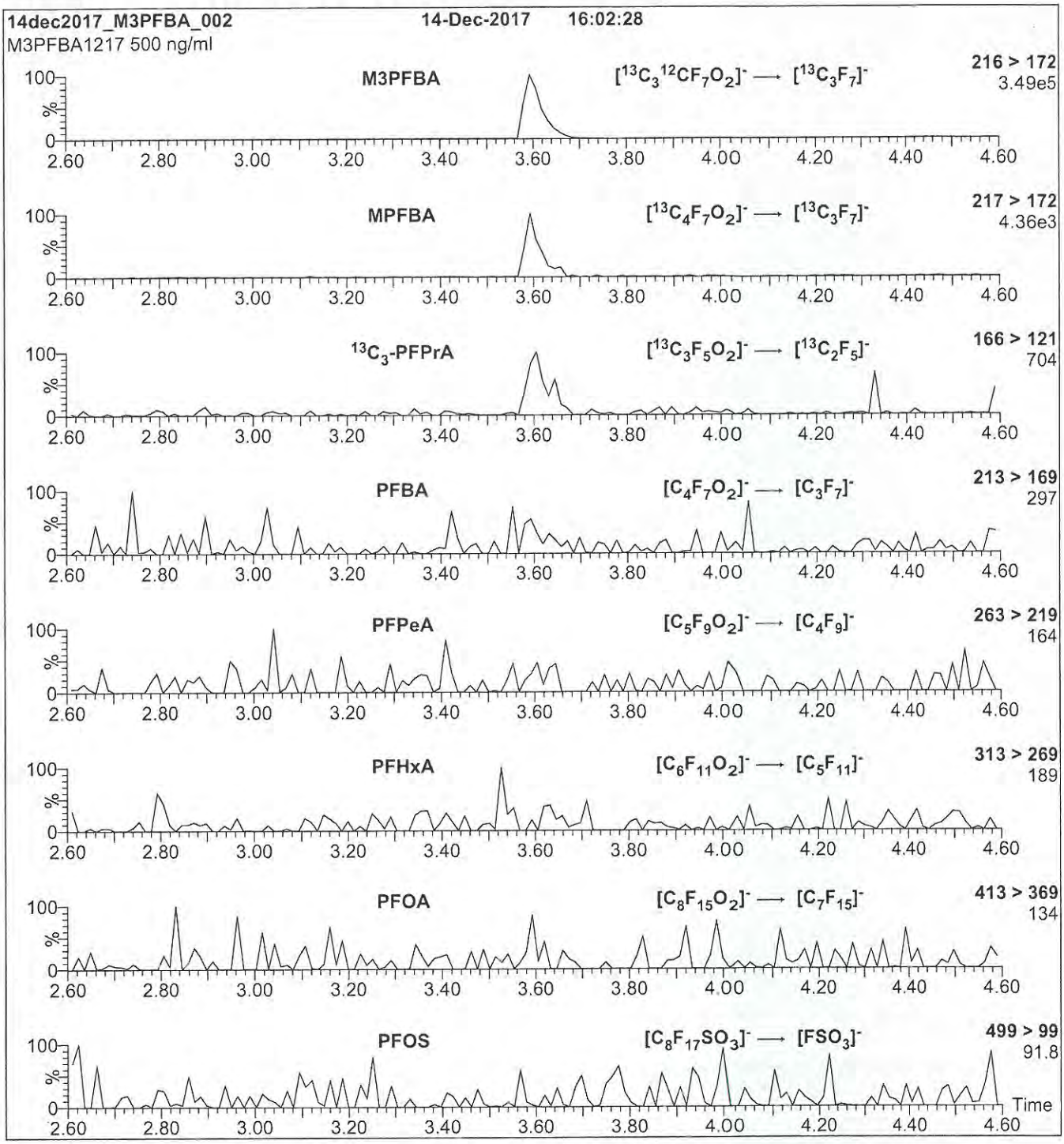
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18F2211

Figure 2: **M3PFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

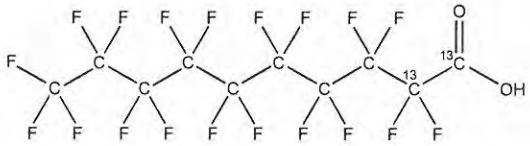
Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 10

18F2212

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFDA	**LOT NUMBER:**	MPFDA0218
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]decanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8HF_{19}O_2$	**MOLECULAR WEIGHT:**	516.07
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of $^{13}C_1$-PFNA.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2212

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCERS

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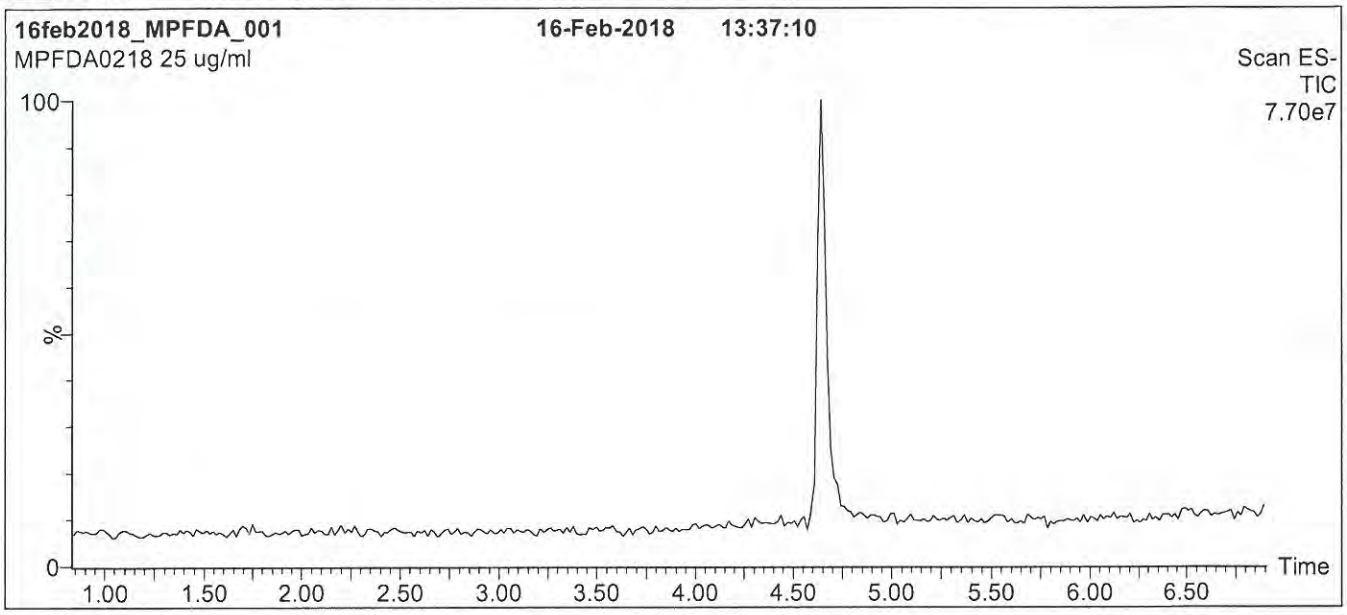
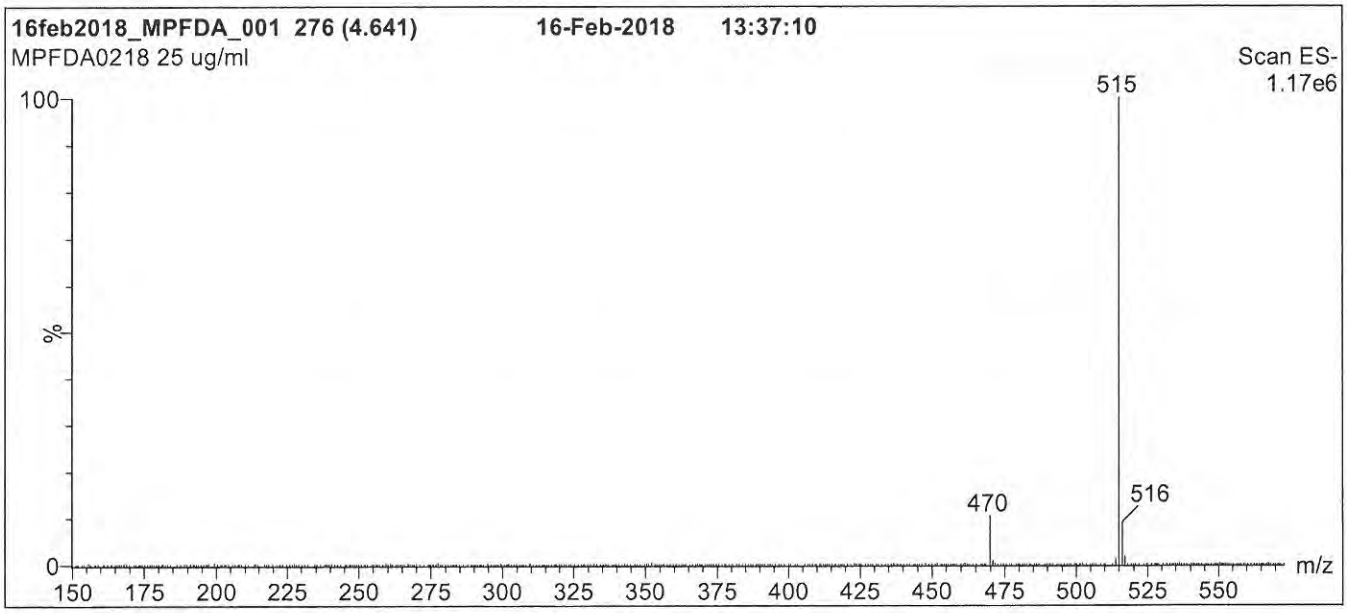
18F2212

Figure 1: **MPFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

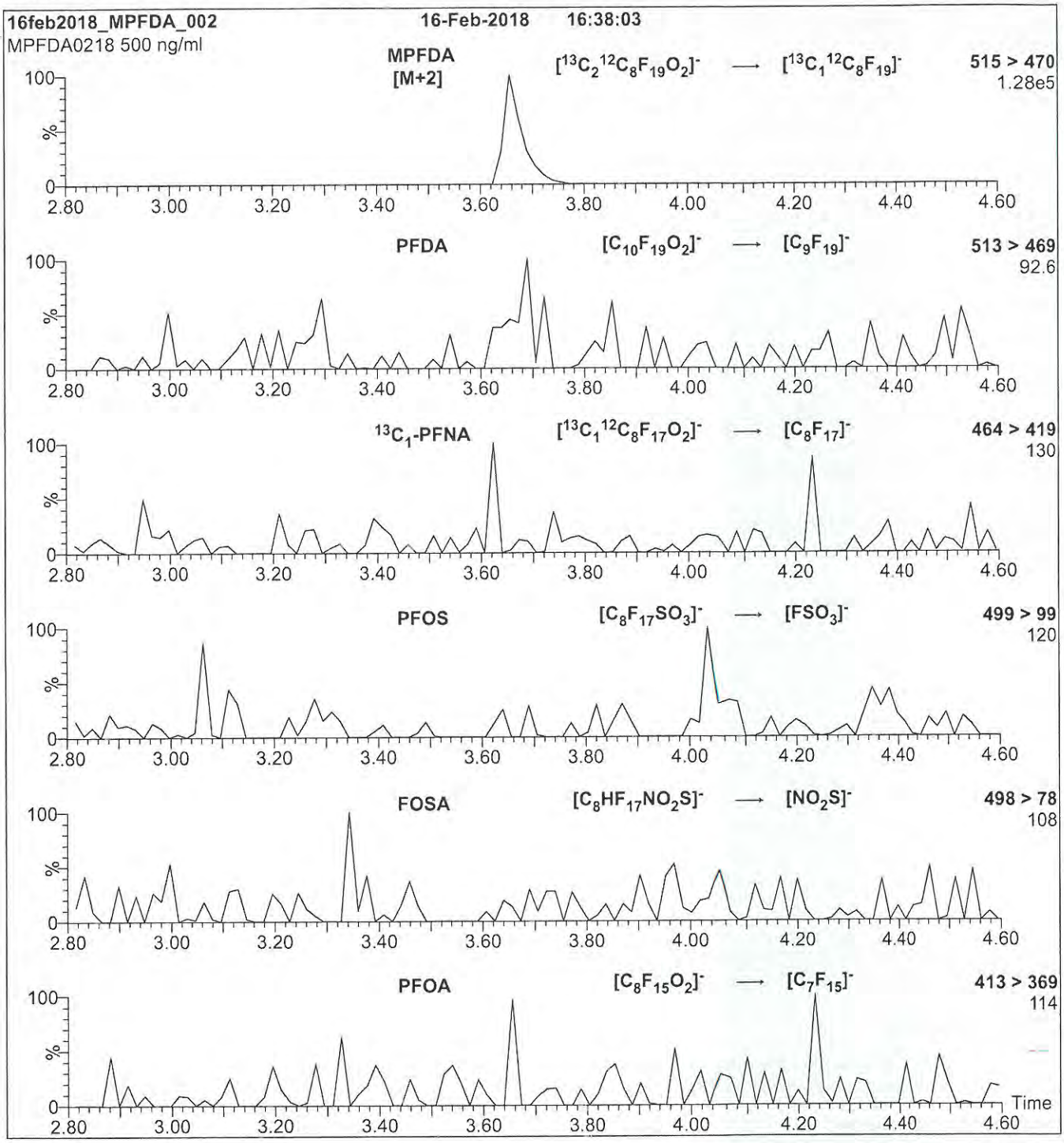
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2212

Figure 2: **MPFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

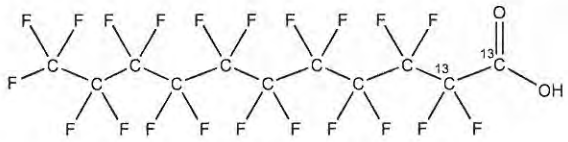
Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 13

18F2213

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFUdA	**LOT NUMBER:**	MPFUdA1116
COMPOUND:	Perfluoro-n-[1,2-$^{13}C_2$]undecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_9HF_{21}O_2$	**MOLECULAR WEIGHT:**	566.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2-$^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/22/2016		
EXPIRY DATE: (mm/dd/yyyy)	11/22/2021		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Presence of 1-$^{13}C_1$-PFUdA (~1%; see Figure 2), 2-$^{13}C_1$-PFUdA (~1%), and PFUdA (~0.2%; see Figure 2) are due to the isotopic purity of the ^{13}C-precursor.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/07/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2213

INTENDED USE:

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HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

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UNCERTAINTY:

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TRACEABILITY:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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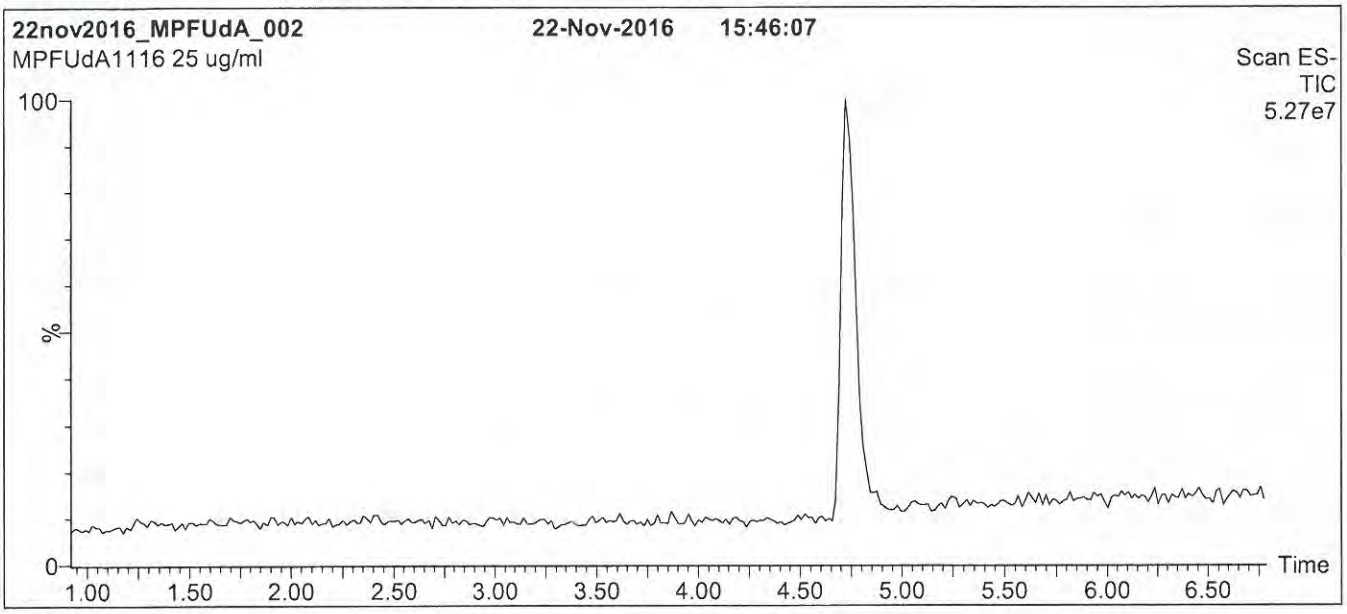
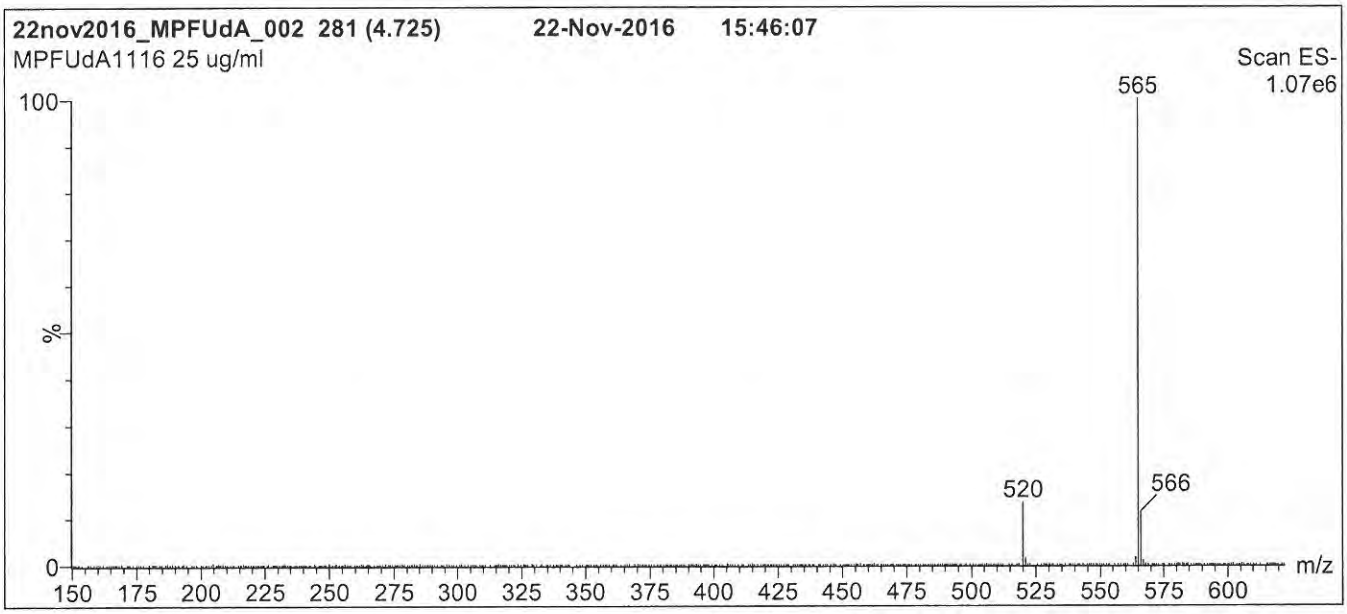
18F2213

Figure 1: **MPFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

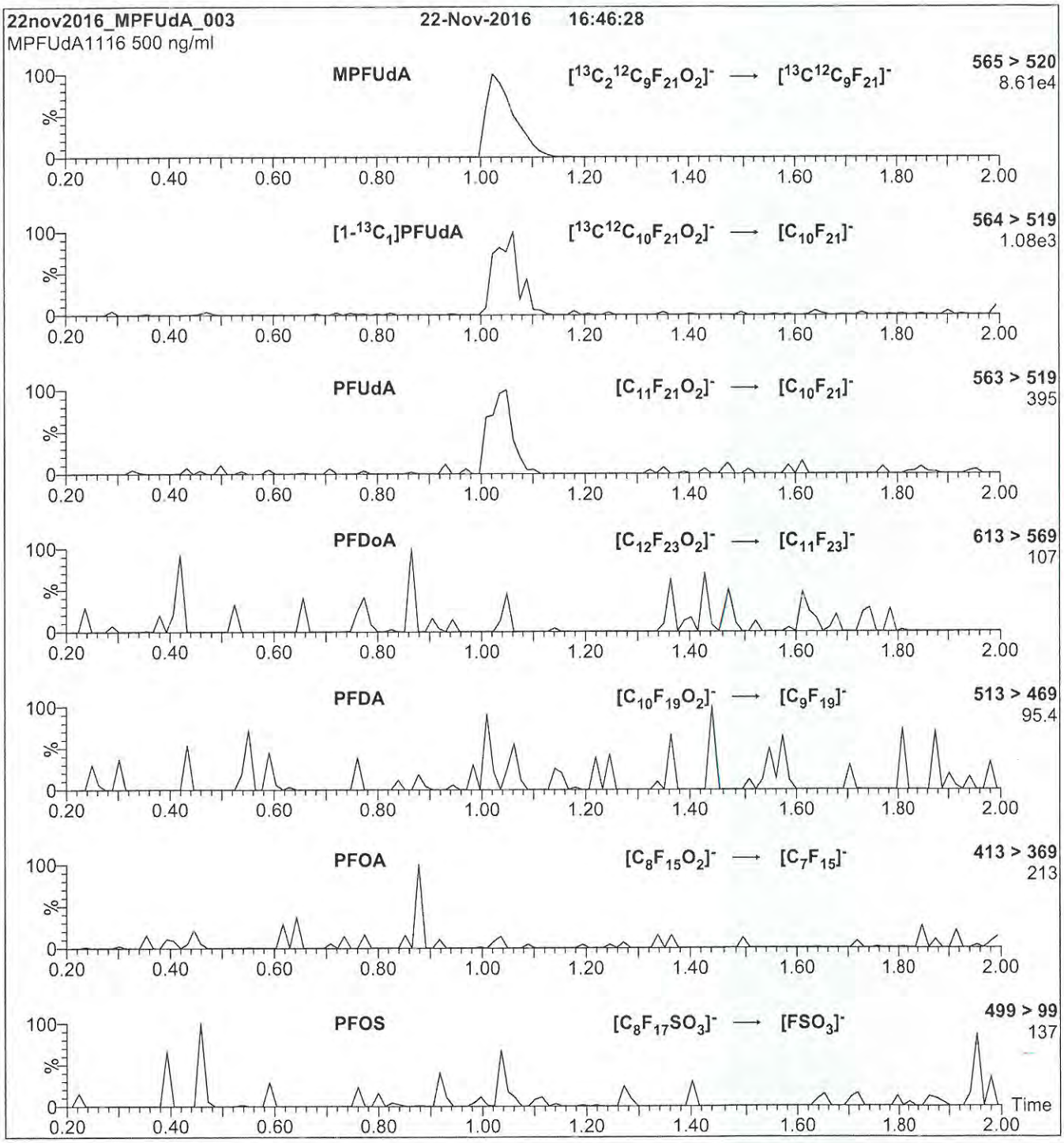
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

18F2213

Figure 2: **MPFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

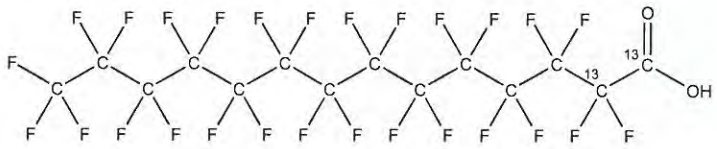
Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

18F2214

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFTeDA
LOT NUMBER: M2PFTeDA1117
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]tetradecanoic acid
STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{12}HF_{27}O_2$	**MOLECULAR WEIGHT:**	716.10
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/30/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/30/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2214

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

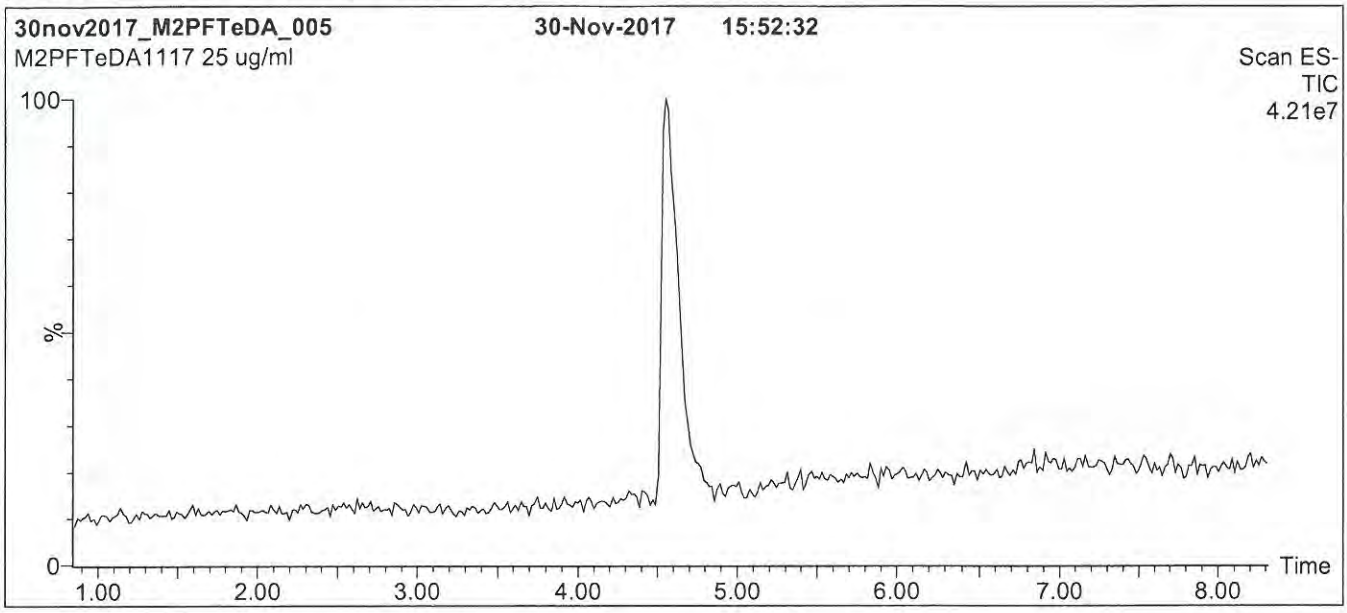
CALA

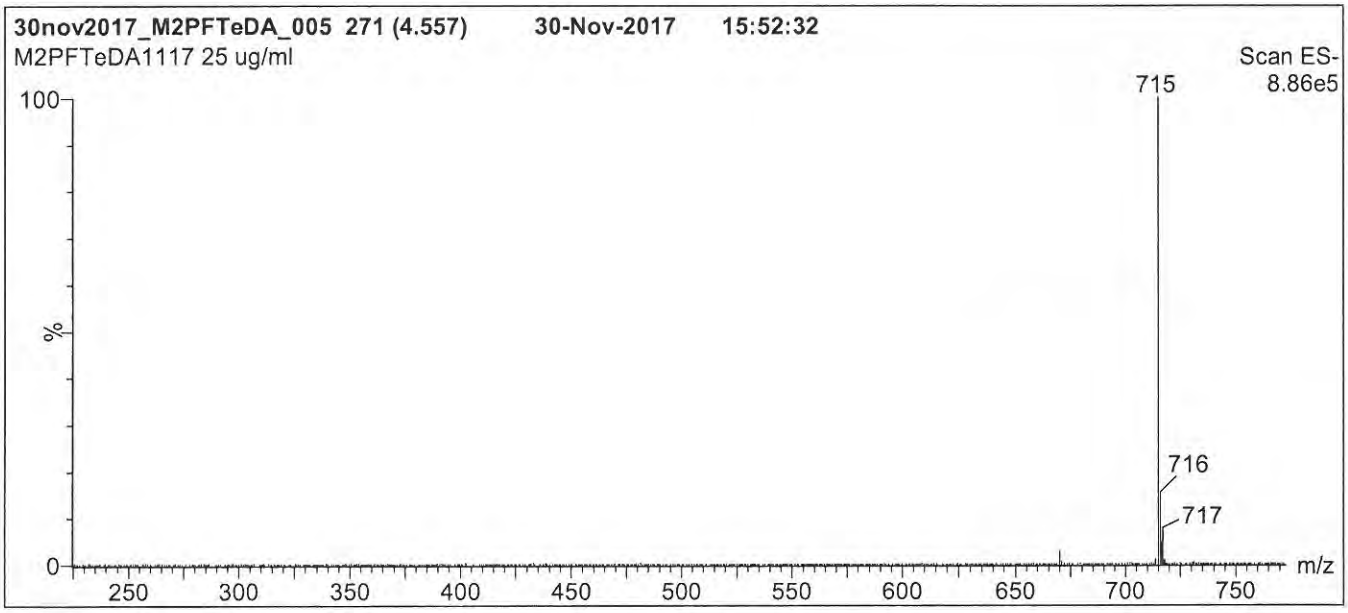
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2214

Figure 1: **M2PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% (80:20 MeOH:ACN) / 35% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

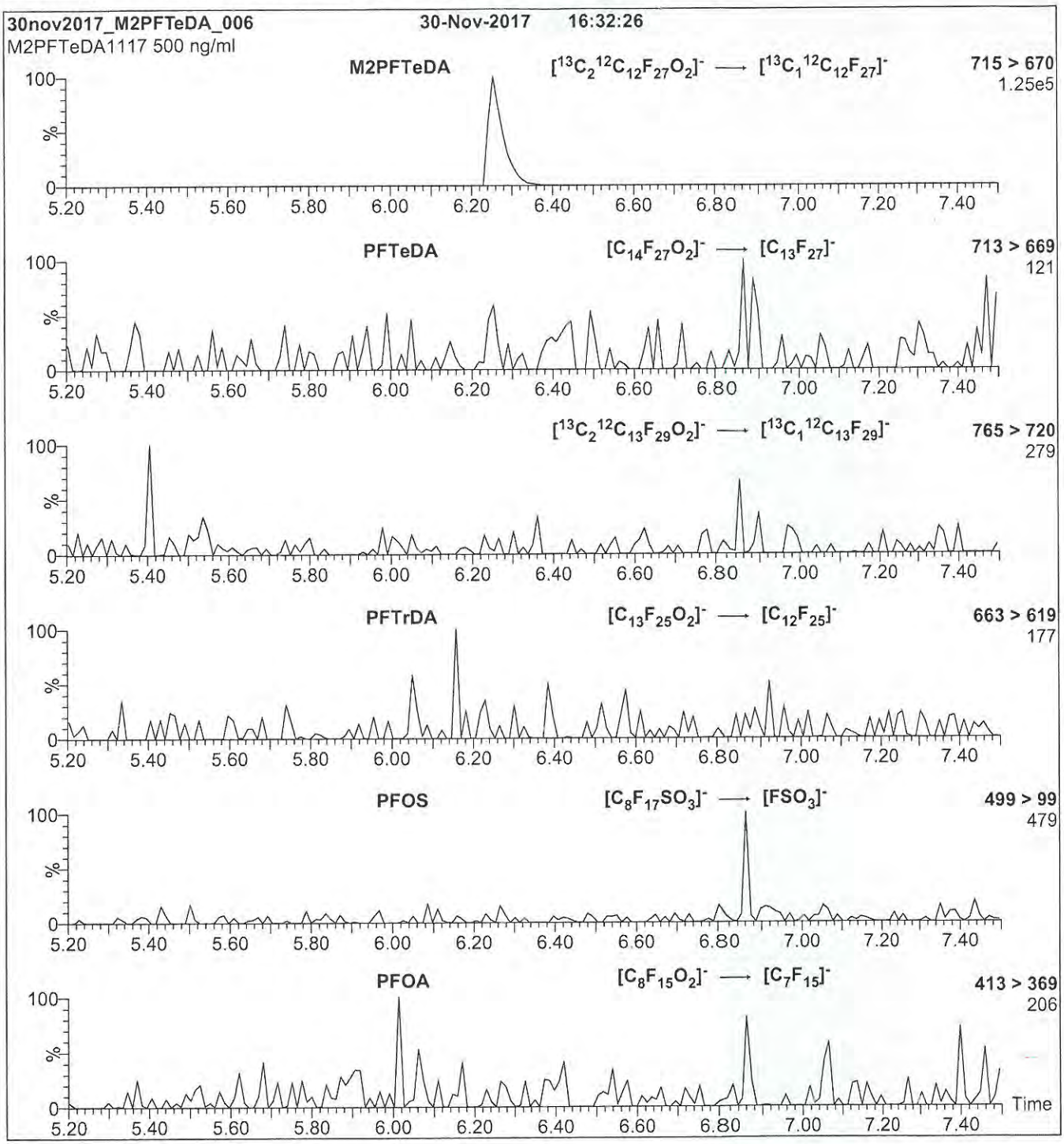
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18F2214

Figure 2: **M2PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

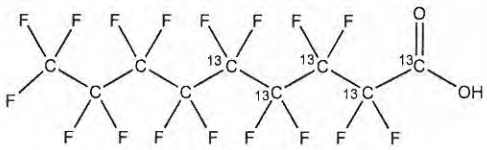
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 14

18F2215

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFNA	**LOT NUMBER:**	MPFNA1217
COMPOUND:	Perfluoro-n-[1,2,3,4,5-$^{13}C_5$]nonanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_4HF_{17}O_2$	**MOLECULAR WEIGHT:**	469.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	12/14/2017		
EXPIRY DATE: (mm/dd/yyyy)	12/14/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/19/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2215

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

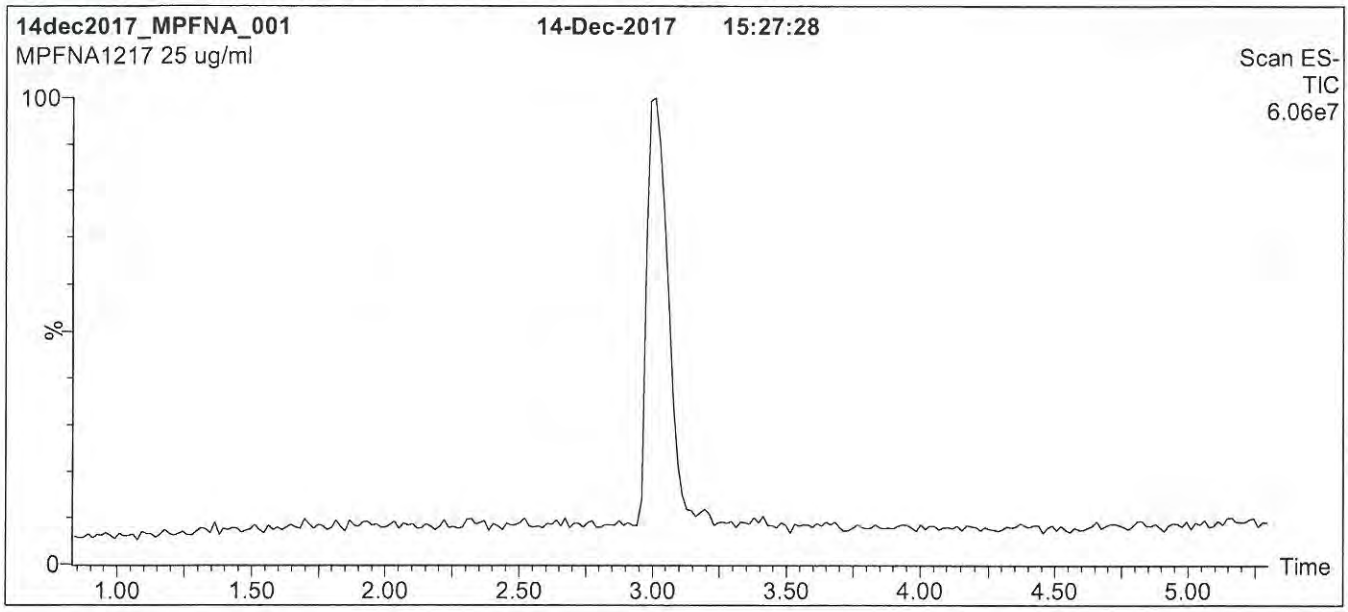
CALA

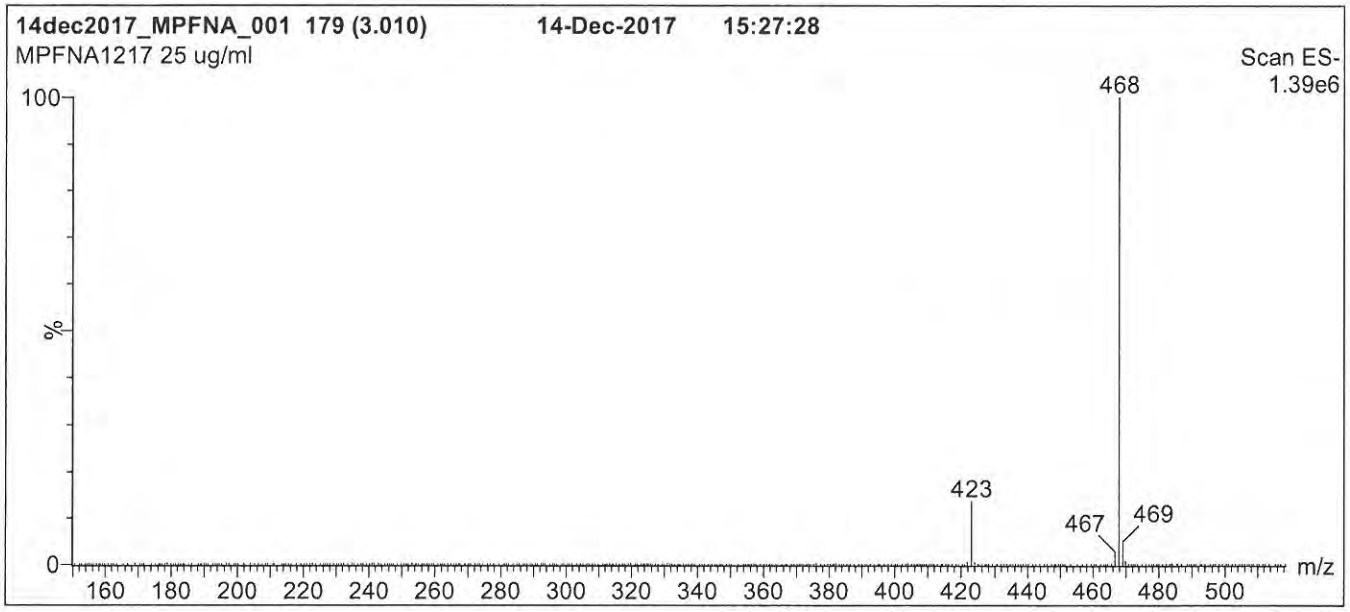
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2215

Figure 1: **MPFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

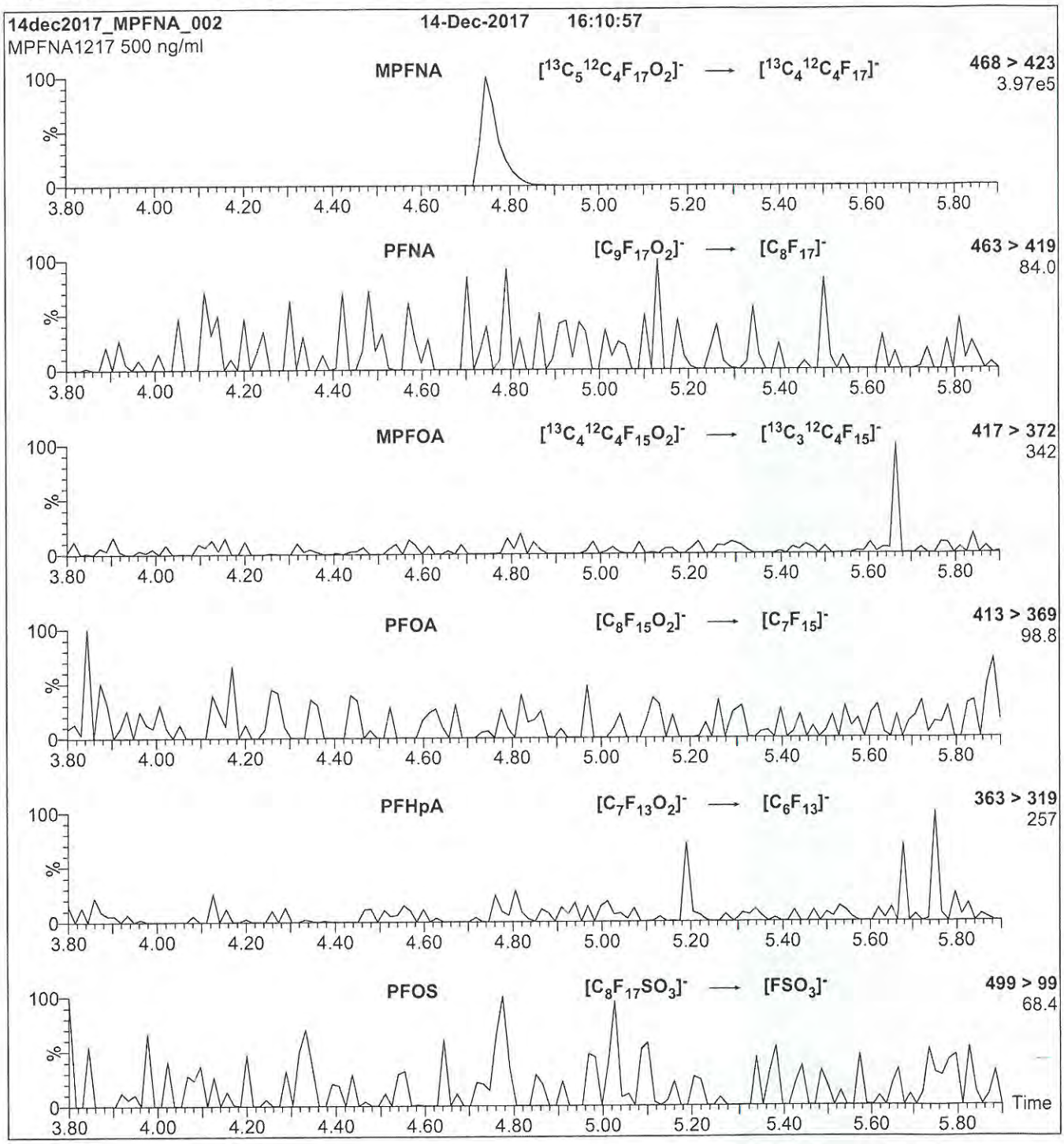
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2215

Figure 2: **MPFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 11

18F2216

WELLINGTON LABORATORIES

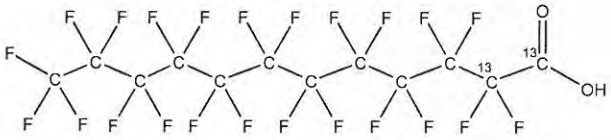
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFDoA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]dodecanoic acid

LOT NUMBER: MPFDoA0218

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{10}HF_{23}O_2$	**MOLECULAR WEIGHT:**	616.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/23/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2216

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

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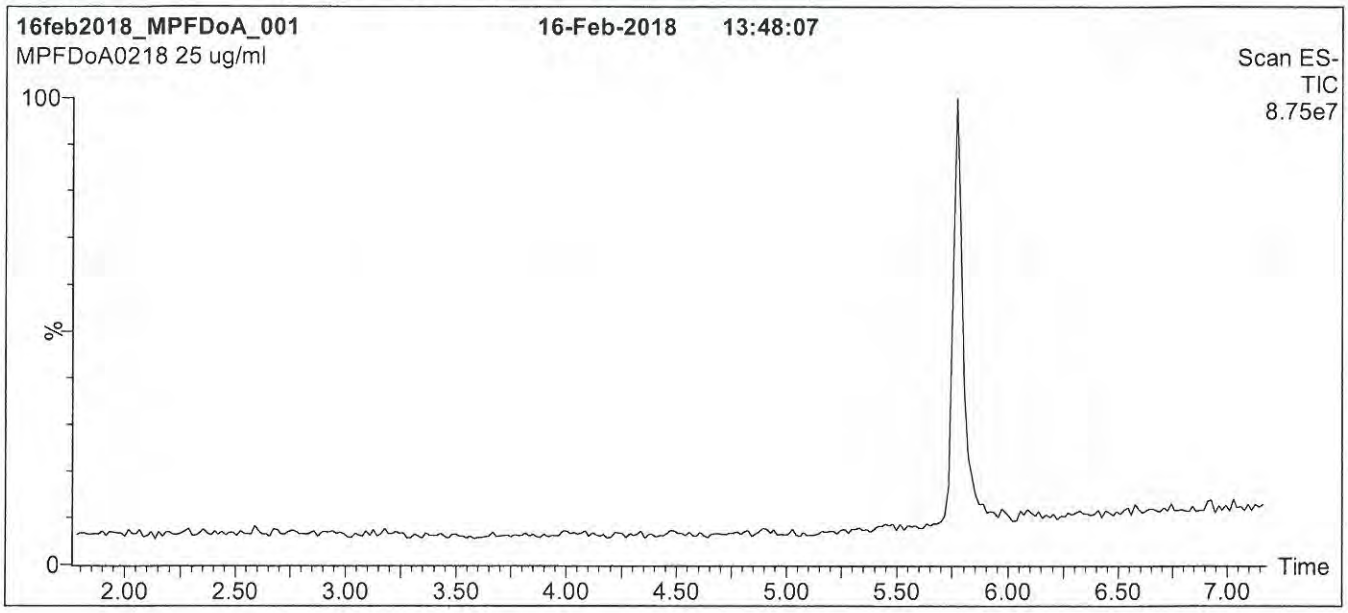
CALA

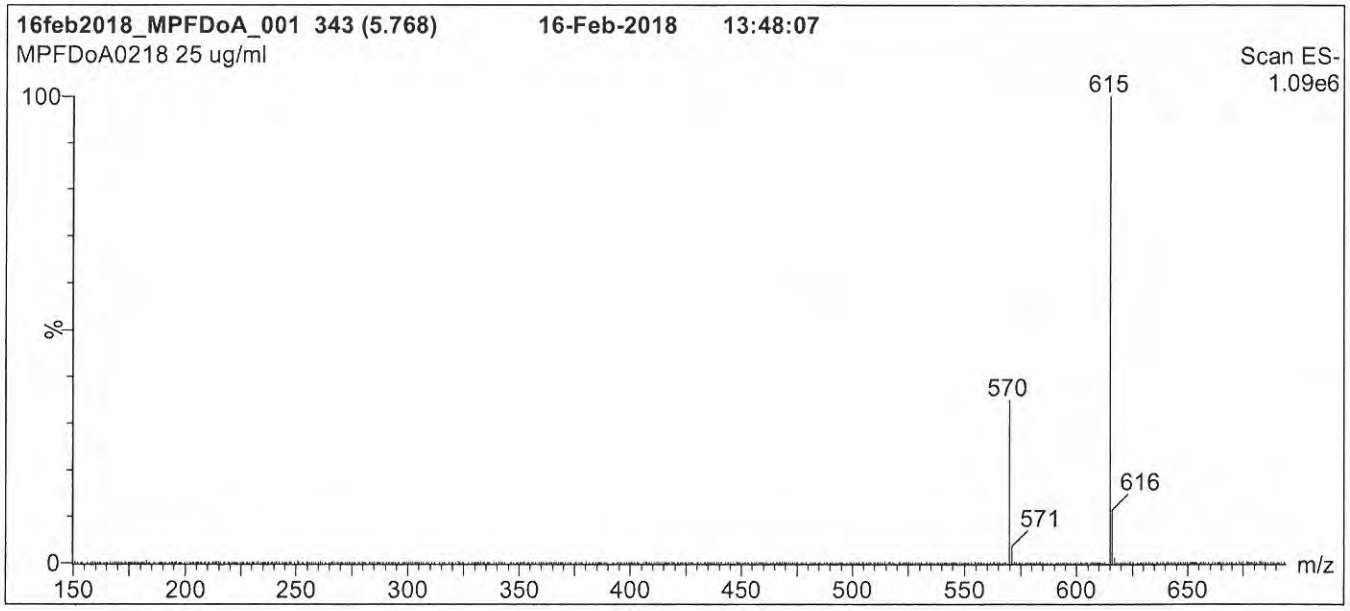
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2216

Figure 1: **MPFDoA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

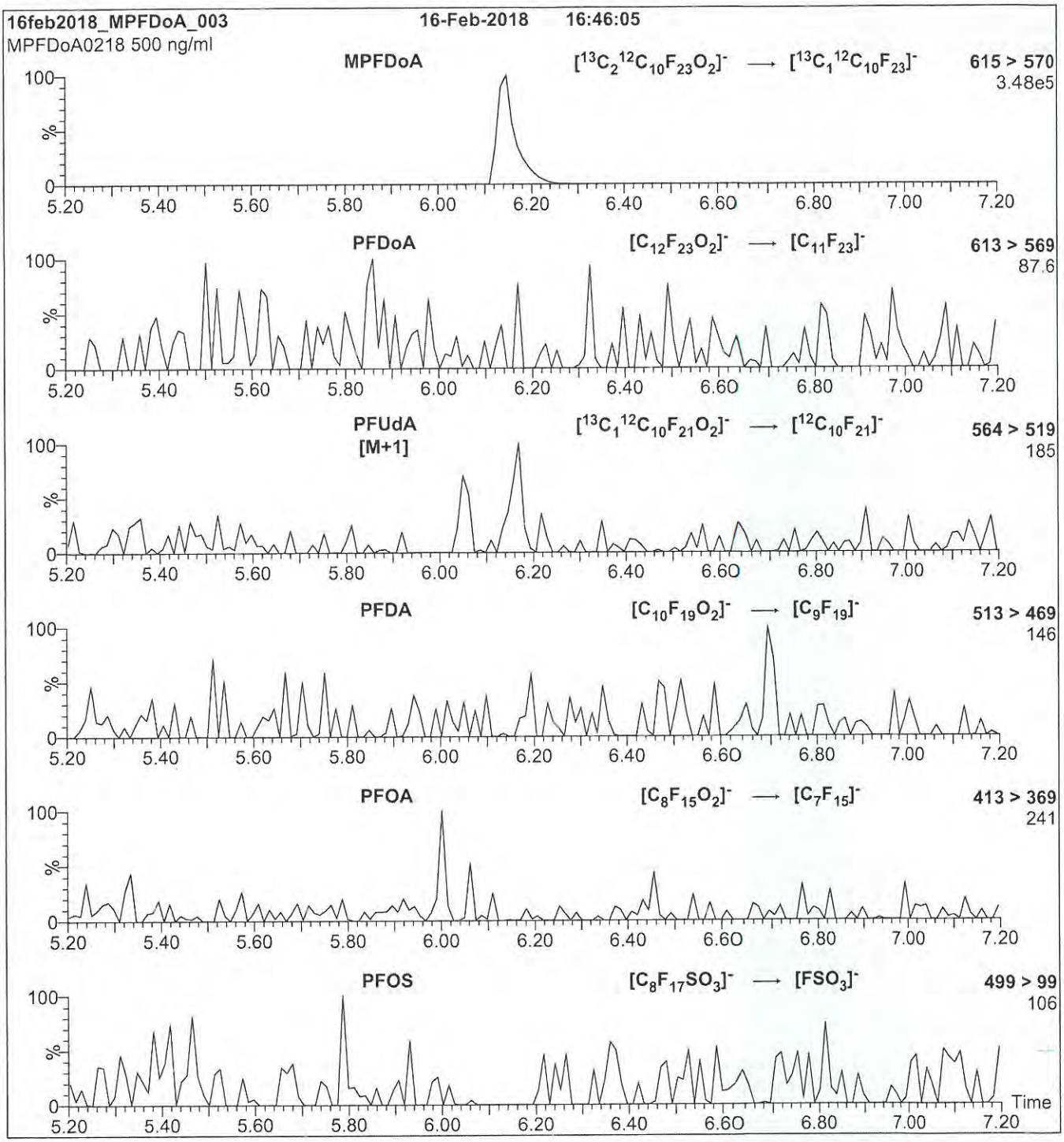
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 20.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2216

Figure 2: **MPFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFDoA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

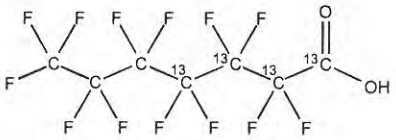
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 13

18F2217

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M4PFHpA	**LOT NUMBER:**	M4PFHpA0517
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]heptanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_3HF_{13}O_2$	**MOLECULAR WEIGHT:**	368.03
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	05/03/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/03/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/11/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2217

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

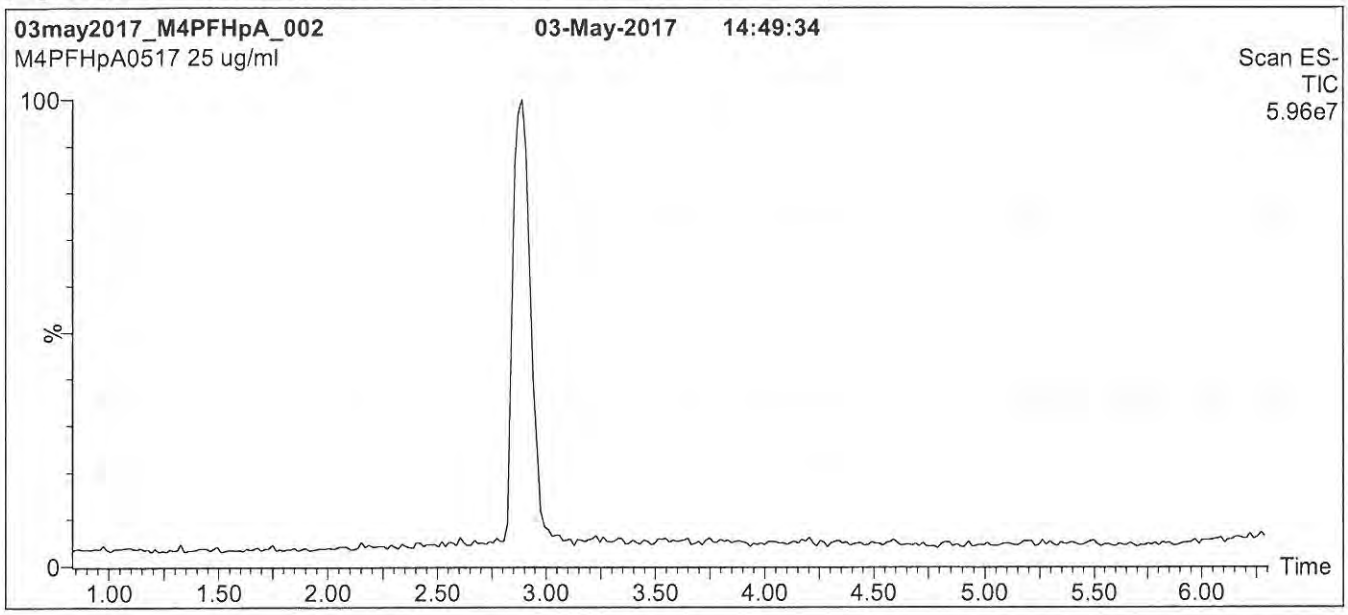
CALA Testing

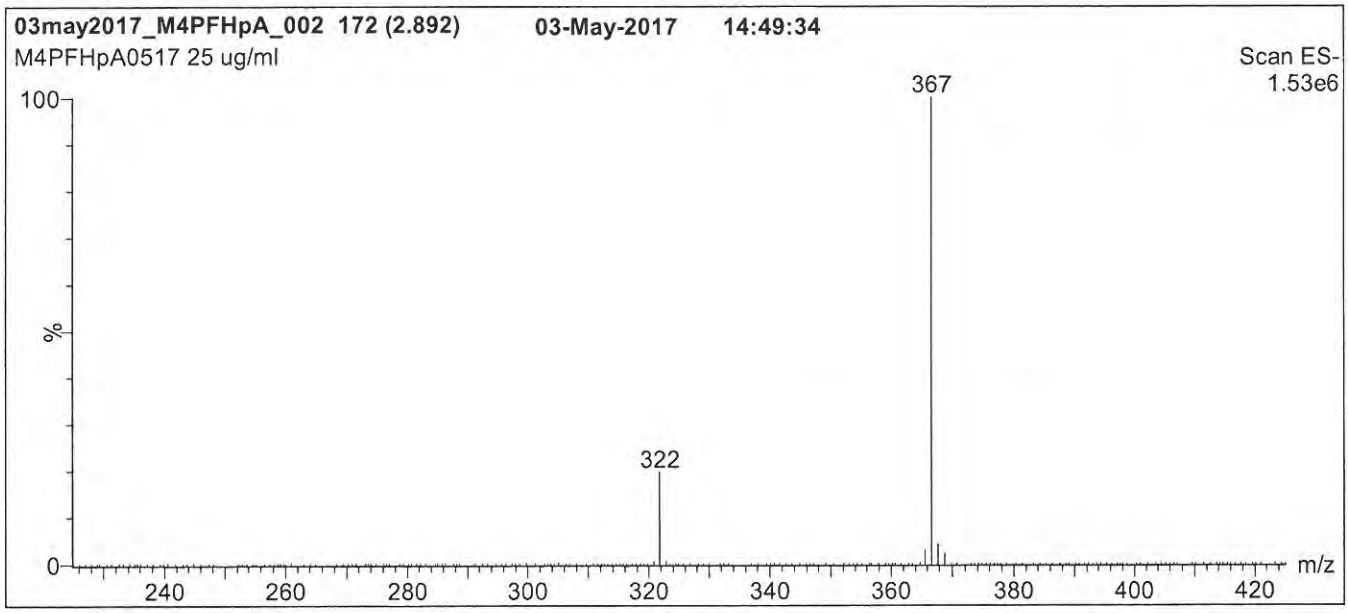
ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2217

Figure 1: **M4PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

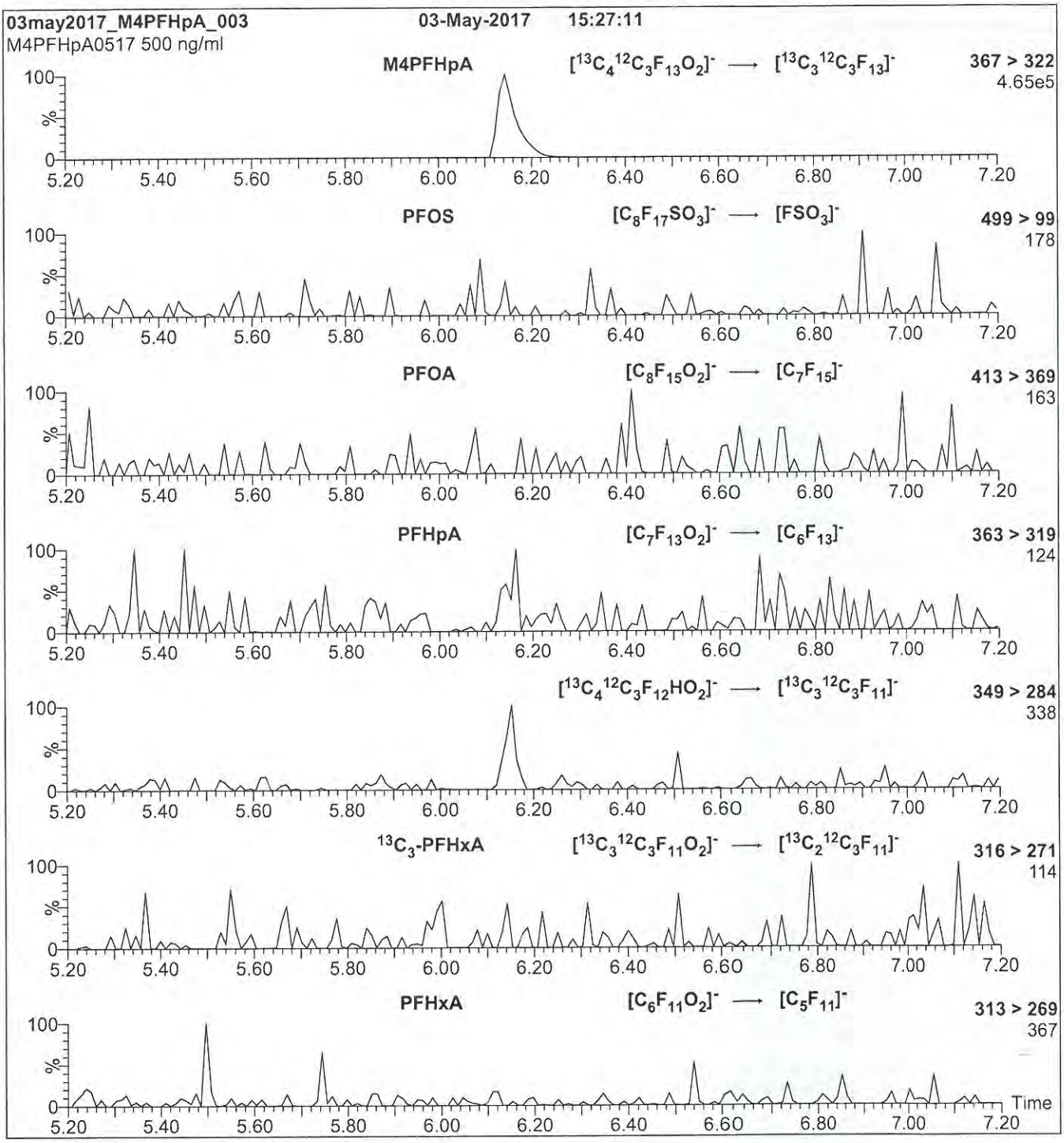
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

185217

Figure 2: **M4PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M4PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 9

18F2218

WELLINGTON LABORATORIES

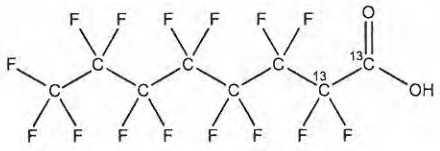
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFOA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]octanoic acid

LOT NUMBER: M2PFOA1017

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_2{}^{12}C_6HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 10/26/2017
EXPIRY DATE: (mm/dd/yyyy) 10/26/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

MOLECULAR WEIGHT: 416.05
SOLVENT(S): Methanol
Water (<1%)
ISOTOPIC PURITY: ≥99% ^{13}C (1,2-$^{13}C_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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EXPIRY DATE / PERIOD OF VALIDITY:

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ANAB ACCREDITED

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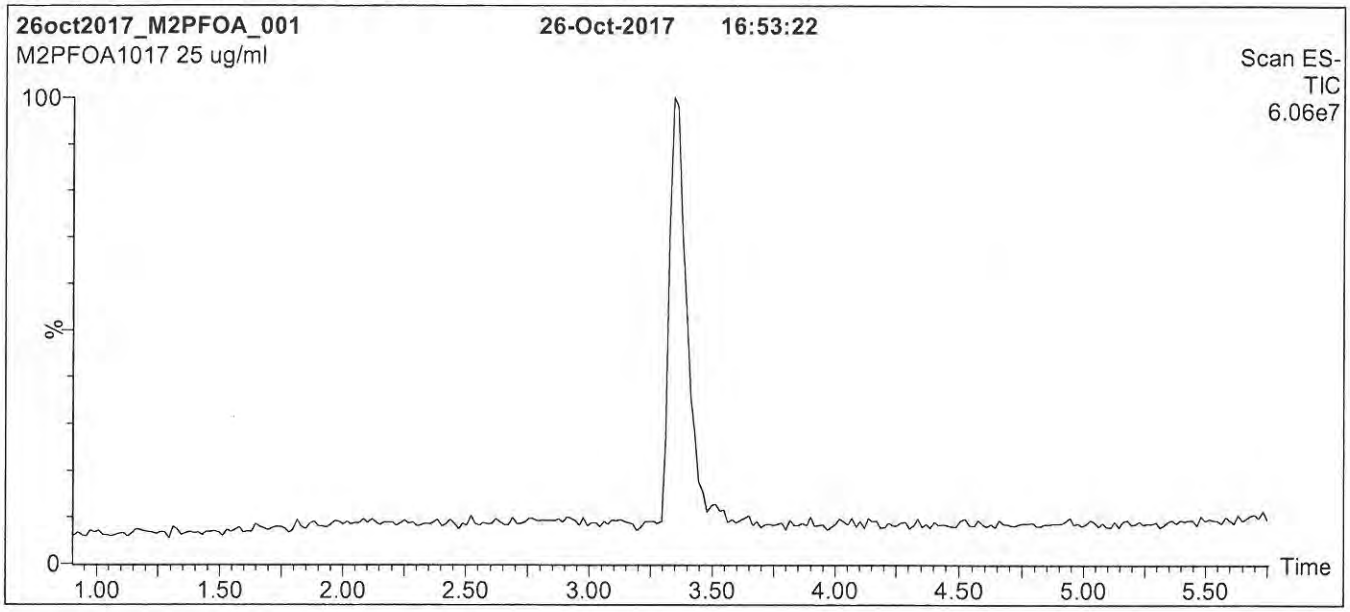
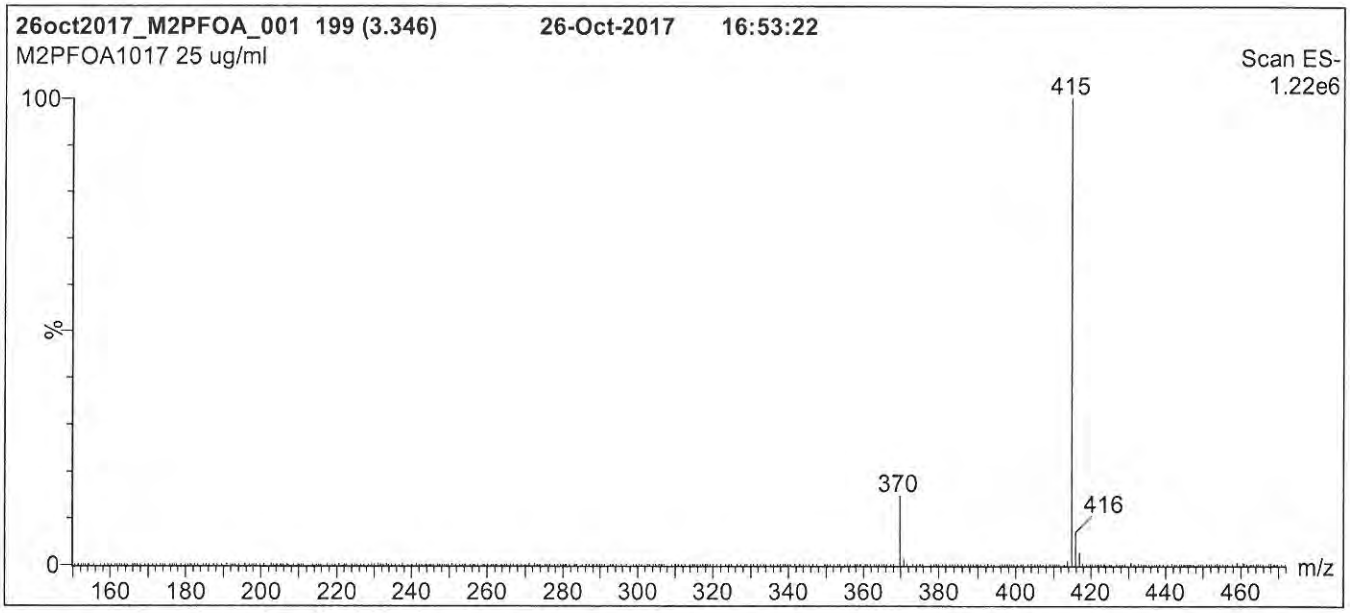
18F2218

Figure 1: **M2PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

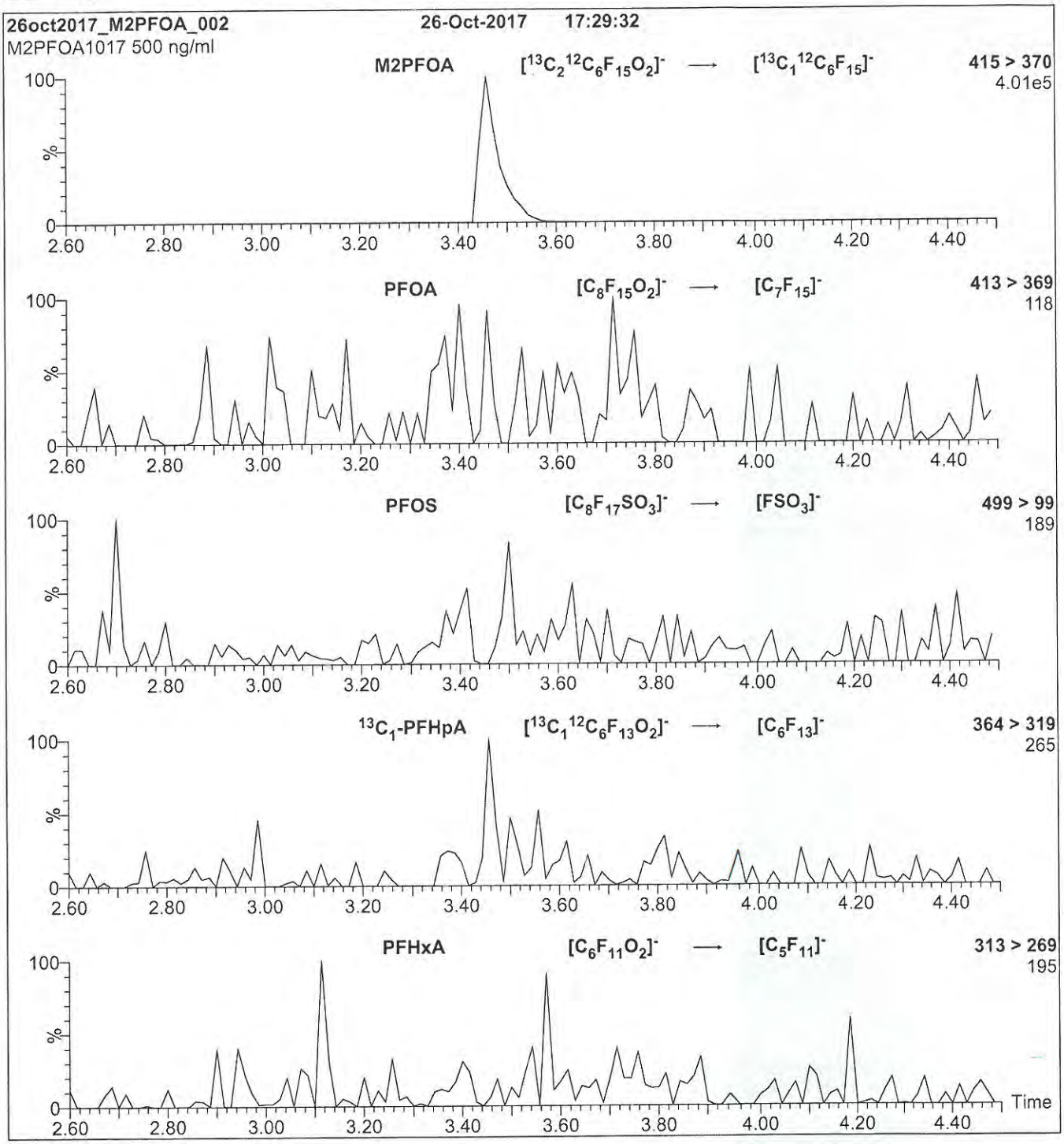
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18F2218

Figure 2: **M2PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 10

18F2219

WELLINGTON LABORATORIES

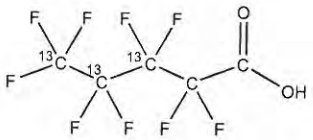
CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFPeA
COMPOUND: Perfluoro-n-[3,4,5-$^{13}C_3$]pentanoic acid

LOT NUMBER: M3PFPeA0417

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA: $^{13}C_3{}^{12}C_2HF_9O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 267.02
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/20/2017
EXPIRY DATE: (mm/dd/yyyy) 04/20/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

ISOTOPIC PURITY: ≥99% ^{13}C ($3,4,5$-$^{13}C_3$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.95% of perfluoro-n-[$^{13}C_3$]butanoic acid and 0.05% of perfluoro-1-pentanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/24/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2219

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ANAB ACCREDITED

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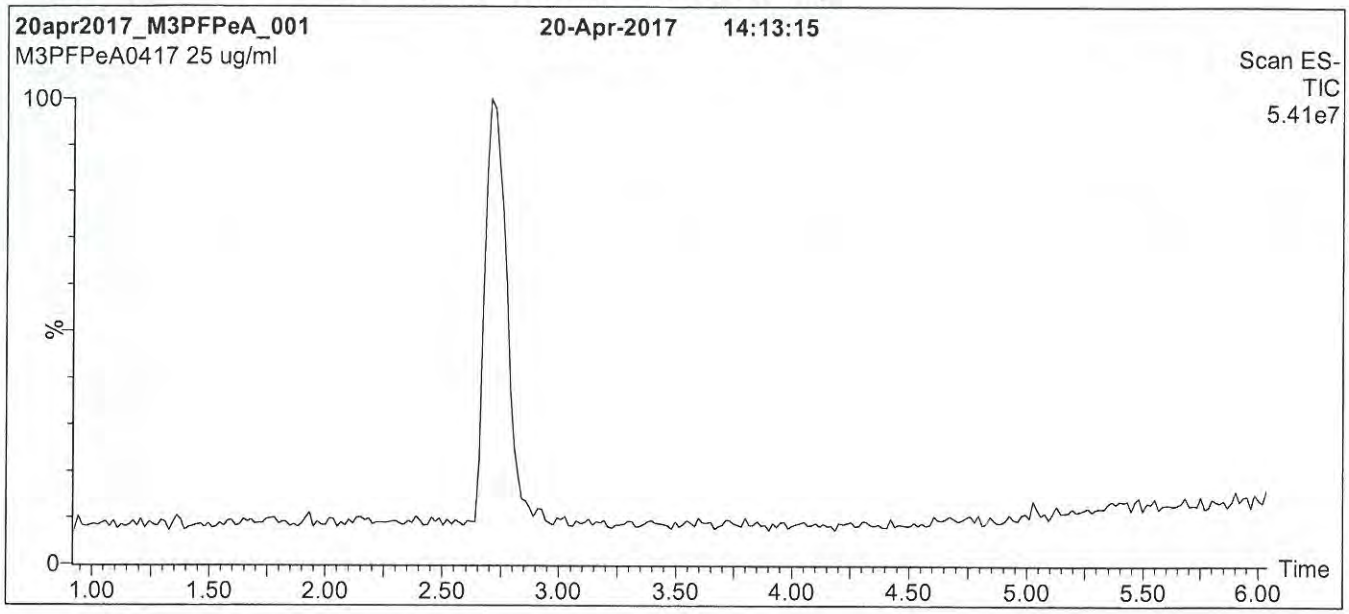
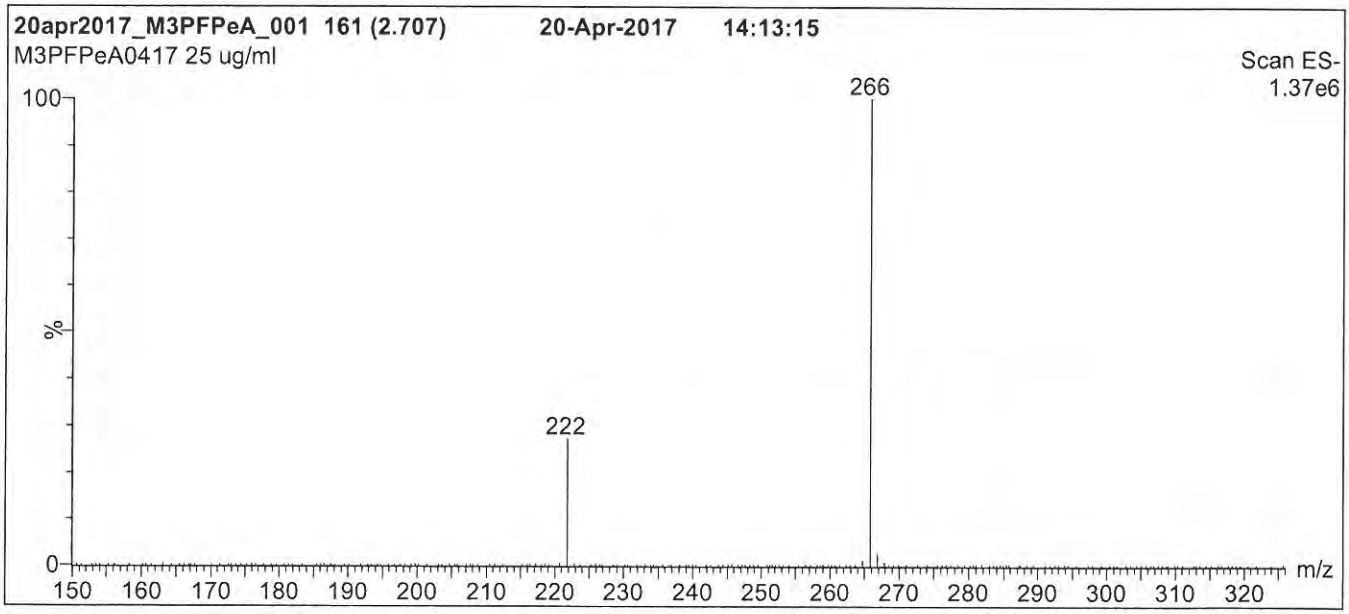
18F2219

Figure 1: **M3PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

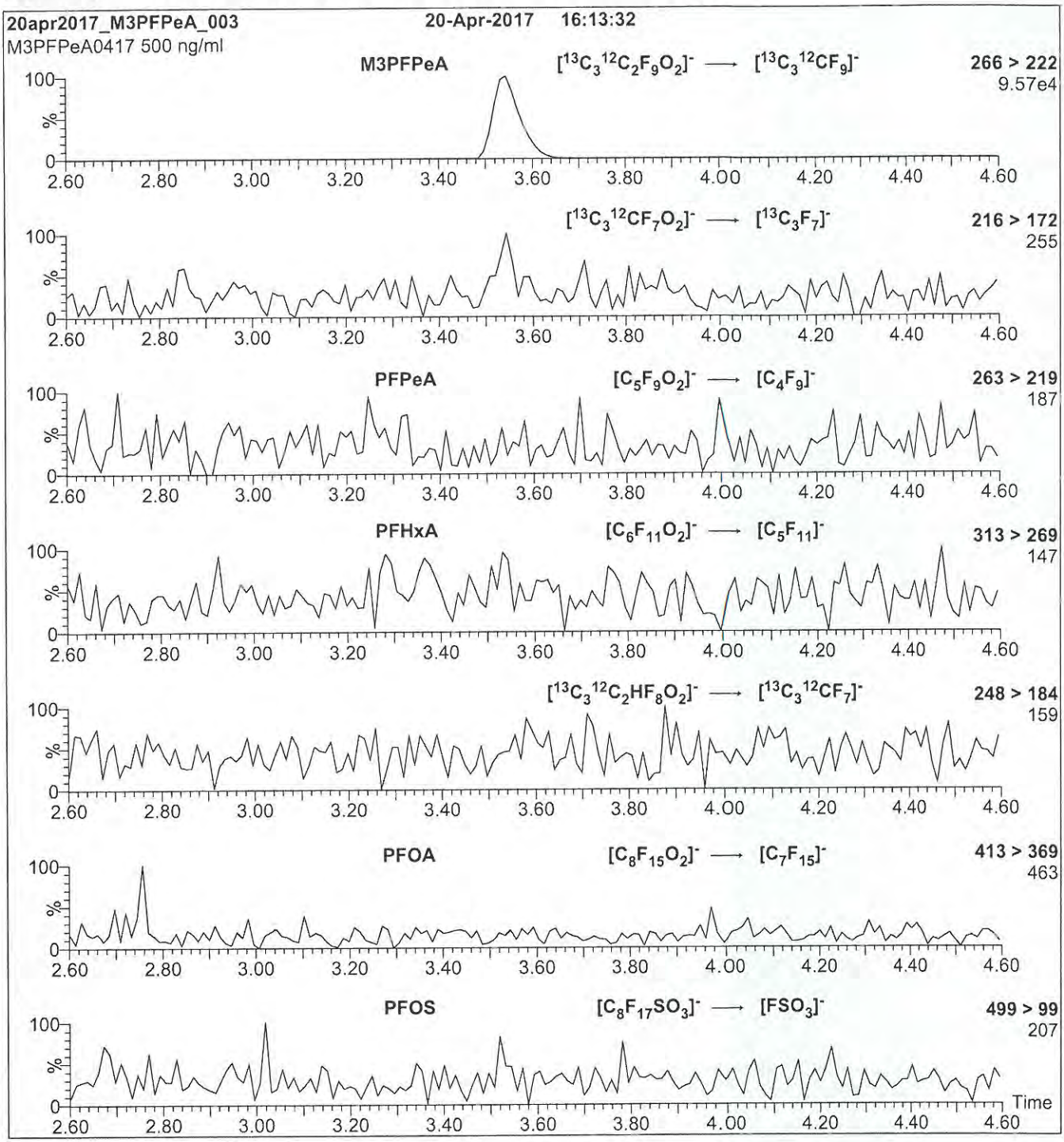
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

18F2219

Figure 2: **M3PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 9

18F2220

WELLINGTON LABORATORIES

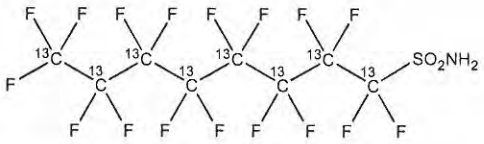
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M8FOSA-I
COMPOUND: Perfluoro-1-[$^{13}C_8$]octanesulfonamide

LOT NUMBER: M8FOSA1017I

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	507.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	10/11/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/11/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 1.1% of perfluoro-1-[$^{13}C_4$]octanesulfonamide and ~ 0.01% of perfluoro-1-[$^{13}C_7$]heptanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/20/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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18F2220

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HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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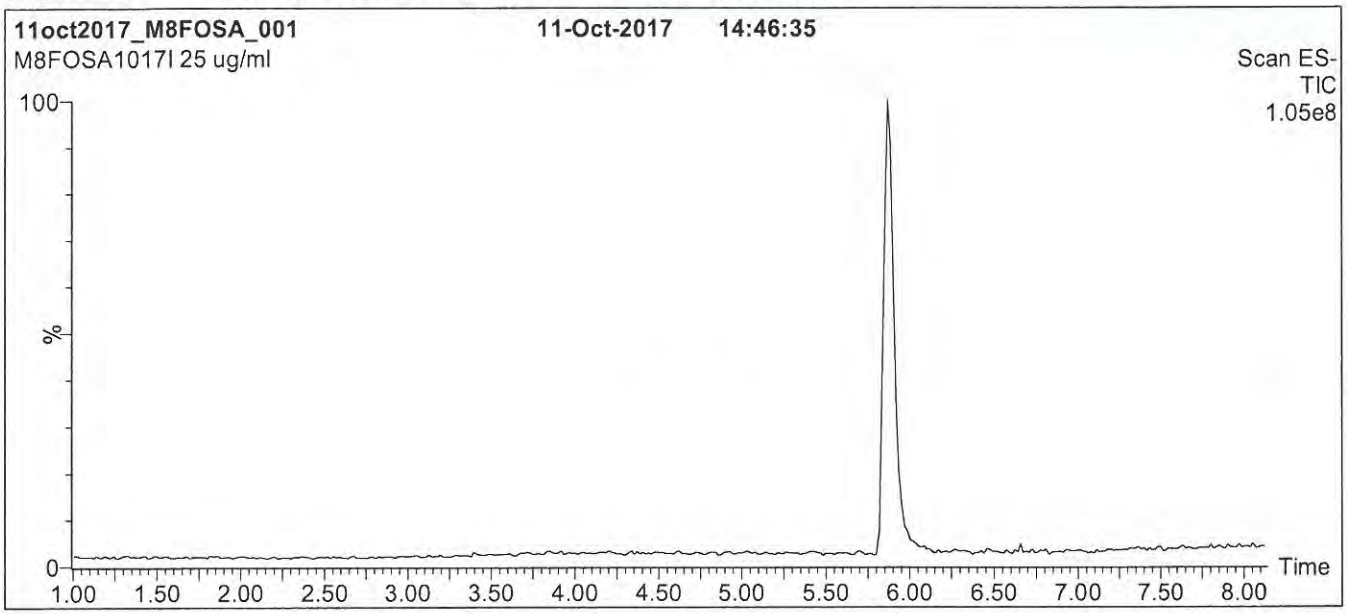
CALA Testing Accreditation No. A 1226

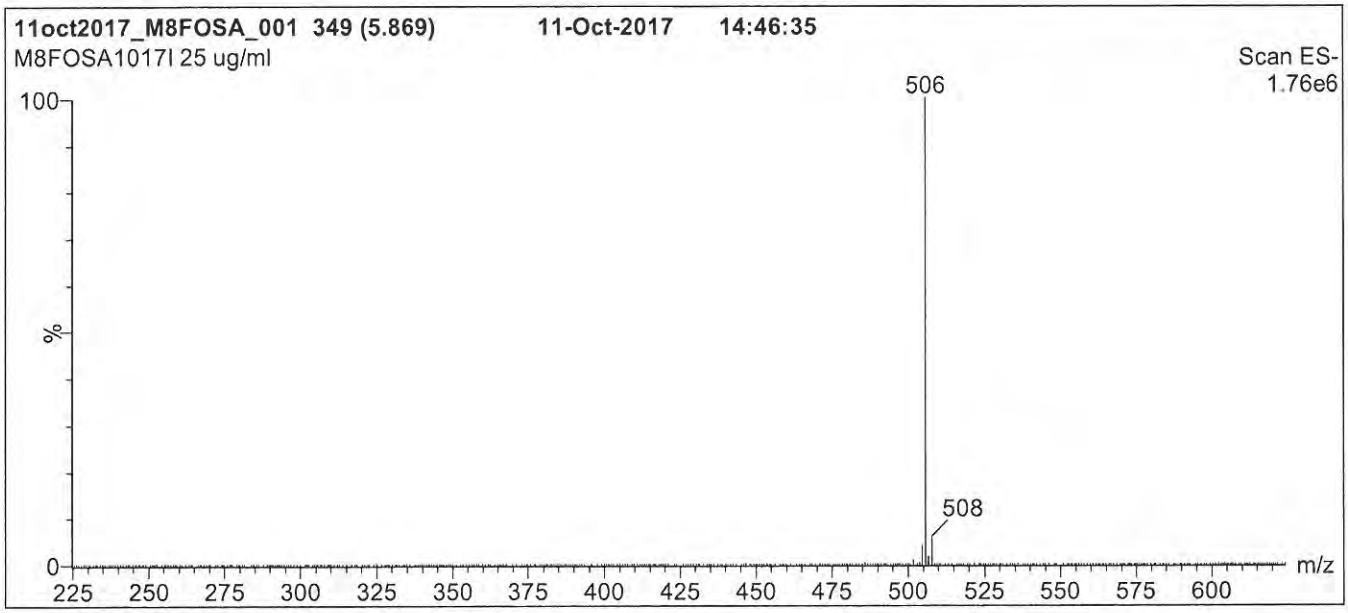
ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2220

Figure 1: **M8FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

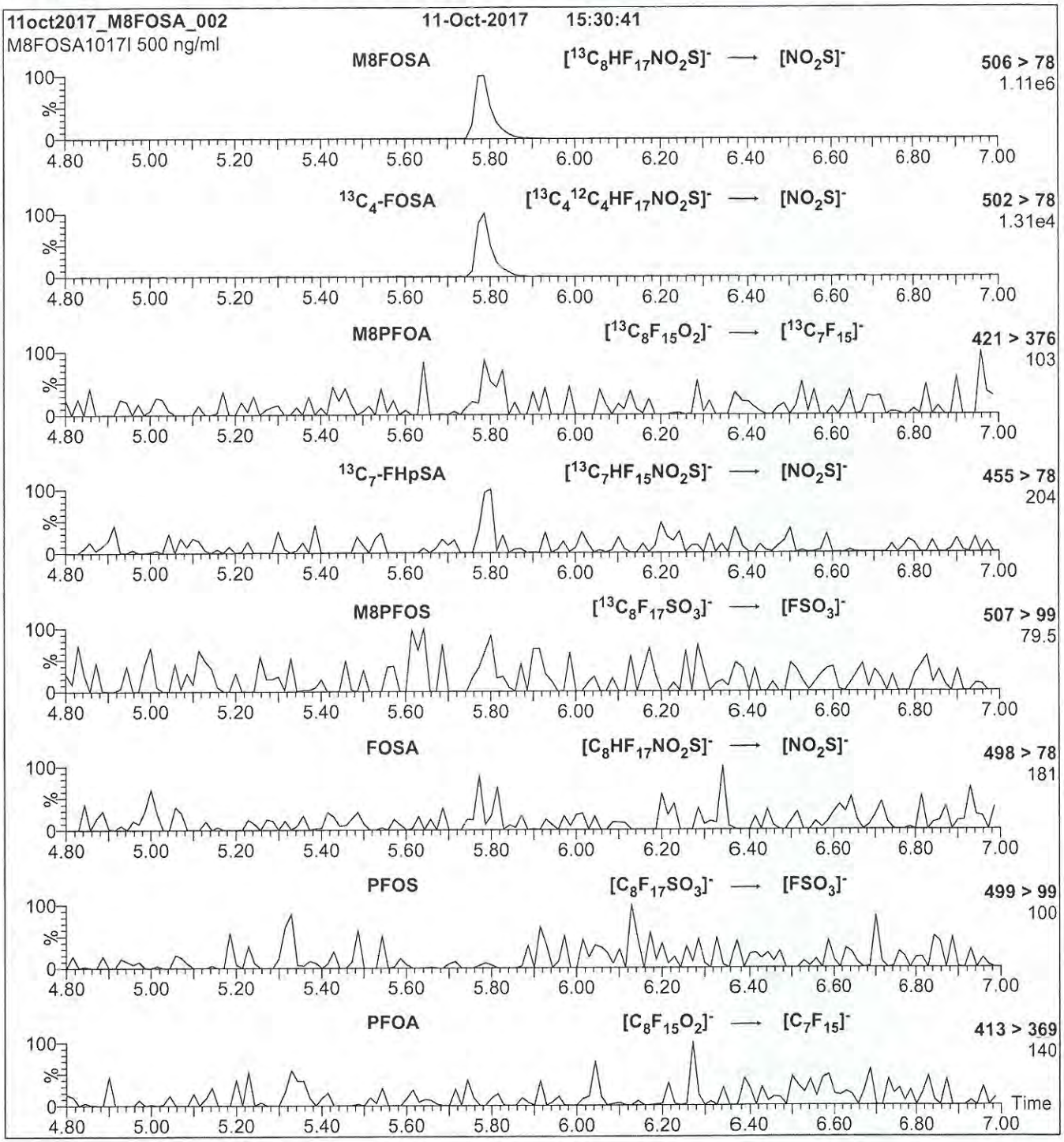
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2220

Figure 2: **M8FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 30

18F2221

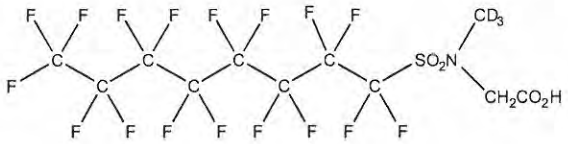
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d3-N-MeFOSAA **LOT NUMBER:** d3NMeFOSAA1117

COMPOUND: N-methyl-d3-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{11}D_3H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	574.23
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_3$
LAST TESTED: (mm/dd/yyyy)	11/08/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2221

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HAZARDS:

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CALA Testing

ANAB ACCREDITED

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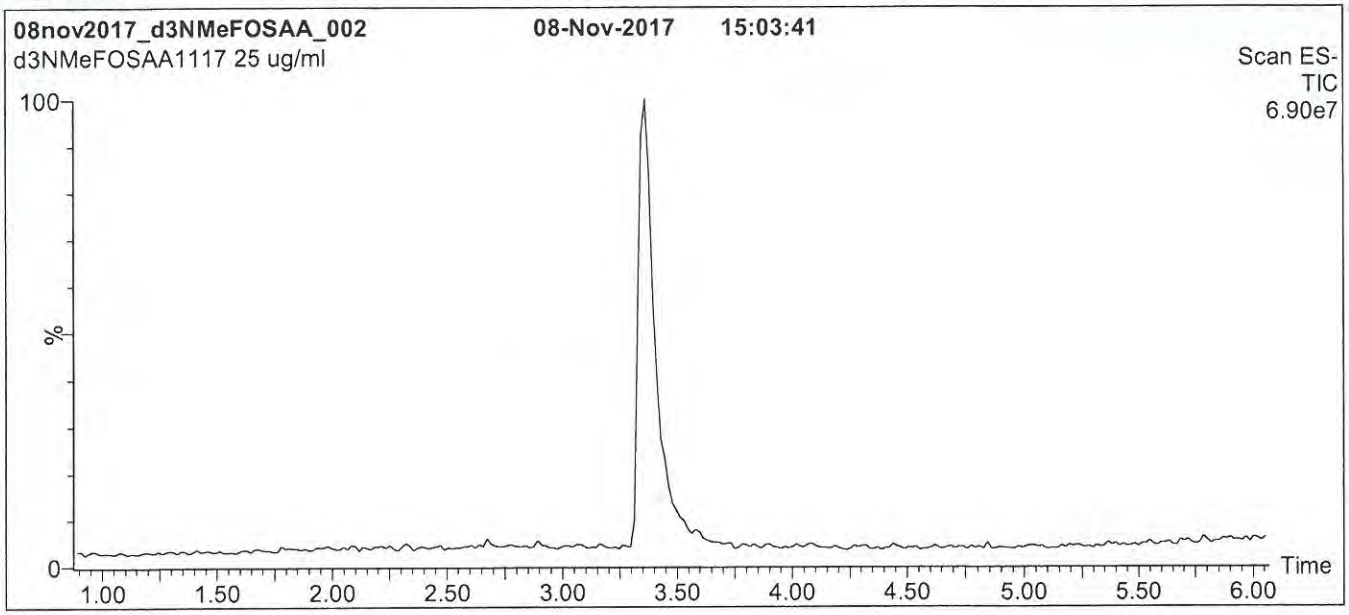
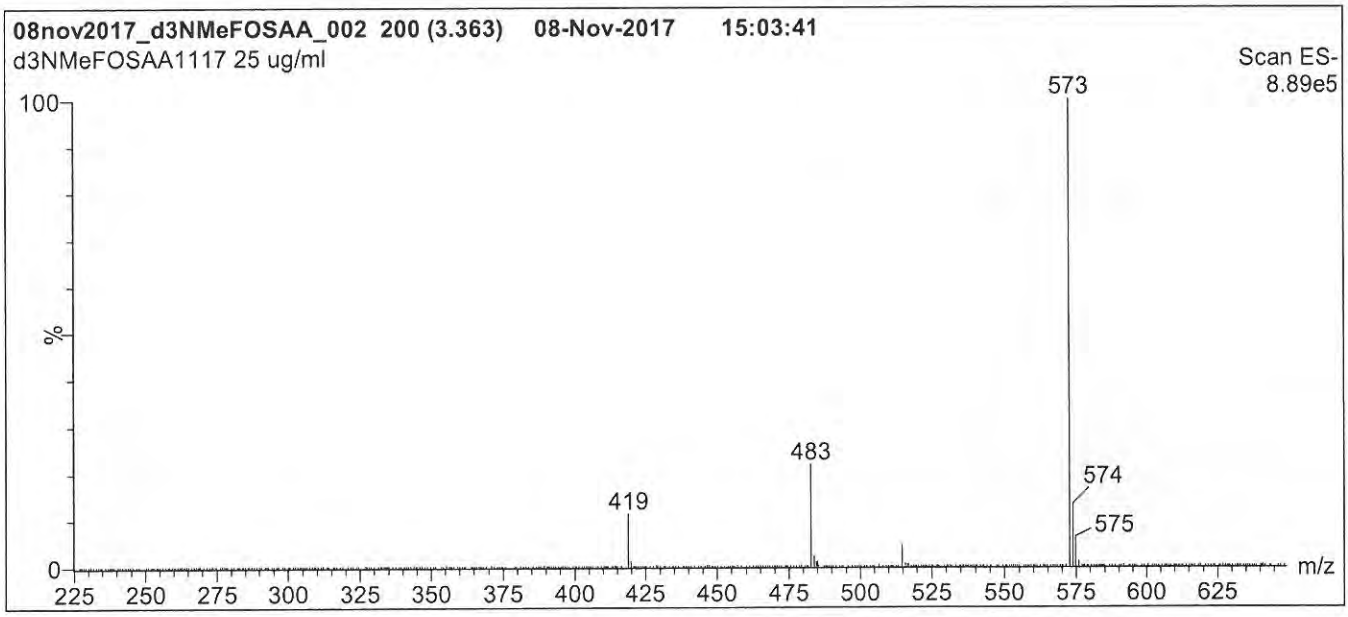
18F2221

Figure 1: **d3-N-MeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

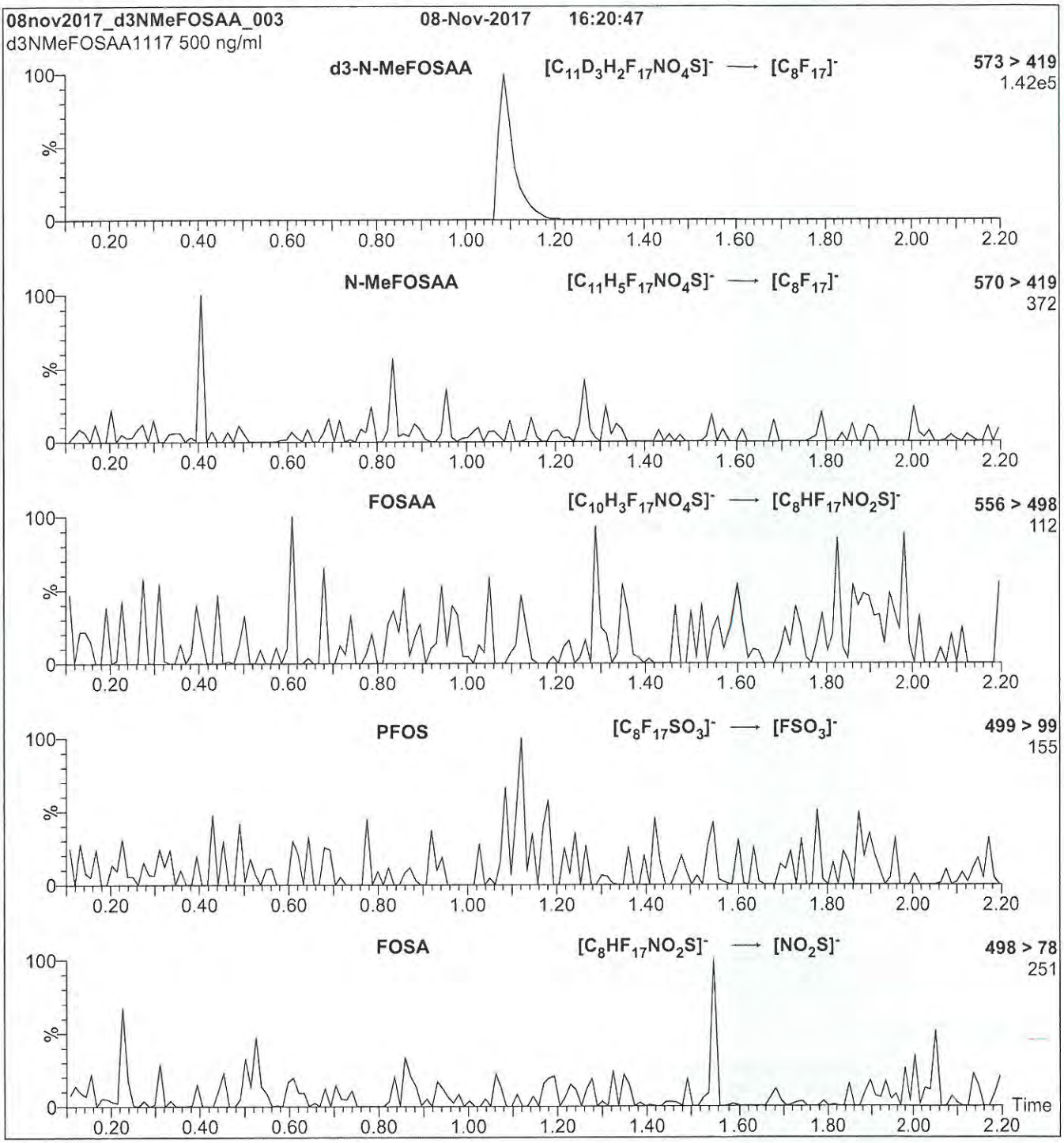
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2221

Figure 2: **d3-N-MeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d3-N-MeFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 20

18F2222

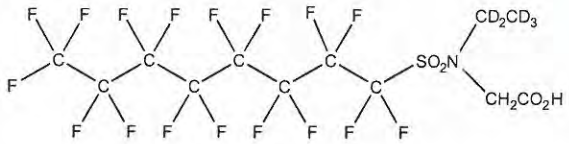
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: d5-N-EtFOSAA **LOT NUMBER:** d5NEtFOSAA1117

COMPOUND: N-ethyl-d5-perfluoro-1-octanesulfonamidoacetic acid

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{12}D_5H_3F_{17}NO_4S$	**MOLECULAR WEIGHT:**	590.26
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥98% $^2H_5$
LAST TESTED: (mm/dd/yyyy)	11/08/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent the conversion of the acetic acid moiety to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2222

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CALA

ANAB ACCREDITED

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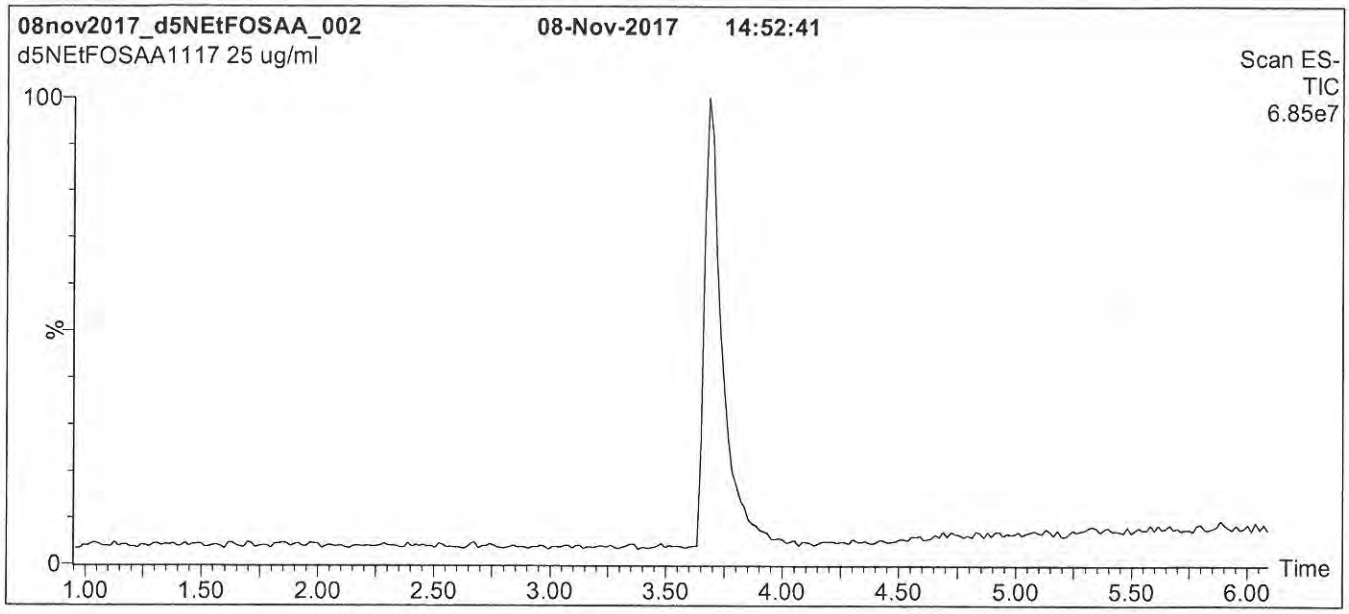
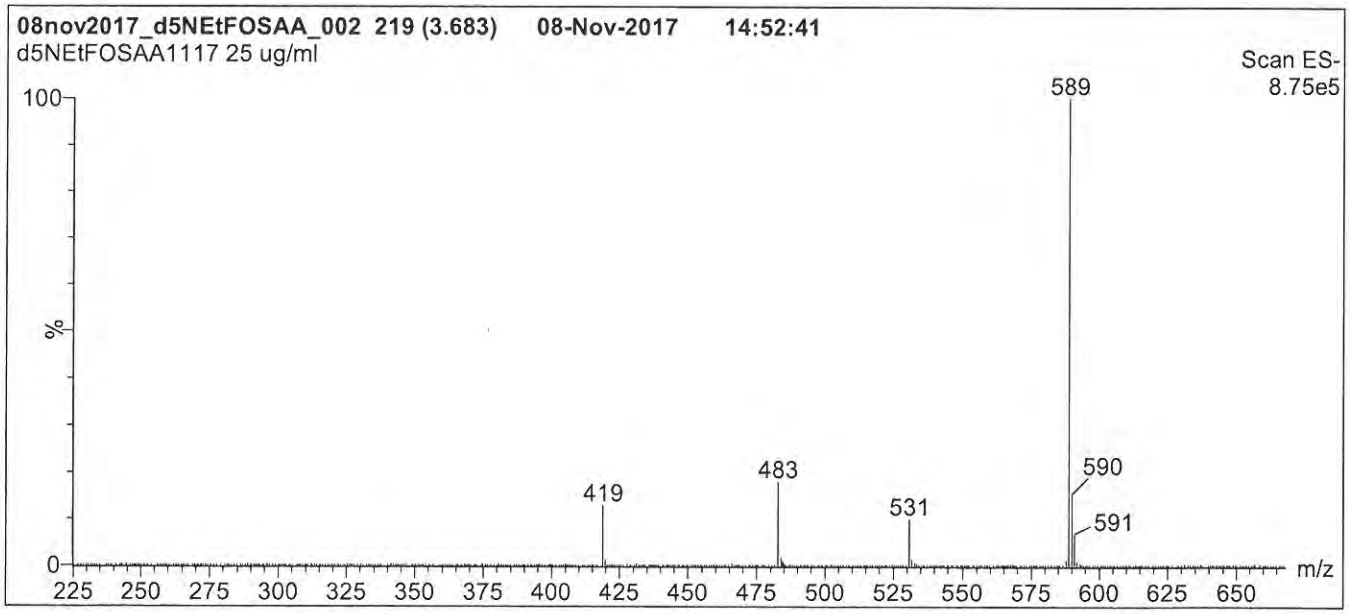
18F2222

Figure 1: **d5-N-EtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

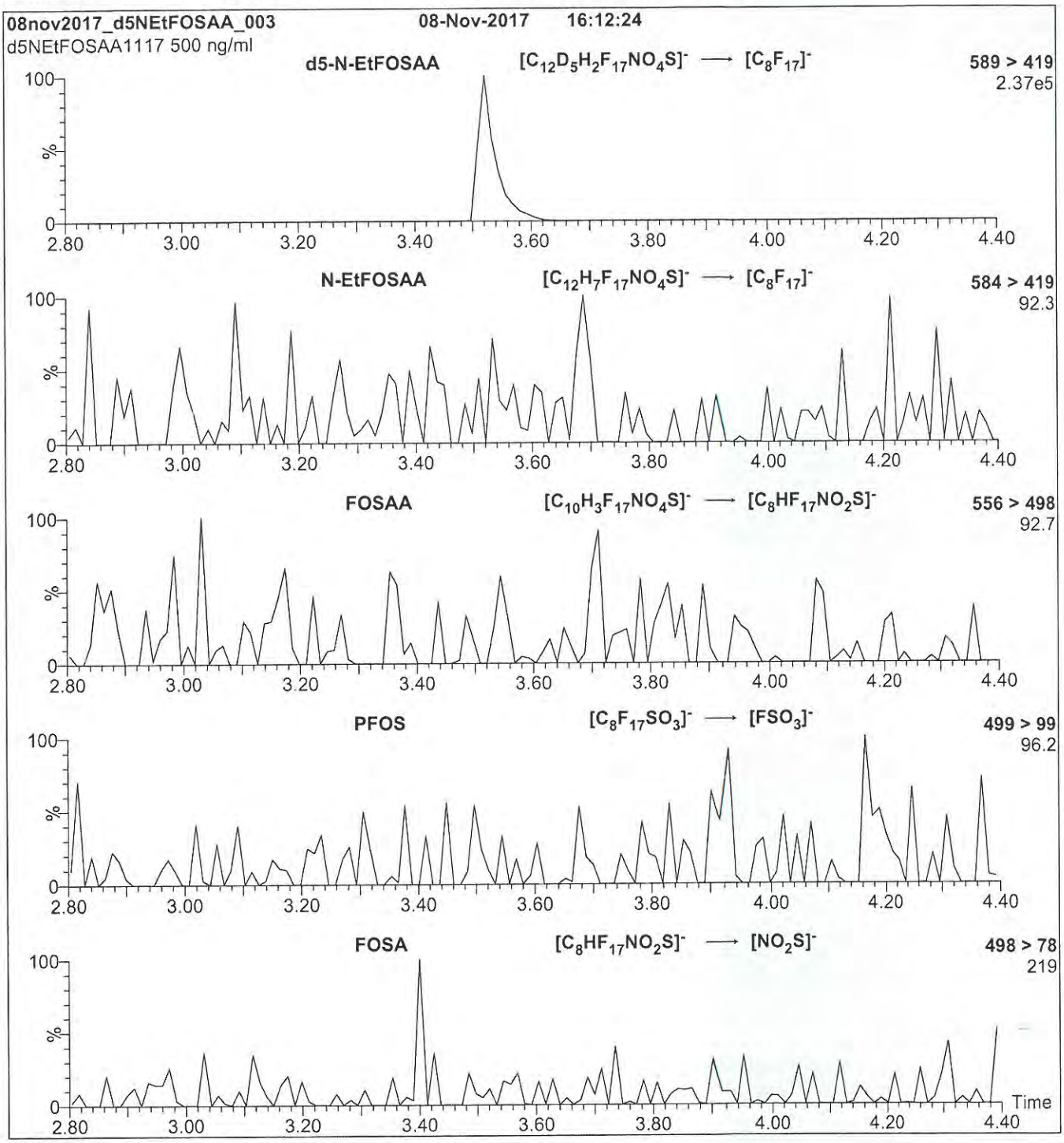
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2222

Figure 2: d5-N-EtFOSAA; LC/MS/MS Data (Selected MRM Transitions)



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml d5-N-EtFOSAA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 20

18F2223

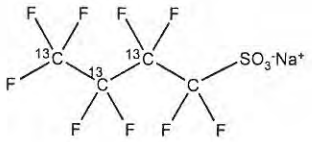
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M3PFBS **LOT NUMBER:** M3PFBS0218

COMPOUND: Sodium perfluoro-1-[2,3,4-$^{13}C_3$]butanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}CF_9SO_3Na$	**MOLECULAR WEIGHT:**	325.06
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.5 ± 2.3 µg/ml (M3PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($2,3,4\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	02/15/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/15/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

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Certified By: _____ **Date:** 02/16/2018 (mm/dd/yyyy)
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18F2223

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LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

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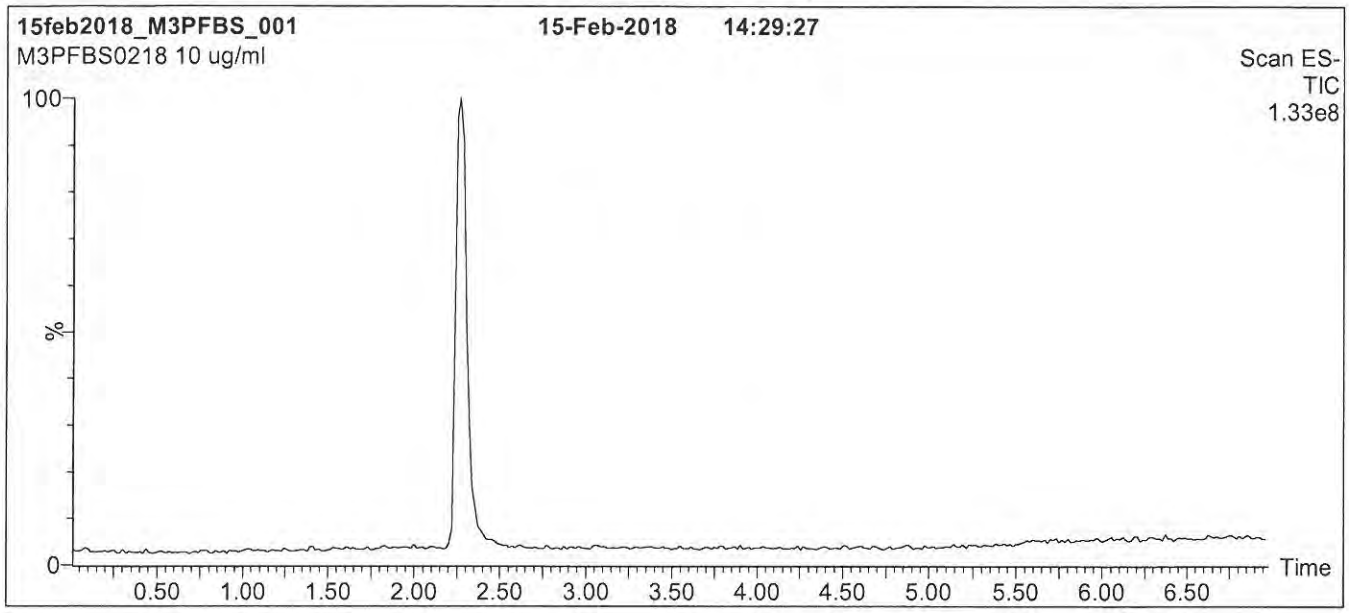
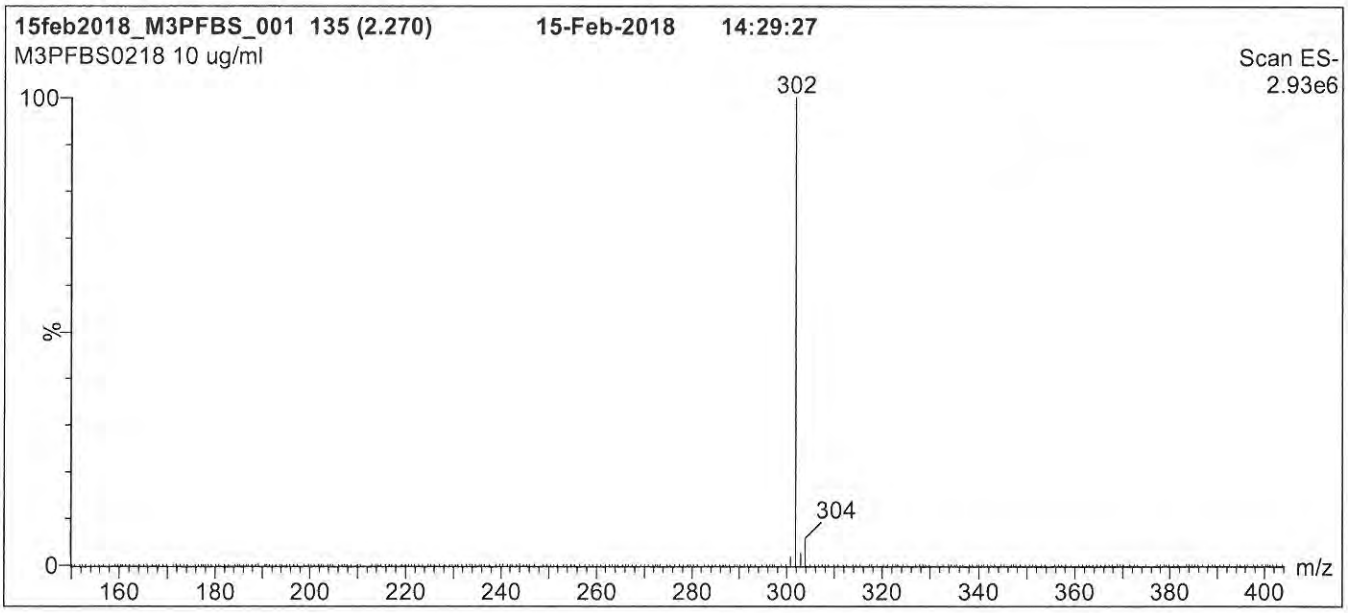
18F2223

Figure 1: **M3PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

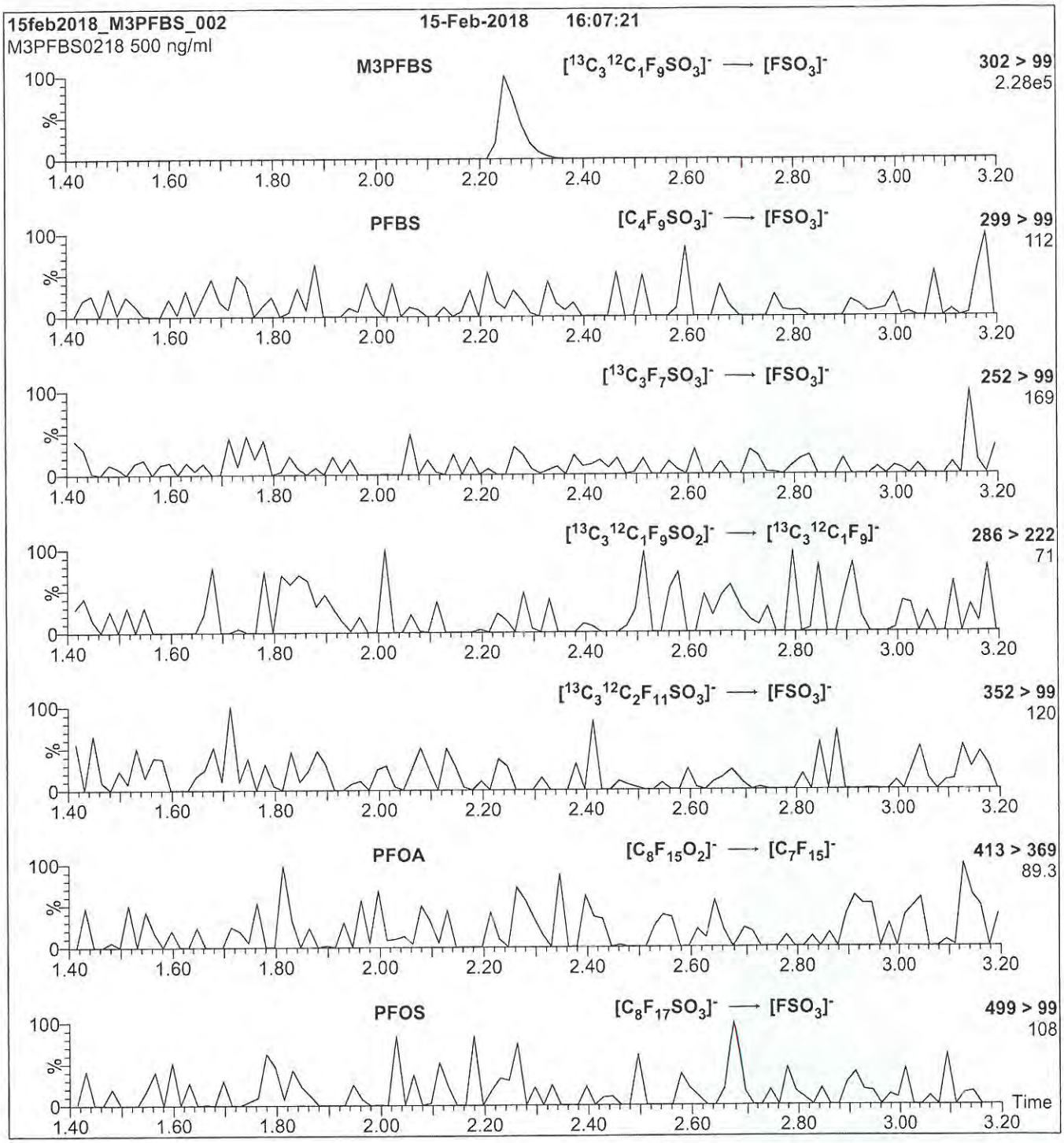
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2223

Figure 2: **M3PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 25

18F2224

WELLINGTON LABORATORIES

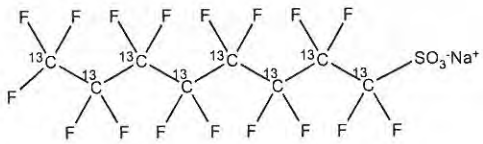
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M8PFOS
COMPOUND: Sodium perfluoro-1-[$^{13}C_8$]octanesulfonate

LOT NUMBER: M8PFOS1117

CAS #: Not available

STRUCTURE:



MOLECULAR FORMULA:	$^{13}C_8F_{17}SO_3Na$
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (M8PFOS anion)
CHEMICAL PURITY:	>98%
LAST TESTED: (mm/dd/yyyy)	11/08/2017
EXPIRY DATE: (mm/dd/yyyy)	11/08/2022
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

MOLECULAR WEIGHT:	530.05
SOLVENT(S):	Methanol
ISOTOPIC PURITY:	>99% ^{13}C ($^{13}C_8$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.3% of sodium perfluoro-1-[$^{13}C_7$]heptanesulfonate ($^{13}C_7$-PFHpS) and ~ 0.8% of sodium perfluoro-1-[$^{13}C_4$]octanesulfonate (MPFOS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/22/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2224

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

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ANAB ACCREDITED

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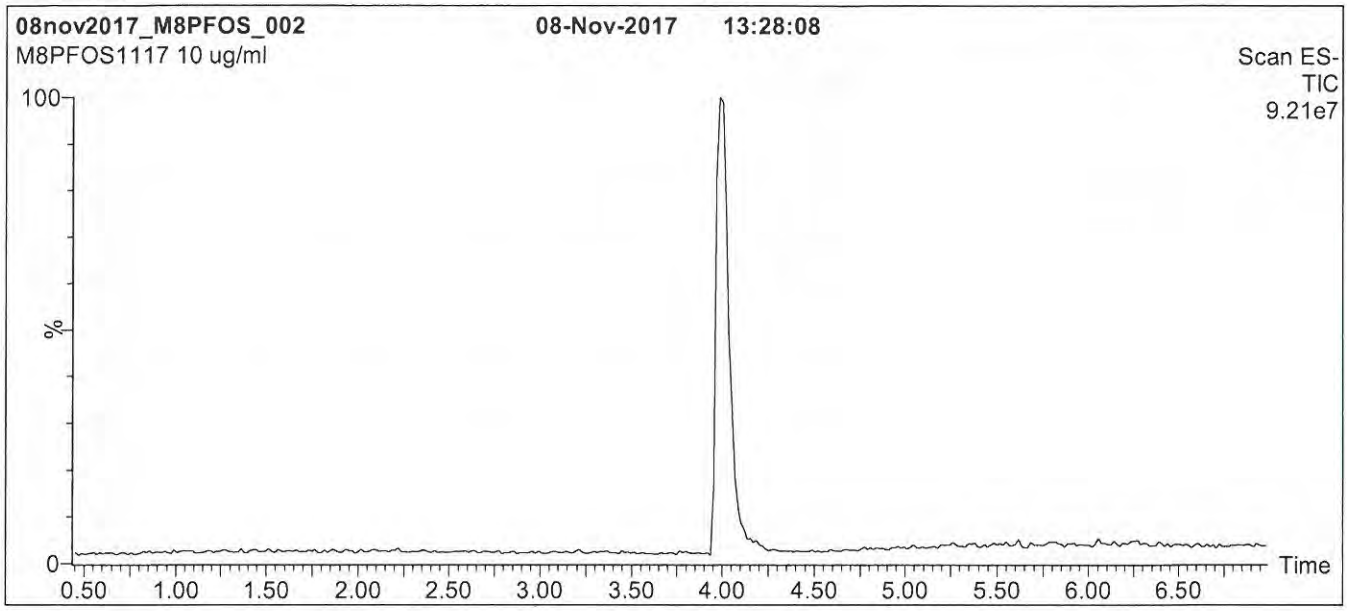
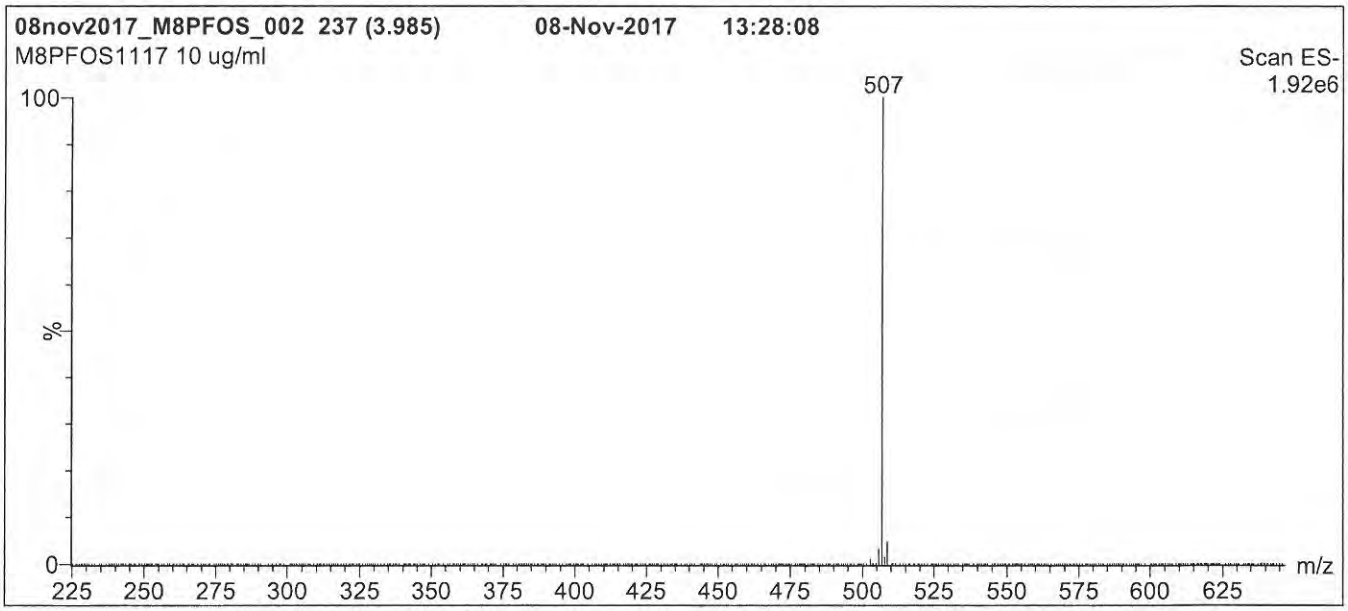
18F2224

Figure 1: **M8PFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

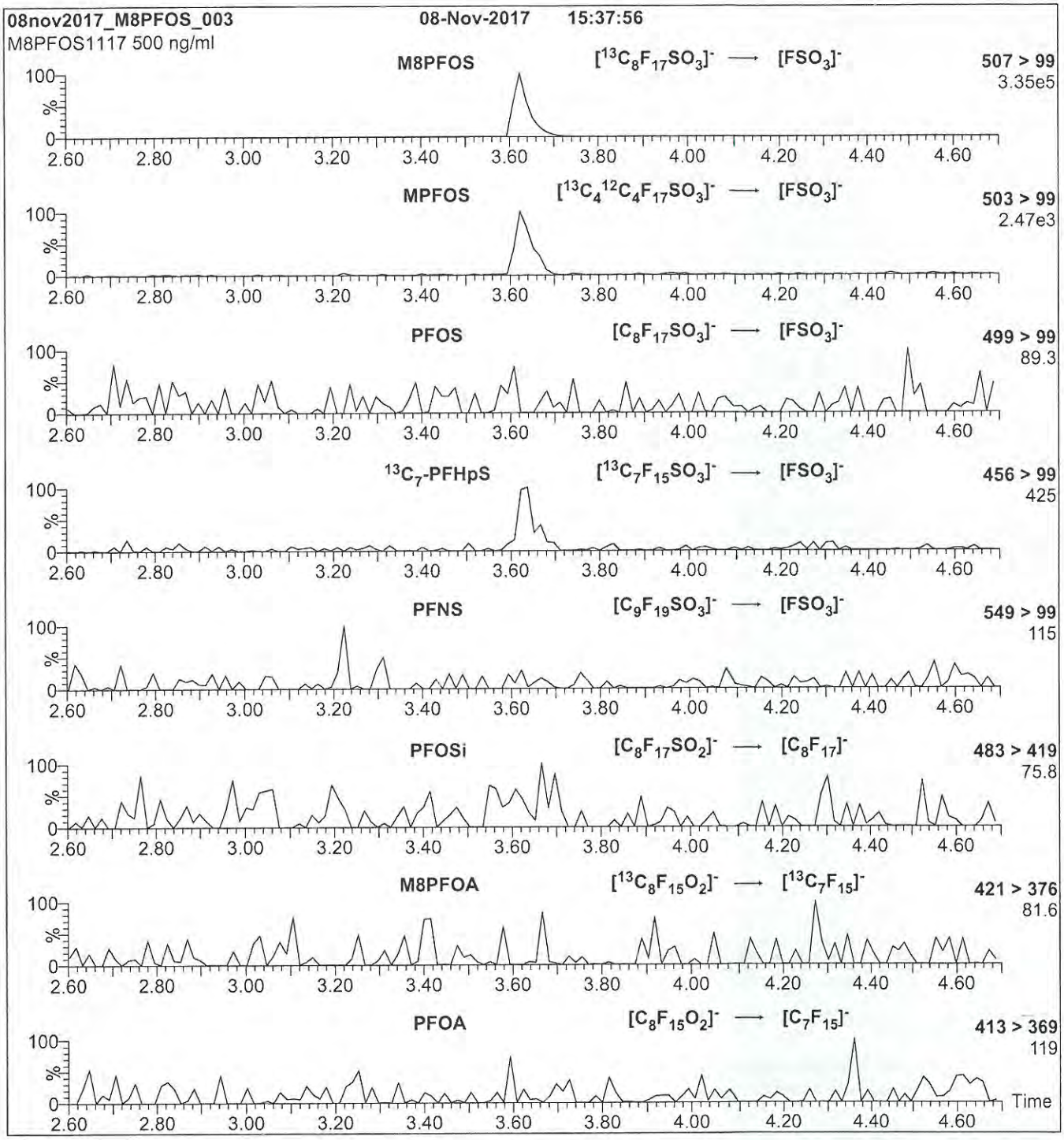
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2224

Figure 2: **M8PFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8PFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 40

18F2225

WELLINGTON LABORATORIES

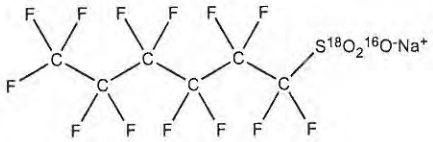
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxS
COMPOUND: Sodium perfluoro-1-hexane[$^{18}O_2$]sulfonate

LOT NUMBER: MPFHxS0318

STRUCTURE:

CAS #: 1585941-14-5



MOLECULAR FORMULA:	$C_6F_{13}S^{18}O_2{}^{16}ONa$
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt)
	47.3 ± 2.4 µg/ml (MPFHxS anion)
CHEMICAL PURITY:	>98%
LAST TESTED: (mm/dd/yyyy)	03/22/2018
EXPIRY DATE: (mm/dd/yyyy)	03/22/2023
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

MOLECULAR WEIGHT:	426.10
SOLVENT(S):	Methanol
ISOTOPIC PURITY:	>94% ($^{18}O_2$)

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The response factor for MPFHxS ($C_6F_{13}S^{18}O_2{}^{16}O^-$) has been observed to be up to 10% lower than for PFHxS ($C_6F_{13}S^{16}O_3^-$) when both compounds are injected together. This difference may vary between instruments.
- Contains ~ 1.0% of sodium perfluoro-1-octane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFOS) and ~ 0.3% of sodium perfluoro-1-heptane[$^{18}O_2$]sulfonate ($^{18}O_2$-PFHpS).
- Due to the isotopic purity of the starting material ($^{18}O_2$ >94%), MPFHxS contains ~ 0.3% of PFHxS. This value agrees with the theoretical percent relative abundance that is expected based on the stated isotopic purity.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2225

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

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where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

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ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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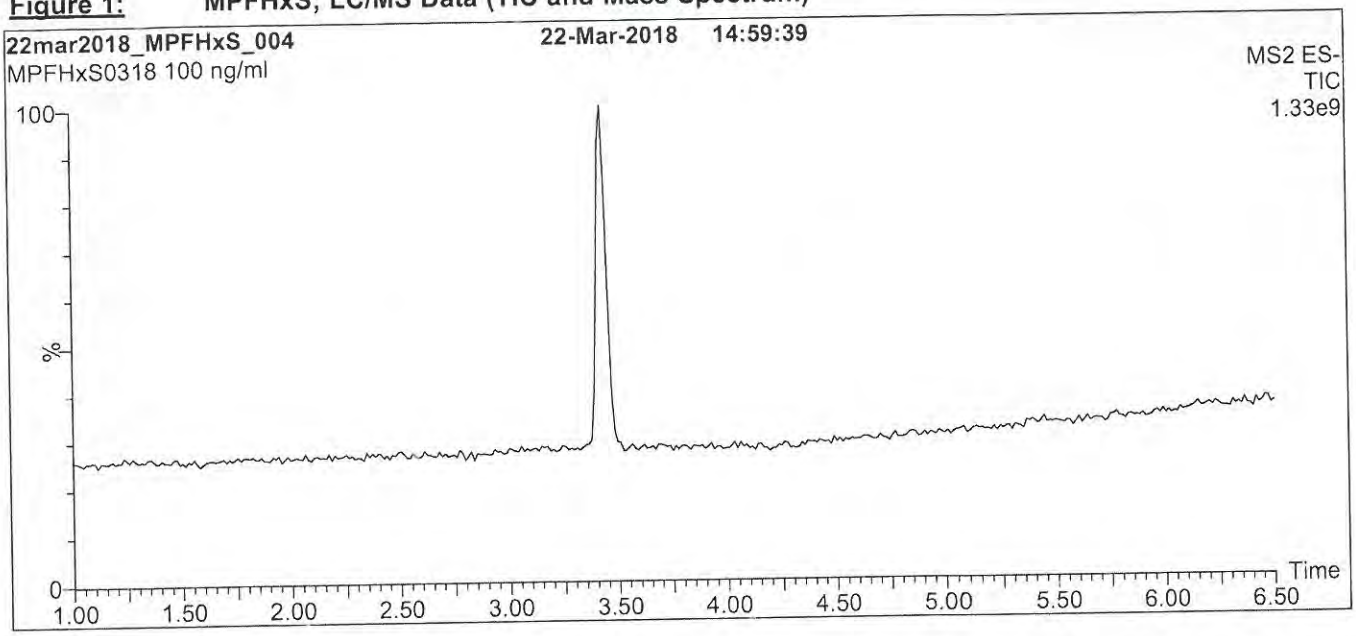
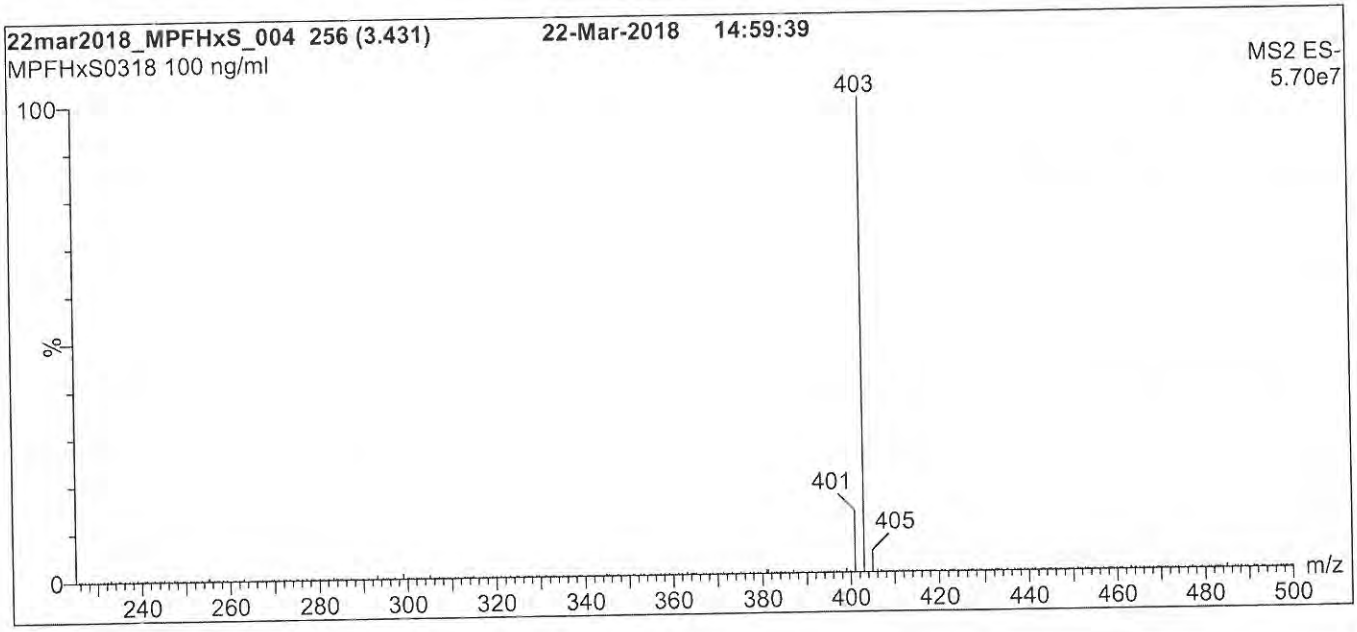
18F2225

Figure 1: **MPFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for 3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

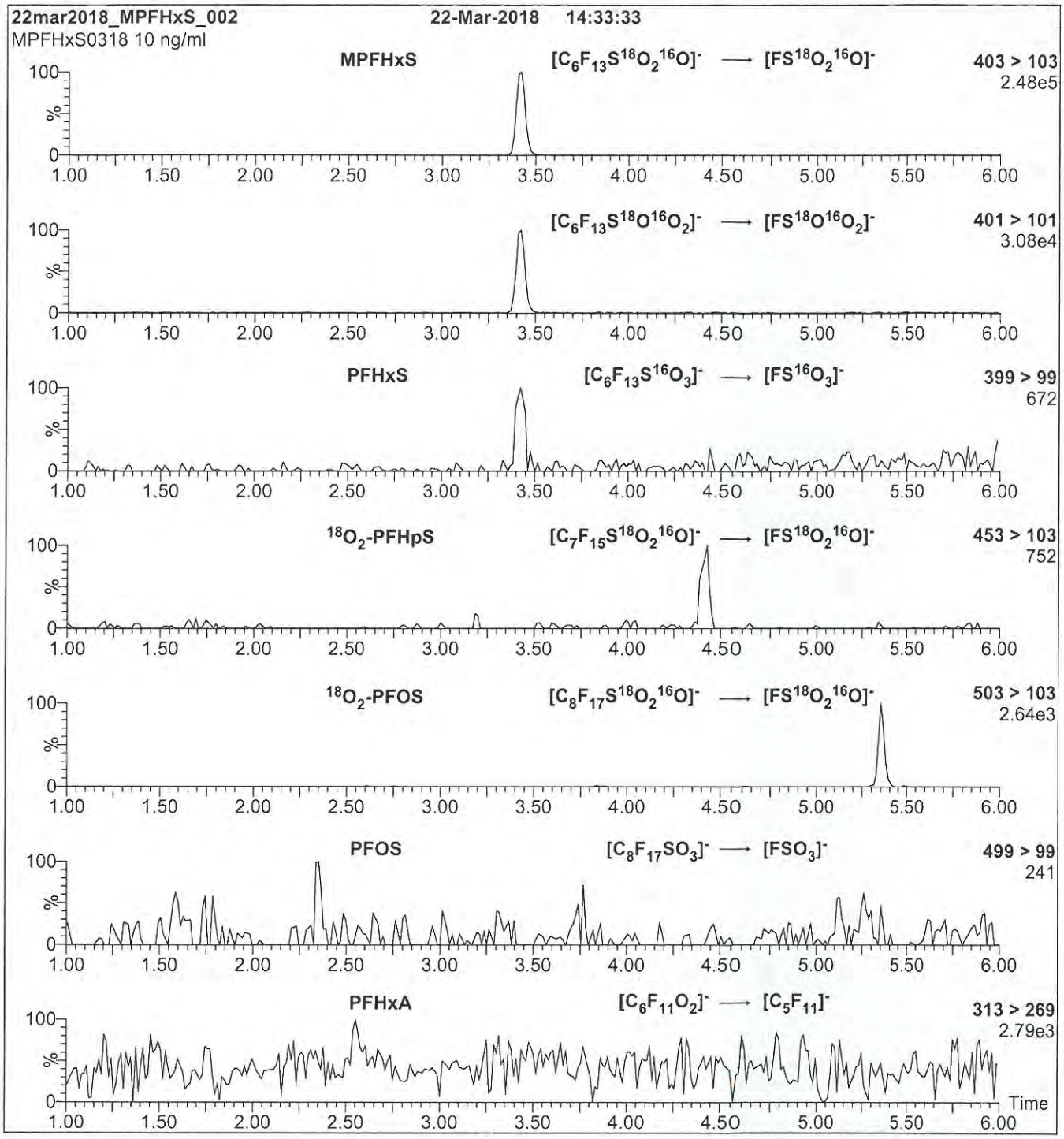
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

18F2225

Figure 2: **MPFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (MPFHxS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.64e-3

Collision Energy (eV) = 32

18F2226

WELLINGTON LABORATORIES

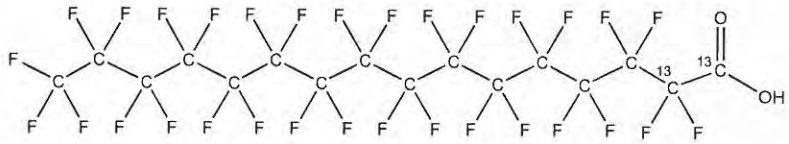
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M2PFHxDA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexadecanoic acid

LOT NUMBER: M2PFHxDA0717

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_{14}HF_{31}O_2$	**MOLECULAR WEIGHT:**	816.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of native perfluoro-n-hexadecanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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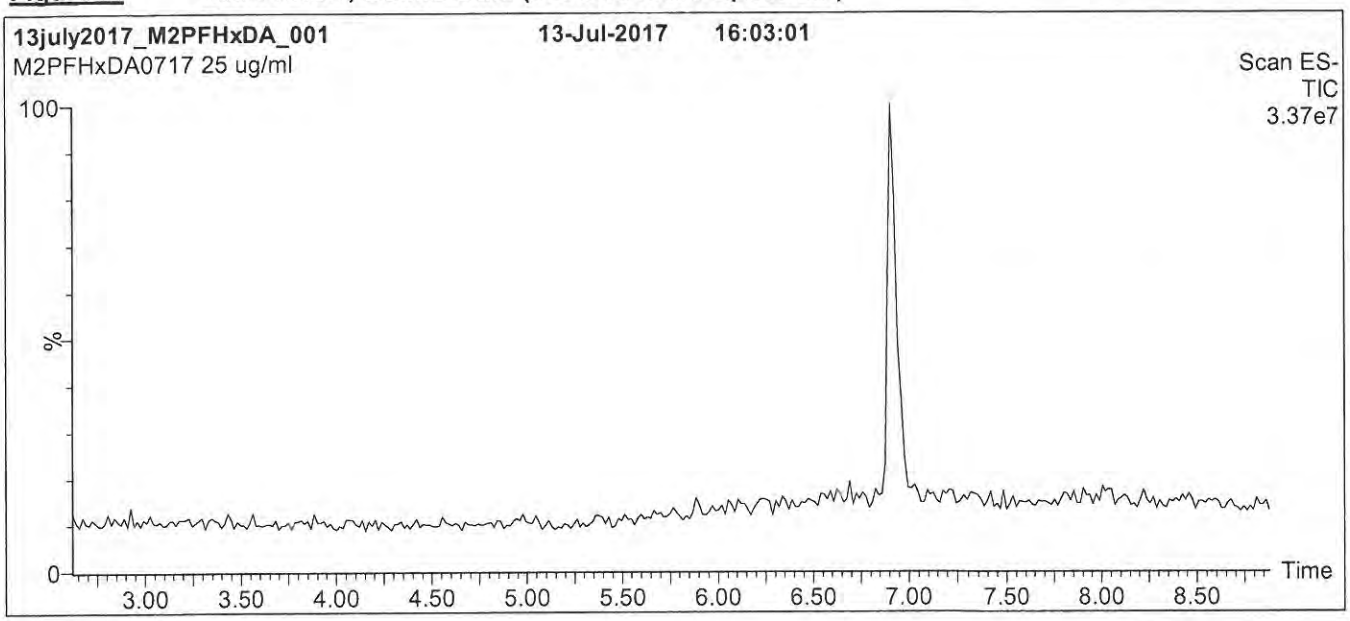
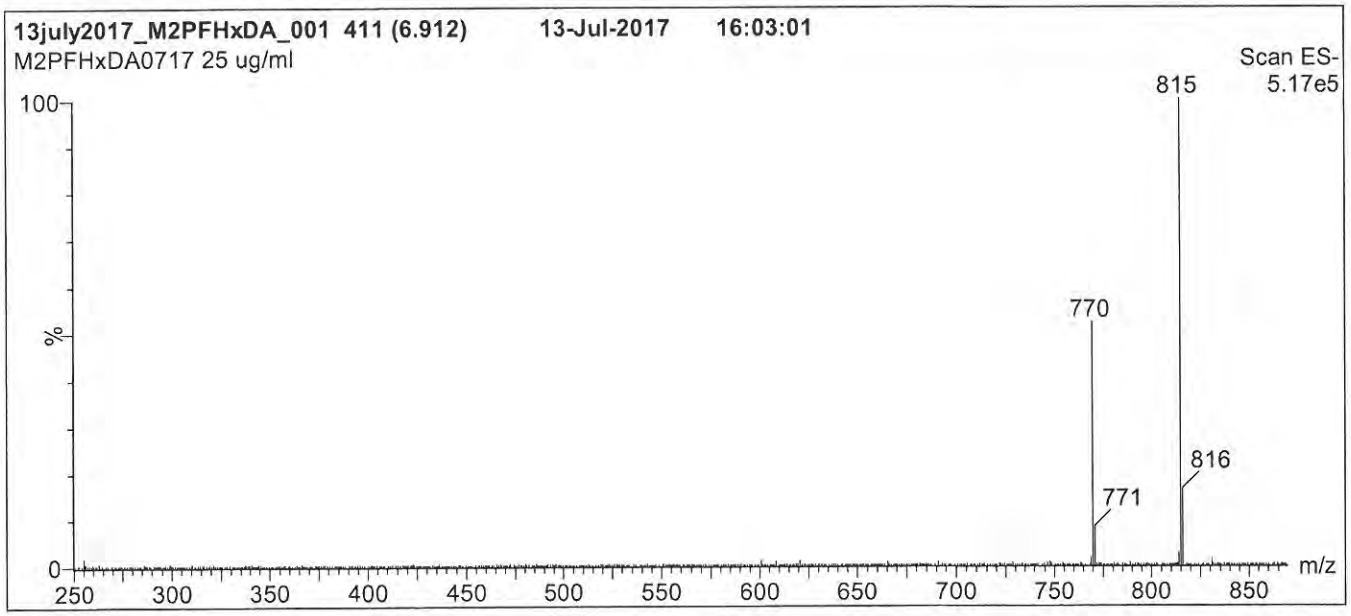
18F2226

Figure 1: **M2PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

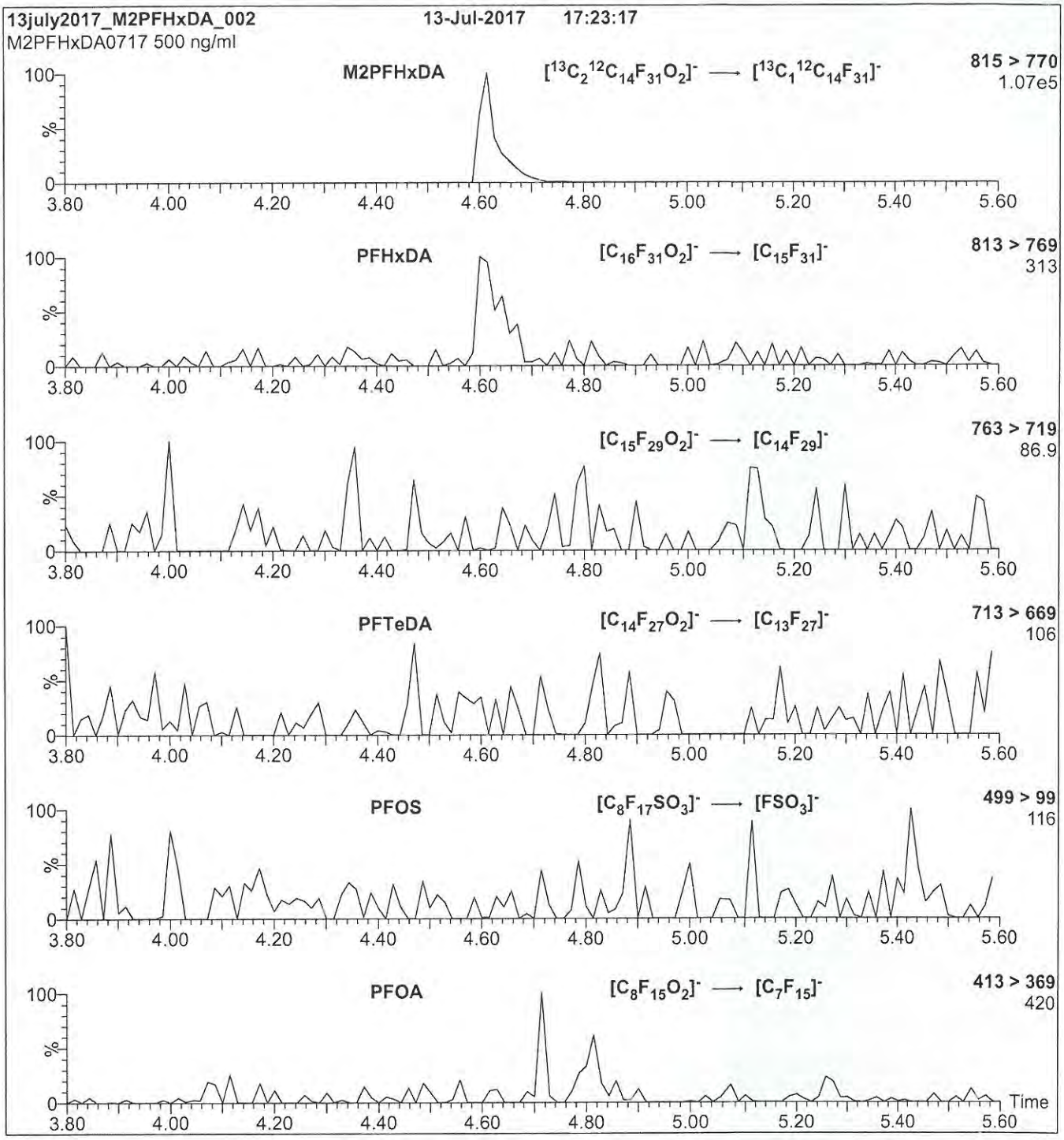
MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

18F2226

Figure 2: **M2PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M2PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 15

18F2227

WELLINGTON LABORATORIES

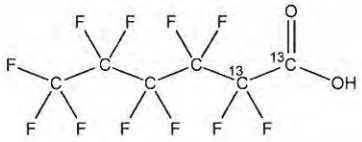
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFHxA
COMPOUND: Perfluoro-n-[1,2-$^{13}C_2$]hexanoic acid

LOT NUMBER: MPFHxA1017

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_4HF_{11}O_2$	**MOLECULAR WEIGHT:**	316.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	10/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/27/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of perfluoro-n-hexanoic acid and < 0.3% of perfluoro-n-octanoic acid.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/30/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2227

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

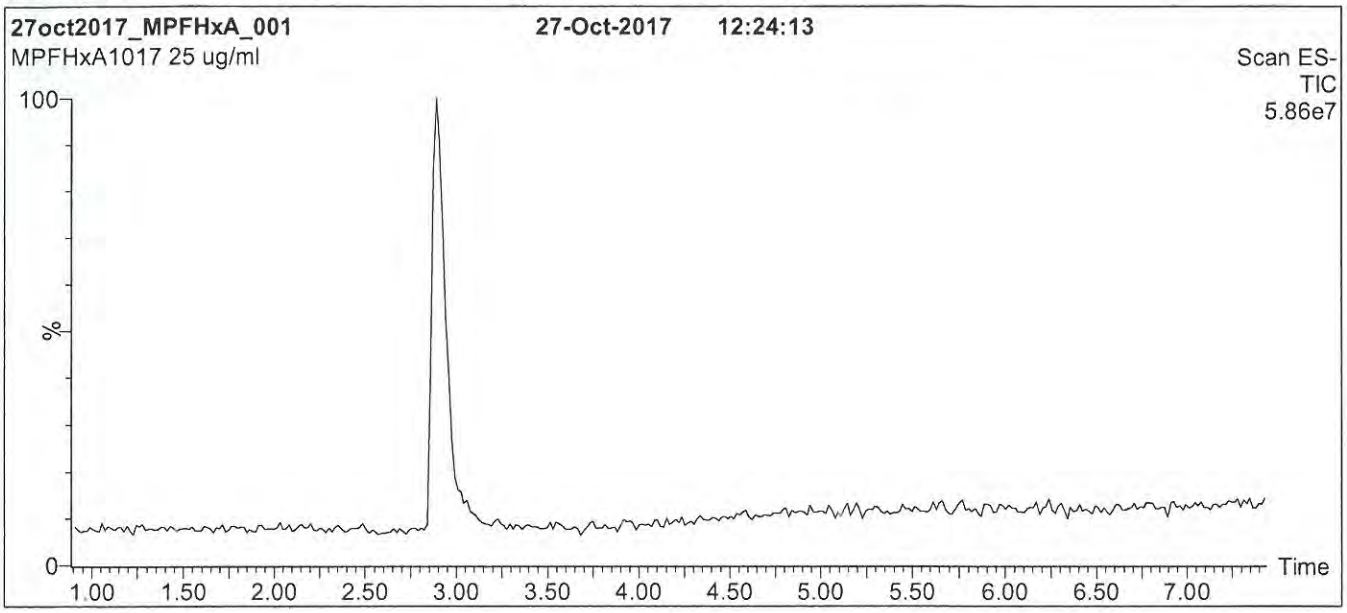
CALA

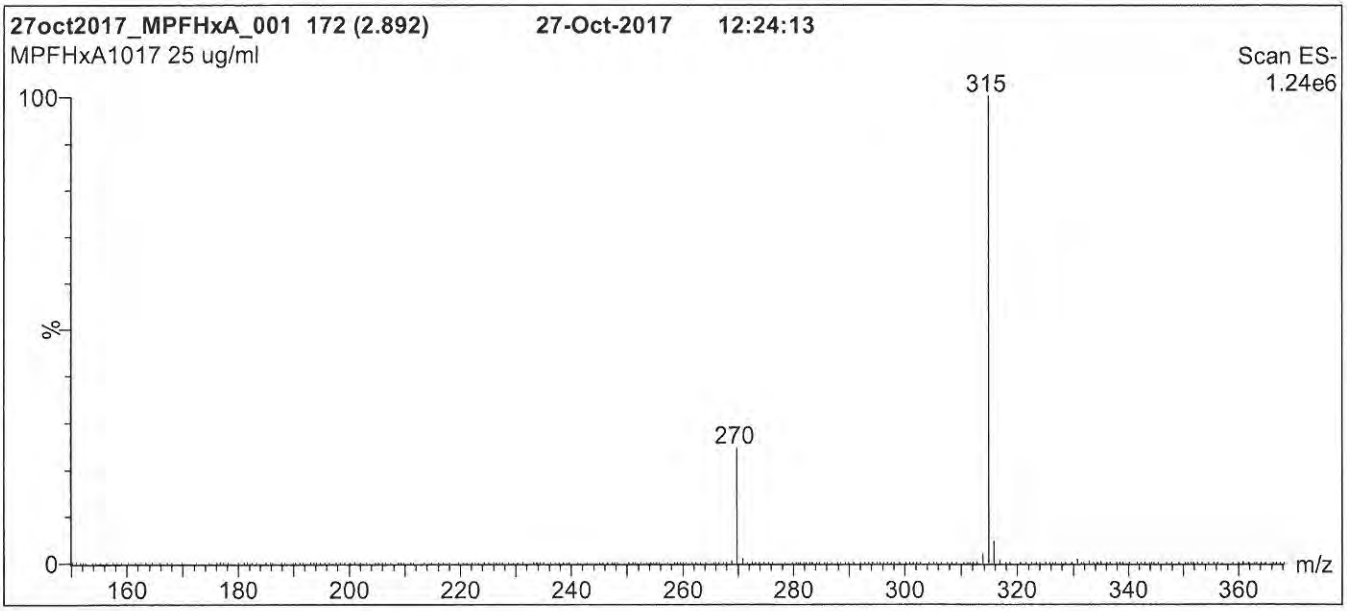
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2227

Figure 1: **MPFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions over 0.5 min.
Time: 10 min

Flow: 300 µl/min

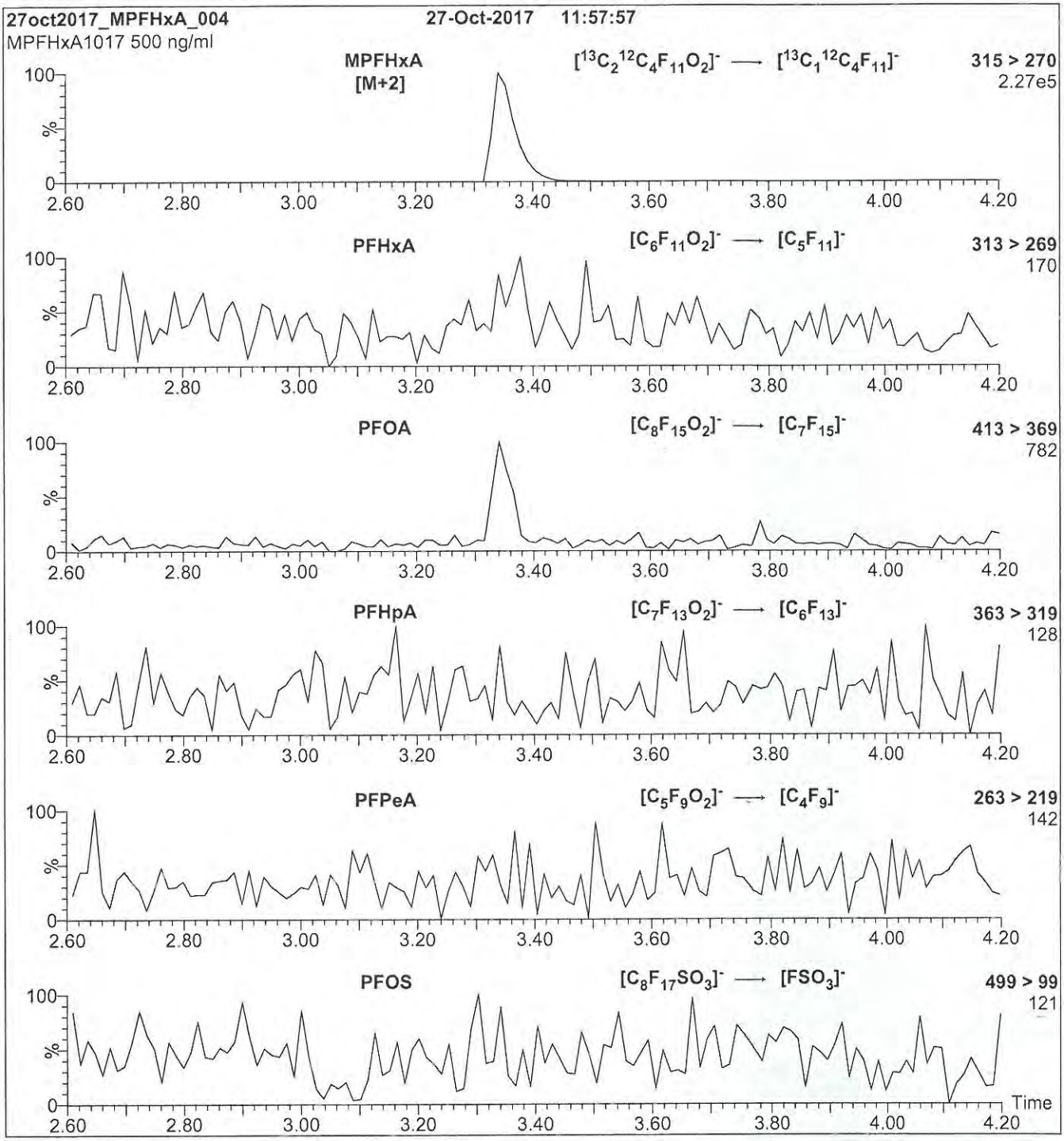
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18F2227

Figure 2: **MPFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.58e-3
Collision Energy (eV) = 10

Analytical Standard Record

Vista Analytical Laboratory

18J1505

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	(mls)
18E0707	PFDoA	07-May-18	** Vendor **	18-Apr-23	0.4
18E0708	PFBA	07-May-18	** Vendor **	14-Dec-22	0.4
18E0709	PFPeA	07-May-18	** Vendor **	16-Feb-23	0.4
18E0710	PFHxA	07-May-18	** Vendor **	27-Sep-22	0.4
18E0711	PFDA	07-May-18	** Vendor **	14-Dec-22	0.4
18E0712	PFUdA	07-May-18	** Vendor **	21-Sep-22	0.4
18E0713	PFTrDA	07-May-18	** Vendor **	02-May-22	0.4
18E0714	PFHpA	07-May-18	** Vendor **	27-Sep-22	0.4
18E0715	PFOA	07-May-18	** Vendor **	16-Feb-23	0.4
18E0716	PFNA	07-May-18	** Vendor **	20-Jul-22	0.4
18E0717	PFTeDA	07-May-18	** Vendor **	21-Sep-22	0.4
18E0718	PFHxDA	07-May-18	** Vendor **	13-Jul-22	0.4
18E0719	PFODA	07-May-18	** Vendor **	13-Jul-22	0.4
18E0720	L-PFBS	07-May-18	** Vendor **	21-Sep-22	0.454
18E0721	L-PFPeS	07-May-18	** Vendor **	11-Jan-22	0.428
18E0722	L-PFHpS	07-May-18	** Vendor **	01-Sep-22	0.42
18E0723	L-PFNS	07-May-18	** Vendor **	27-Sep-22	0.418
18E0724	L-PFDS	07-May-18	** Vendor **	08-Nov-22	0.415
18E0725	br-PFHxSK	07-May-18	** Vendor **	04-Jan-22	0.44
18E0726	br-PFOSK anion	07-May-18	** Vendor **	12-Jan-22	0.431
18E0727	4:2 FTS	07-May-18	** Vendor **	12-Dec-21	0.43
18E0728	6:2FTS	07-May-18	** Vendor **	03-Apr-23	0.422
18E0729	8:2FTS	07-May-18	** Vendor **	24-Jan-23	0.418
18E0730	FOSA-I	07-May-18	** Vendor **	01-Sep-22	0.4
18E0731	br-NMeFOSAA	07-May-18	** Vendor **	17-Jan-23	0.4
18E0732	br-NEtFOSAA	07-May-18	** Vendor **	17-Jan-23	0.4
18I0762	N-MeFOSA-M	07-Sep-18	** Vendor **	07-May-23	2
18I0763	N-EtFOSA-M	07-Sep-18	** Vendor **	07-May-23	2
18I0764	N-MeFOSE-M	07-Sep-18	** Vendor **	04-Jun-23	2
18I0765	N-EtFOSE-M	07-Sep-18	** Vendor **	14-Dec-22	2

Description:	PFC NS Stock	Expires:	15-Oct-20
Standard Type:	Analyte Spike	Prepared:	15-Oct-18
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	20	Department:	LCMS
Vials:	1	Last Edit:	15-Oct-18 14:52 by GRB

PFOS and PFHxS linear and branched components
As of 5/27/18, MeFOSAA and EtFOSAA include Linear and Branched.

Analyte	CAS Number	Concentration	Units
L-PFOA		1	ug/mL
L-PFTrDA		1	ug/mL
L-PFHpA		1	ug/mL
L-PFHpS		1	ug/mL

Analytical Standard Record

Vista Analytical Laboratory

18J1505

Description:	PFC NS Stock	Expires:	15-Oct-20
Standard Type:	Analyte Spike	Prepared:	15-Oct-18
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	20	Department:	LCMS
Vials:	1	Last Edit:	15-Oct-18 14:52 by GRB

PFOS and PFHxS linear and branched components
As of 5/27/18, MeFOSAA and EtFOSAA include Linear and Branched.

Analyte	CAS Number	Concentration	Units
L-PFHxA		1	ug/mL
L-PFHxDA		1	ug/mL
L-PFHxS		0.812	ug/mL
L-PFDoA		1	ug/mL
L-PFNS	68259-12-1	1	ug/mL
L-PFDA		1	ug/mL
L-PFODA		1	ug/mL
L-PFOS		0.789	ug/mL
L-PFOSA		1	ug/mL
L-PFPeA		1	ug/mL
L-PFPeS	2706-91-4	1	ug/mL
4:2 FTS	757124-72-4	1	ug/mL
L-PFNA		1	ug/mL
L-4:2 FTS	75124-72-4	1	ug/mL
6:2 FTS	27619-97-2	1	ug/mL
8:2 FTS	39108-34-4	1	ug/mL
Br-EtFOSAA		0.224	ug/mL
Br-MeFOSAA		0.24	ug/mL
Br-PFHxS	3871-99-6	0.189	ug/mL
EtFOSA	4151-50-2	5	ug/mL
L-PFDS		1	ug/mL
EtFOSE	1691-99-2	5	ug/mL
L-PFUnA		1	ug/mL
L-6:2 FTS		1	ug/mL
L-8:2FTS		1	ug/mL
L-EtFOSAA	2991-50-6	0.776	ug/mL
L-MeFOSAA	2355-31-9	0.76	ug/mL
L-PFBA		1	ug/mL
L-PFBS		1	ug/mL
EtFOSAA	2991-50-6	1	ug/mL
Total EtFOSAA		1	ug/mL
L-PFTeDA		1	ug/mL
PFOSA	754-91-6	1	ug/mL
PFPeA	2706-90-3	1	ug/mL

Analytical Standard Record

Vista Analytical Laboratory

18J1505

Description:	PFC NS Stock	Expires:	15-Oct-20
Standard Type:	Analyte Spike	Prepared:	15-Oct-18
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	20	Department:	LCMS
Vials:	1	Last Edit:	15-Oct-18 14:52 by GRB

PFOS and PFHxS linear and branched components
As of 5/27/18, MeFOSAA and EtFOSAA include Linear and Branched.

Analyte	CAS Number	Concentration	Units
PFPeS	2706-91-4	1	ug/mL
PFTeDA	376-06-7	1	ug/mL
PFTrDA	72629-94-8	1	ug/mL
PFODA	16517-11-6	1	ug/mL
Total 6:2 FTS		1	ug/mL
PFOA	335-67-1	1	ug/mL
Total MeFOSAA		1	ug/mL
Total PFDS		1	ug/mL
Total PFHpS		1	ug/mL
Total PFHxS		1	ug/mL
Total PFOA		1	ug/mL
Total PFOS		1	ug/mL
PFUnA	2058-94-8	1	ug/mL
PFHpA	375-85-9	1	ug/mL
MeFOSA	31506-32-8	5	ug/mL
MeFOSAA	2355-31-9	1	ug/mL
MeFOSE	24448-09-7	5	ug/mL
PFBA	375-22-4	1	ug/mL
PFBS	375-73-5	1	ug/mL
PFDA	335-76-2	1	ug/mL
PFOS	1763-23-1	1	ug/mL
PFDS	335-77-3	1	ug/mL
Total PFUnA		1	ug/mL
PFHpS	375-92-8	1	ug/mL
PFHxA	307-24-4	1	ug/mL
PFHxDA	67905-19-5	1	ug/mL
PFHxS	355-46-4	1	ug/mL
PFNA	375-95-1	1	ug/mL
PFNS	68259-12-1	1	ug/mL
PFDoA	307-55-1	1	ug/mL

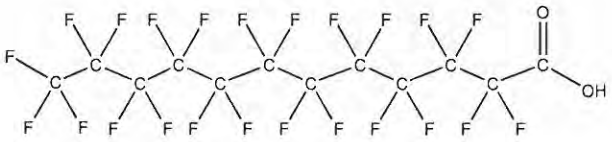
18E0707

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDoA
COMPOUND: Perfluoro-n-dodecanoic acid
LOT NUMBER: PFDoA0418

STRUCTURE:
CAS #: 307-55-1



MOLECULAR FORMULA: $C_{12}HF_{23}O_2$
MOLECULAR WEIGHT: 614.10
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 04/18/2018
EXPIRY DATE: (mm/dd/yyyy) 04/18/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS Data (Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/24/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0707

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0707

Figure 1: **PFDoA; LC/MS Data (SIR)**

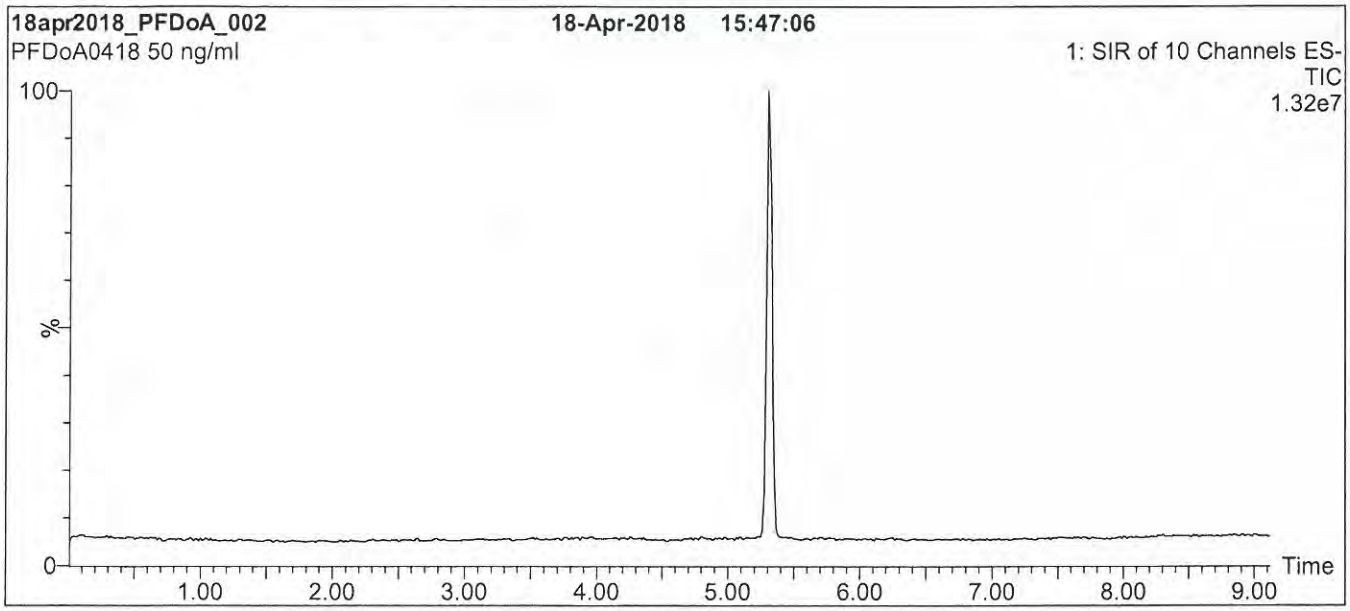
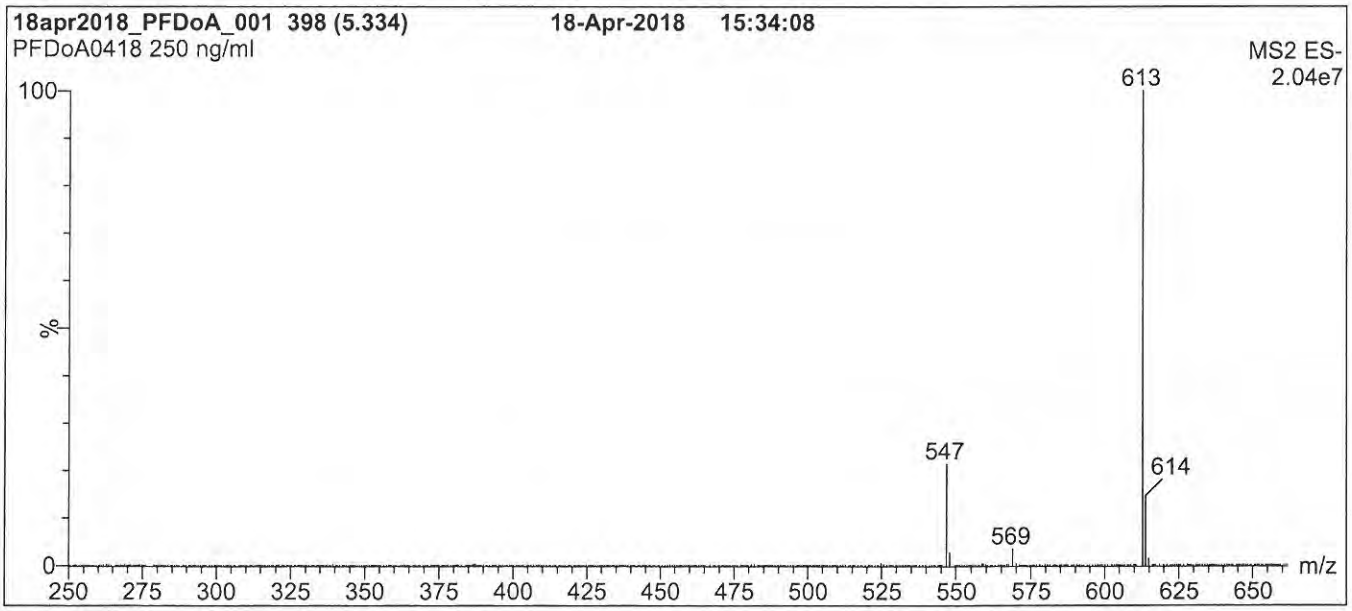


Figure 2: **PFDoA; LC/MS Data (Mass Spectrum)**



Conditions for Figures 1 & 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

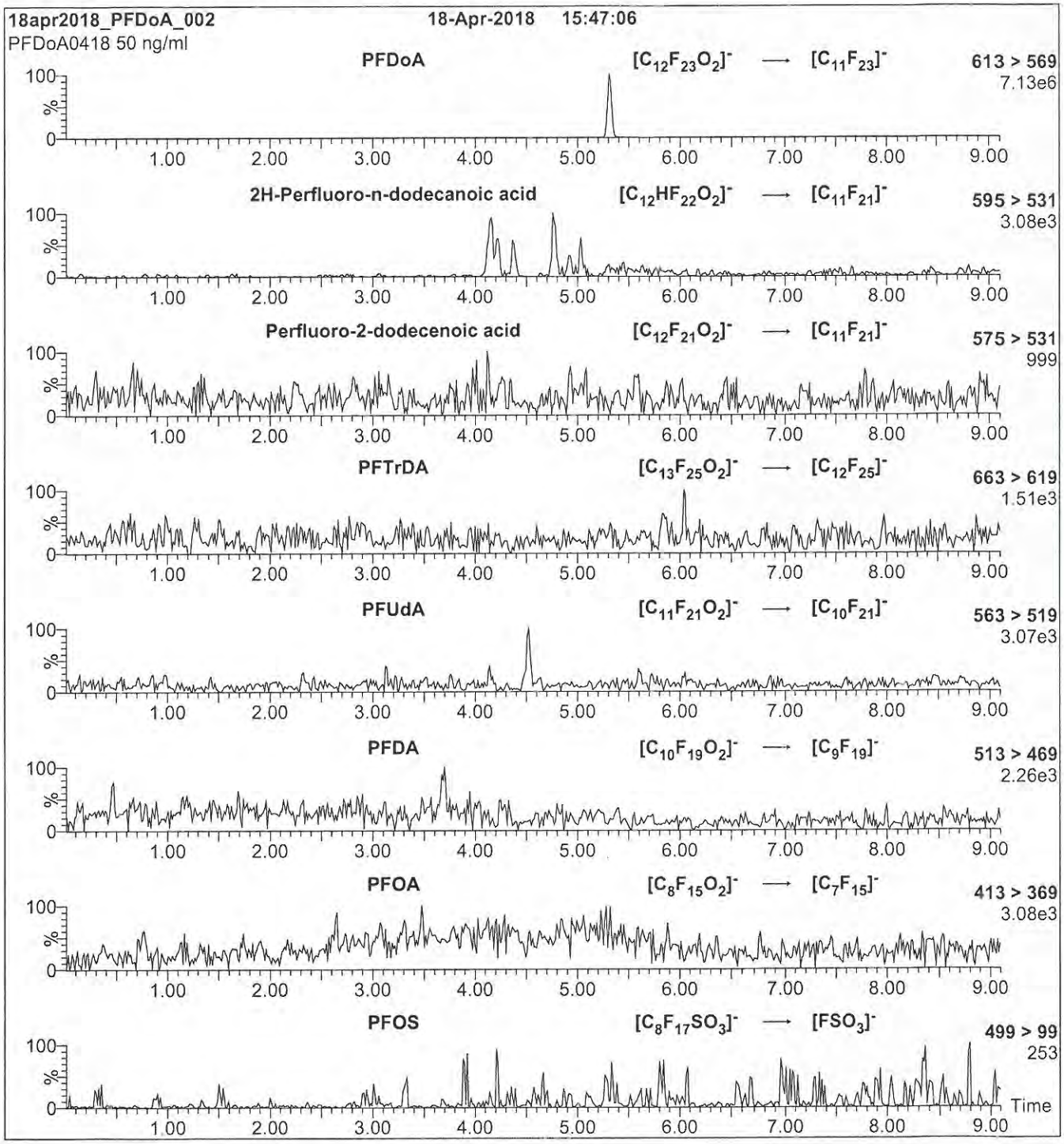
Flow: 300 µl/min

MS Parameters

Experiments: SIR of 10 channels
Full Scan (250 - 850 amu)
Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 5 (variable for SIR (2-12))
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

18E0707

Figure 3: **PFDoA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column (PFDoA)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.47e-3

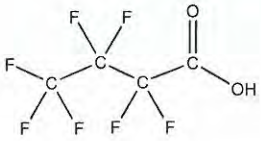
Collision Energy (eV) = 12

18E0708

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFBA	**LOT NUMBER:**	PFBA1217
COMPOUND:	Perfluoro-n-butanoic acid		
STRUCTURE:		**CAS #:**	375-22-4



MOLECULAR FORMULA:	$C_4HF_7O_2$	**MOLECULAR WEIGHT:**	214.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	12/14/2017		
EXPIRY DATE: (mm/dd/yyyy)	12/14/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/18/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0708

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

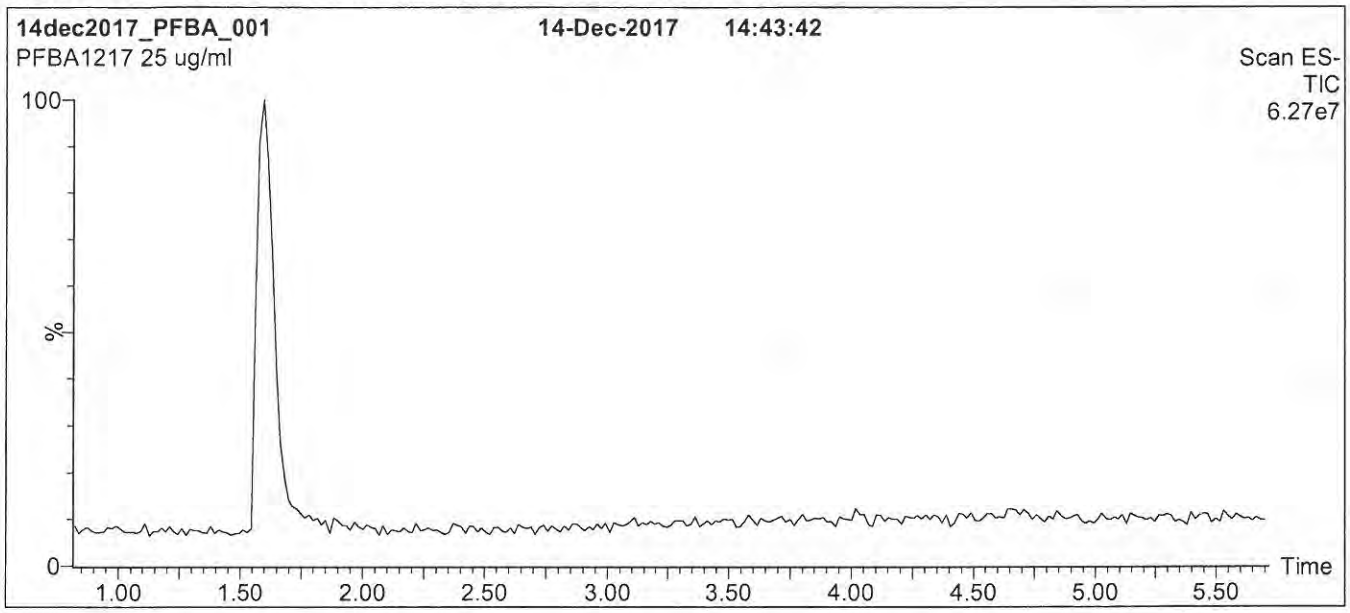
CALA

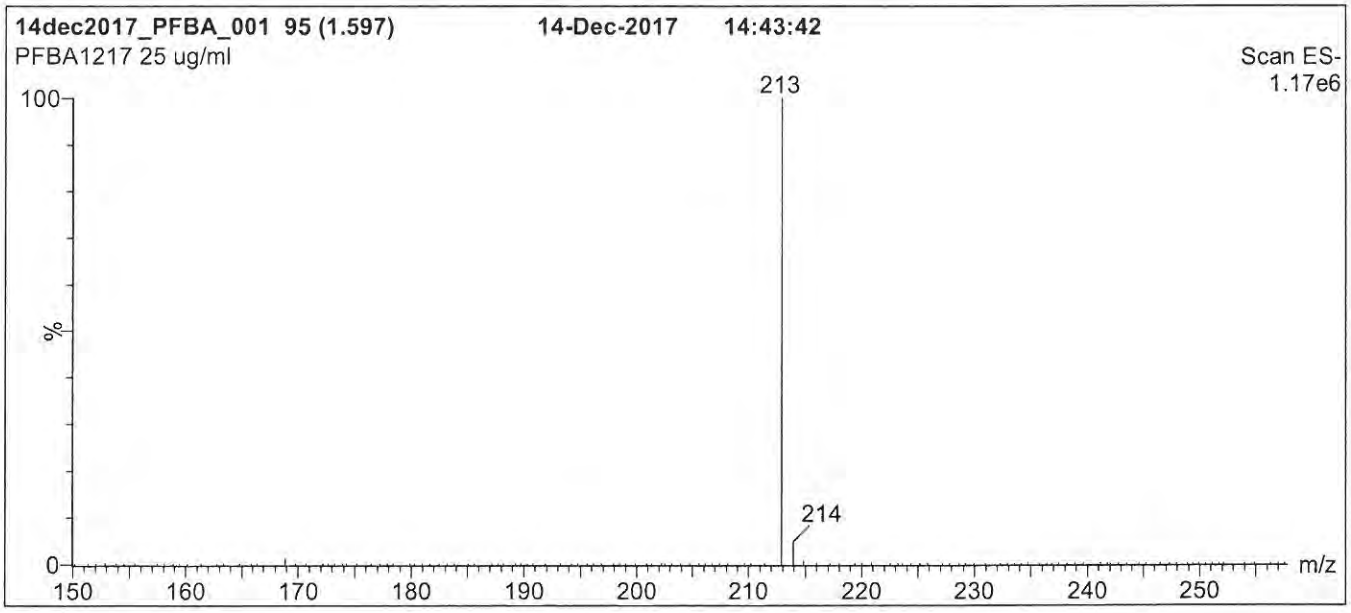
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0708

Figure 1: **PFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

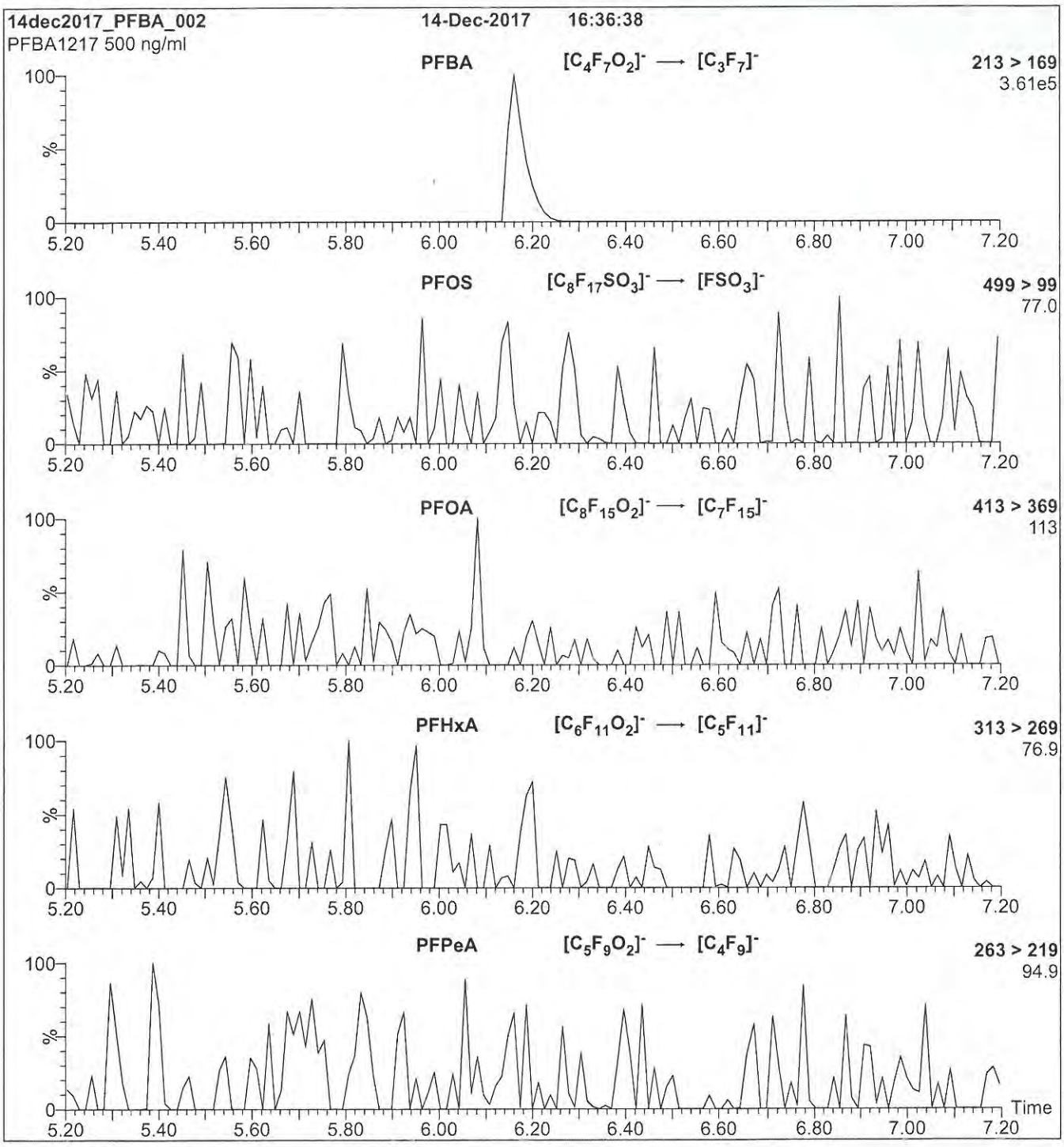
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18E0708

Figure 2: **PFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

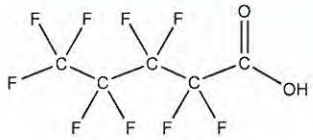
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 10

18E0709

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFPeA	**LOT NUMBER:**	PFPeA0218
COMPOUND:	Perfluoro-n-pentanoic acid		
STRUCTURE:		**CAS #:**	2706-90-3



MOLECULAR FORMULA:	$C_5HF_9O_2$	**MOLECULAR WEIGHT:**	264.05
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.3% of Perfluoro-n-heptanoic acid (PFHpA) and ~ 0.2% of $C_5H_2F_8O_2$ (hydrido - derivative) as measured by ^{19}F NMR.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/20/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0709

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

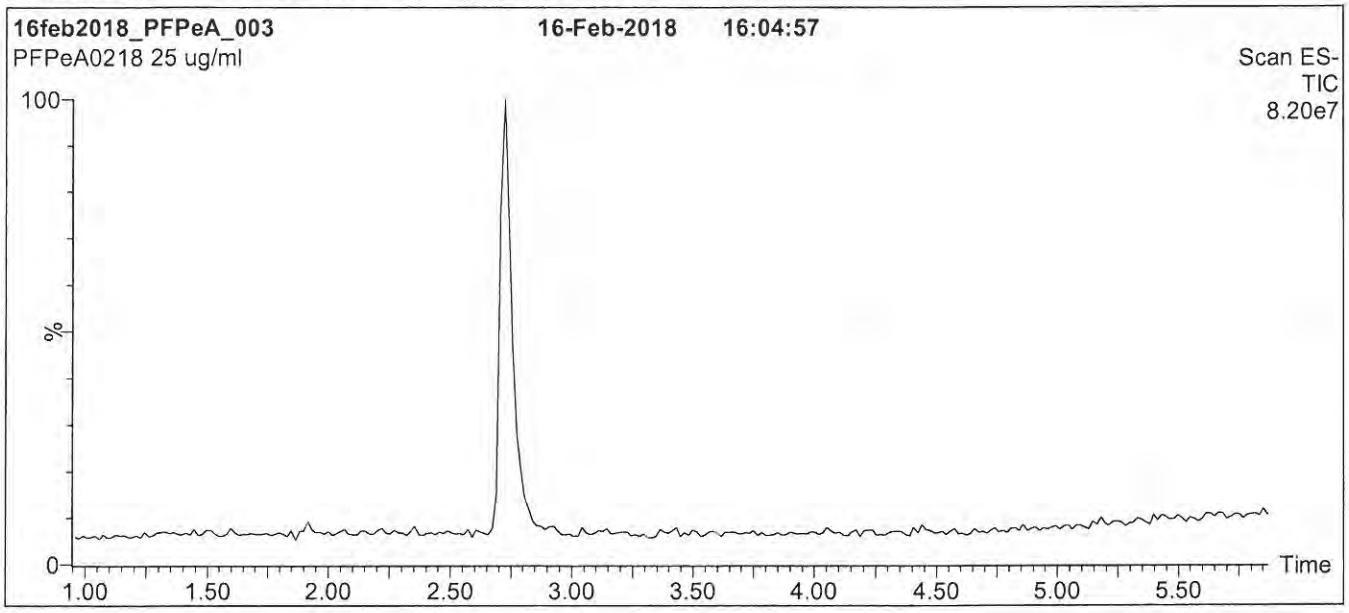
CALA Testing

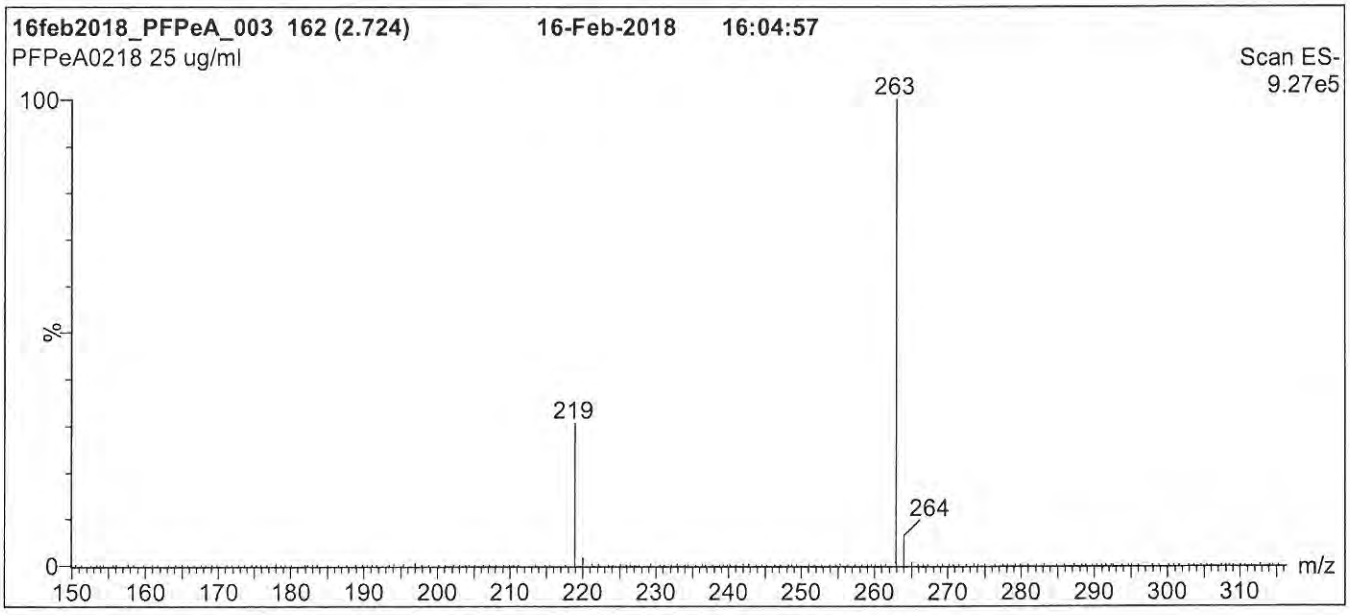
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0709

Figure 1: **PFPeA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

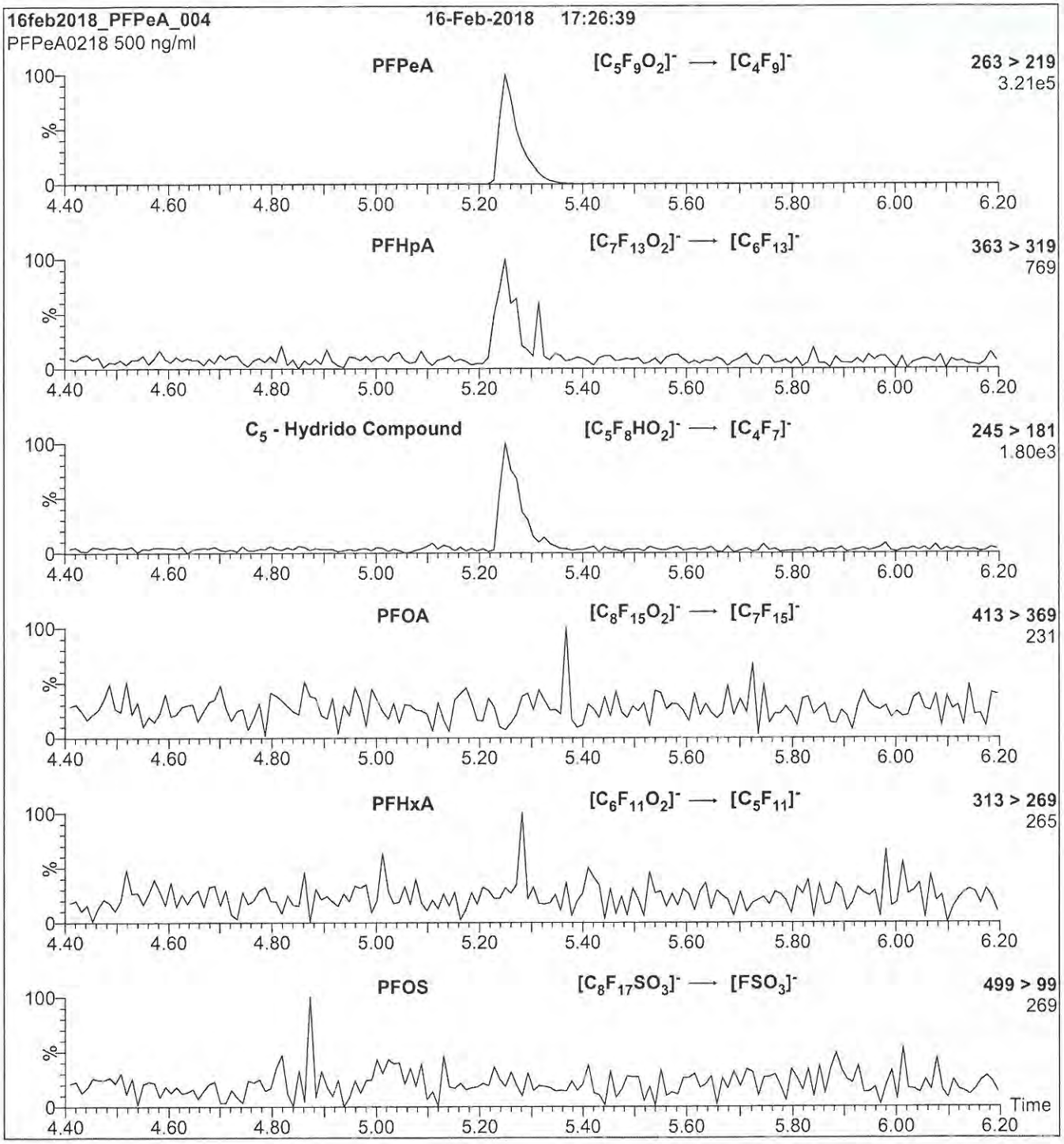
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18E0709

Figure 2: **PFPeA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFPeA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 9

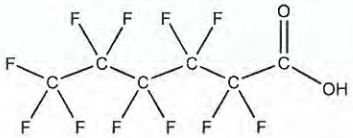
18E0710

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFHxA
COMPOUND: Perfluoro-n-hexanoic acid
LOT NUMBER: PFHxA0917

STRUCTURE:
CAS #: 307-24-4



MOLECULAR FORMULA: $C_6HF_{11}O_2$
MOLECULAR WEIGHT: 314.05
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 09/27/2017
EXPIRY DATE: (mm/dd/yyyy) 09/27/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 1.0% of branched isomers.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/01/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0710

INTENDED USE:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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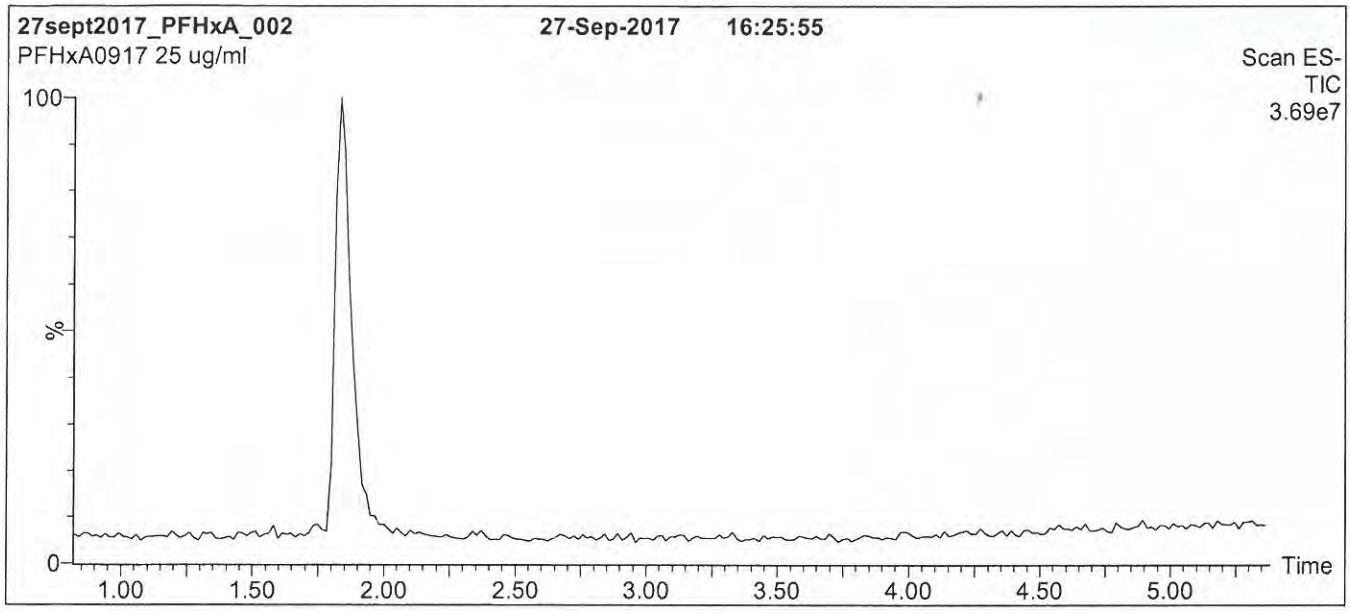
CALA

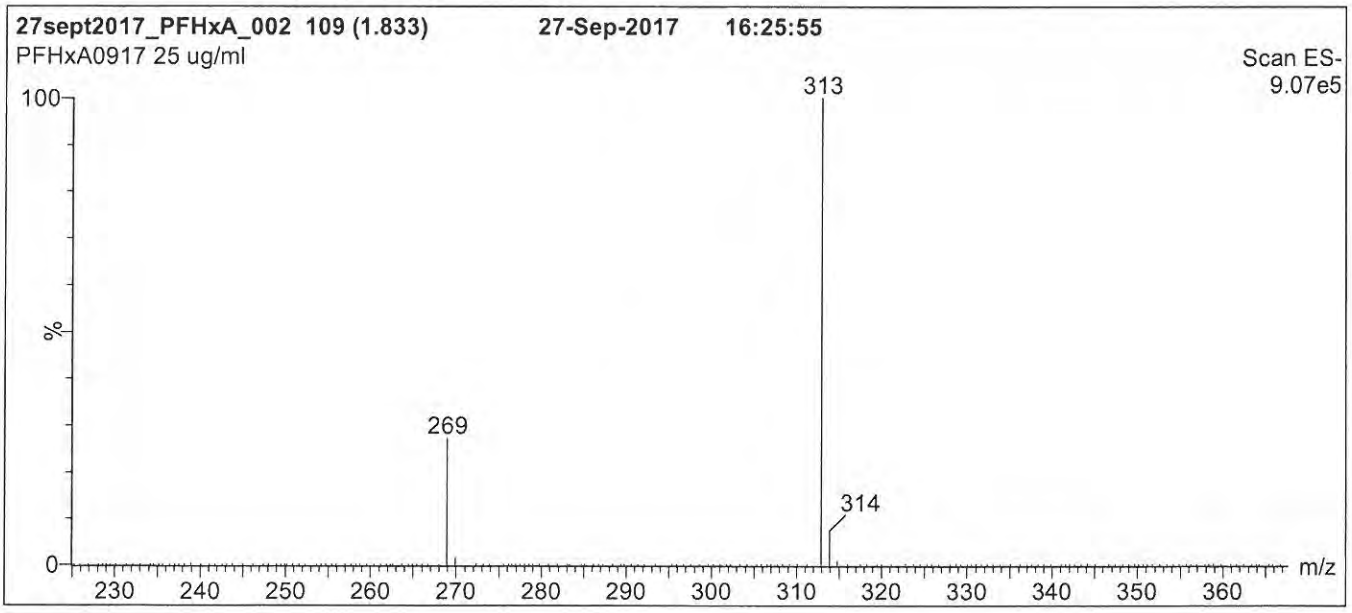
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0710

Figure 1: **PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

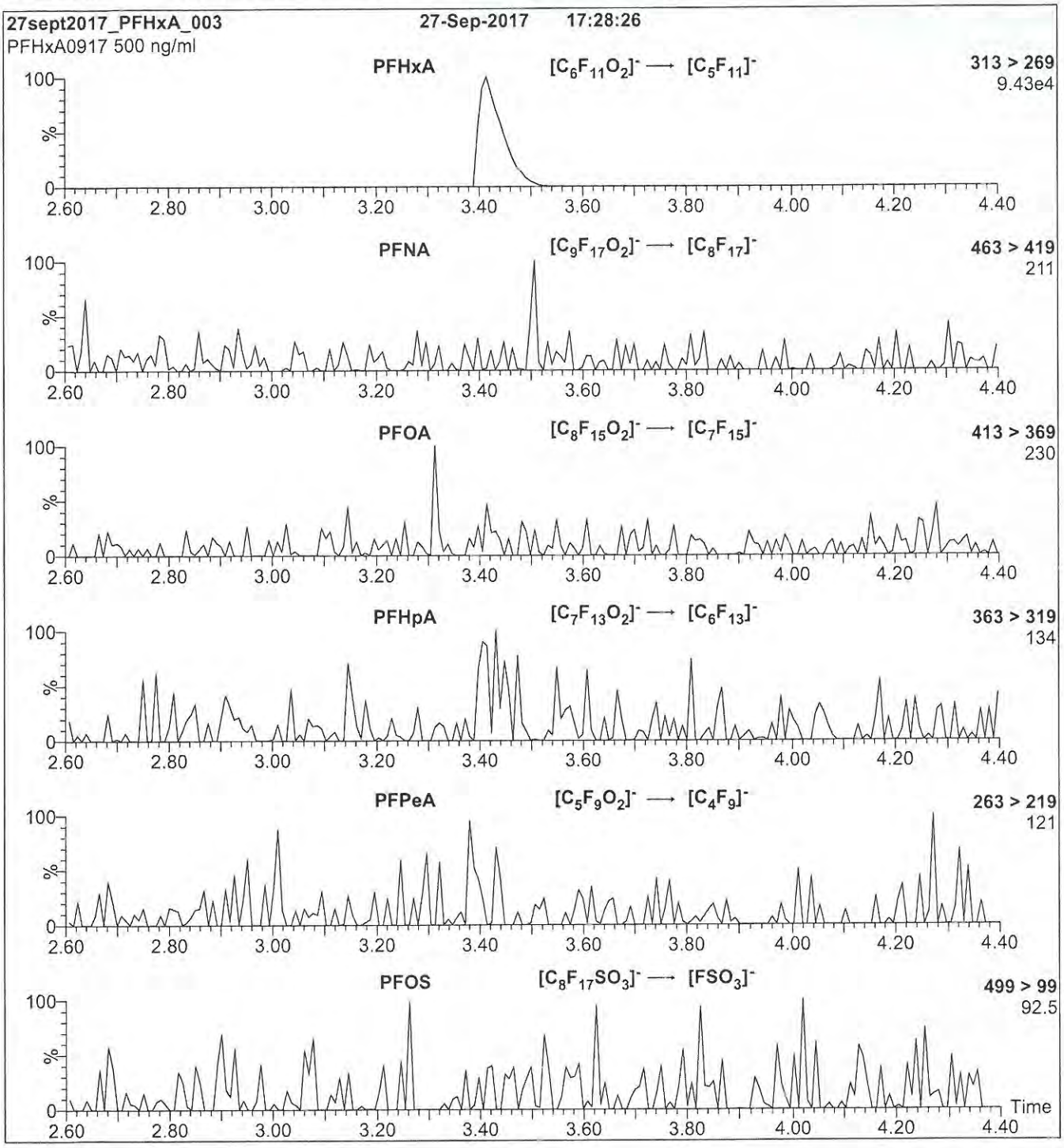
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

1803710

Figure 2: **PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 10

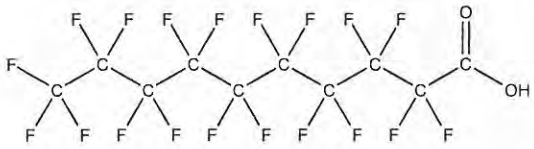
18E0711

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFDA
COMPOUND: Perfluoro-n-decanoic acid
LOT NUMBER: PFDA1217

STRUCTURE:
CAS #: 335-76-2



MOLECULAR FORMULA: $C_{10}HF_{19}O_2$
MOLECULAR WEIGHT: 514.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 12/14/2017
EXPIRY DATE: (mm/dd/yyyy) 12/14/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of perfluoro-n-nonanoic acid (PFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 12/18/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0711

INTENDED USE:

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HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

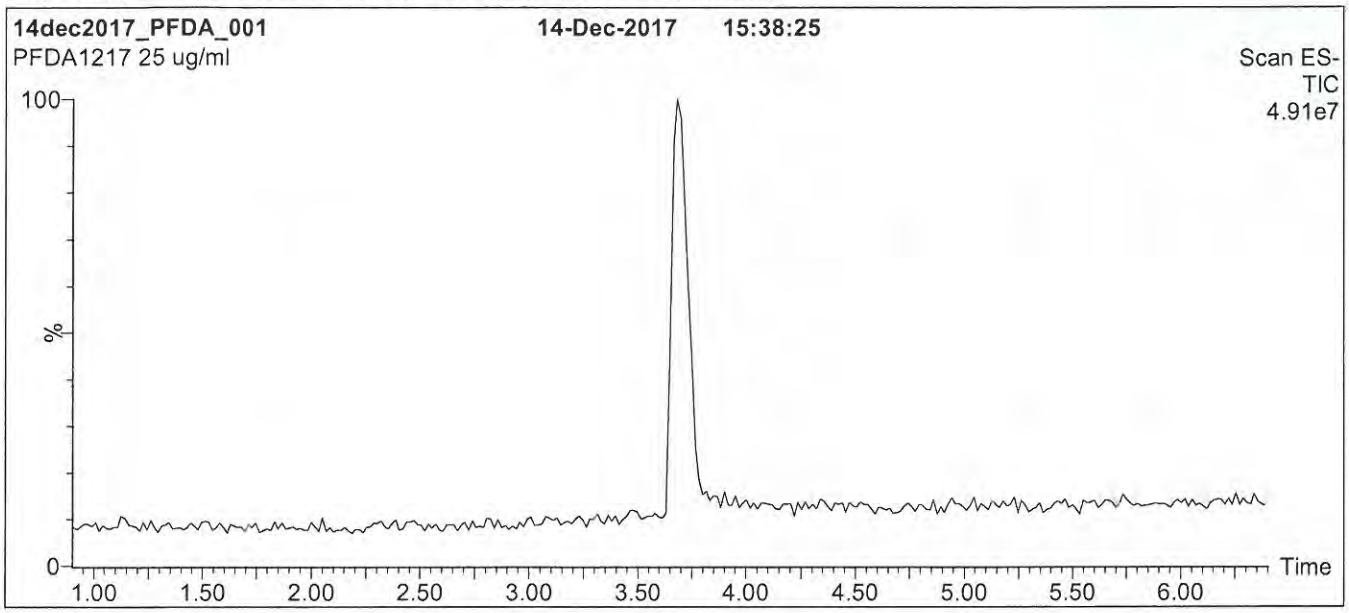
CALA

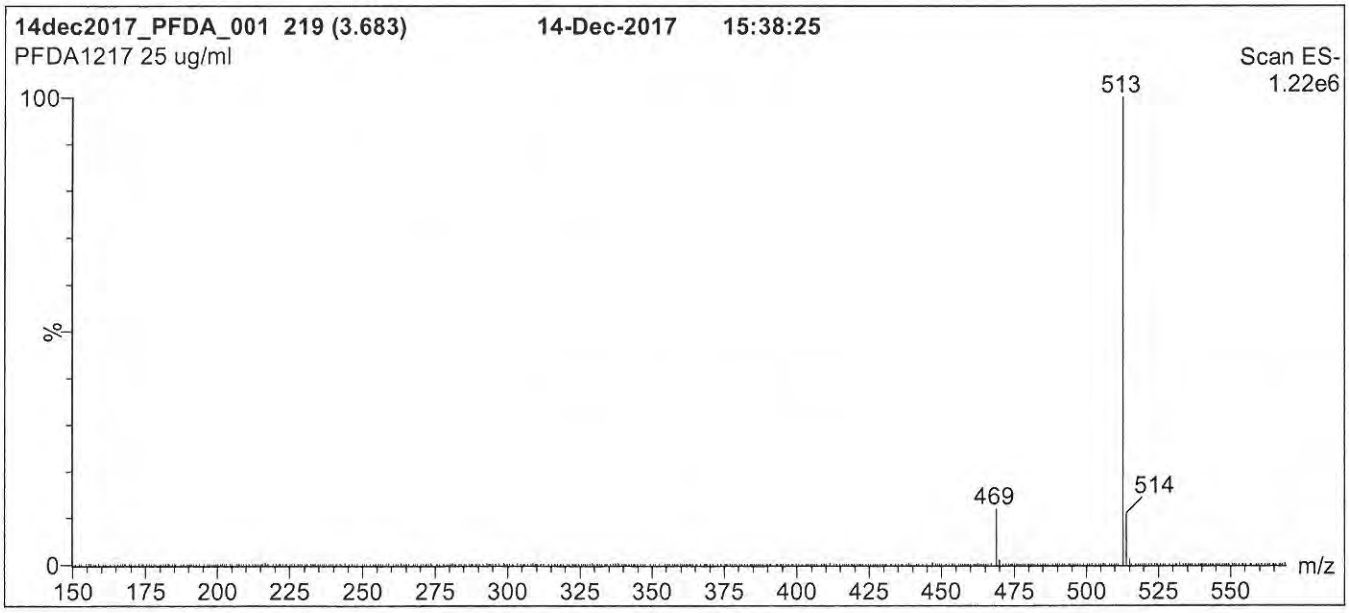
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0711

Figure 1: **PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

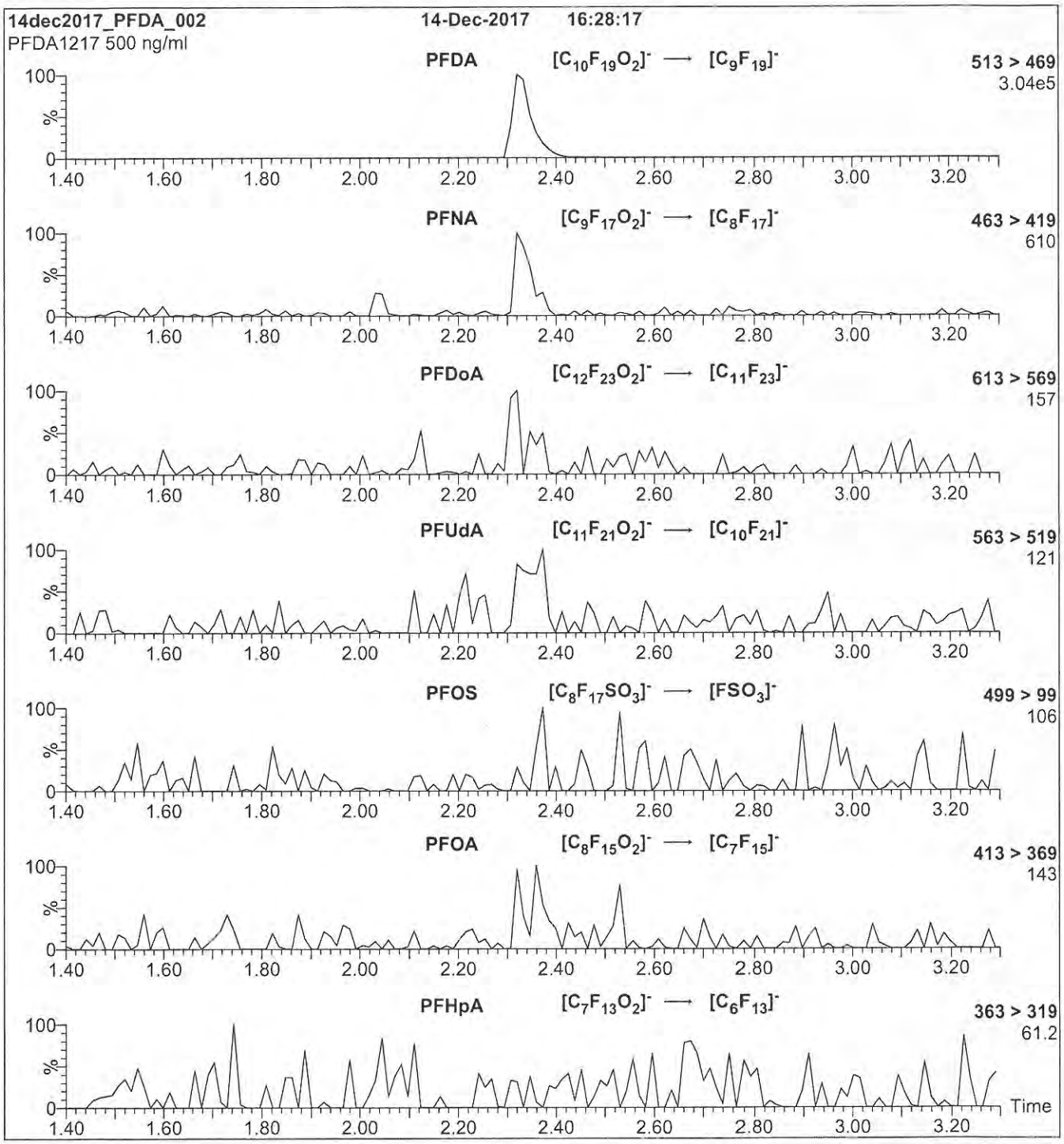
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

180711

Figure 2: **PFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

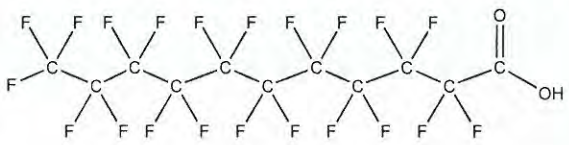
Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 13

18E0712

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFUdA	**LOT NUMBER:**	PFUdA0917
COMPOUND:	Perfluoro-n-undecanoic acid		
STRUCTURE:		**CAS #:**	2058-94-8



MOLECULAR FORMULA:	$C_{11}HF_{21}O_2$	**MOLECULAR WEIGHT:**	564.09
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/21/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/21/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/22/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0712

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CALA

ANAB ACCREDITED

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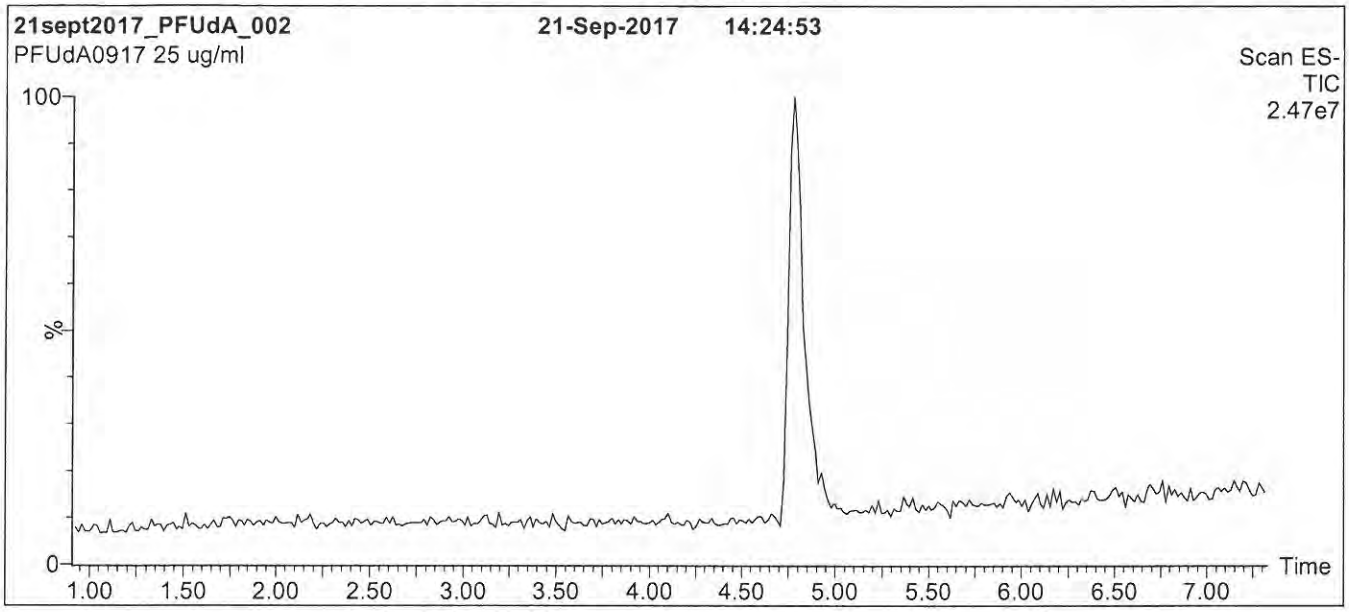
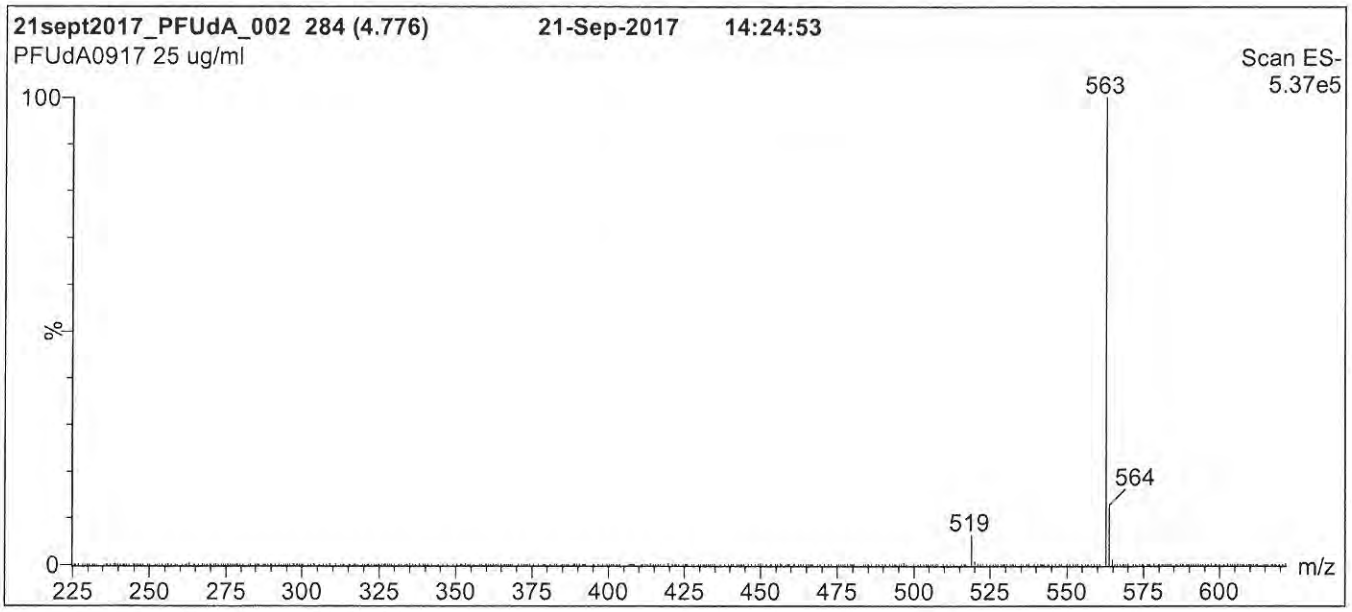
18E0712

Figure 1: **PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

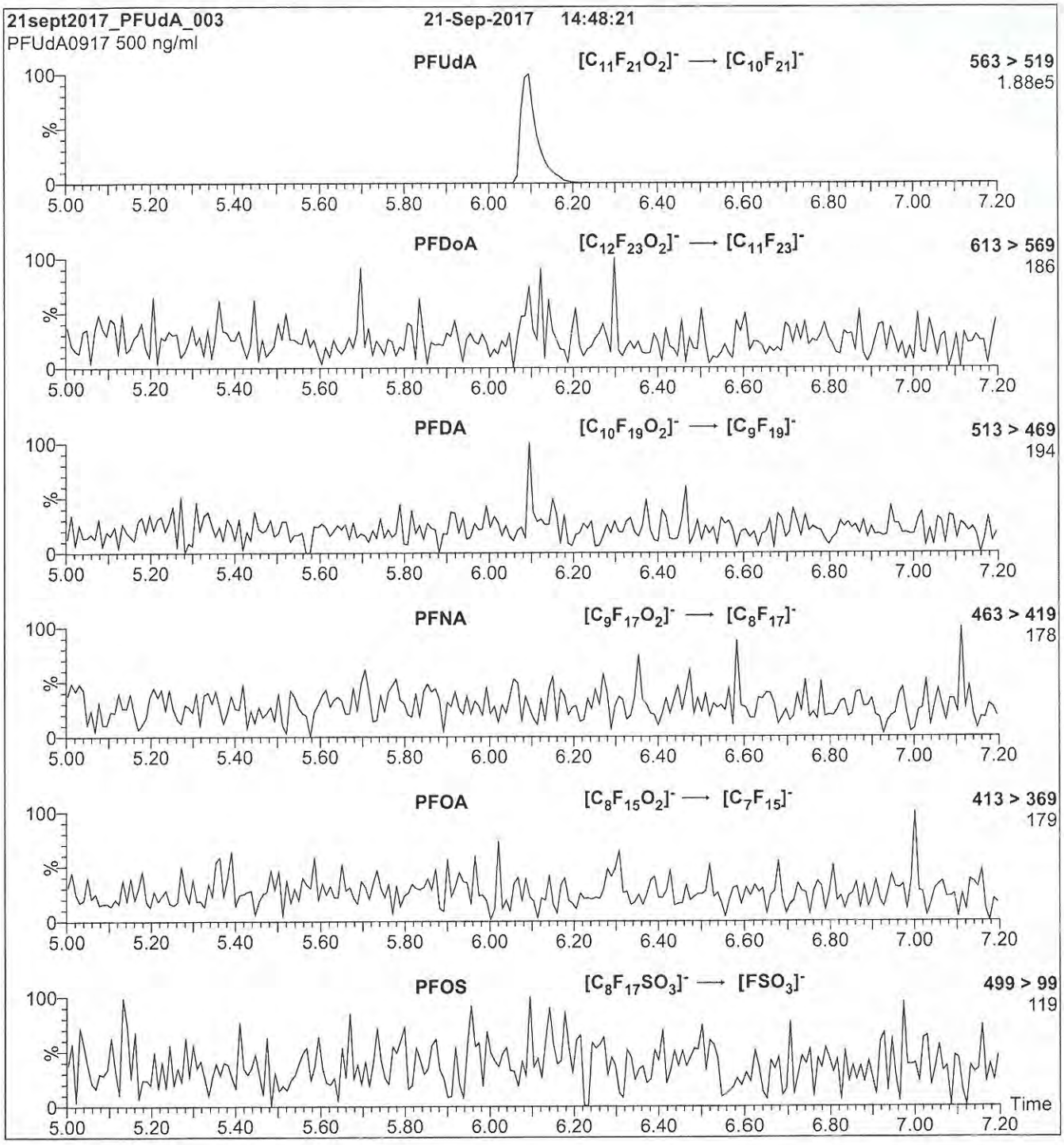
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

18E0712

Figure 2: **PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

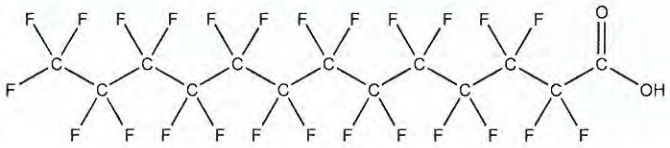
Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 11

18E0713

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFTrDA	**LOT NUMBER:**	PFTrDA0517
COMPOUND:	Perfluoro-n-tridecanoic acid		
STRUCTURE:		**CAS #:**	72629-94-8



MOLECULAR FORMULA:	$C_{13}HF_{25}O_2$	**MOLECULAR WEIGHT:**	664.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/02/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/02/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of PFUdA ($C_{11}HF_{21}O_2$), ~ 0.4% of PFDoA ($C_{12}HF_{23}O_2$), and ~ 0.1% of PFTeDA ($C_{14}HF_{27}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/04/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

180713

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ANAB ACCREDITED

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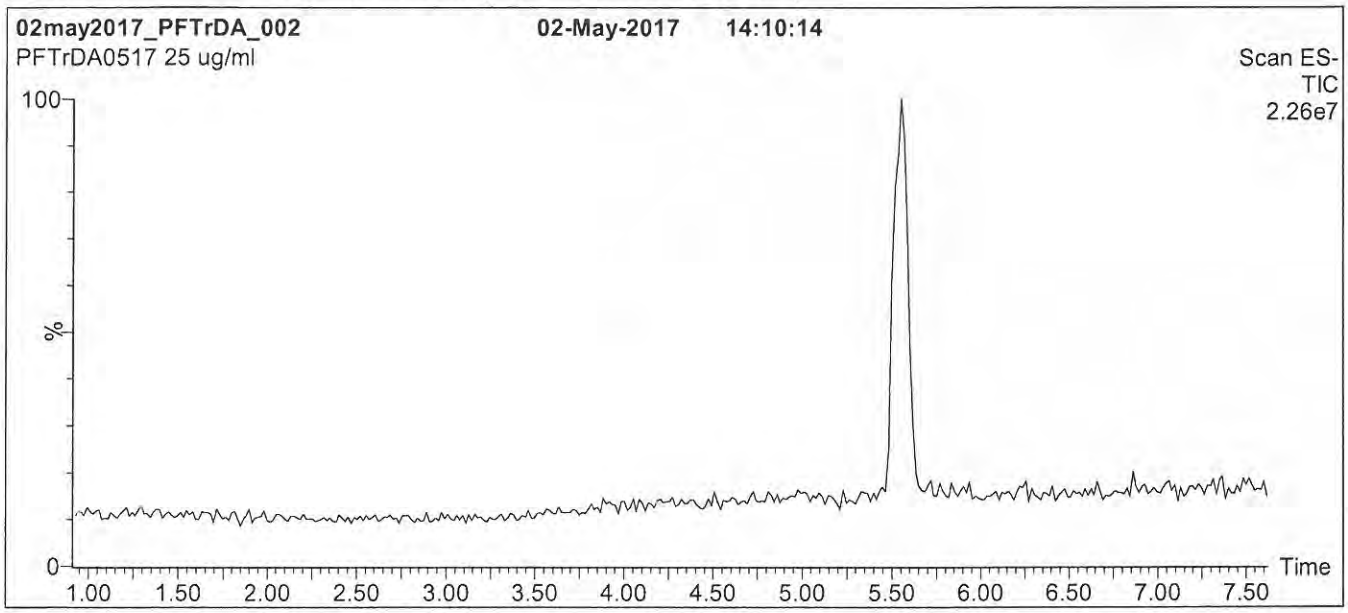
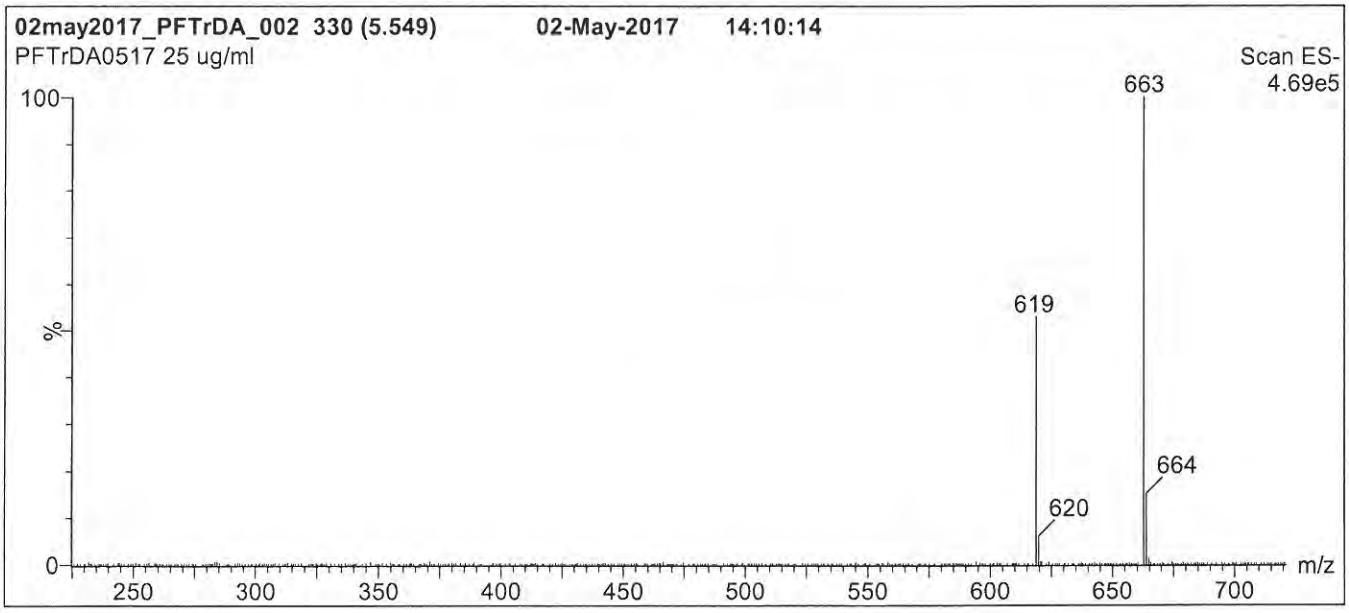
18E0713

Figure 1: **PFTrDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

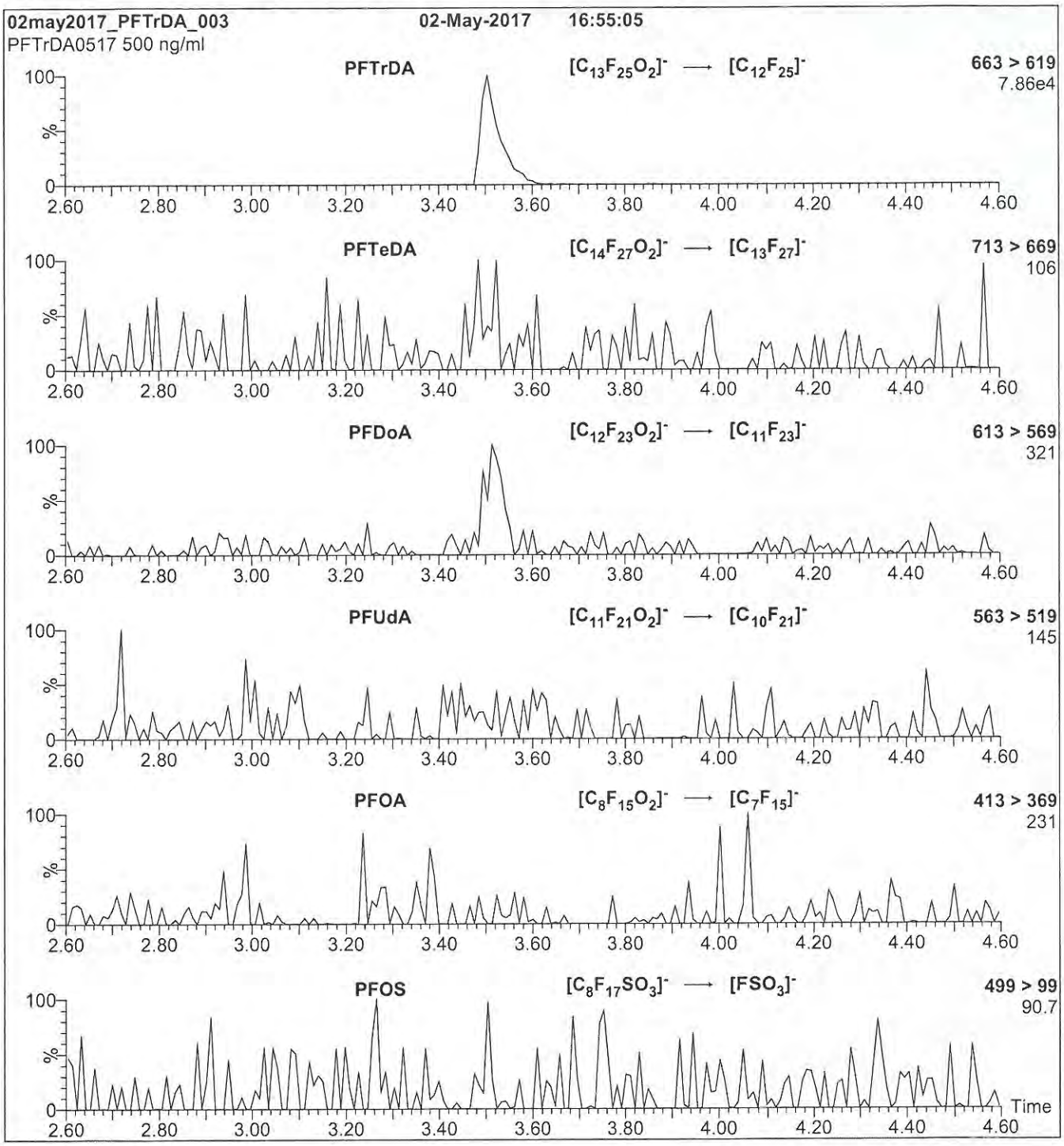
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 22.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 650

18E0713

Figure 2: **PFTrDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTrDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

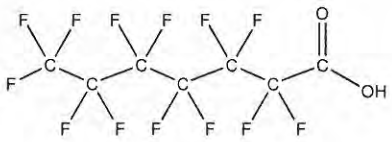
Collision Gas (mbar) = 3.17e-3
Collision Energy (eV) = 15

18E0714

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFHpA	**LOT NUMBER:**	PFHpA0917
COMPOUND:	Perfluoro-n-heptanoic acid		
STRUCTURE:		**CAS #:**	375-85-9



MOLECULAR FORMULA:	$C_7HF_{13}O_2$	**MOLECULAR WEIGHT:**	364.06
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/27/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

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Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: _____ **Date:** 09/29/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

1803714

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EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED

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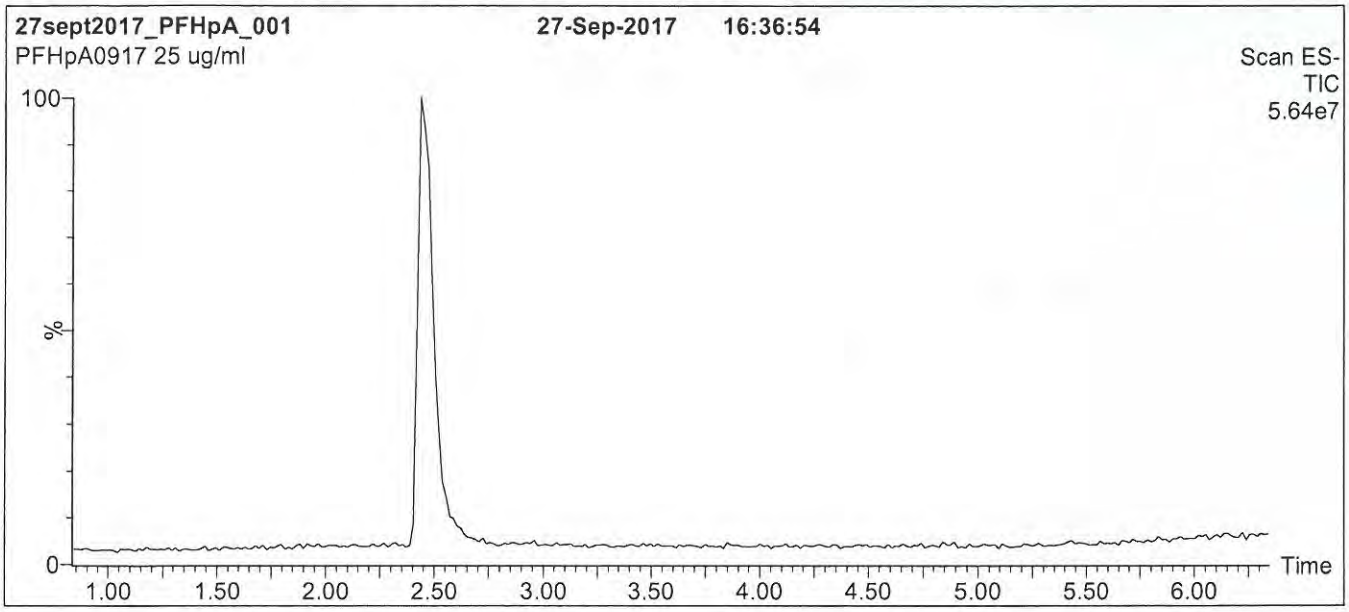
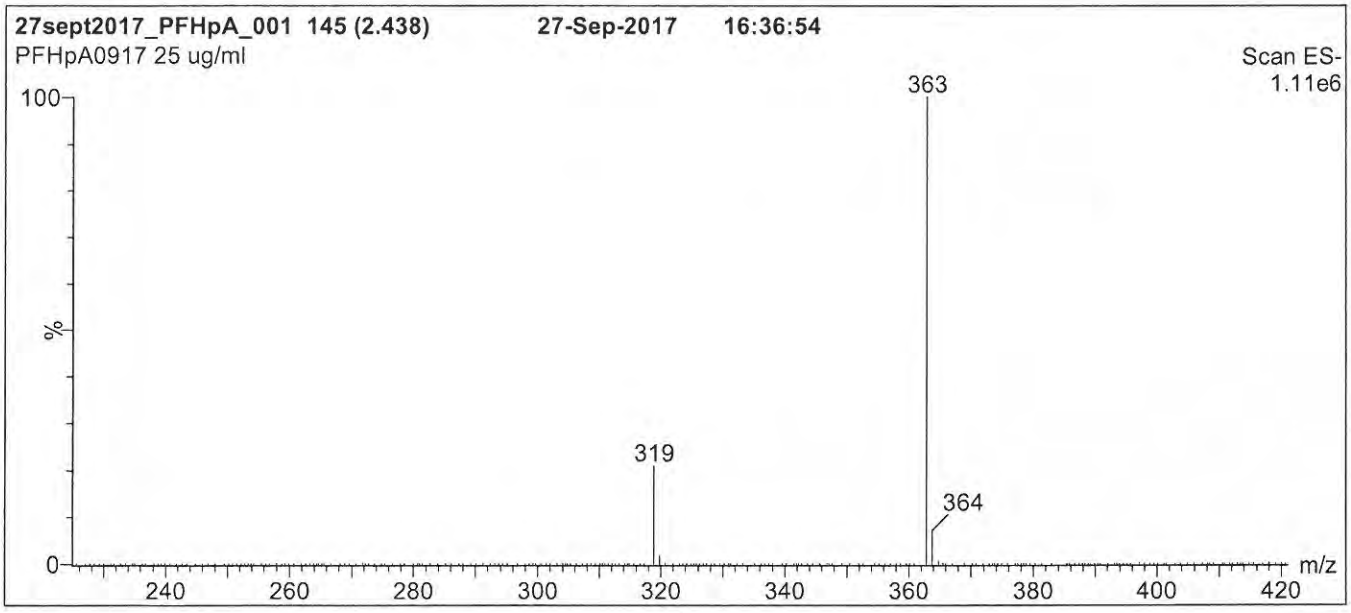
18E0714

Figure 1: **PFHpA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

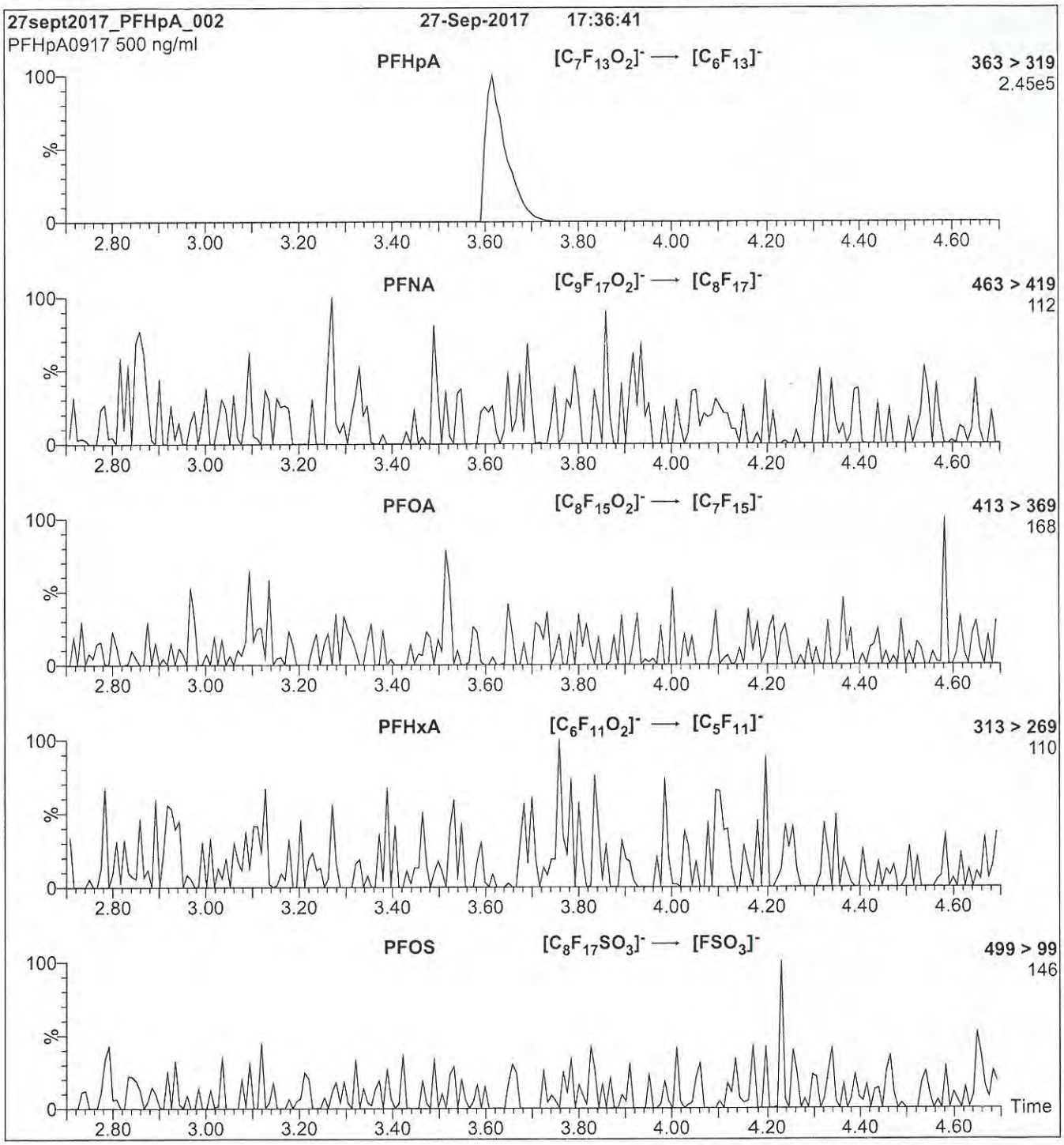
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18E0714

Figure 2: **PFHpA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHpA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 11

18E0715

WELLINGTON LABORATORIES

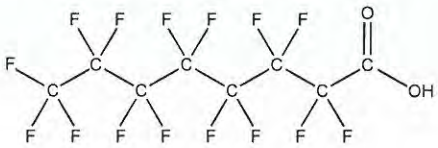
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFOA
COMPOUND: Perfluoro-n-octanoic acid

LOT NUMBER: PFOA0218

STRUCTURE:

CAS #: 335-67-1



MOLECULAR FORMULA: $C_8HF_{15}O_2$
CONCENTRATION: 50 ± 2.5 µg/ml

MOLECULAR WEIGHT: 414.07
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 02/16/2018
EXPIRY DATE: (mm/dd/yyyy) 02/16/2023
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/20/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0715

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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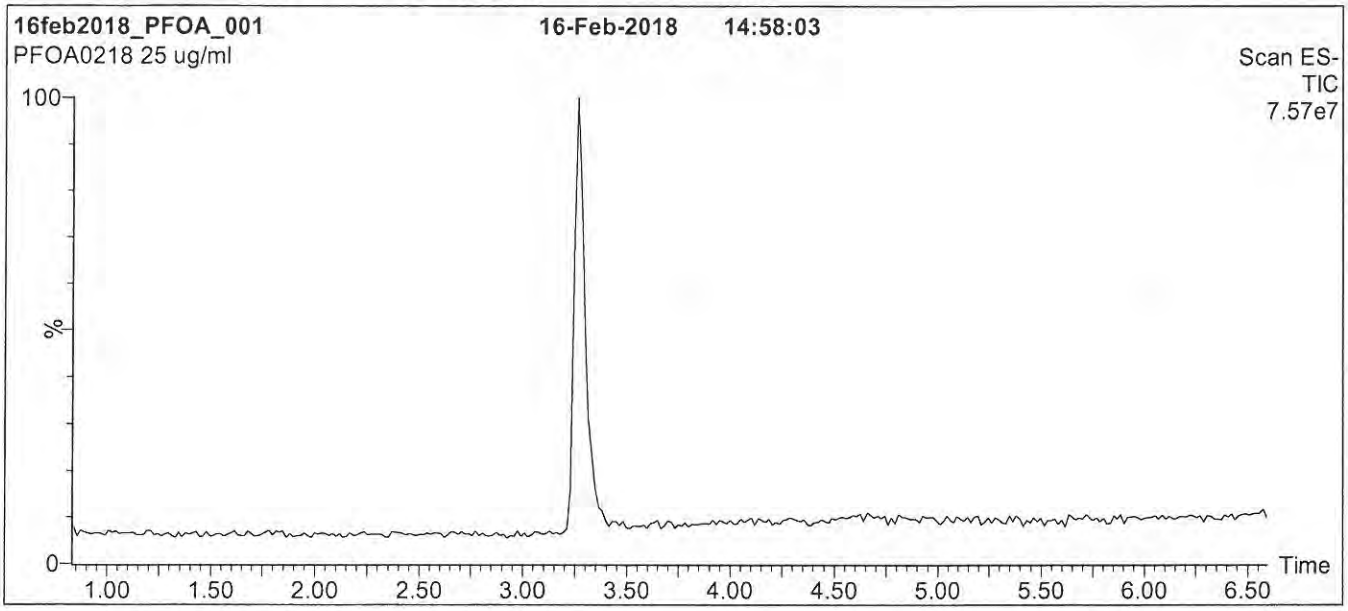
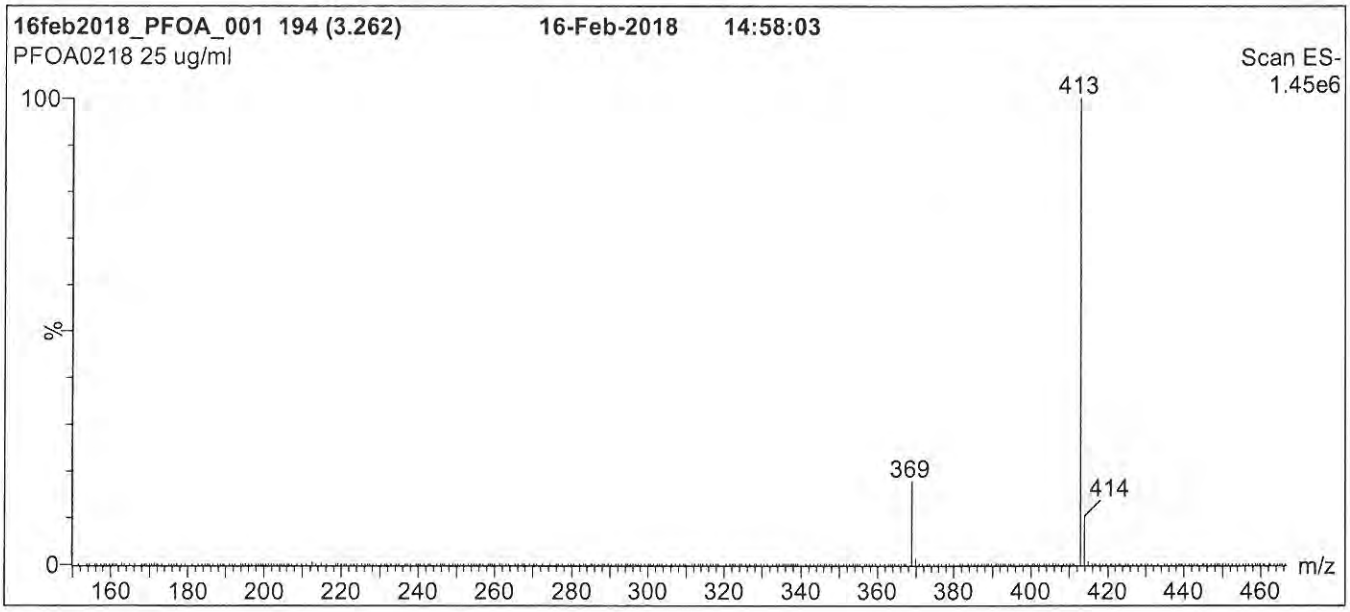
18E0715

Figure 1: **PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

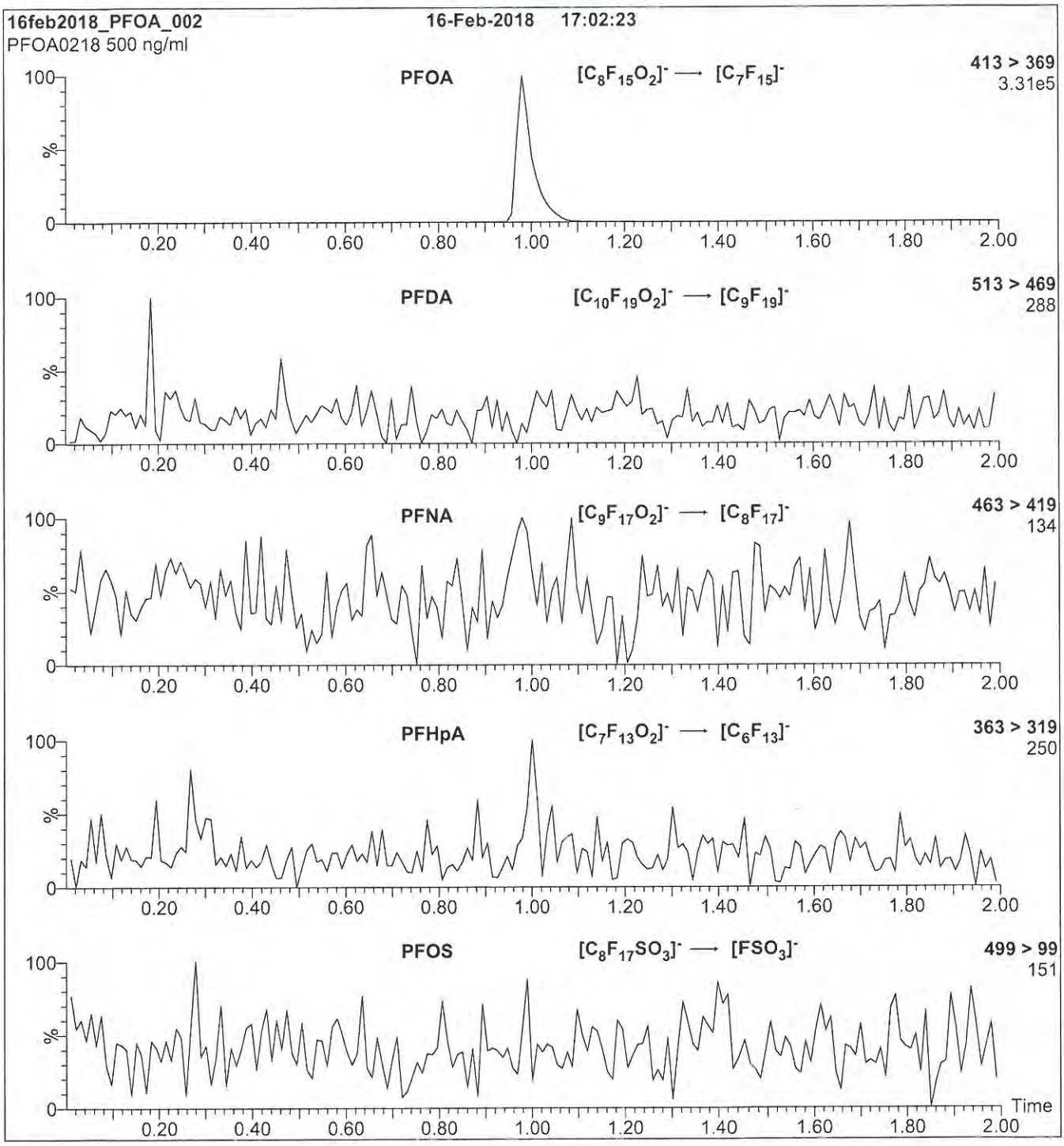
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

180715

Figure 2: **PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 10

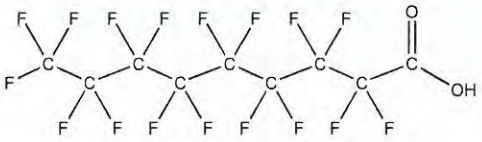
18E0716

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFNA
COMPOUND: Perfluoro-n-nonanoic acid
LOT NUMBER: PFNA0717

STRUCTURE:
CAS #: 375-95-1



MOLECULAR FORMULA: $C_9HF_{17}O_2$
MOLECULAR WEIGHT: 464.08
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/20/2017
EXPIRY DATE: (mm/dd/yyyy) 07/20/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.1% of perfluoro-n-octanoic acid (PFOA), < 0.1% of perfluoro-n-heptanoic acid (PFHpA), and < 0.1% of perfluoro-n-undecanoic acid (PFUdA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/24/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0716

INTENDED USE:

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HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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UNCERTAINTY:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

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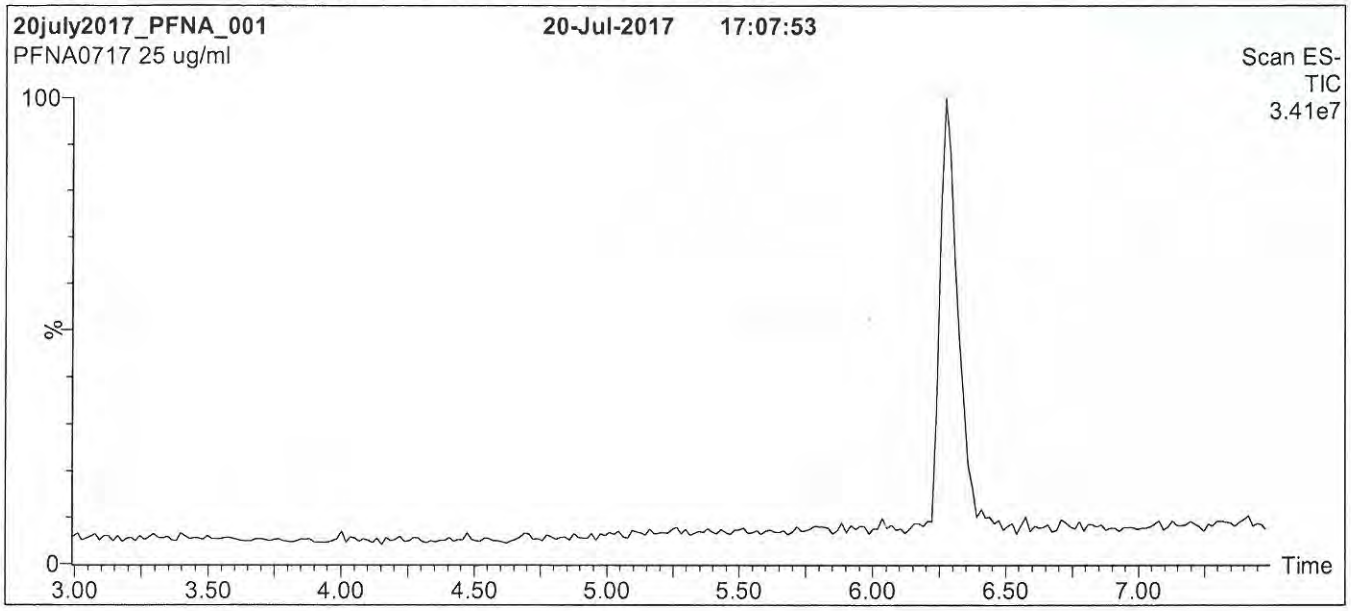
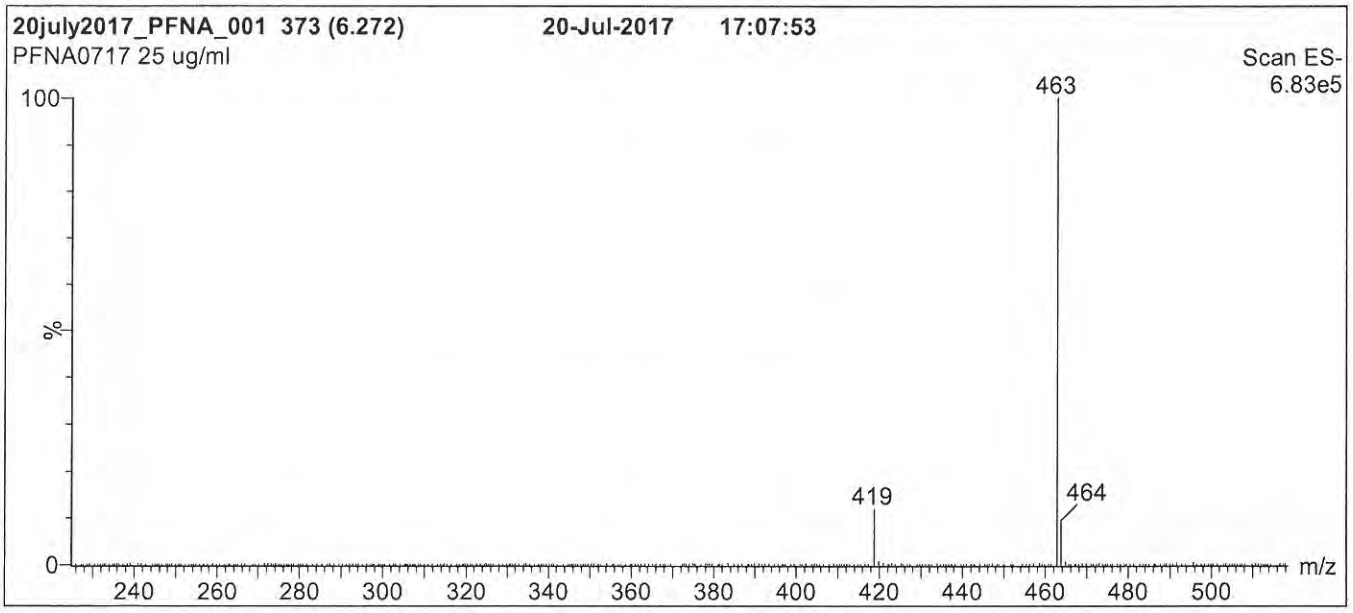
18E0716

Figure 1: **PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Hold for 1 min. Ramp to 90% organic over 7 min and hold for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

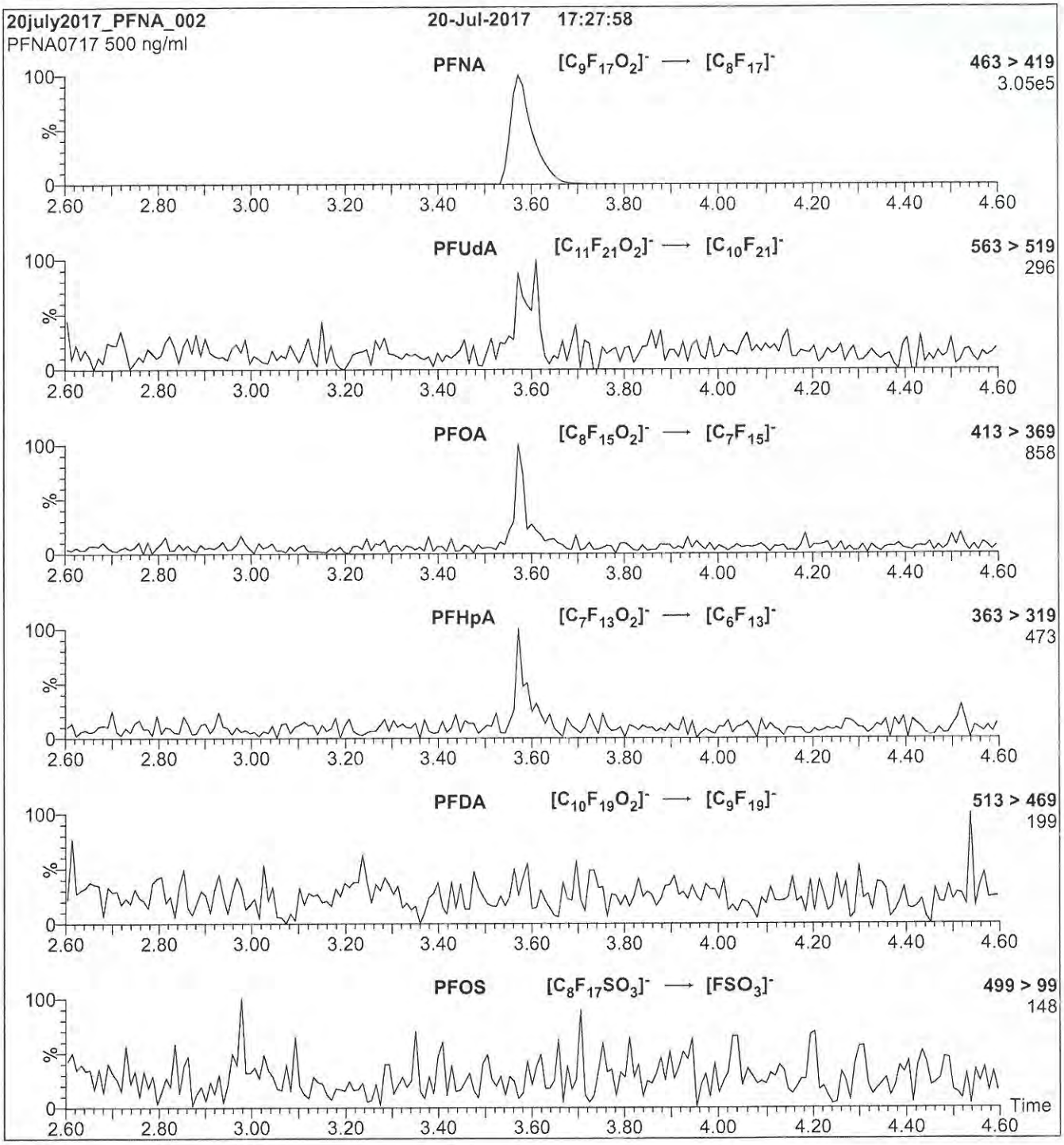
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

1803716

Figure 2: **PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

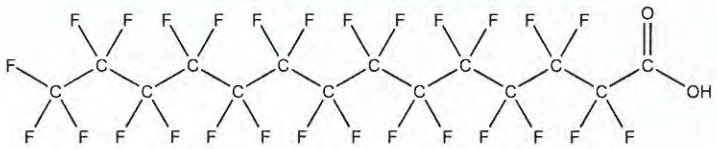
Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 11

18E0717

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	PFTeDA	**LOT NUMBER:**	PFTeDA0917
COMPOUND:	Perfluoro-n-tetradecanoic acid		
STRUCTURE:		**CAS #:**	376-06-7



MOLECULAR FORMULA:	$C_{14}HF_{27}O_2$	**MOLECULAR WEIGHT:**	714.11
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/21/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/21/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.2% of PFDoA ($C_{12}HF_{23}O_2$) and ~ 0.2% of PFPeDA ($C_{15}HF_{29}O_2$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/21/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

180717

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CALA

ANAB ACCREDITED

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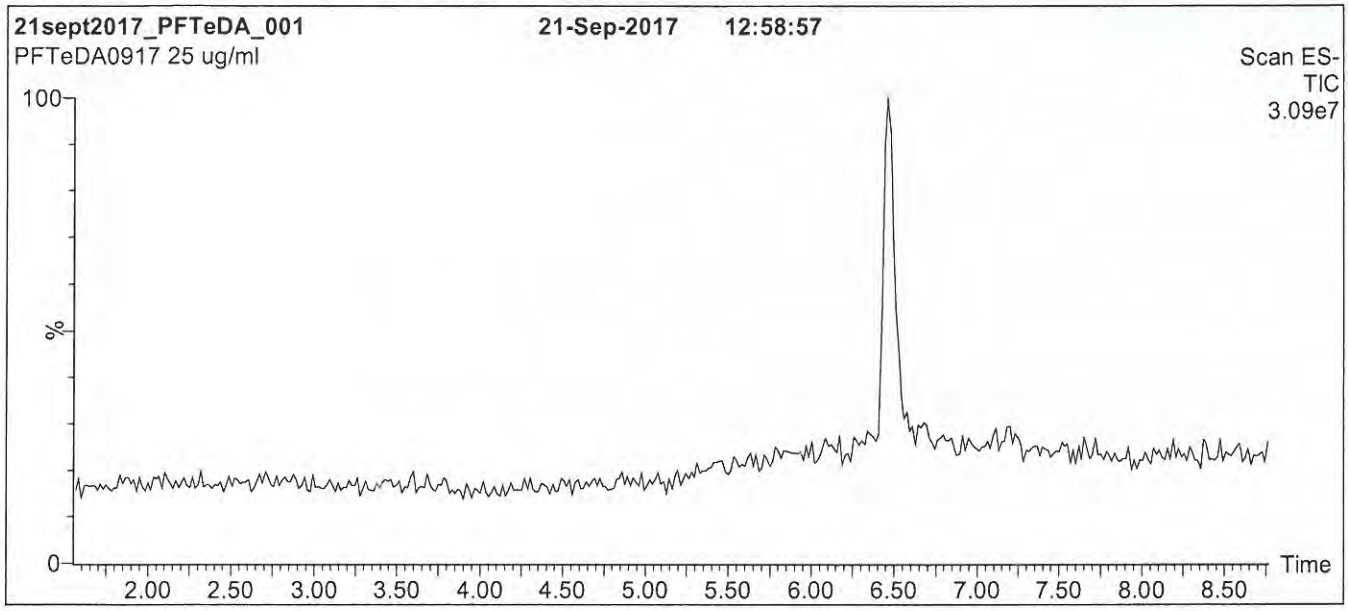
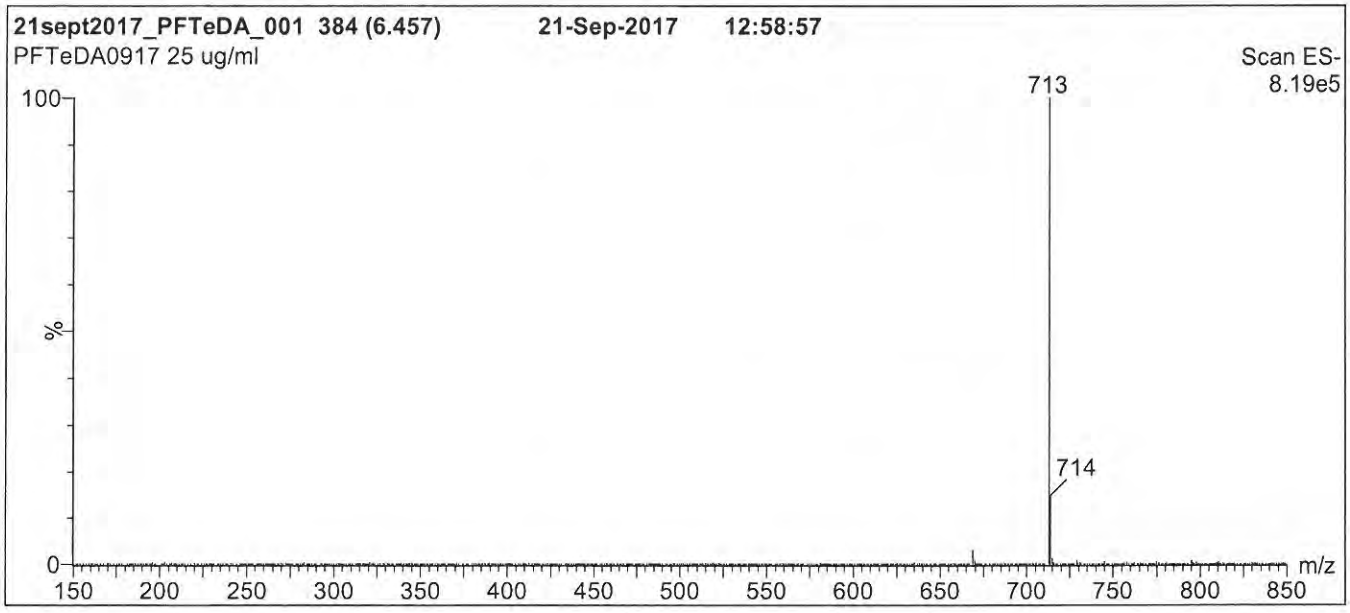
1803717

Figure 1: **PFTeDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

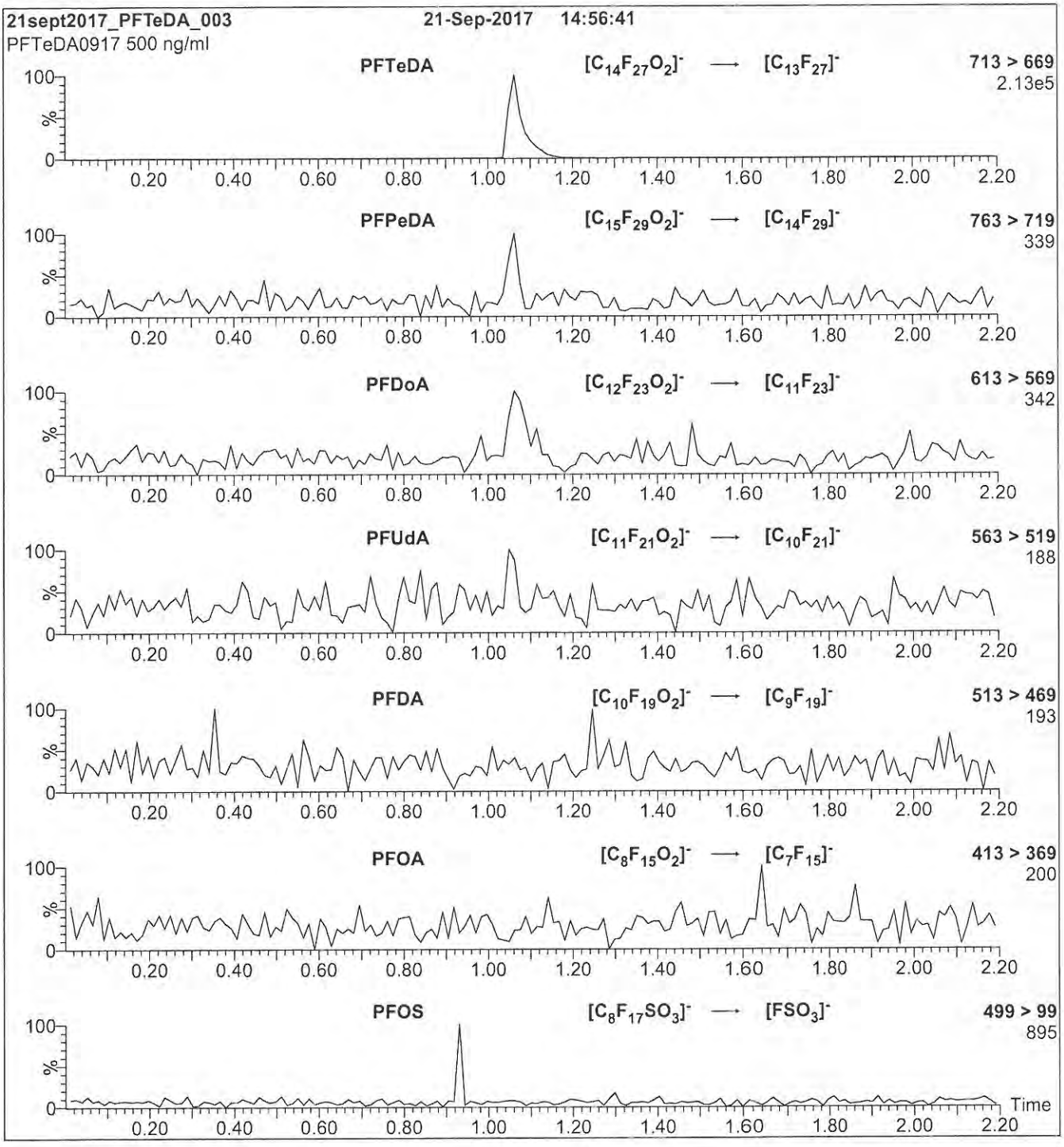
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

1803717

Figure 2: **PFTeDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFTeDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 14

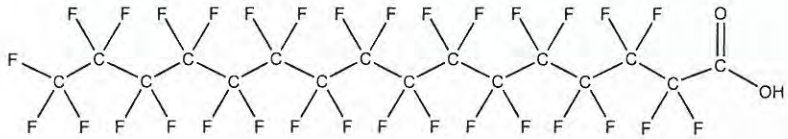
18E0718

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: PFHxDA
COMPOUND: Perfluoro-n-hexadecanoic acid
LOT NUMBER: PFHxDA0717

STRUCTURE:
CAS #: 67905-19-5



MOLECULAR FORMULA: $C_{16}HF_{31}O_2$
MOLECULAR WEIGHT: 814.13
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/13/2017
EXPIRY DATE: (mm/dd/yyyy) 07/13/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 08/04/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0718

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

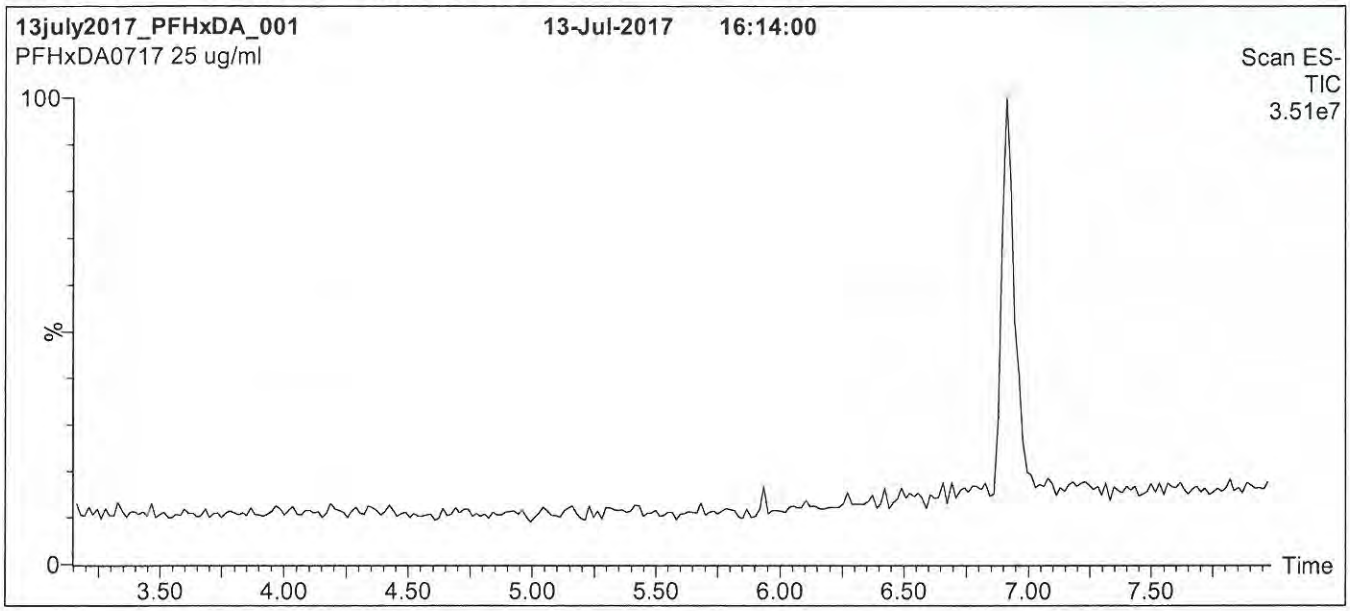
CALA Testing

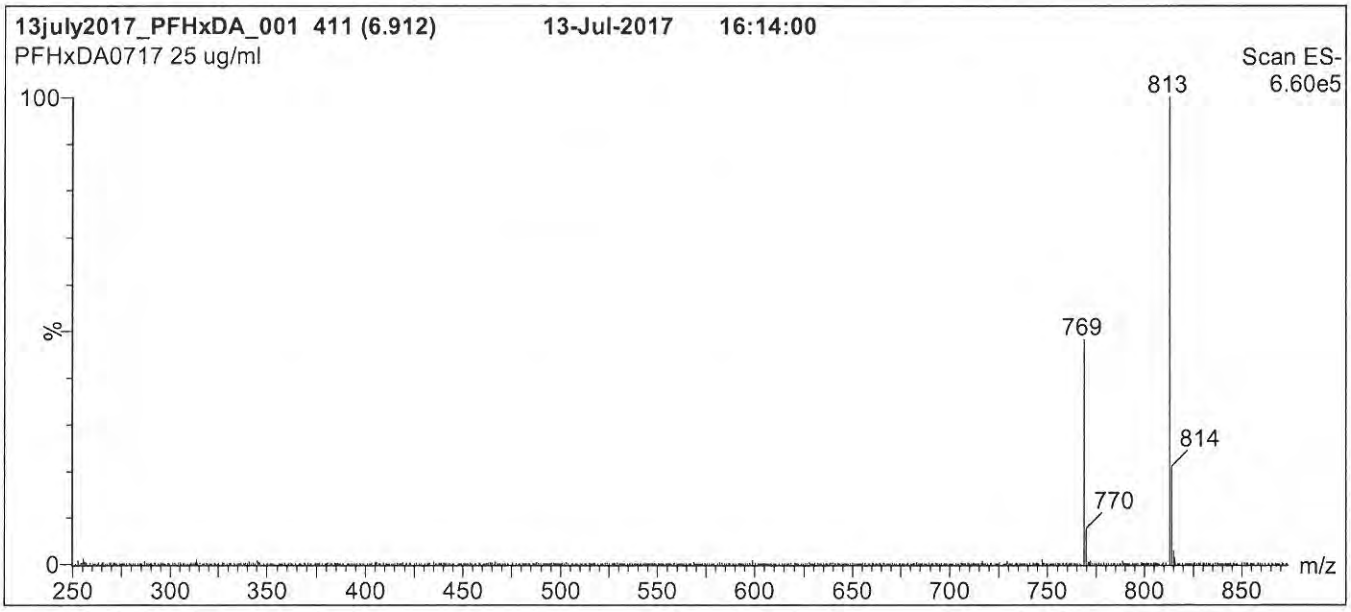
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0718

Figure 1: **PFHxDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

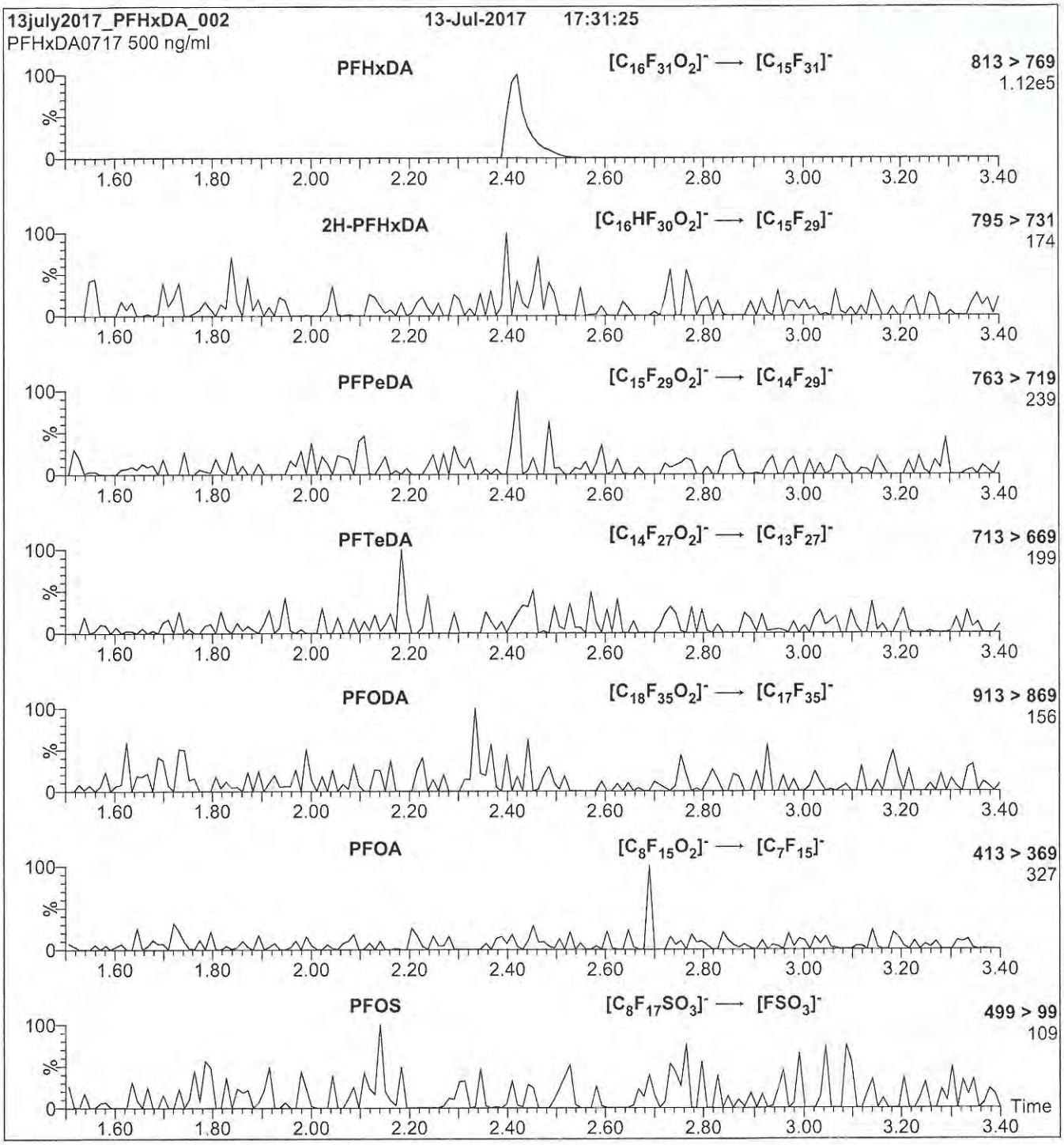
MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

18E0718

Figure 2: **PFHxDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFHxDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.13e-3
Collision Energy (eV) = 15

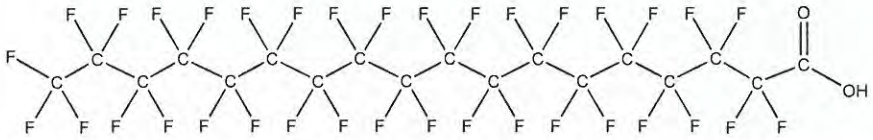
18E0719

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: PFODA
COMPOUND: Perfluoro-n-octadecanoic acid
LOT NUMBER: PFODA0717

STRUCTURE:
CAS #: 16517-11-6



MOLECULAR FORMULA: $C_{18}HF_{35}O_2$
MOLECULAR WEIGHT: 914.14
CONCENTRATION: 50 ± 2.5 µg/ml
SOLVENT(S): Methanol
Water (<1%)

CHEMICAL PURITY: >98%
LAST TESTED: (mm/dd/yyyy) 07/13/2017
EXPIRY DATE: (mm/dd/yyyy) 07/13/2022
RECOMMENDED STORAGE: Store ampoule in a cool, dark place

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0719

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED

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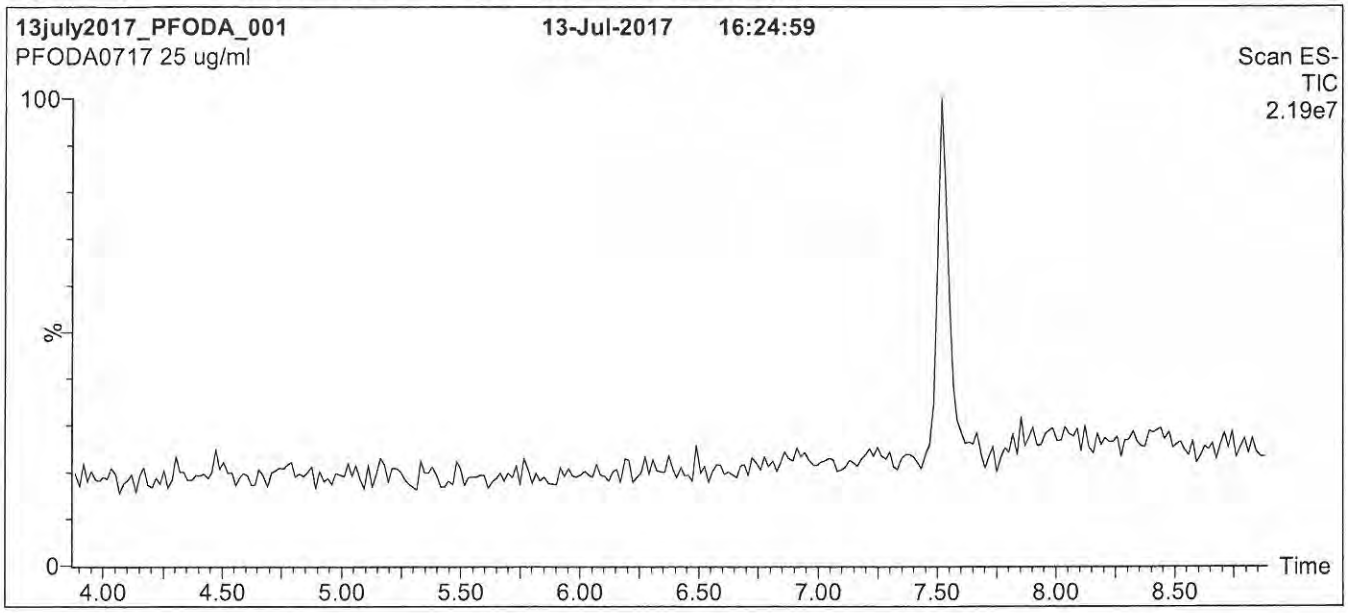
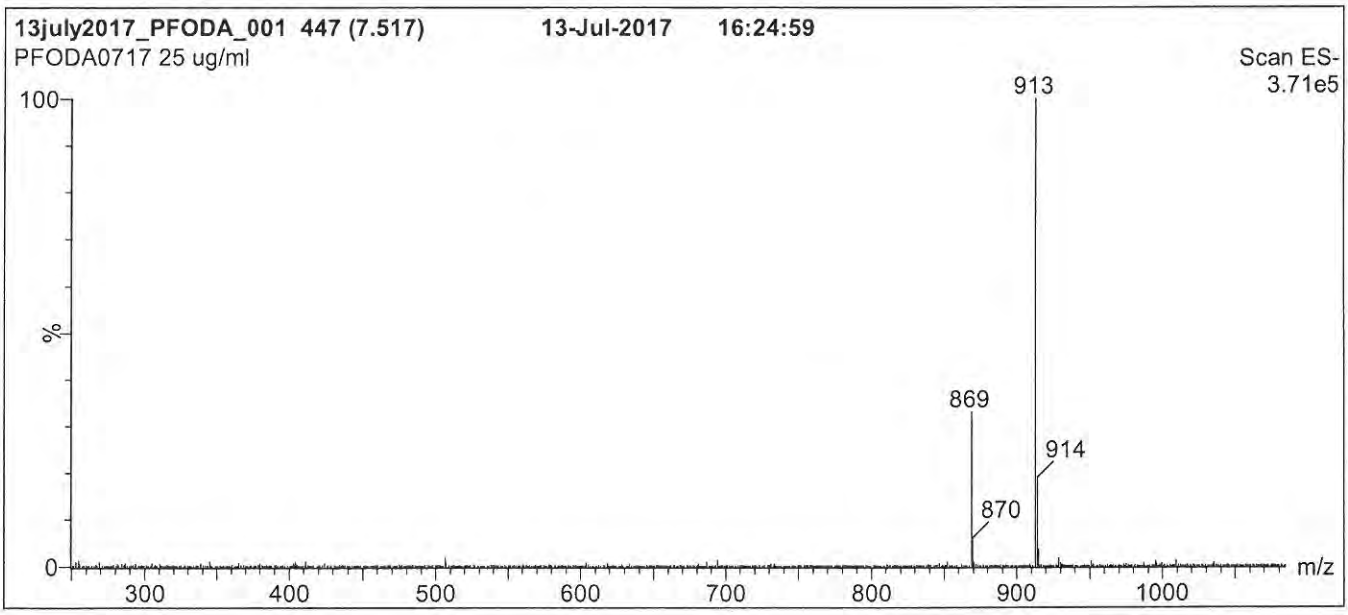
18E0719

Figure 1: **PFODA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

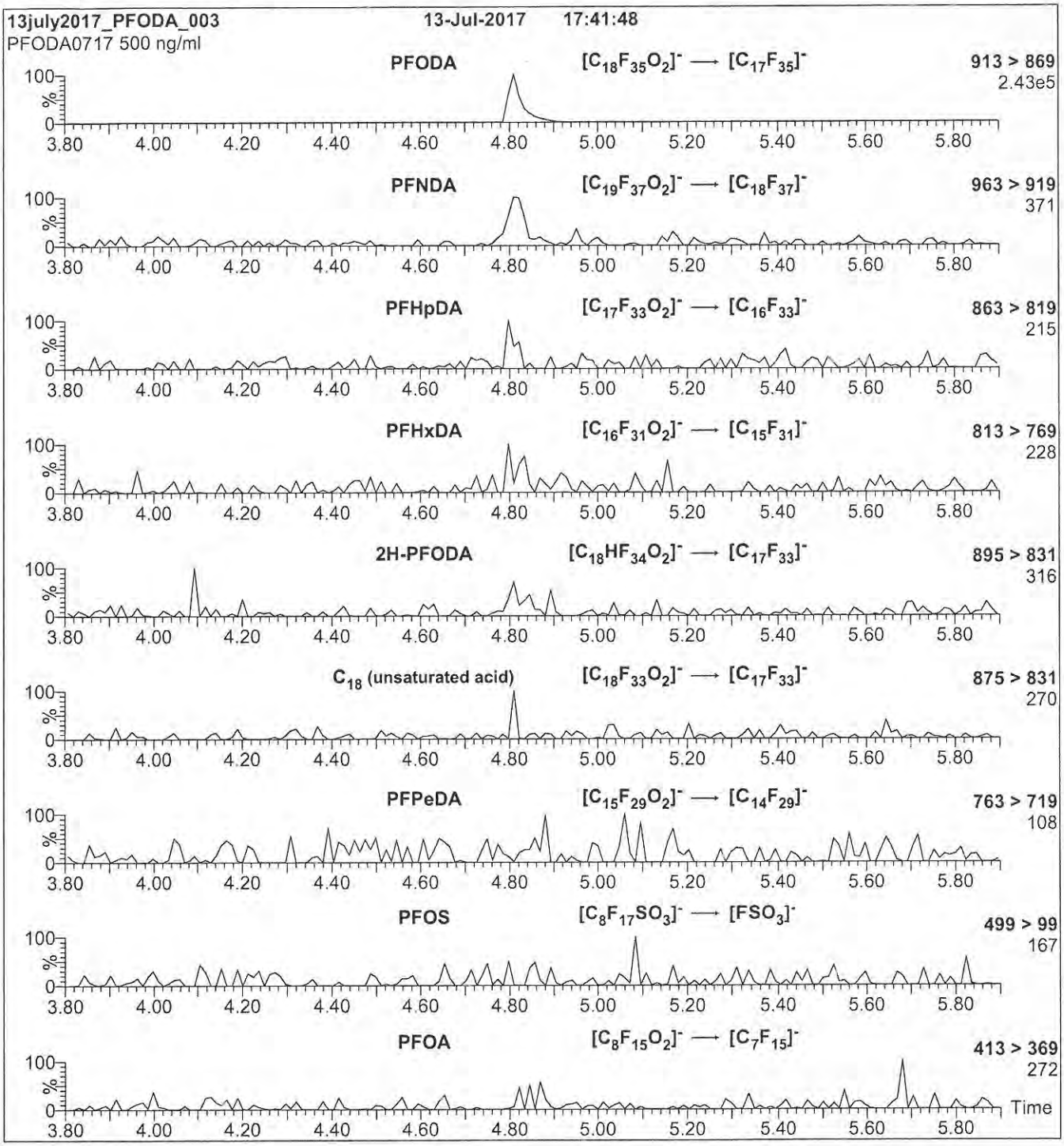
MS Parameters

Experiment: Full Scan (250 - 1250 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18E0719

Figure 2: **PFODA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml PFODA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

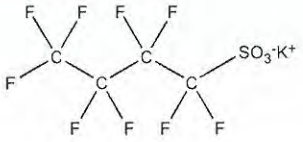
Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 15

18E0720

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	L-PFBS	**LOT NUMBER:**	LPFBS0917
COMPOUND:	Potassium perfluoro-1-butanesulfonate		
STRUCTURE:		**CAS #:**	29420-49-3



MOLECULAR FORMULA:	$C_4F_9SO_3K$	**MOLECULAR WEIGHT:**	338.19
CONCENTRATION:	50.0 ± 2.5 µg/ml (K salt) 44.2 ± 2.2 µg/ml (PFBS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/21/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/21/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/22/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

1803720

INTENDED USE:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

ANAB ACCREDITED

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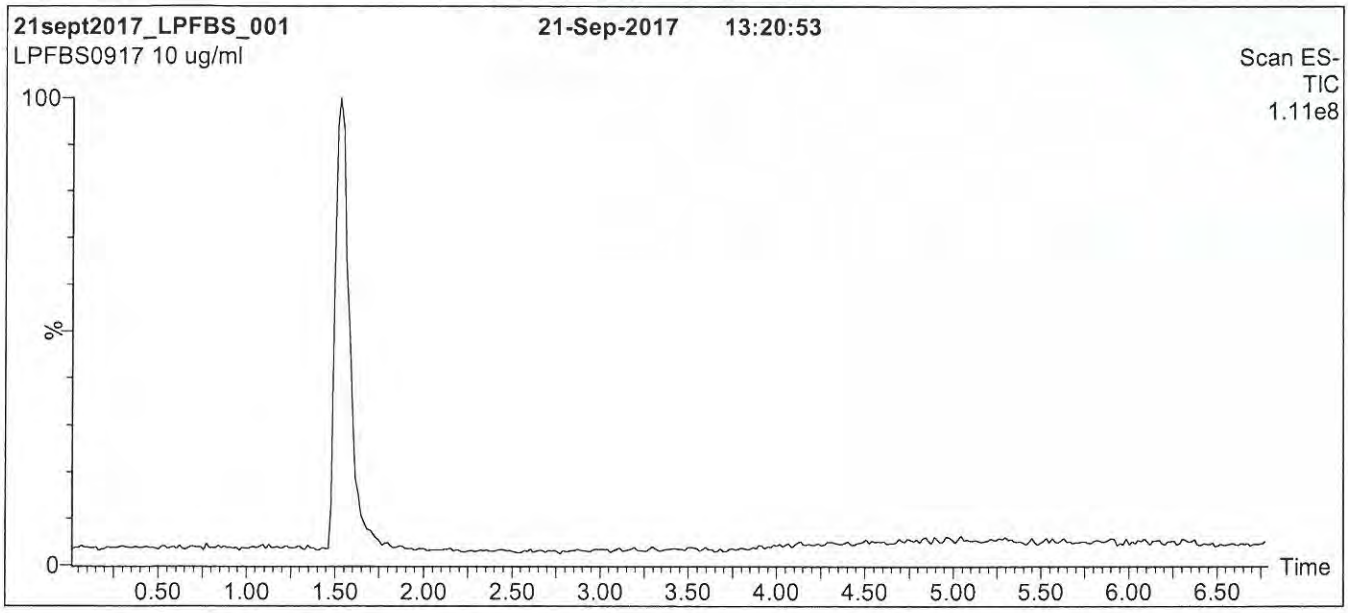
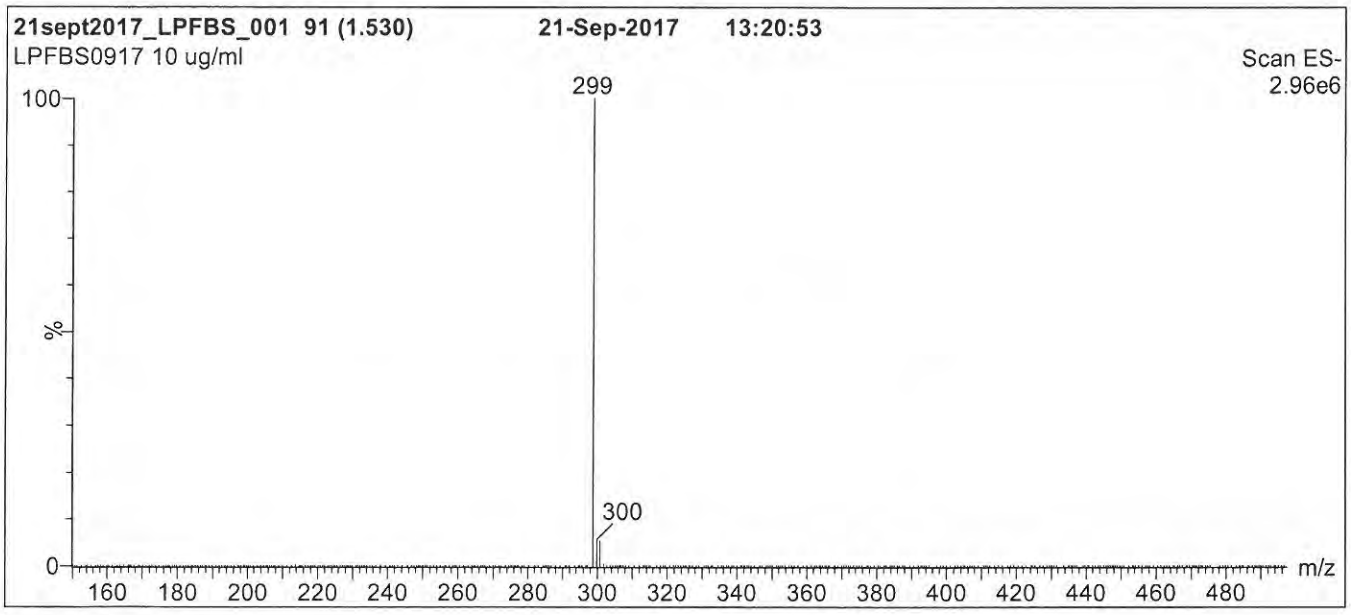
18E0720

Figure 1: **L-PFBS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

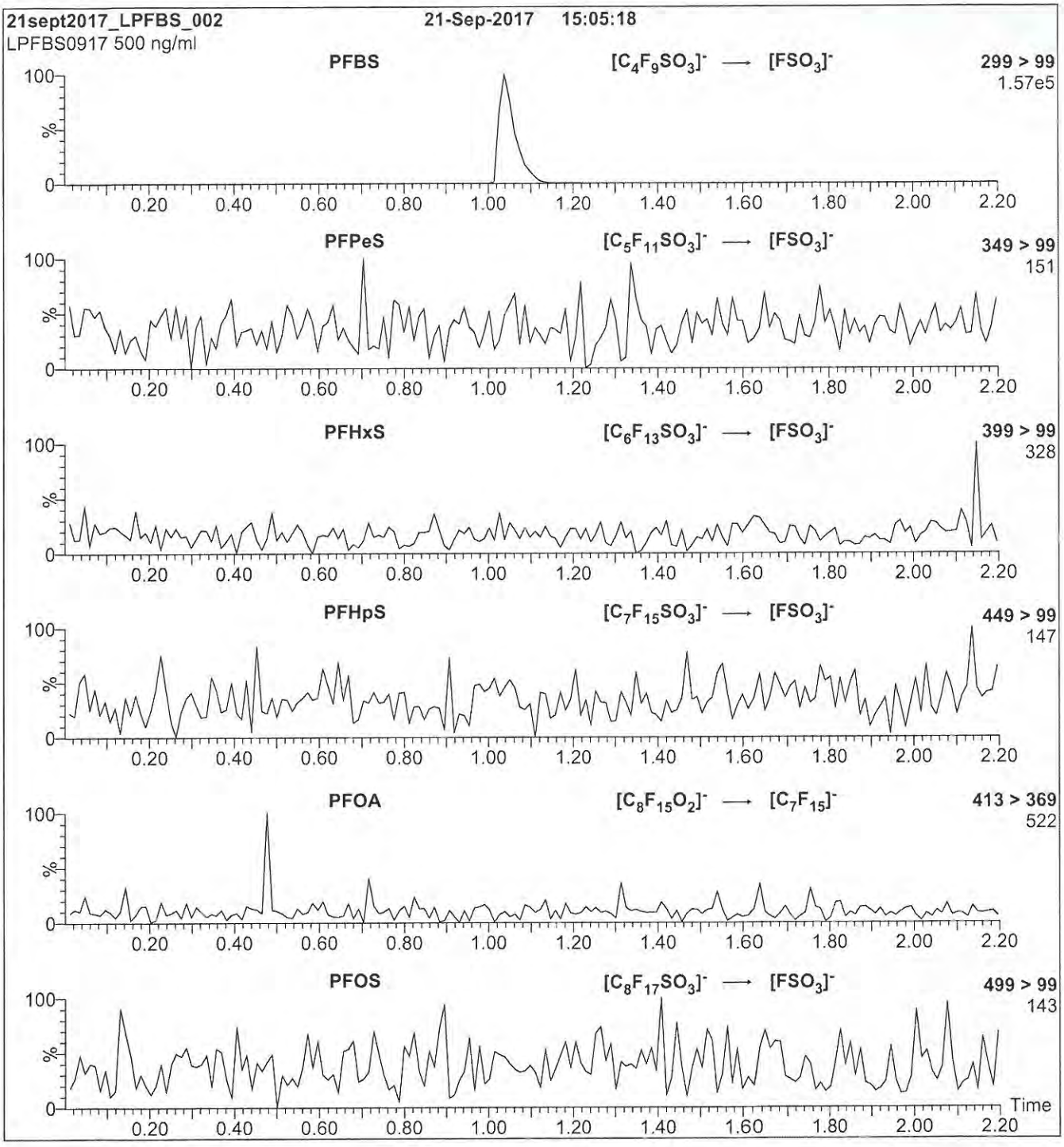
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18E0720

Figure 2: **L-PFBS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFBS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

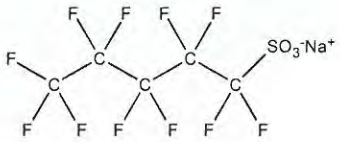
Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

18E0721

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	L-PFPeS	**LOT NUMBER:**	LPFPeS0117
COMPOUND:	Sodium perfluoro-1-pentanesulfonate		
STRUCTURE:		**CAS #:**	630402-22-1



MOLECULAR FORMULA:	$C_5F_{11}SO_3Na$	**MOLECULAR WEIGHT:**	372.09
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 46.9 ± 2.3 µg/ml (PFPeS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	01/11/2017		
EXPIRY DATE: (mm/dd/yyyy)	01/11/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/06/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0721

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

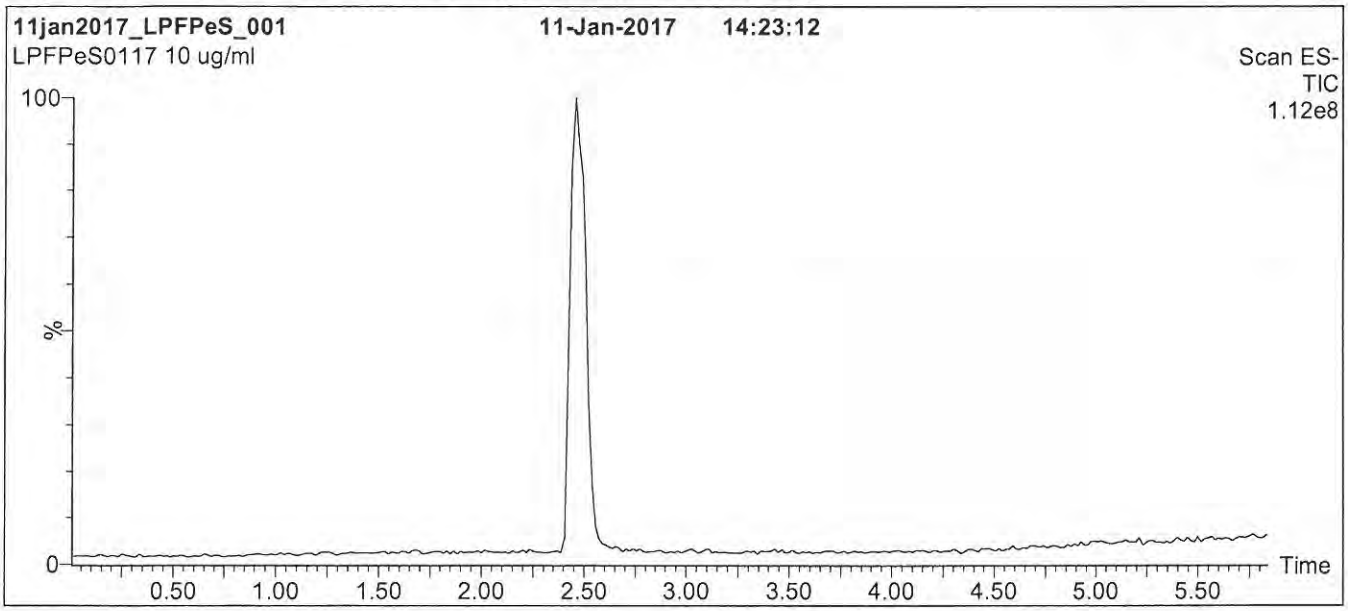
CALA

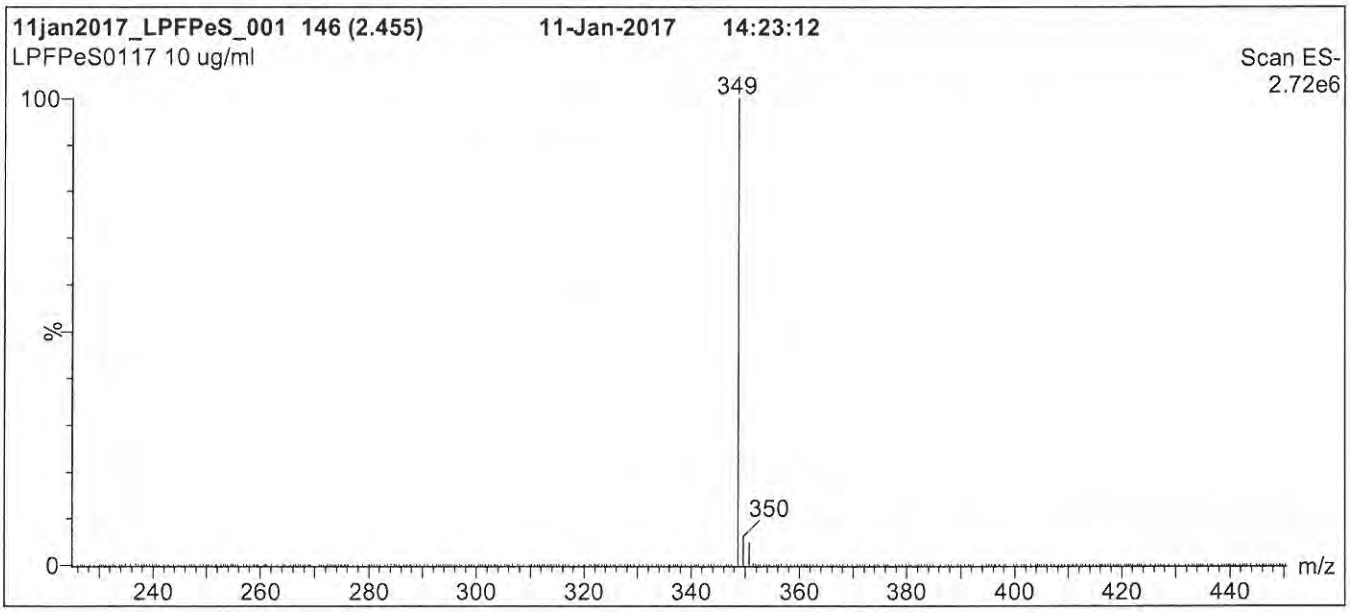
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0721

Figure 1: **L-PFPeS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions over 0.5 min.
Time: 10 min

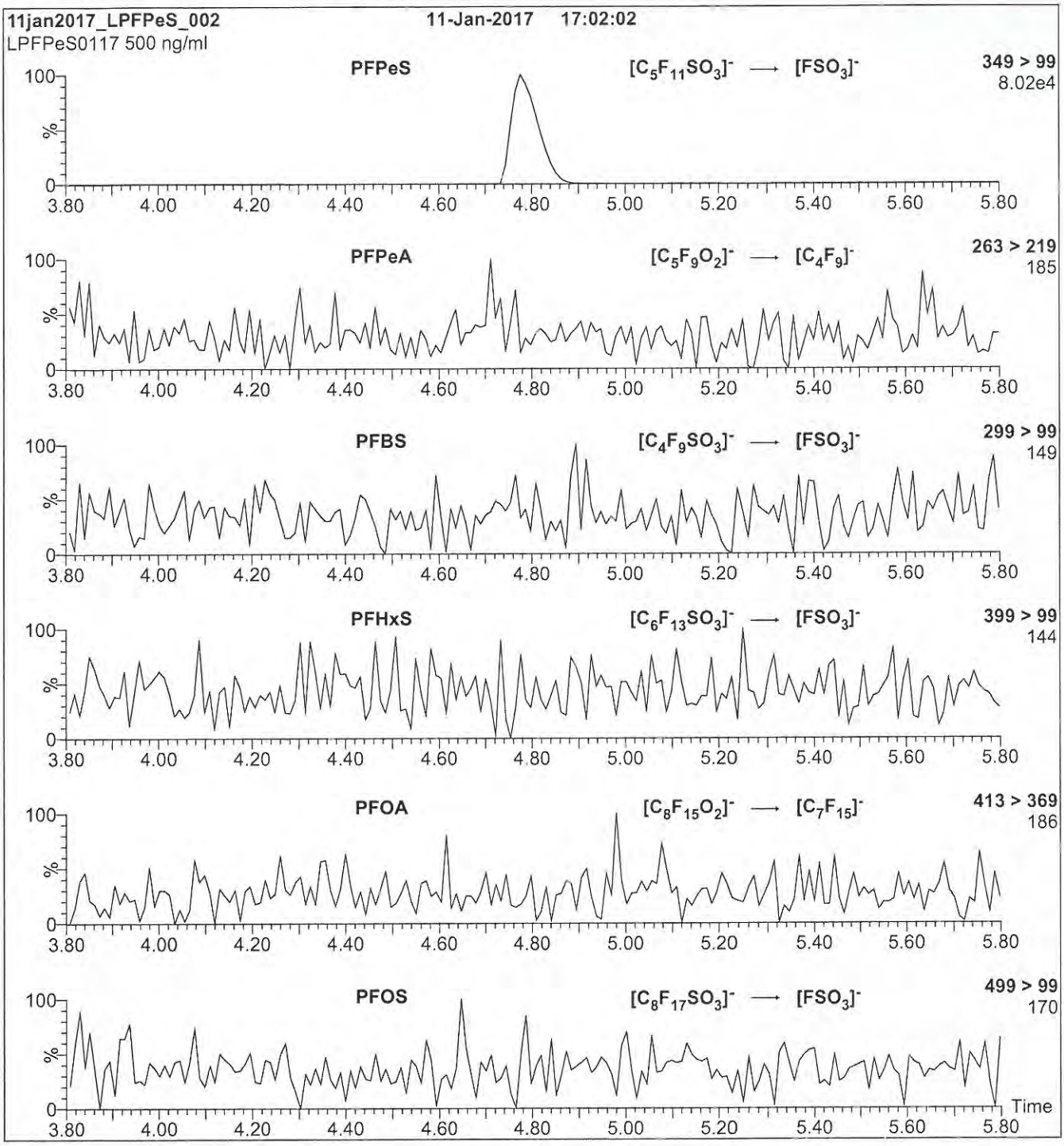
Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

Figure 2: **L-PFPeS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFPeS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 30

18E0722

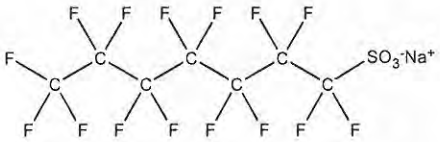
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFHpS
COMPOUND: Sodium perfluoro-1-heptanesulfonate
LOT NUMBER: LPFHpS0817

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$C_7F_{15}SO_3Na$	**MOLECULAR WEIGHT:**	472.10
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.6 ± 2.4 µg/ml (PFHpS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/01/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.2% of L-PFHxS ($C_6F_{13}SO_3Na$) and ~ 0.1% of L-PFOS ($C_8F_{17}SO_3Na$).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/07/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0722

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18E0722

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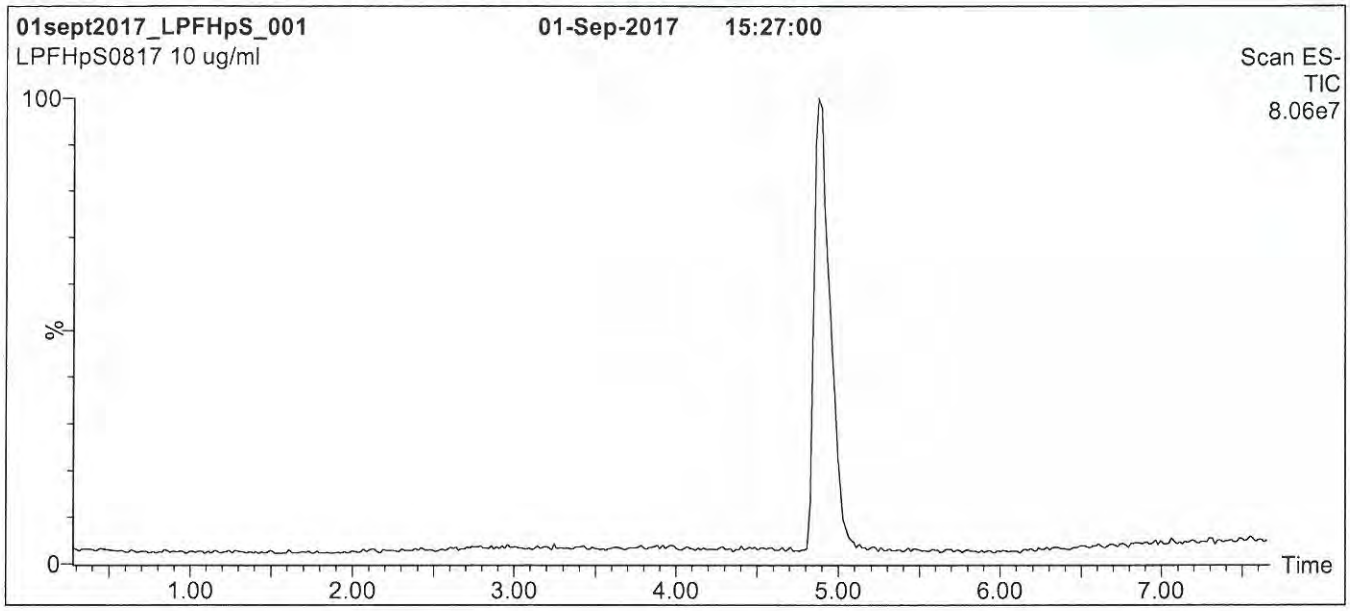

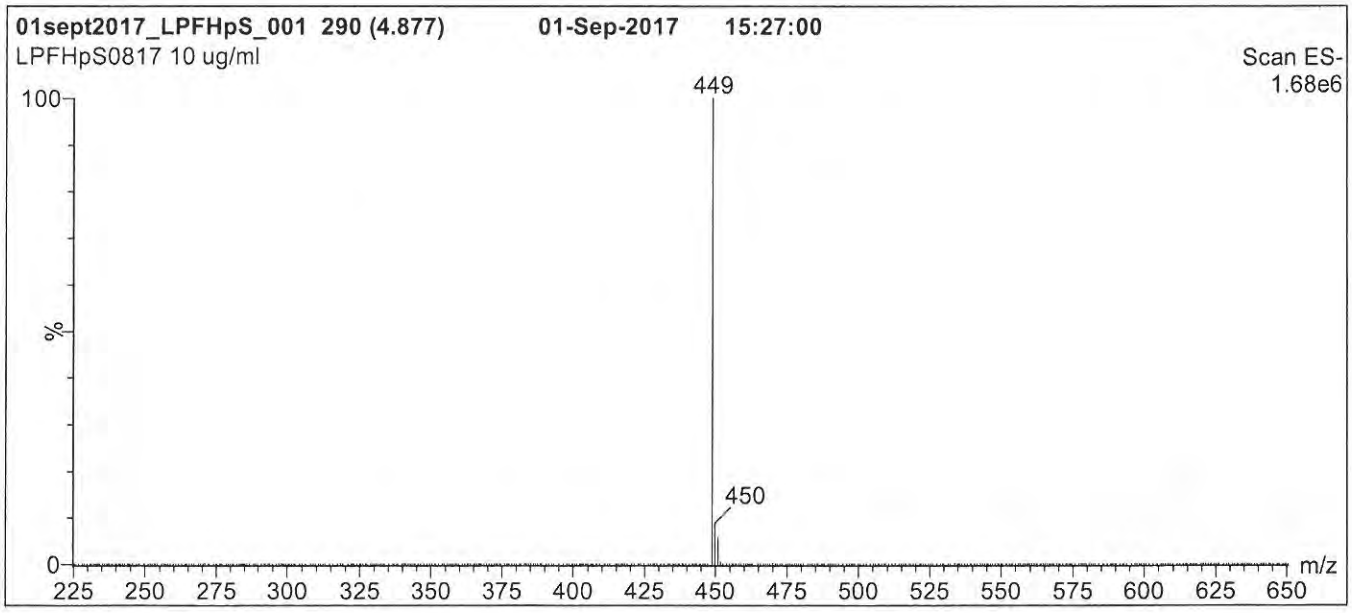

Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold
for 1 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

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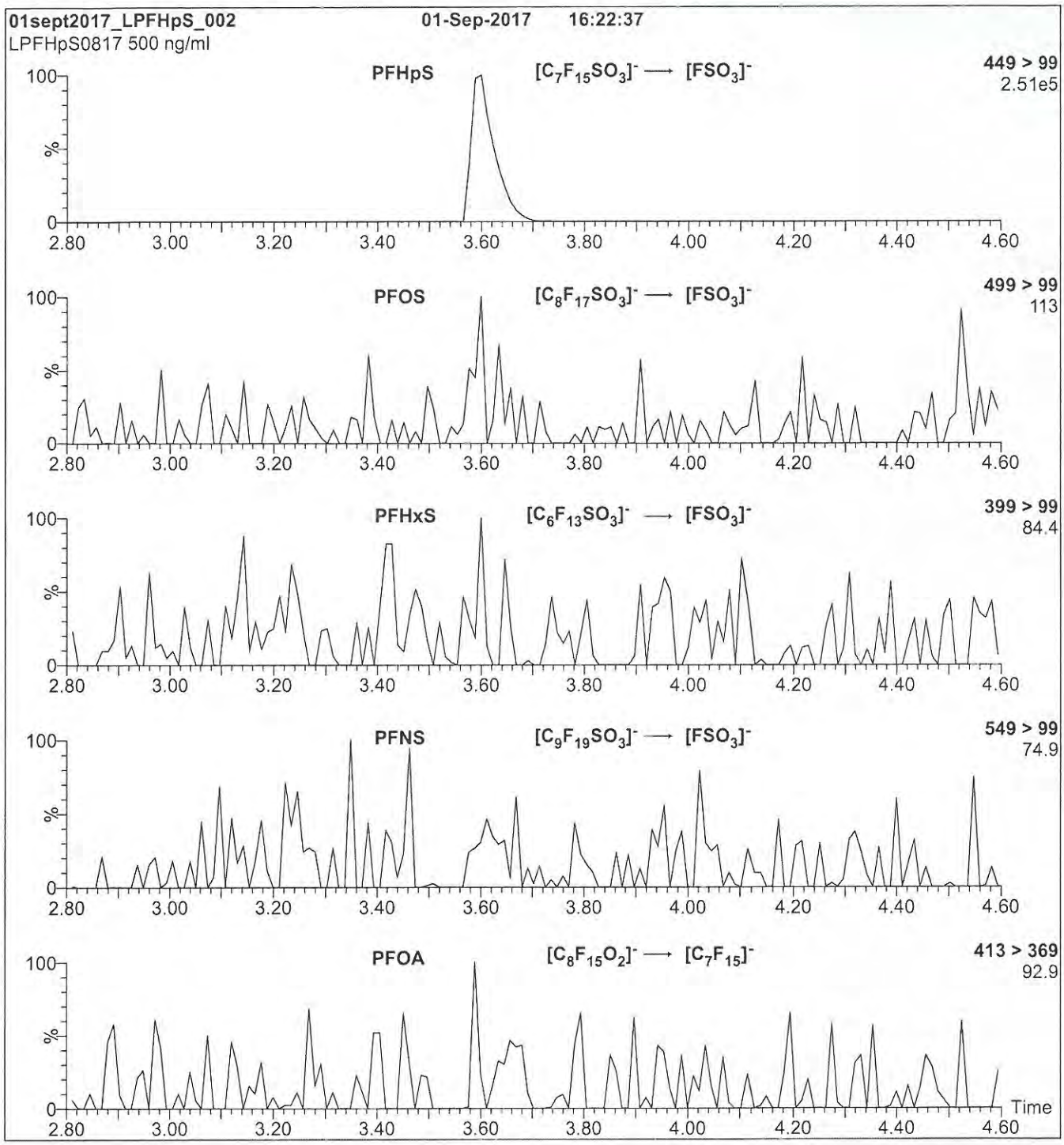
Figure 2: **L-PFHpS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFHpS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

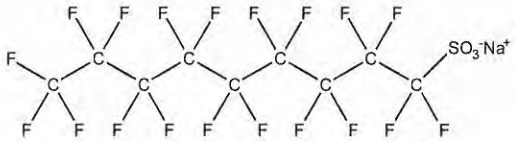
Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 35

18E0723

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE:	L-PFNS	**LOT NUMBER:**	LPFNS0917
COMPOUND:	Sodium perfluoro-1-nonanesulfonate		
STRUCTURE:		**CAS #:**	98789-57-2



MOLECULAR FORMULA:	$C_9F_{19}SO_3Na$	**MOLECULAR WEIGHT:**	572.12
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.0 ± 2.4 µg/ml (PFNS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/27/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/27/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/28/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0723

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CALA

ANAB ACCREDITED

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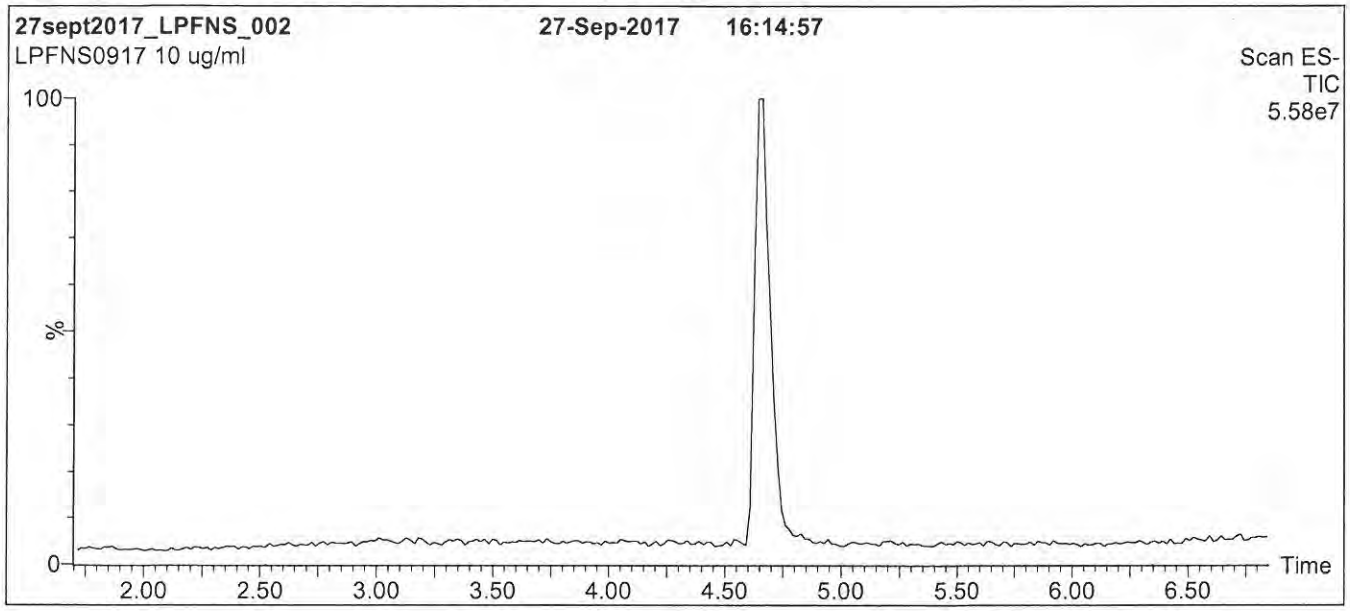
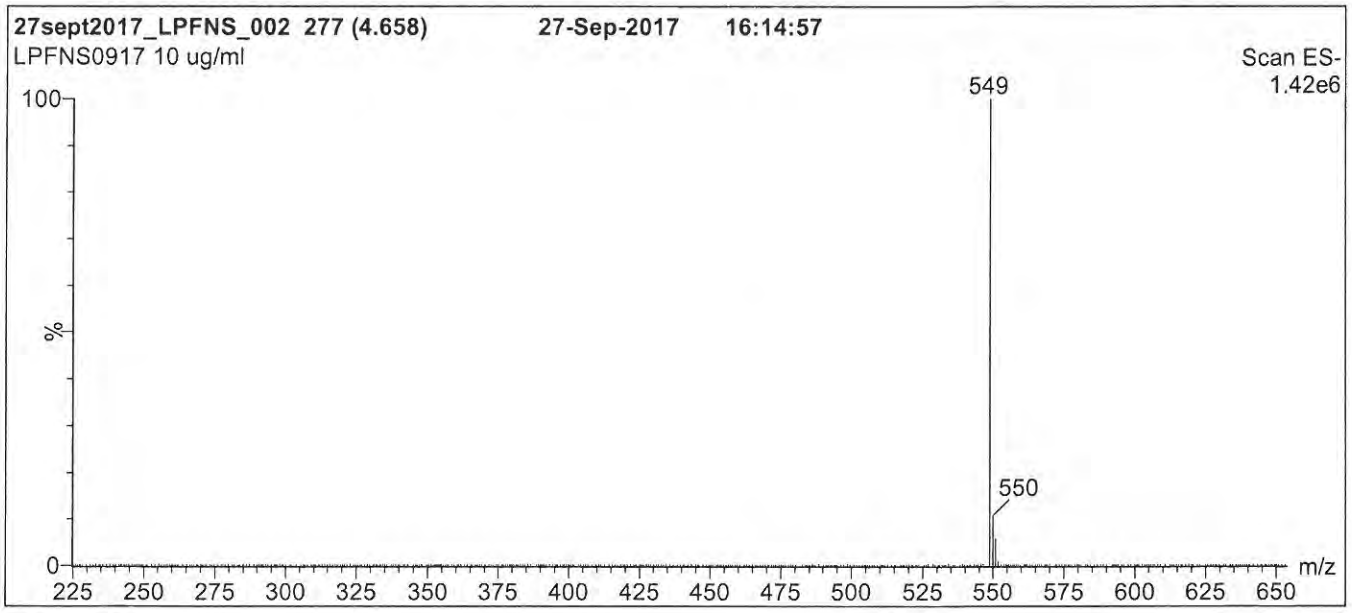
18E0723

Figure 1: **L-PFNS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

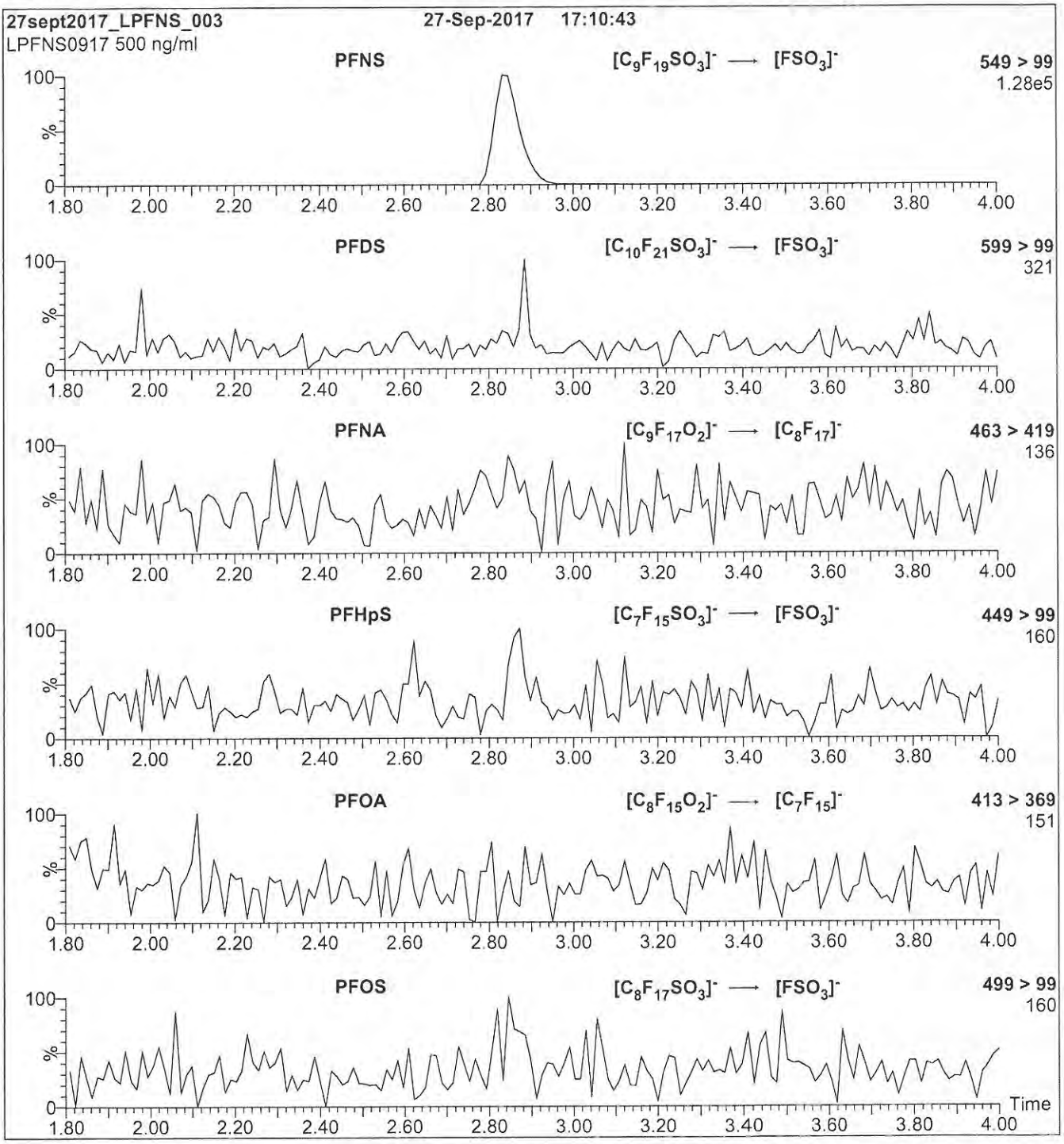
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18E0723

Figure 2: **L-PFNS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFNS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.50e-3
Collision Energy (eV) = 45

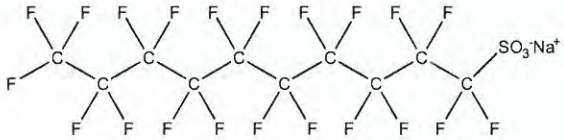
18E0724

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: L-PFDS
LOT NUMBER: LPFDS1117
COMPOUND: Sodium perfluoro-1-decanesulfonate

STRUCTURE:
CAS #: 2806-15-7



MOLECULAR FORMULA:	$C_{10}F_{21}SO_3Na$	**MOLECULAR WEIGHT:**	622.13
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 48.2 ± 2.4 µg/ml (PFDS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	11/08/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/08/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.9% of sodium perfluoro-1-dodecanesulfonate (L-PFDoS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/16/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
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TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

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LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

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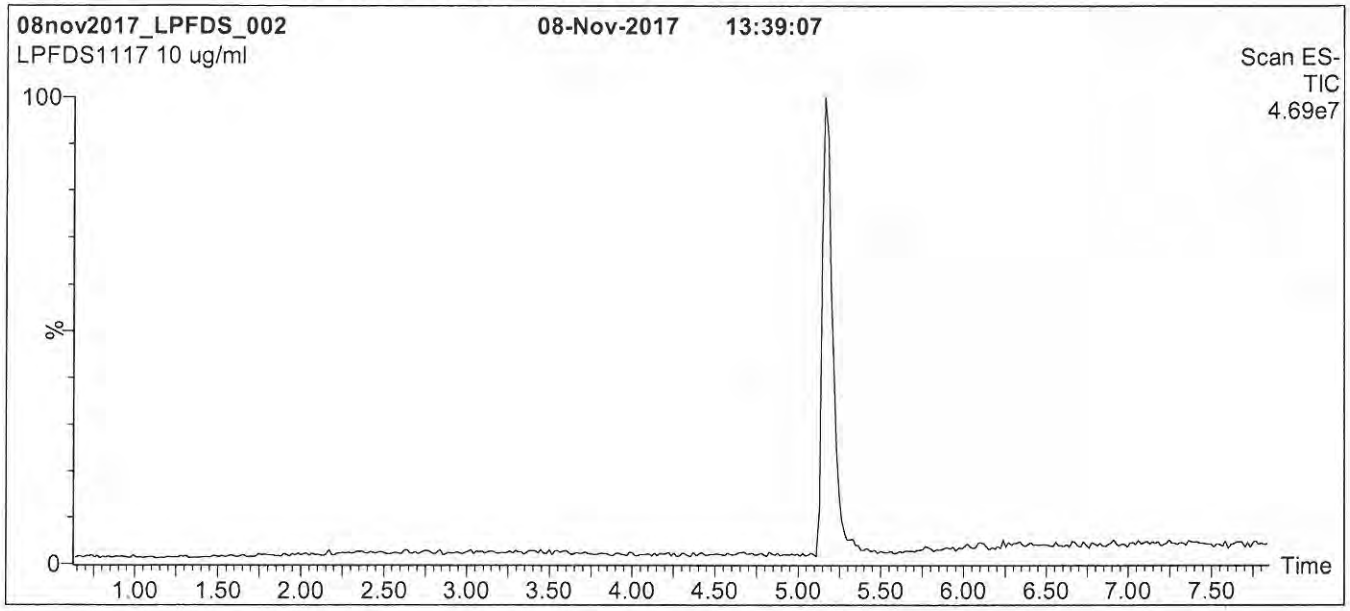
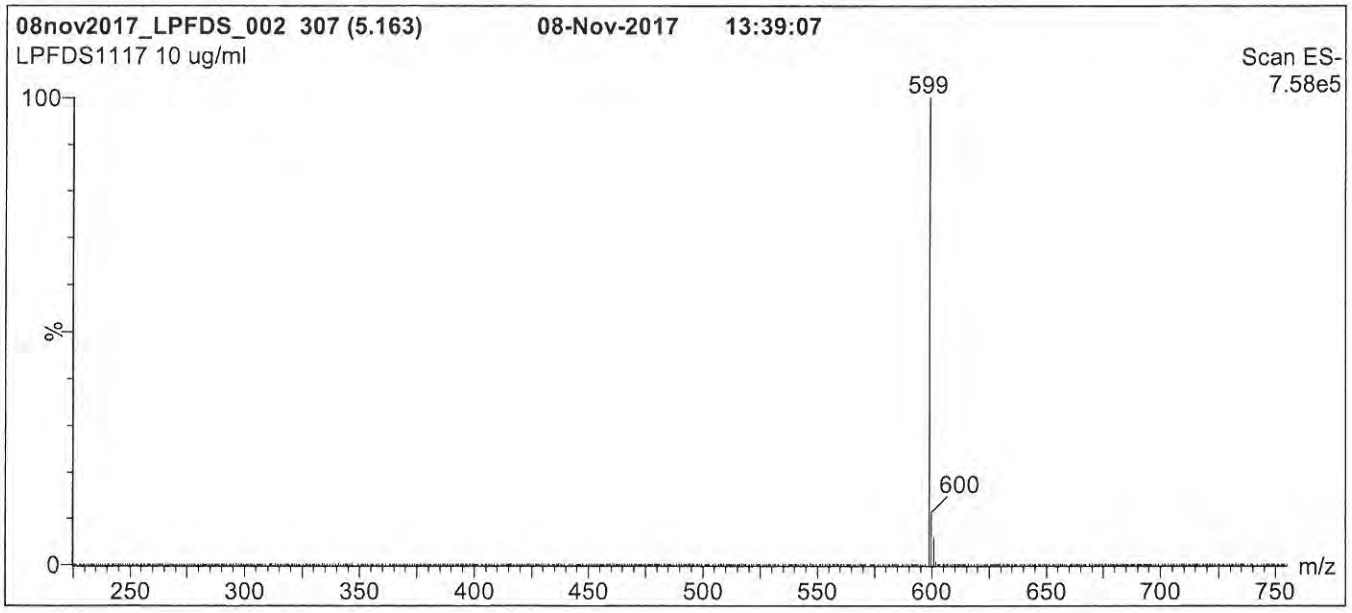
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0724

Figure 1: **L-PFDS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

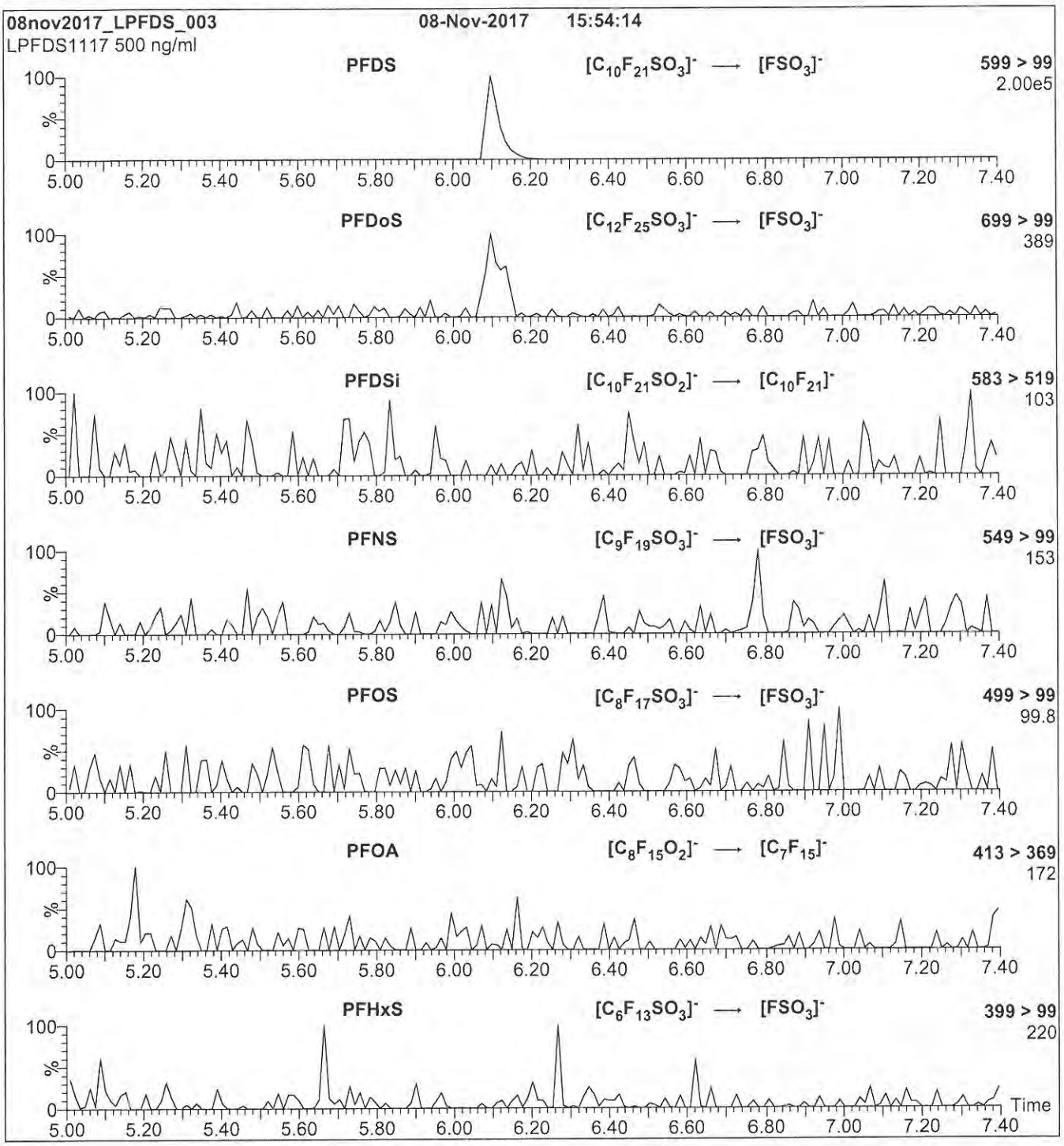
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 70.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18E0724

Figure 2: **L-PFDS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml L-PFDS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.46e-3
Collision Energy (eV) = 50

18E0725

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFHxSK

Potassium Perfluorohexanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFHxSK
LOT NUMBER:	brPFHxSK0117
CONCENTRATION:	50.0 ± 2.5 µg/ml (total potassium salt)
	45.5 ± 2.3 µg/ml (total PFHxS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	01/03/2017
LAST TESTED: (mm/dd/yyyy)	01/04/2017
EXPIRY DATE: (mm/dd/yyyy)	01/04/2022
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorohexanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% of perfluoro-1-pentanesulfonate and ~ 0.2% of perfluoro-1-octanesulfonate.
- CAS#: 3871-99-6 (for linear isomer; potassium salt).

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0725

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

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For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0725

Table A: **br-PFHxSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

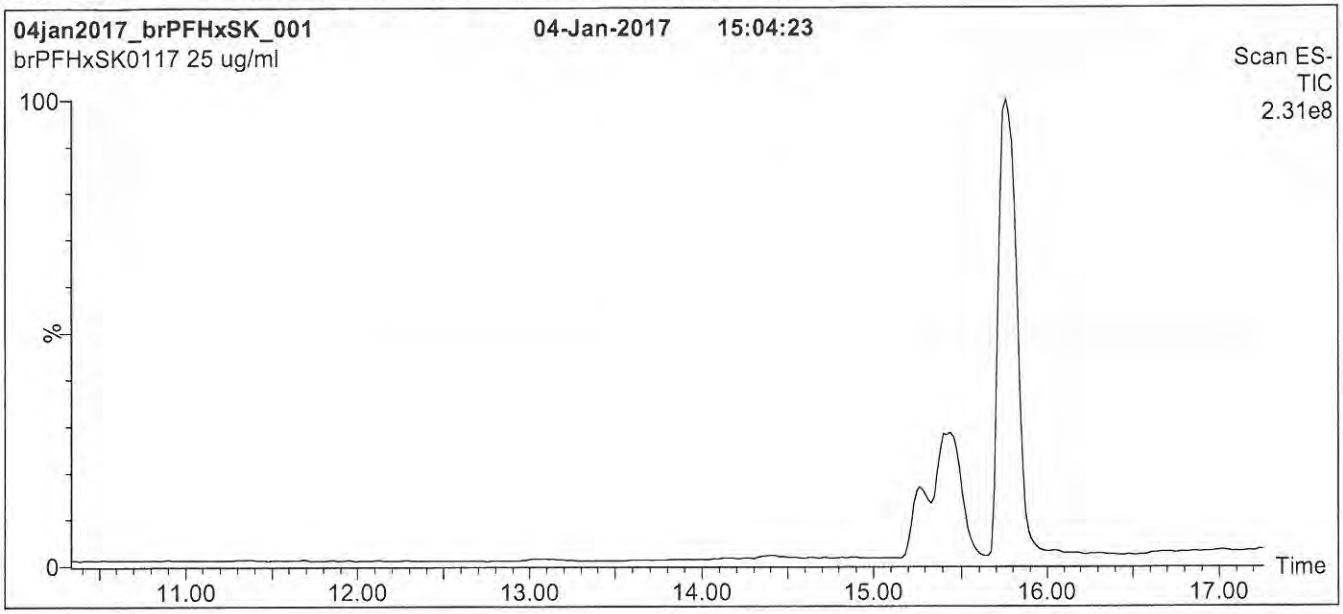
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-hexanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	81.1
2	Potassium 1-trifluoromethylperfluoropentanesulfonate**	$CF_3CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	2.9
3	Potassium 2-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	1.4
4	Potassium 3-trifluoromethylperfluoropentanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	5.0
5	Potassium 4-trifluoromethylperfluoropentanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	8.9
6	Potassium 3,3-di(trifluoromethyl)perfluorobutanesulfonate	$CF_3C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.2
7	Other Unidentified Isomers		0.5

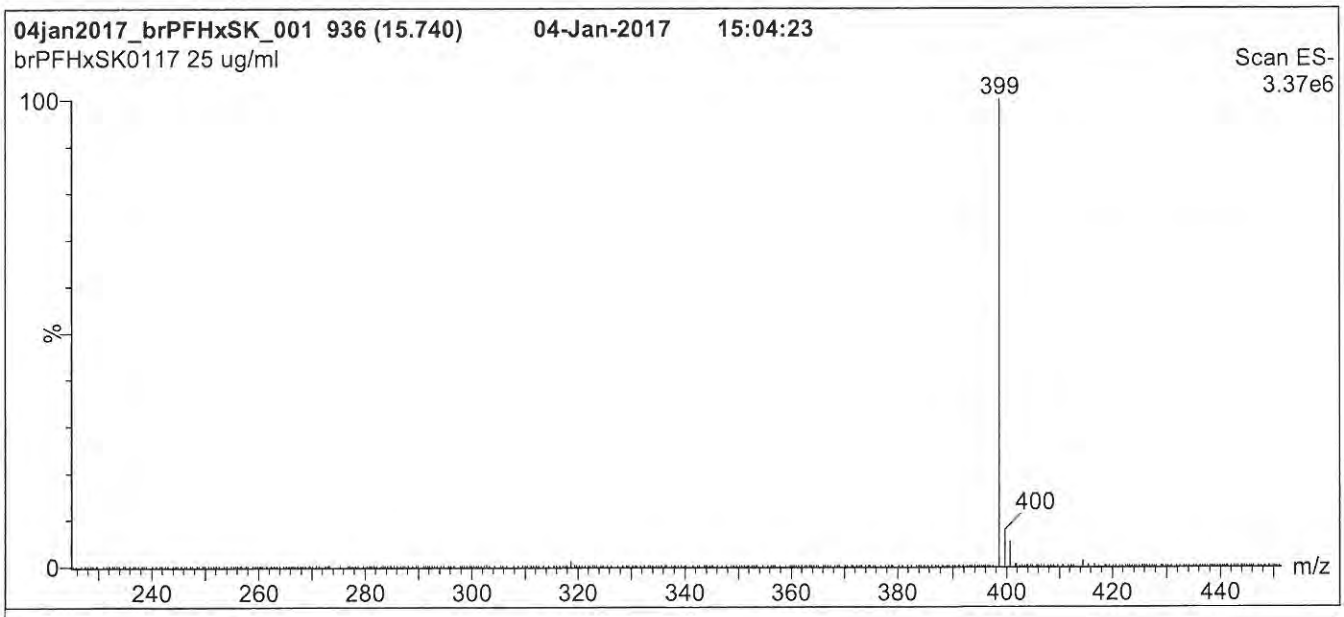
* Percent of total perfluorohexanesulfonate isomers only.
** Systematic Name: Potassium perfluorohexane-2-sulfonate.

Certified By: B.G. Chittim **Date:** 01/20/2017 (mm/dd/yyyy)

18E0725

Figure 1: **br-PFHxSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

Flow: 300 µl/min

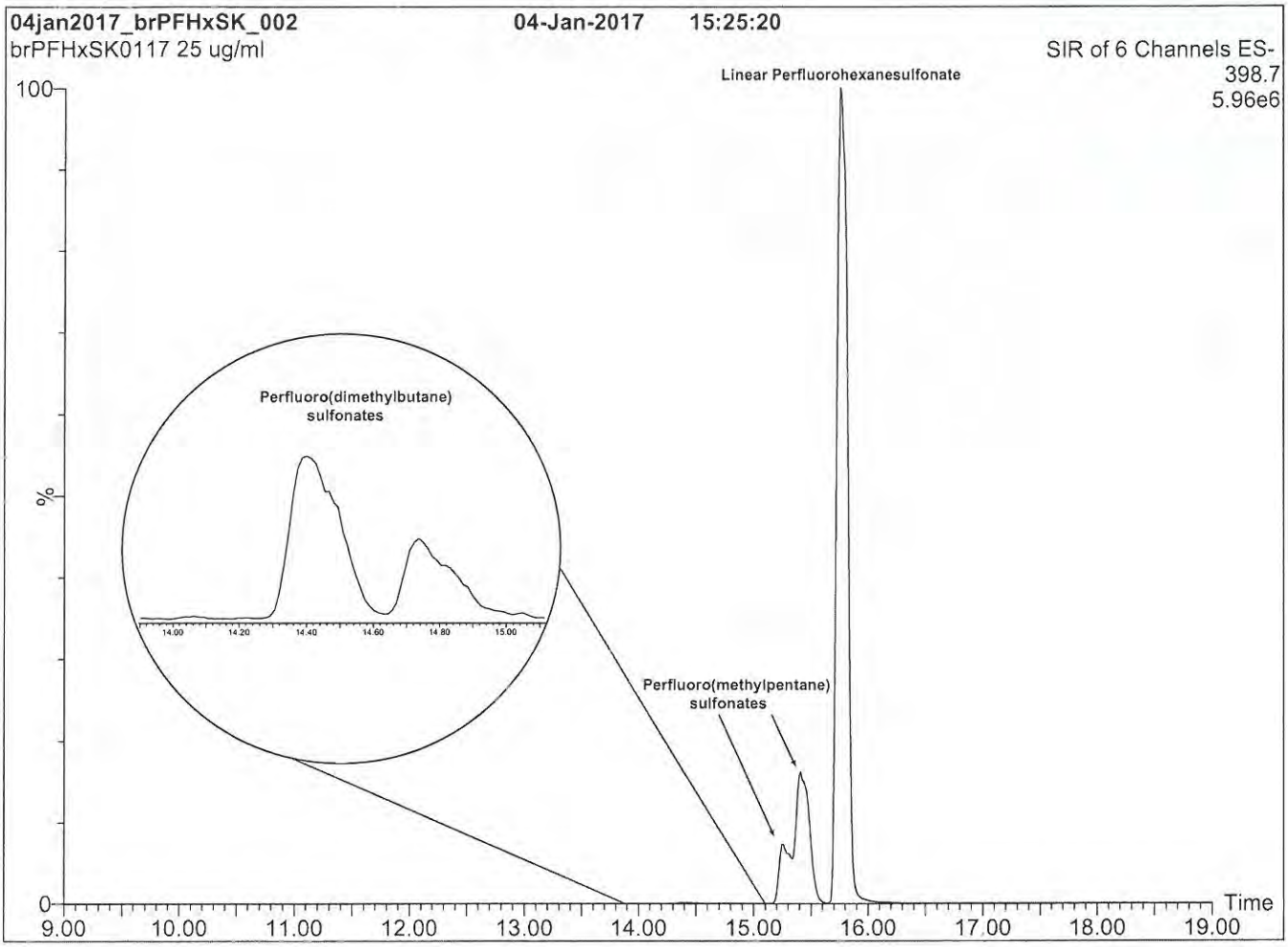
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

18E0725

Figure 2: **br-PFHxSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 20% (80:20 MeOH:ACN) / 80% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 50% organic over 14 min. Ramp to 90% organic over 3 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 20 min

Flow: 300 µl/min

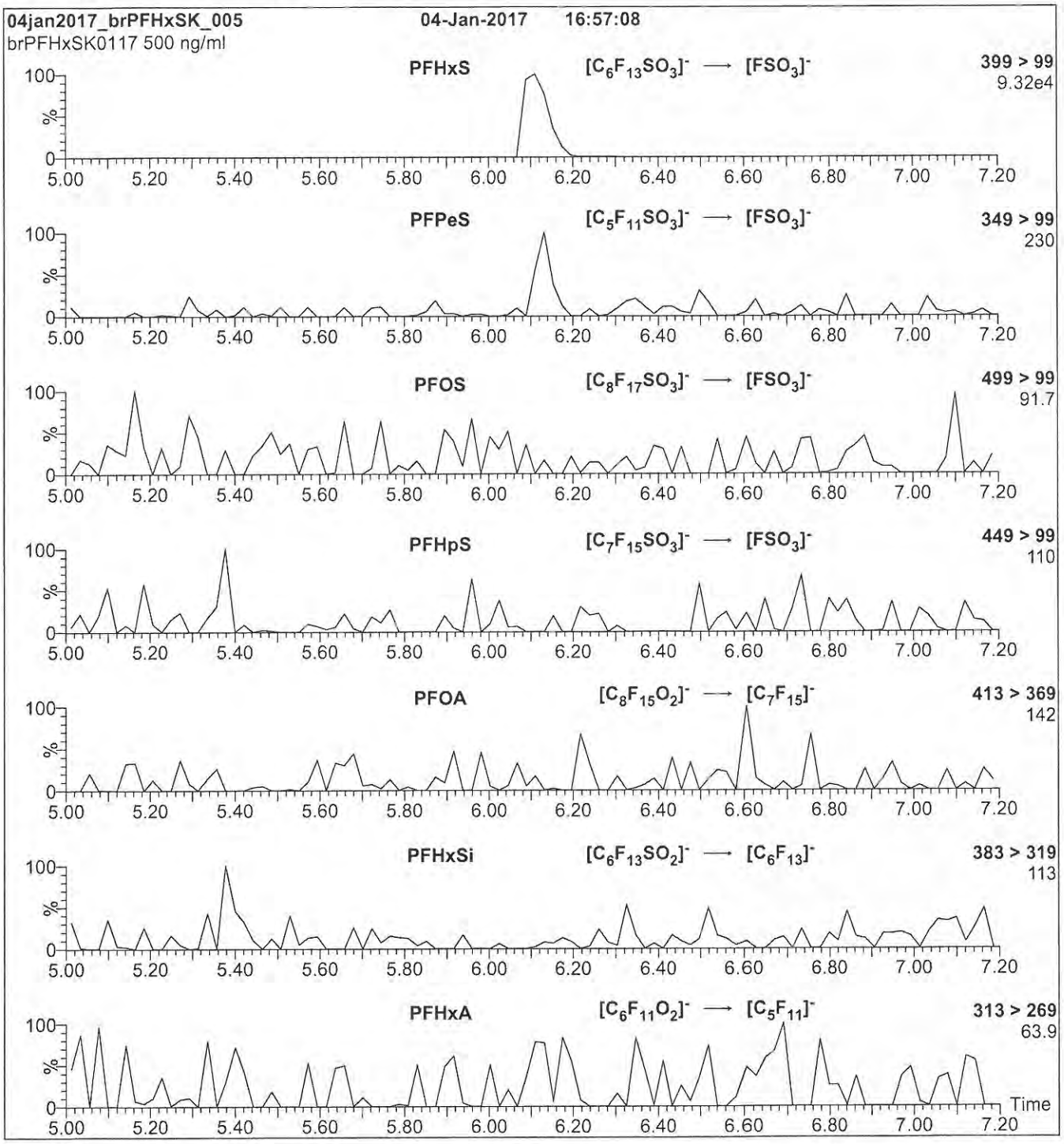
MS Parameters

Experiment: SIR (6 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = variable (15-62)
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

180725

Figure 3: **br-PFHxSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: Direct loop injection
10 µl (500 ng/ml br-PFHxSK)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.35e-3
Collision Energy (eV) = 30

18E0726

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-PFOSK

Potassium Perfluorooctanesulfonate Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-PFOSK
LOT NUMBER:	brPFOSK0117
CONCENTRATION:	50 ± 2.5 µg/ml (total potassium salt)
	46.4 ± 2.3 µg/ml (total PFOS anion)
SOLVENT(S):	Methanol
DATE PREPARED: (mm/dd/yyyy)	01/09/2017
LAST TESTED: (mm/dd/yyyy)	01/12/2017
EXPIRY DATE: (mm/dd/yyyy)	01/12/2022
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

The chemical purity has been determined to be ≥98% perfluorooctanesulfonate linear and branched isomers. The full name, structure and percent composition for each of the isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- A 5-point calibration curve was generated using linear PFOS (potassium salt) and mass-labelled PFOS as an internal standard to enable quantitation of br-PFOSK using isotopic dilution.
- CAS#: 2795-39-3 (for linear isomer; potassium salt).

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INTENDED USE:

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HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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QUALITY MANAGEMENT:

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CALA

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

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18E0726

Table A: **br-PFOSK; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

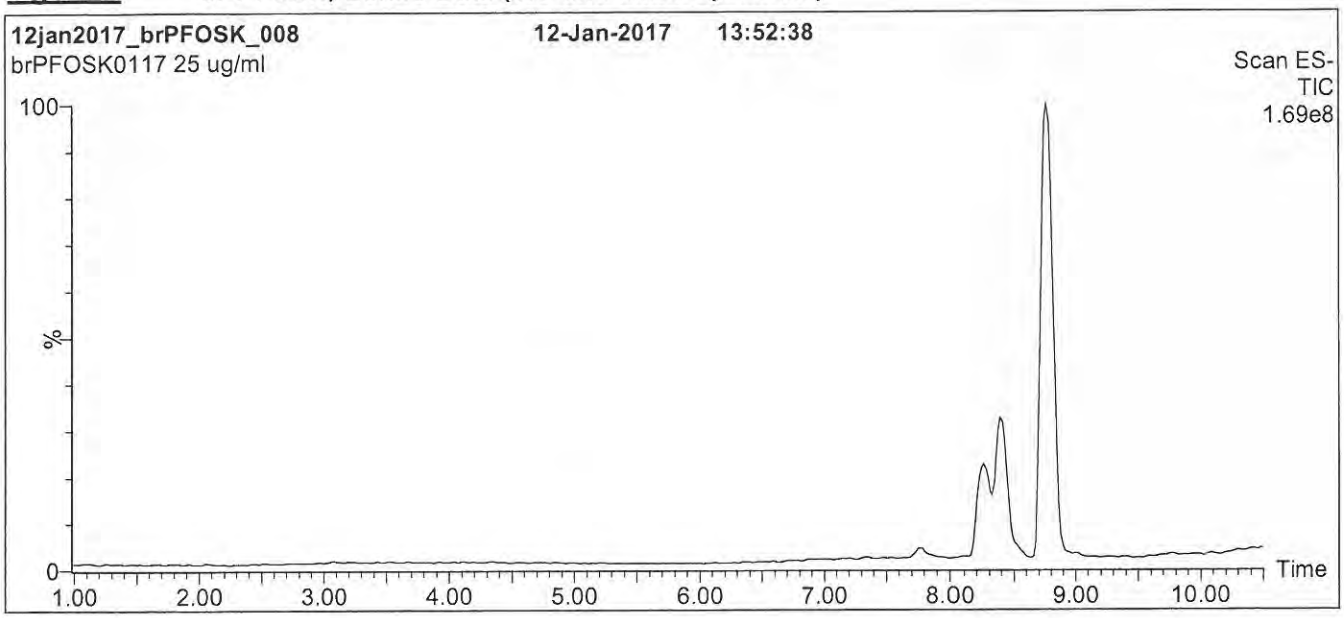
Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	Potassium perfluoro-1-octanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	78.8
2	Potassium 1-trifluoromethylperfluoroheptanesulfonate**	$CF_3CF_2CF_2CF_2CF_2CF_2CF(CF_3)SO_3^-K^+$	1.2
3	Potassium 2-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF_2CF(CF_3)CF_2SO_3^-K^+$	0.6
4	Potassium 3-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF_2CF(CF_3)CF_2CF_2SO_3^-K^+$	1.9
5	Potassium 4-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF_2CF(CF_3)CF_2CF_2CF_2SO_3^-K^+$	2.2
6	Potassium 5-trifluoromethylperfluoroheptanesulfonate	$CF_3CF_2CF(CF_3)CF_2CF_2CF_2CF_2SO_3^-K^+$	4.5
7	Potassium 6-trifluoromethylperfluoroheptanesulfonate	$CF_3CF(CF_3)CF_2CF_2CF_2CF_2CF_2SO_3^-K^+$	10.0
8	Potassium 5,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3C(CF_3)_2CF_2CF_2CF_2SO_3^-K^+$	0.2
9	Potassium 4,4-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF_2C(CF_3)_2CF_2CF_2SO_3^-K^+$	0.03
10	Potassium 4,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF(CF_3)CF_2CF_2SO_3^-K^+$	0.4
11	Potassium 3,5-di(trifluoromethyl)perfluorohexanesulfonate	$CF_3CF(CF_3)CF_2CF(CF_3)CF_2SO_3^-K^+$	0.07

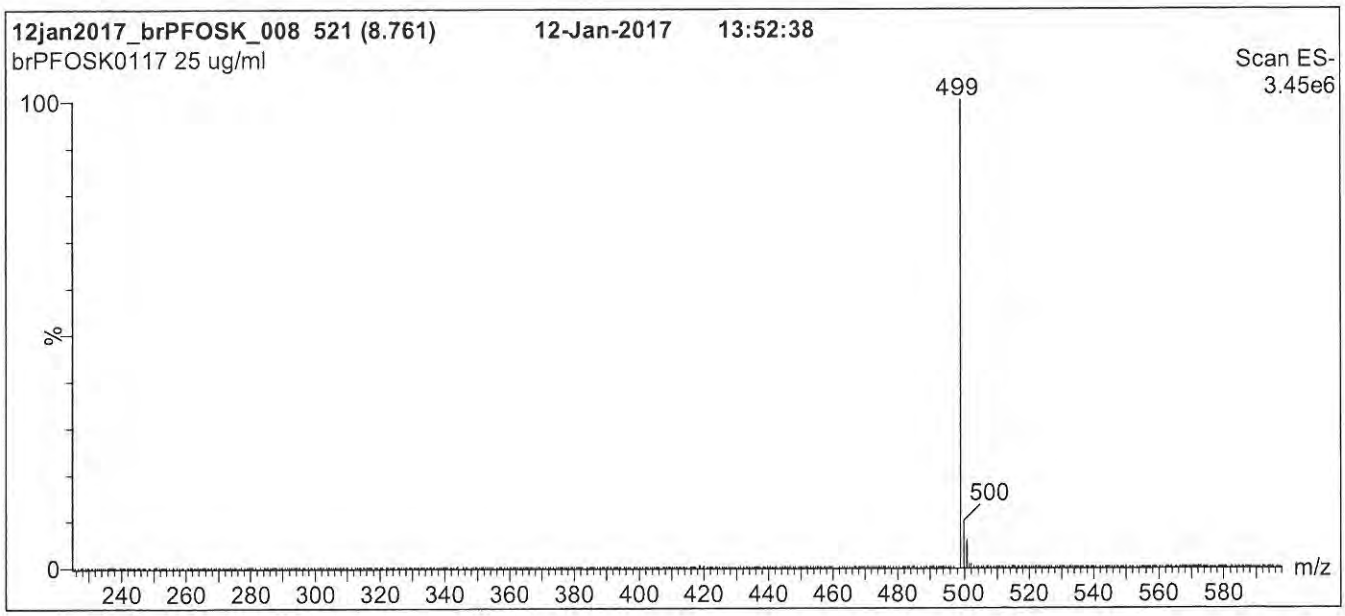
* Percent of total perfluorooctanesulfonate isomers only. Isomers are labelled in Figure 2.
** Systematic Name: Potassium perfluorooctane-2-sulfonate.

Certified By: B.G. Chittim **Date:** 01/20/2017 (mm/dd/yyyy)

18E0726

Figure 1: **br-PFOSK; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 45% (80:20 MeOH:ACN) / 55% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 12 min and hold for 2 min.
Return to initial conditions over 0.5 min.
Time: 16 min

Flow: 300 µl/min

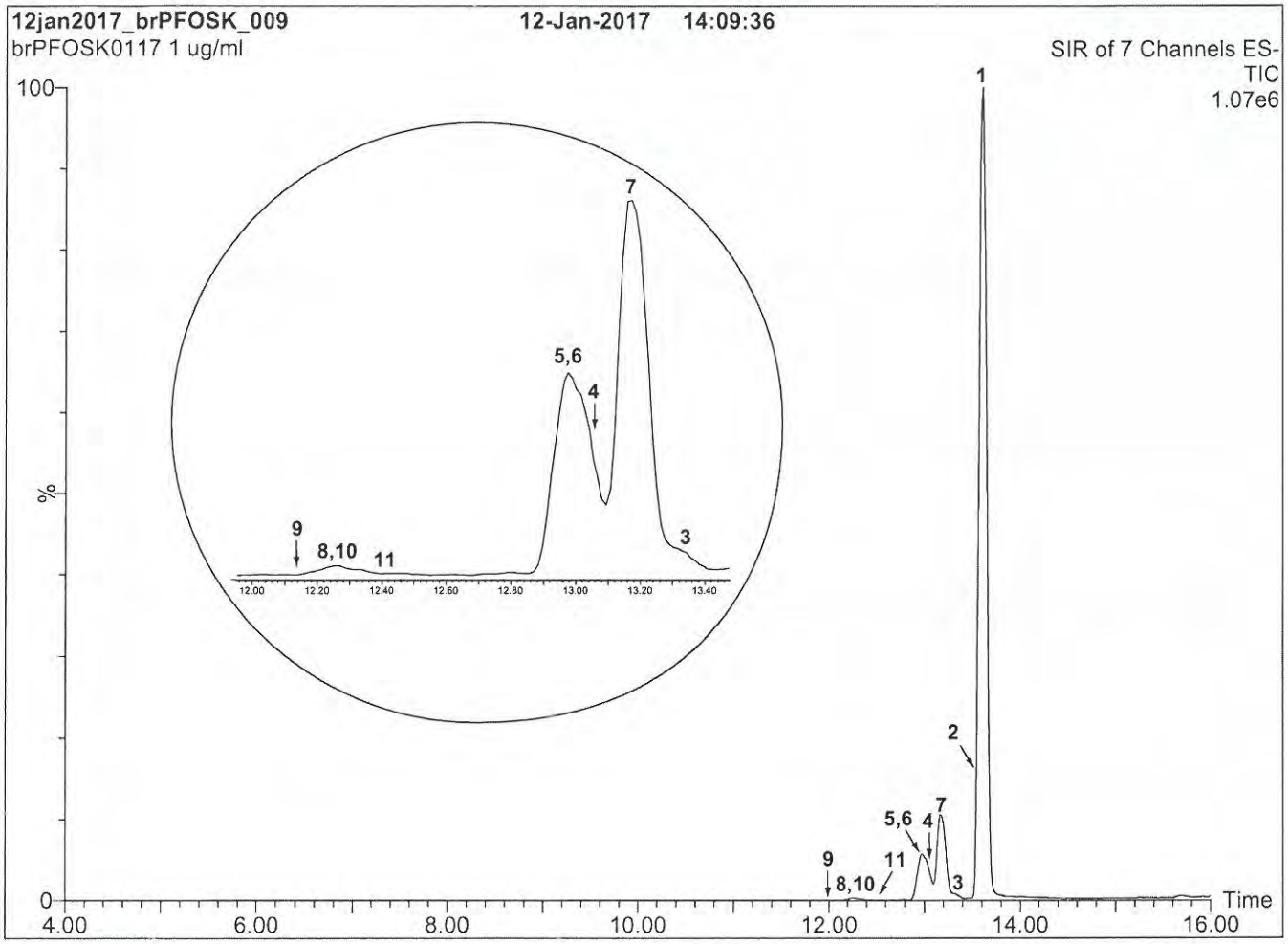
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18E0726

Figure 2: **br-PFOSK; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions:

Column: Acquity UPLC BEH Shield RP_{18} (1.7 µm, 2.1 x 100 mm)

Injection: 1.0 µg/ml of br-PFOSK

Mobile Phase: Gradient
45% (80:20 MeOH:ACN) / 55% H_2O (both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 15 min and hold for 3 min.
Return to initial conditions over 1 min.
Time: 20 min

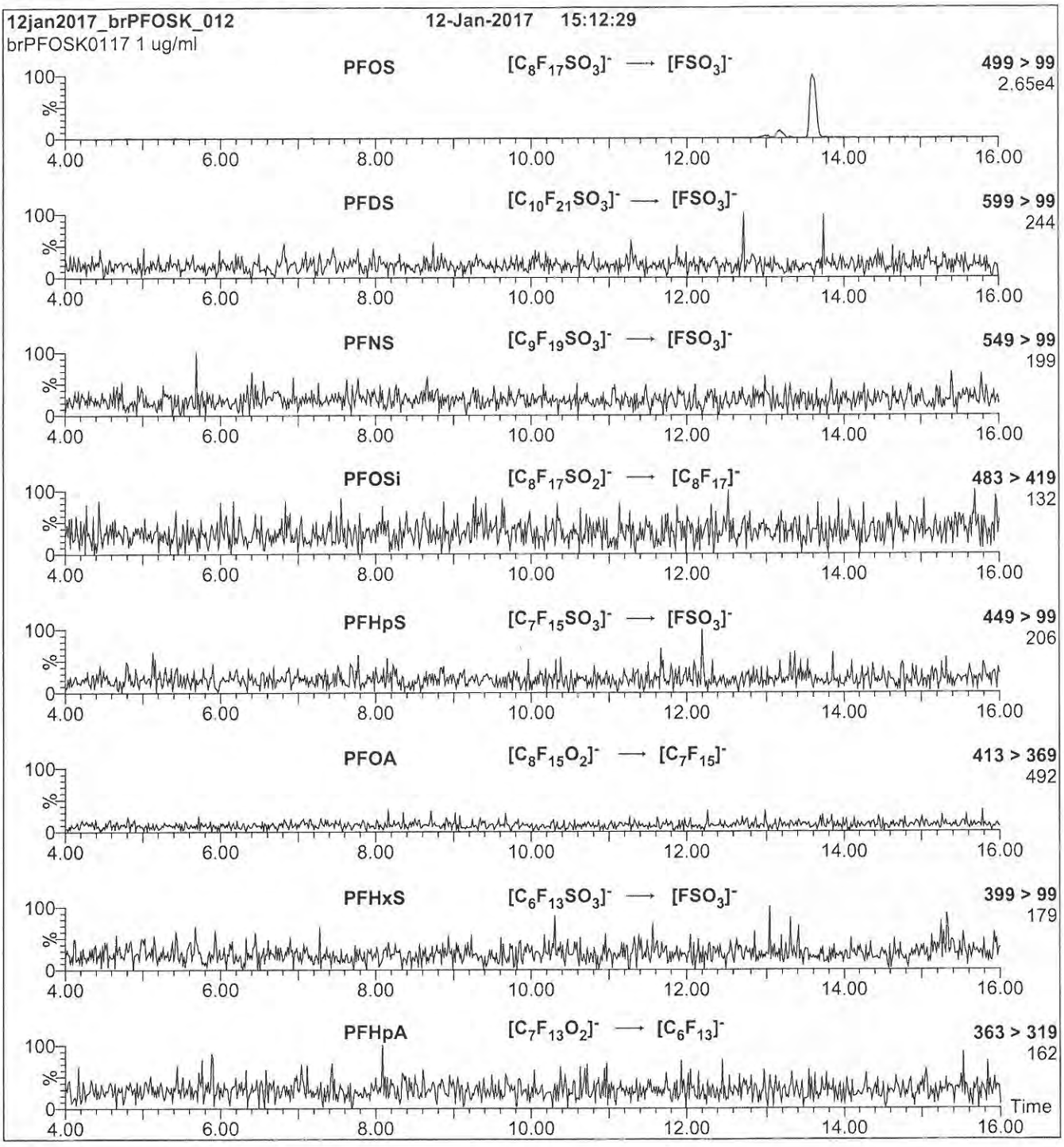
Flow: 300 µl/min

MS Conditions:

SIR (ES^-)
Source = 110 °C
Desolvation = 325 °C
Cone Voltage = 60V

1803726

Figure 3: **br-PFOSK; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 11-50 (variable)

18E0727

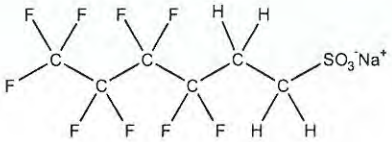
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: 4:2FTS **LOT NUMBER:** 42FTS1216

COMPOUND: Sodium 1H,1H,2H,2H-perfluorohexane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_6H_4F_9SO_3Na$		**MOLECULAR WEIGHT:**	350.13
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	46.7 ± 2.3 µg/ml	(4:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	12/12/2016			
EXPIRY DATE: (mm/dd/yyyy)	12/12/2021			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: B.G. Chittim **Date:** 12/21/2016 (mm/dd/yyyy)

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0727

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using NIST and/or NRC traceable external weights. All volumetric glassware used is of Class A tolerance and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

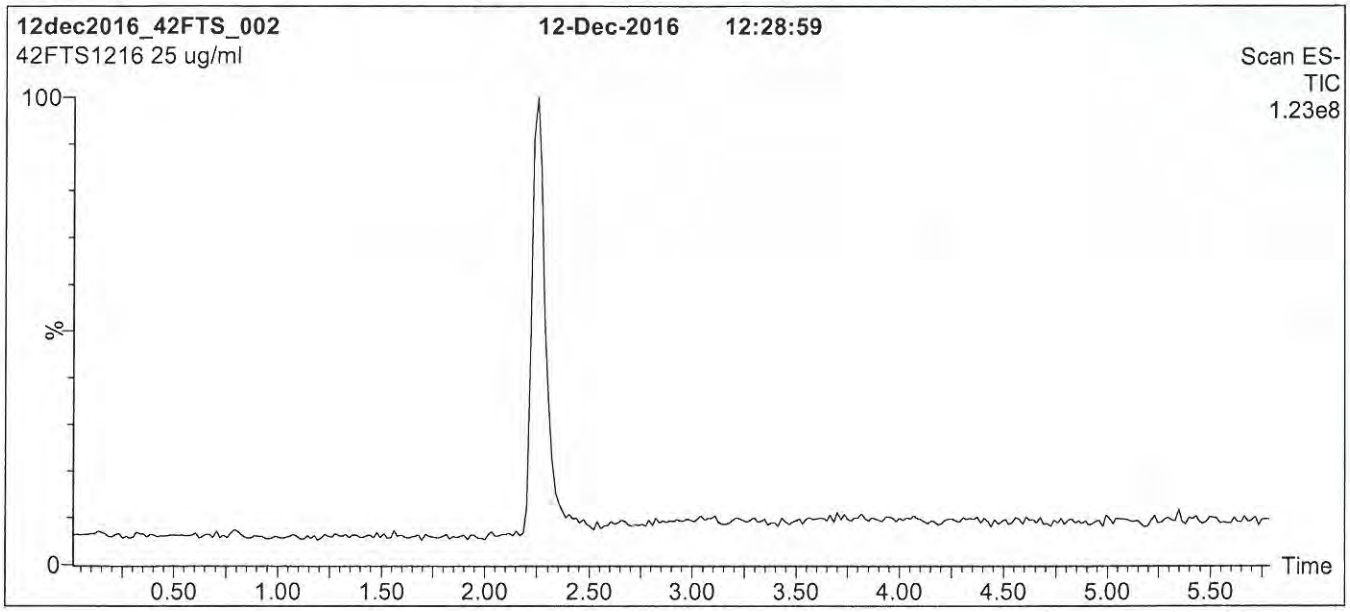
CALA

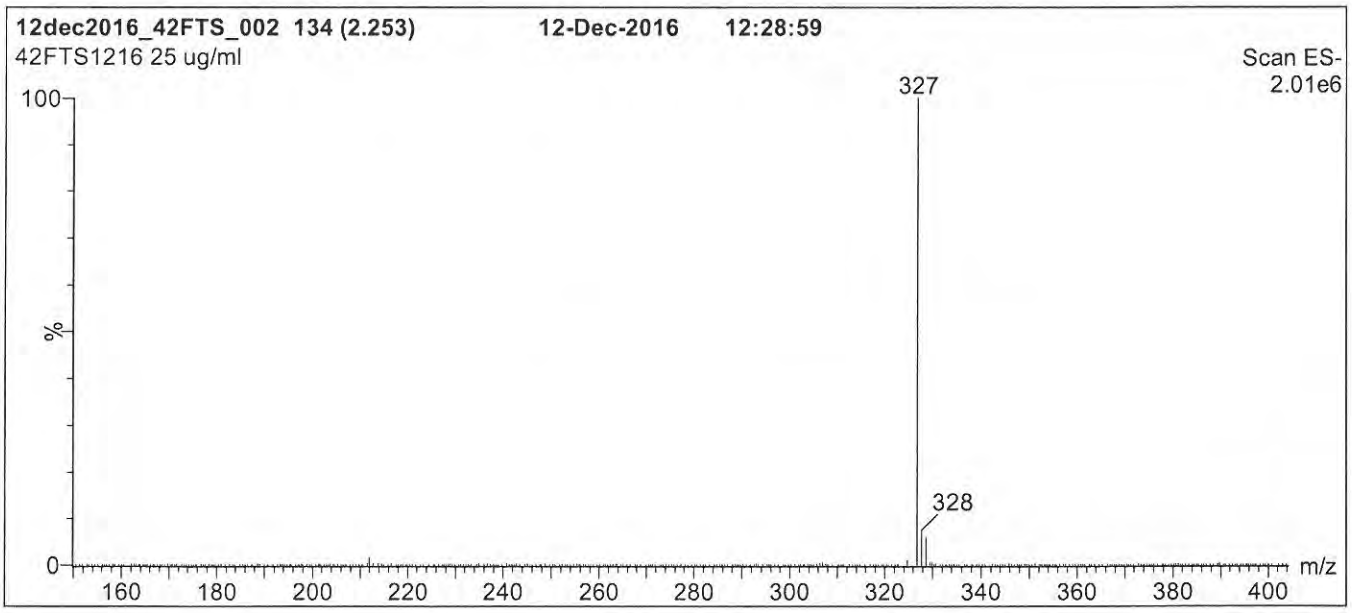
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0727

Figure 1: **4:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

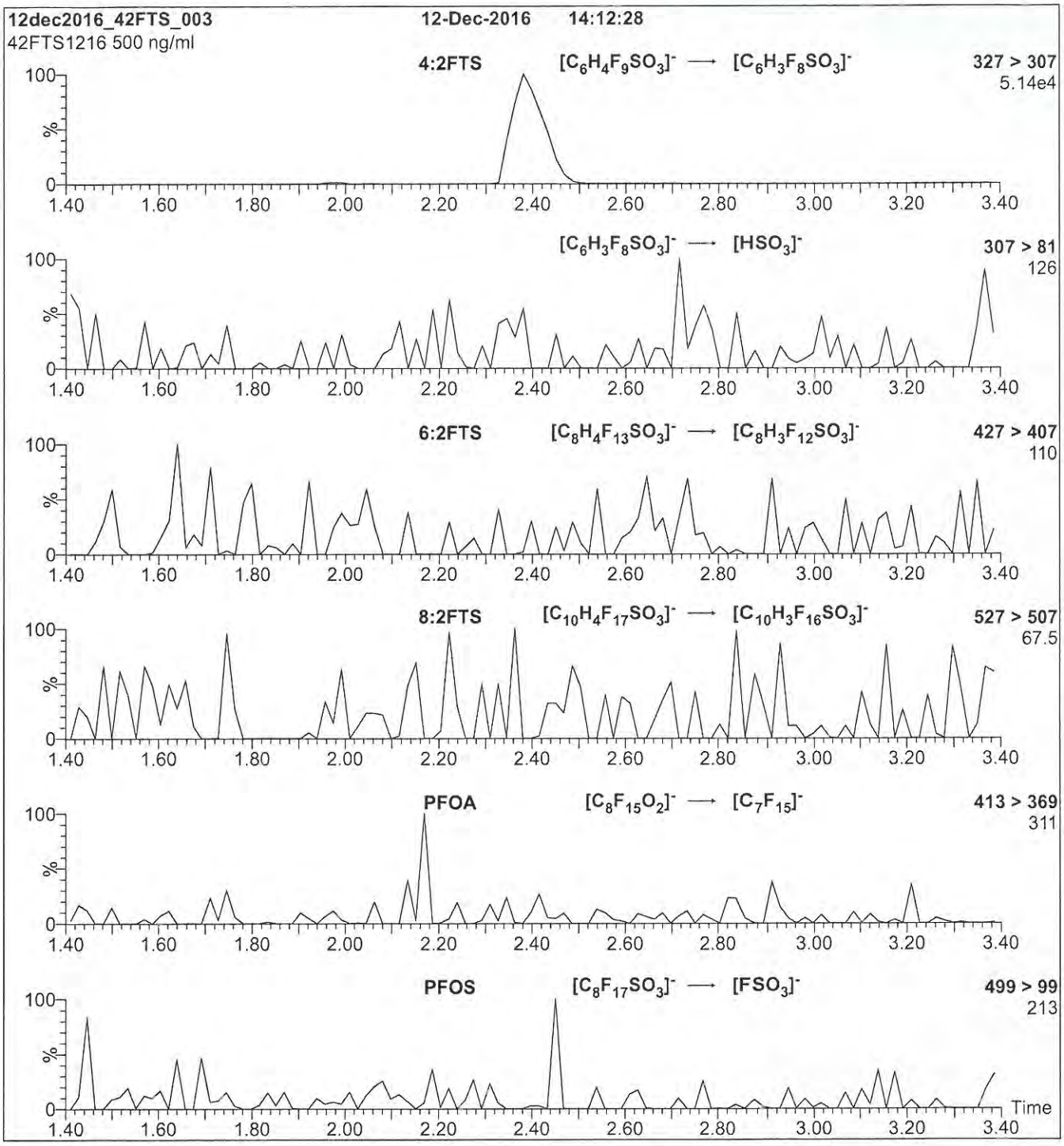
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 25.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

180727

Figure 2: **4:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 4:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 25

18E0728

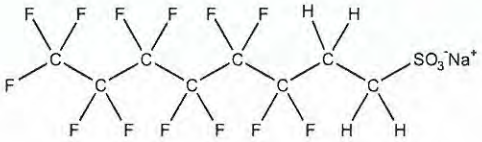
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 6:2FTS **LOT NUMBER:** 62FTS0418

COMPOUND: Sodium 1H,1H,2H,2H-perfluorooctane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_8H_4F_{13}SO_3Na$		**MOLECULAR WEIGHT:**	450.15
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	47.4 ± 2.4 µg/ml	(6:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	04/03/2018			
EXPIRY DATE: (mm/dd/yyyy)	04/03/2023			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.3% of sodium 1H,1H,2H,2H-perfluorodecane sulfonate (8:2FTS).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 04/09/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

1 8E0728

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

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ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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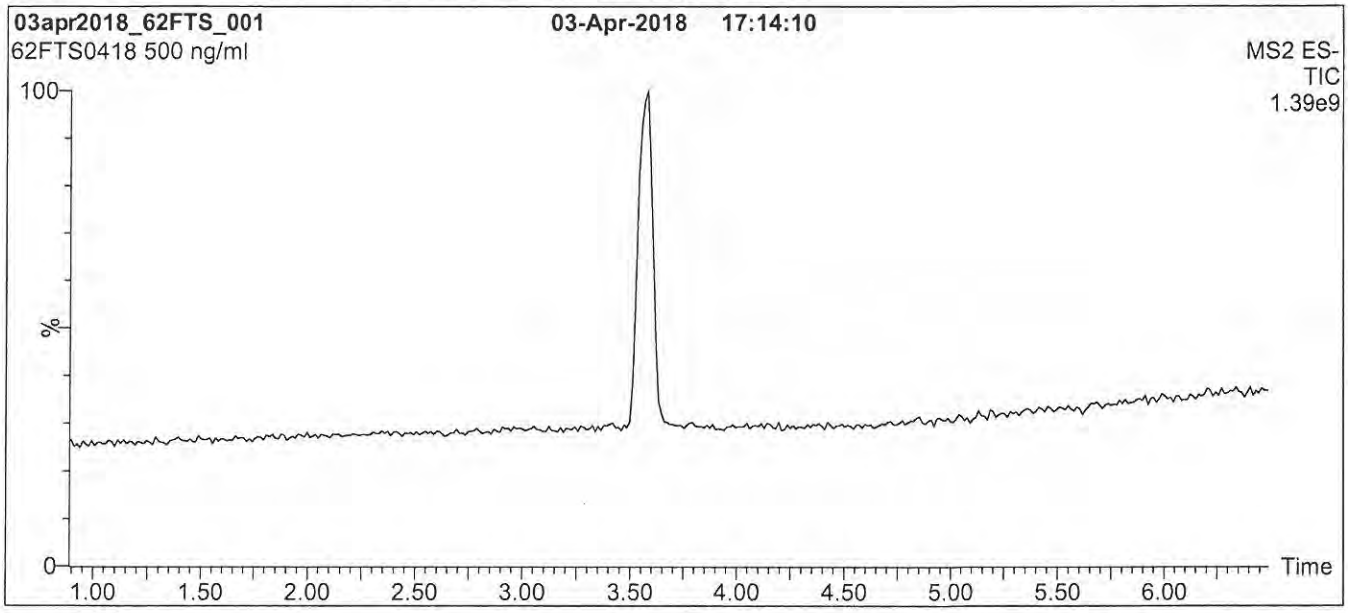
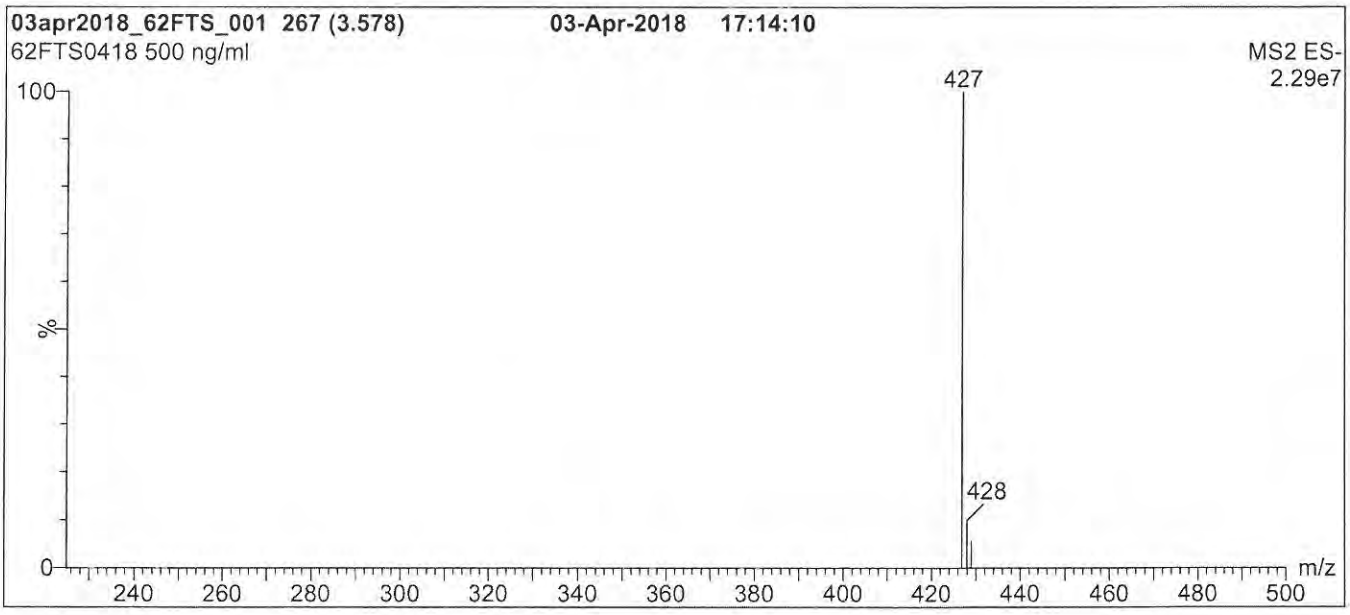
18E0728

Figure 1: 6:2FTS; LC/MS Data (TIC and Mass Spectrum)





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 80% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

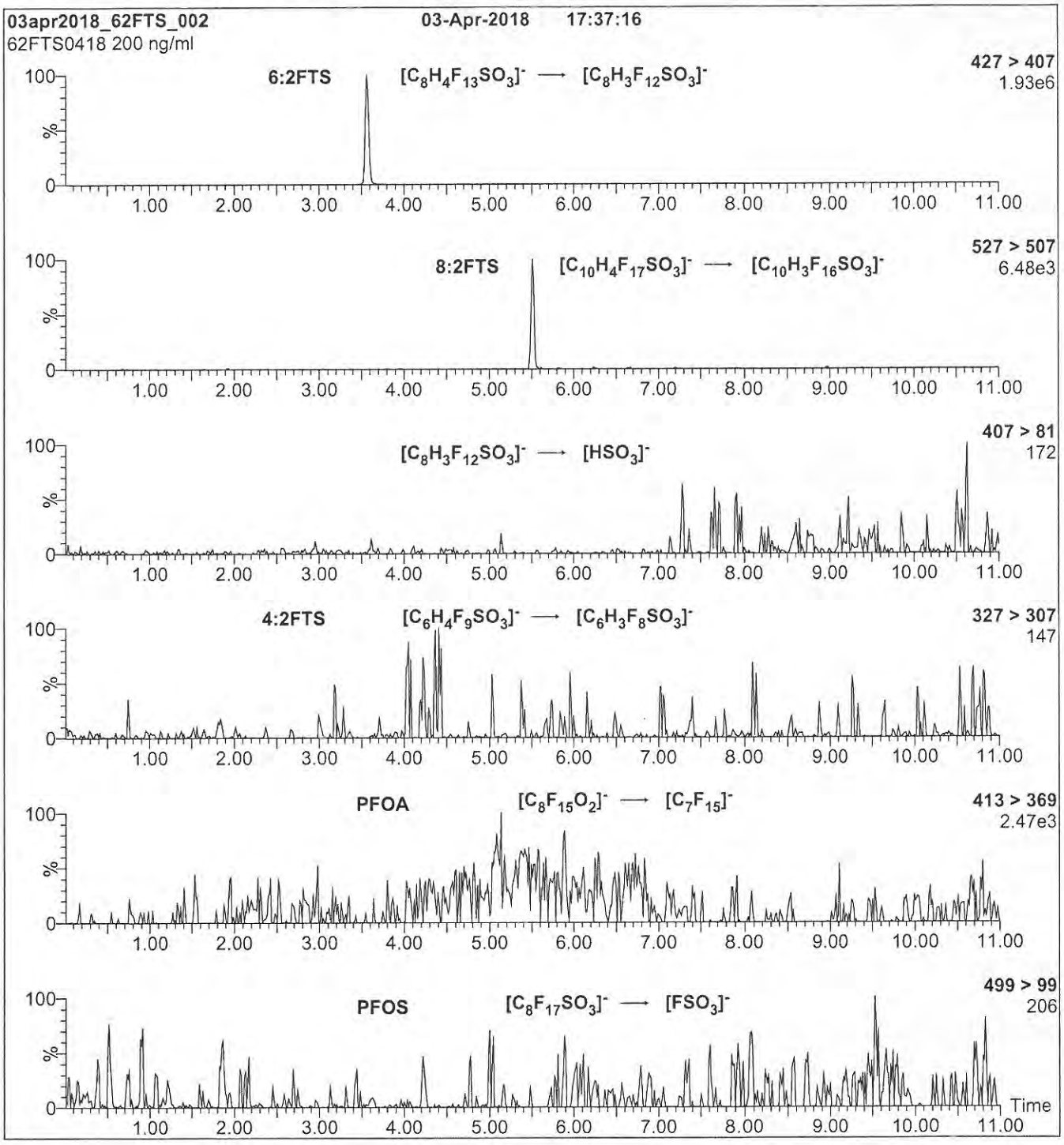
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 0.50
Cone Voltage (V) = 25.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

18E0728

Figure 2: **6:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (6:2FTS)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 20

18E0729

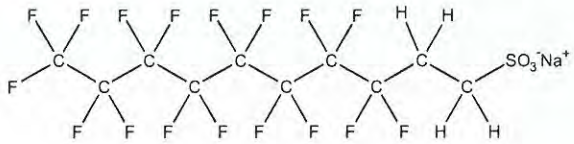
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: 8:2FTS **LOT NUMBER:** 82FTS0118

COMPOUND: Sodium 1H,1H,2H,2H-perfluorodecane sulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$C_{10}H_4F_{17}SO_3Na$		**MOLECULAR WEIGHT:**	550.16
CONCENTRATION:	50.0 ± 2.5 µg/ml	(Na salt)	**SOLVENT(S):**	Methanol
	47.9 ± 2.4 µg/ml	(8:2FTS anion)		
CHEMICAL PURITY:	>98%			
LAST TESTED: (mm/dd/yyyy)	01/24/2018			
EXPIRY DATE: (mm/dd/yyyy)	01/24/2023			
RECOMMENDED STORAGE:	Refrigerate ampoule			

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 01/31/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0729

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CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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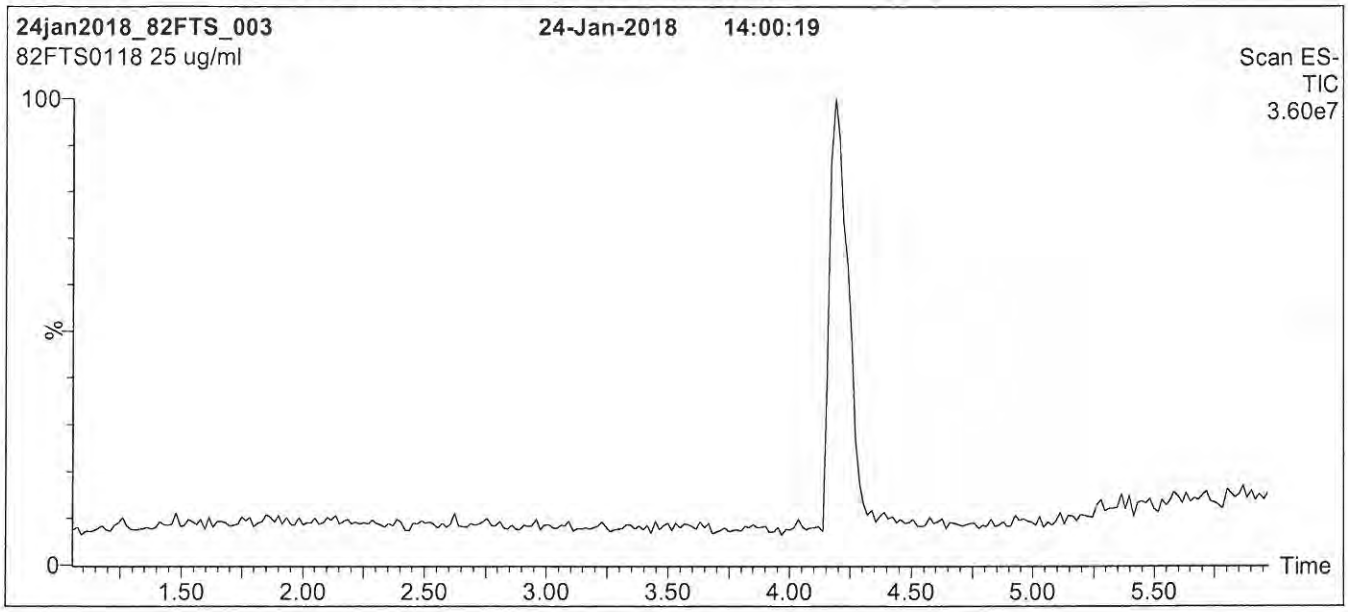
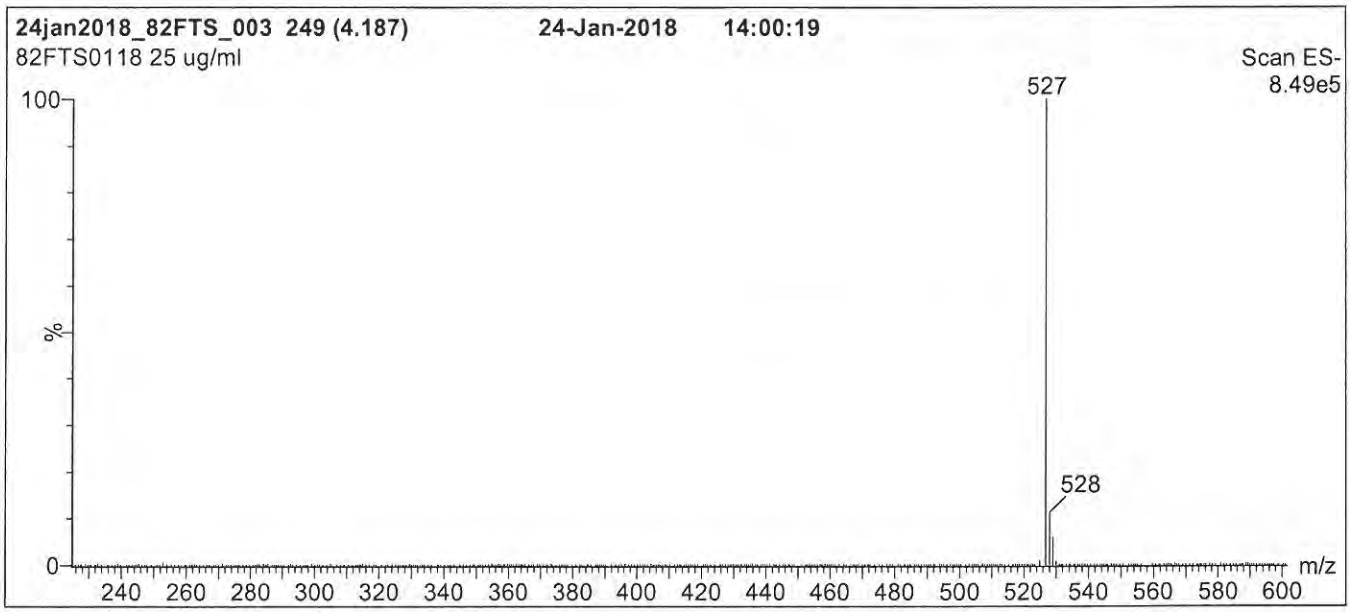
18E0729

Figure 1: **8:2FTS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

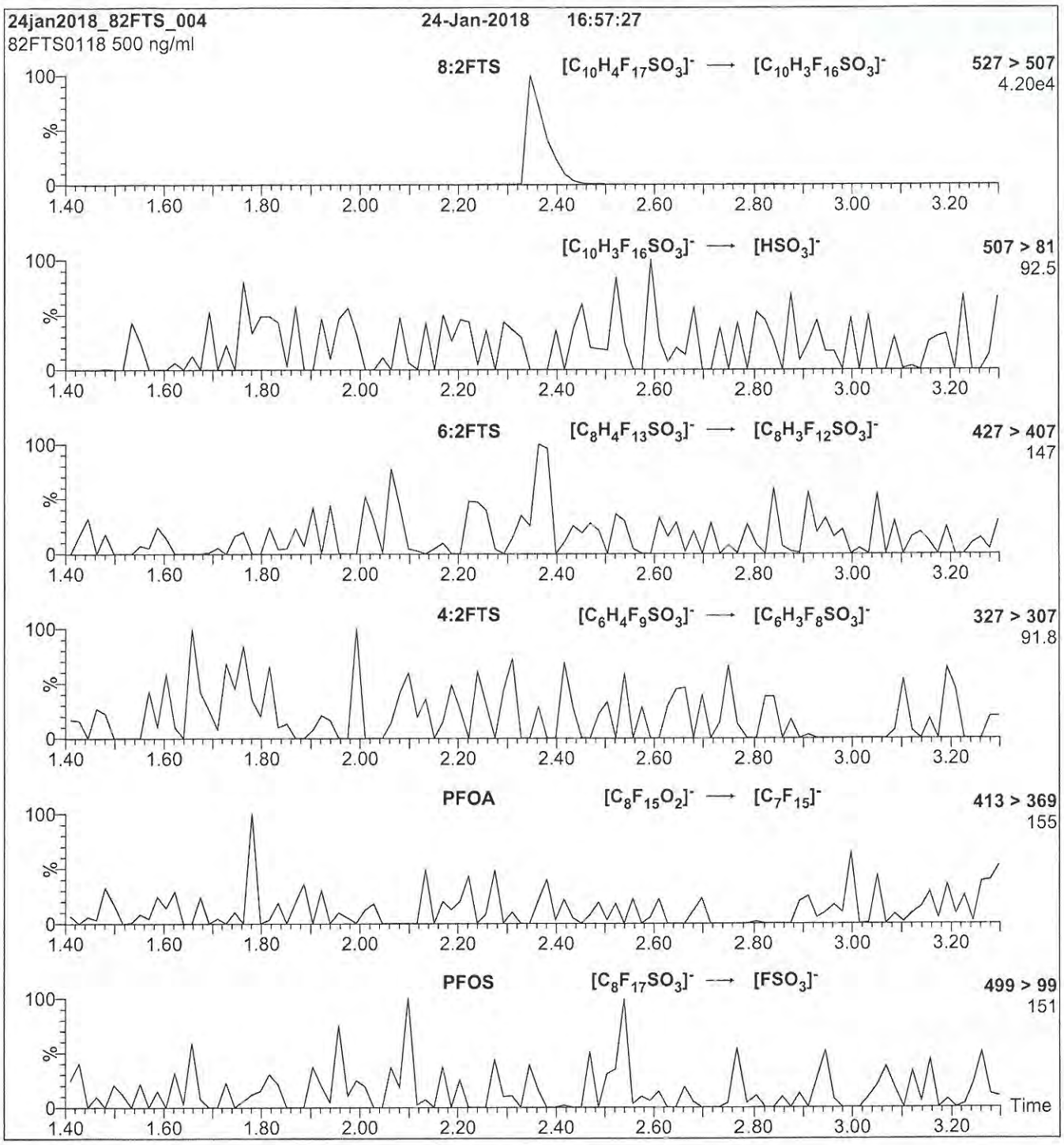
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 30.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

1803729

Figure 2: **8:2FTS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml 8:2FTS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 25

18E0730

WELLINGTON LABORATORIES

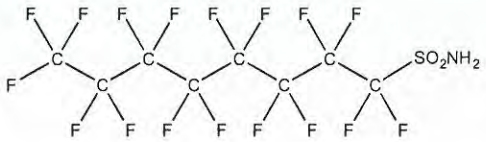
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: FOSA-I
COMPOUND: Perfluoro-1-octanesulfonamide

LOT NUMBER: FOSA0817I

STRUCTURE:

CAS #: 754-91-6



MOLECULAR FORMULA:	$C_8H_2F_{17}NO_2S$	**MOLECULAR WEIGHT:**	499.14
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Isopropanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	09/01/2017		
EXPIRY DATE: (mm/dd/yyyy)	09/01/2022		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 09/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

1803730

INTENDED USE:

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Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

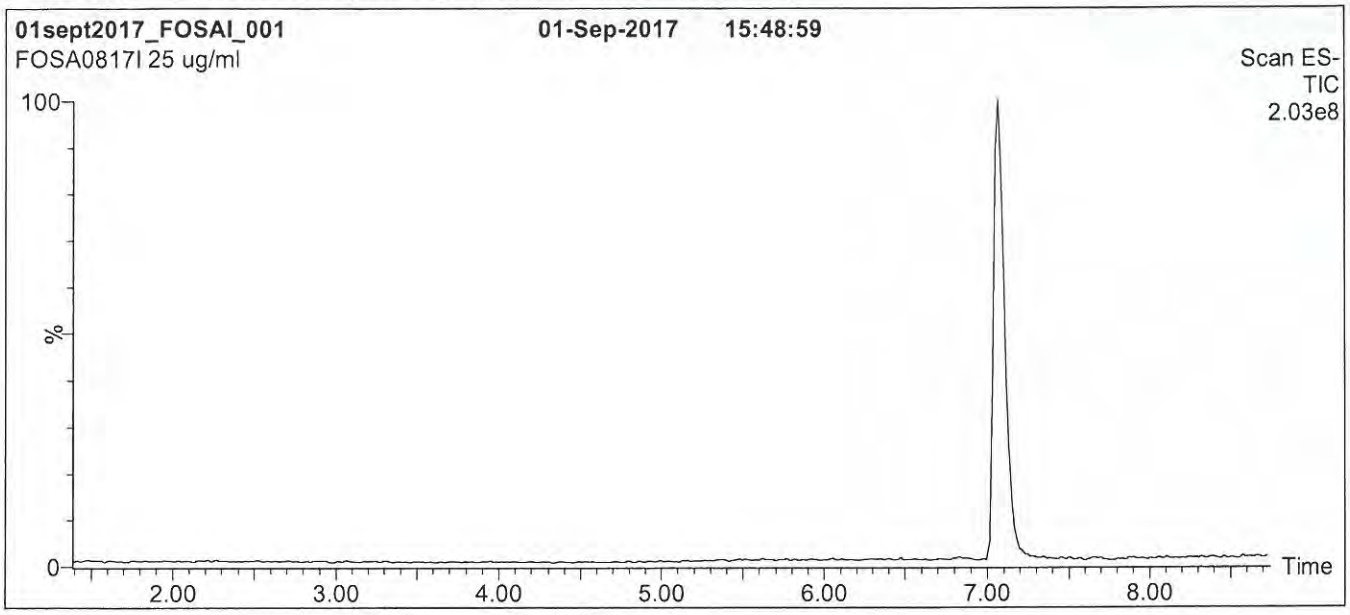
QUALITY MANAGEMENT:

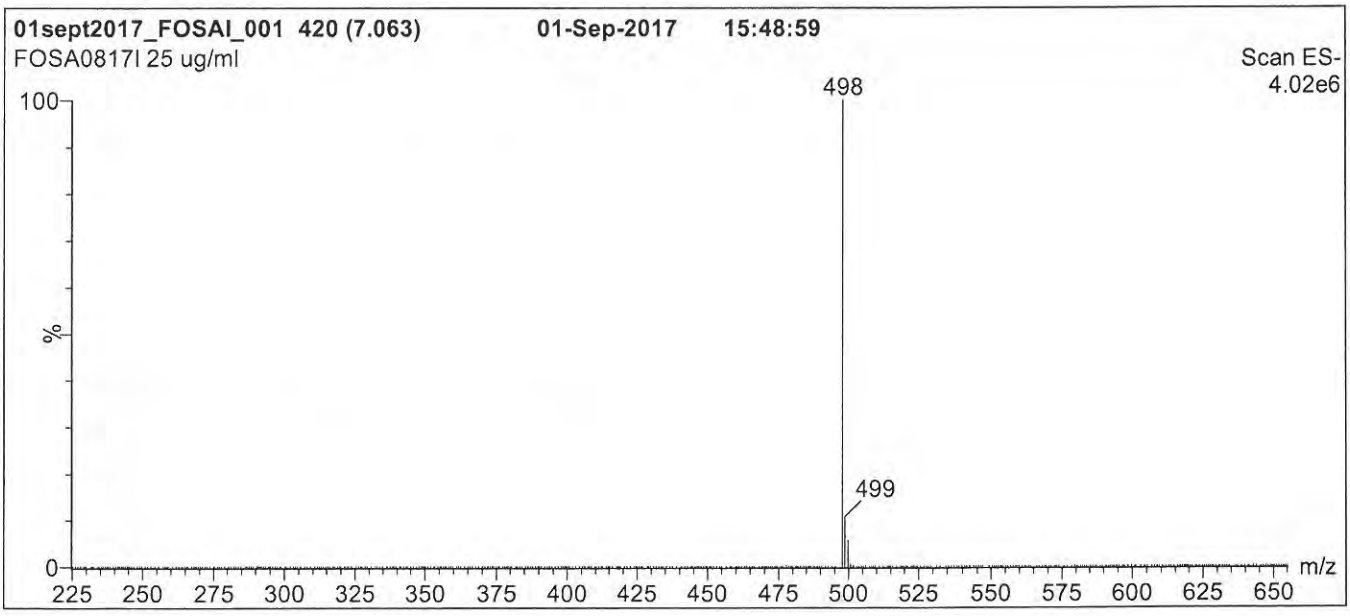
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0730

Figure 1: **FOSA-I; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 8 min and hold for 1 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

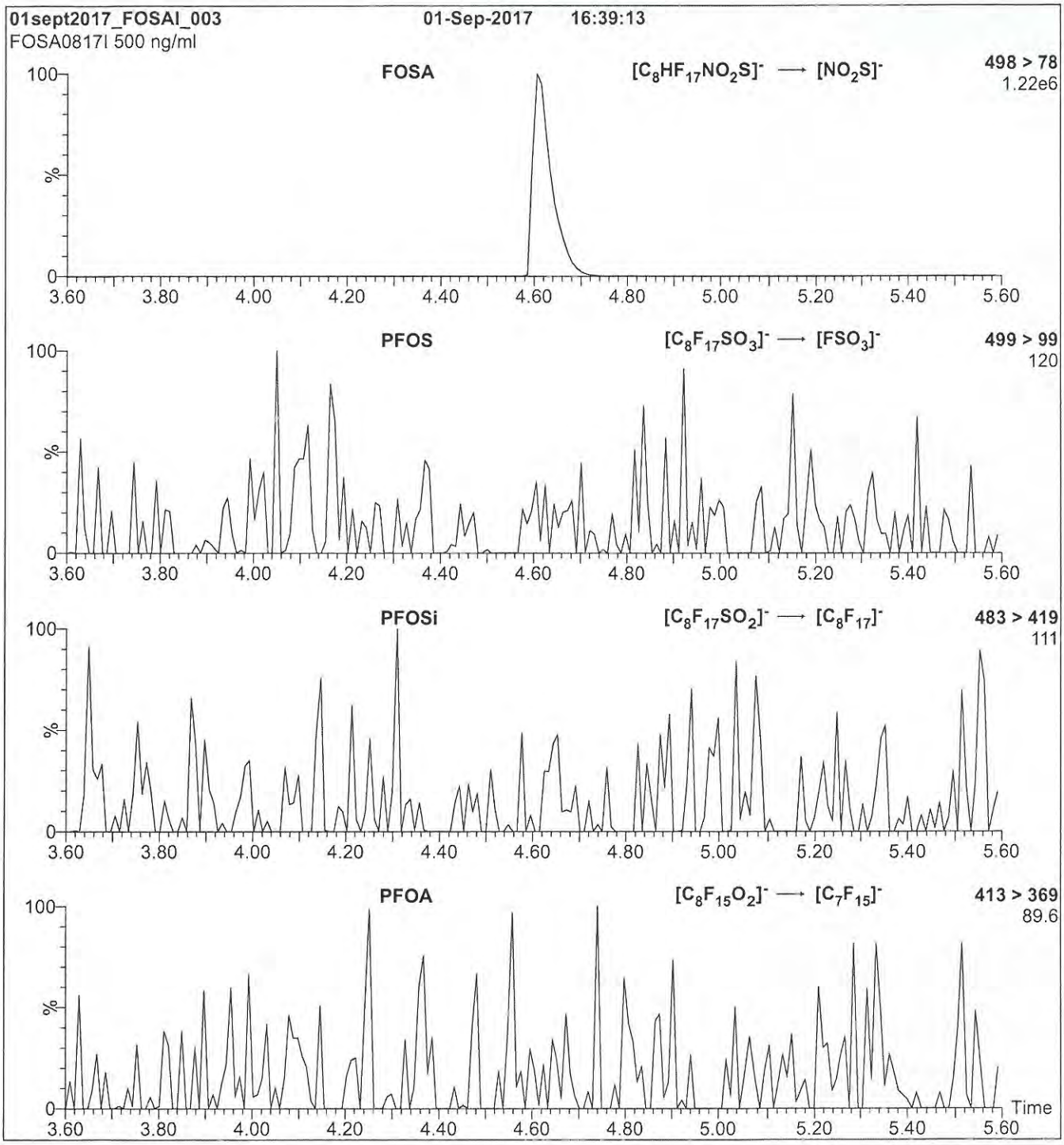
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.50
Cone Voltage (V) = 40.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18E0730

Figure 2: **FOSA-I; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml FOSA-I)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 30

18E0731

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

br-NMeFOSAA

N-Methylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NMeFOSAA
LOT NUMBER:	brNMeFOSAA0118
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2018
LAST TESTED: (mm/dd/yyyy)	01/17/2018
EXPIRY DATE: (mm/dd/yyyy)	01/17/2023
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-methylperfluorooctanesulfonamidoacetic acid (linear and branched isomers). The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the acetic acid moiety to its respective methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18E0731

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation for ISO/IEC 17025

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18E0731

Table A: **br-NMeFOSAA; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-methylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(CH_3)CH_2CO_2H$	76.0
2	N-methylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(CH_3)CH_2CO_2H$	0.7
3	N-methylperfluoro-4-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_2CF(CF_3)(CF_2)_3SO_2N(CH_3)CH_2CO_2H$	2.0
4	N-methylperfluoro-5-methylheptanesulfonamidoacetic acid	$CF_3CF_2CF(CF_3)(CF_2)_4SO_2N(CH_3)CH_2CO_2H$	6.0
5	N-methylperfluoro-6-methylheptanesulfonamidoacetic acid	$CF_3CF(CF_3)(CF_2)_5SO_2N(CH_3)CH_2CO_2H$	14.0
6	N-methylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$CF_3C(CF_3)_2(CF_2)_4SO_2N(CH_3)CH_2CO_2H$	0.2
7	Other Unidentified Isomers		1.1

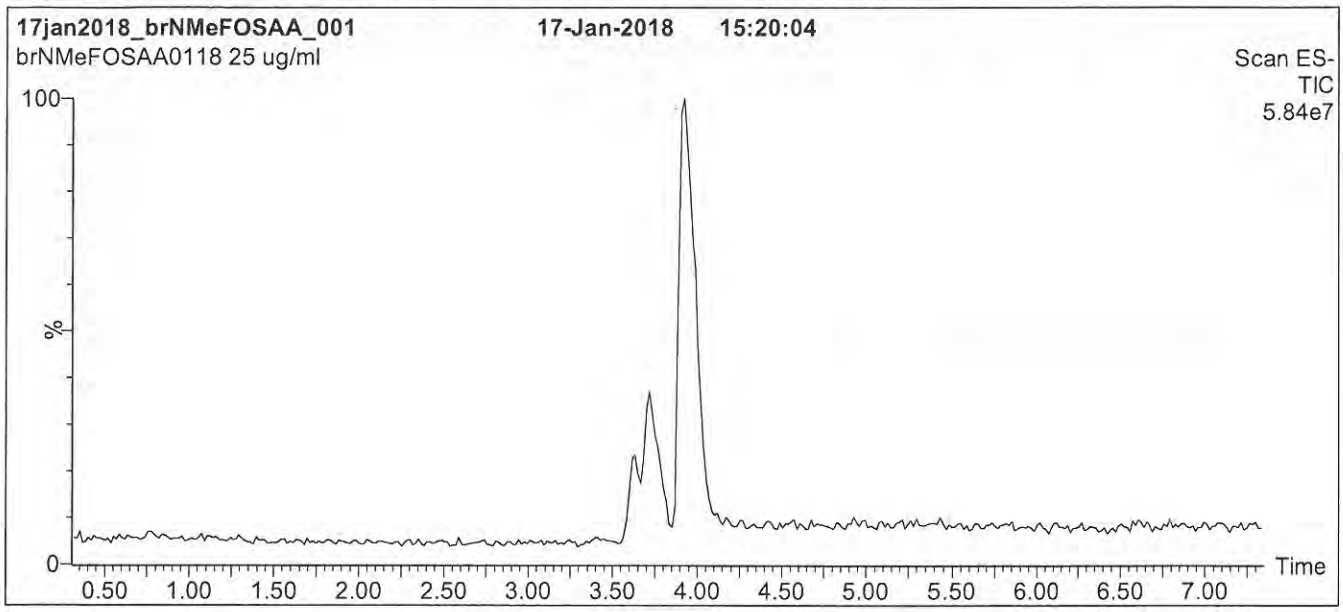
* Percent of total N-methylperfluorooctanesulfonamidoacetic acid isomers only.

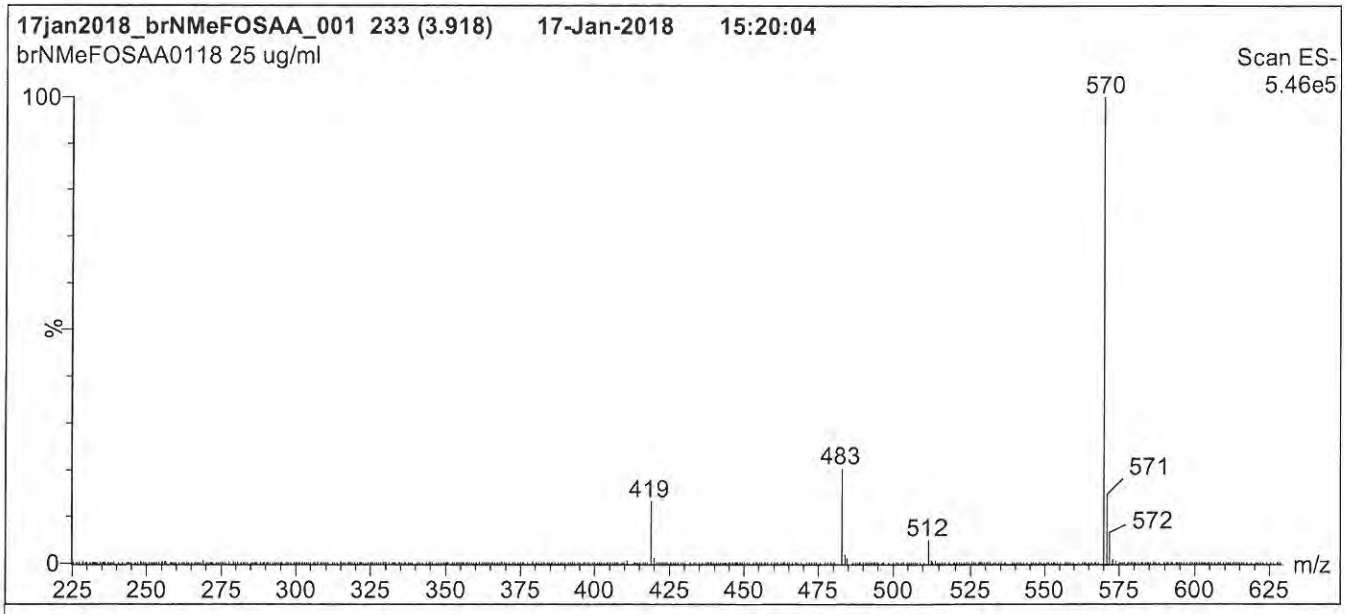
Certified By: _____ **Date:** 03/22/2018
(mm/dd/yyyy)

B.G. Chittim, General Manager

18E0731

Figure 1: **br-NMeFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

Flow: 300 µl/min

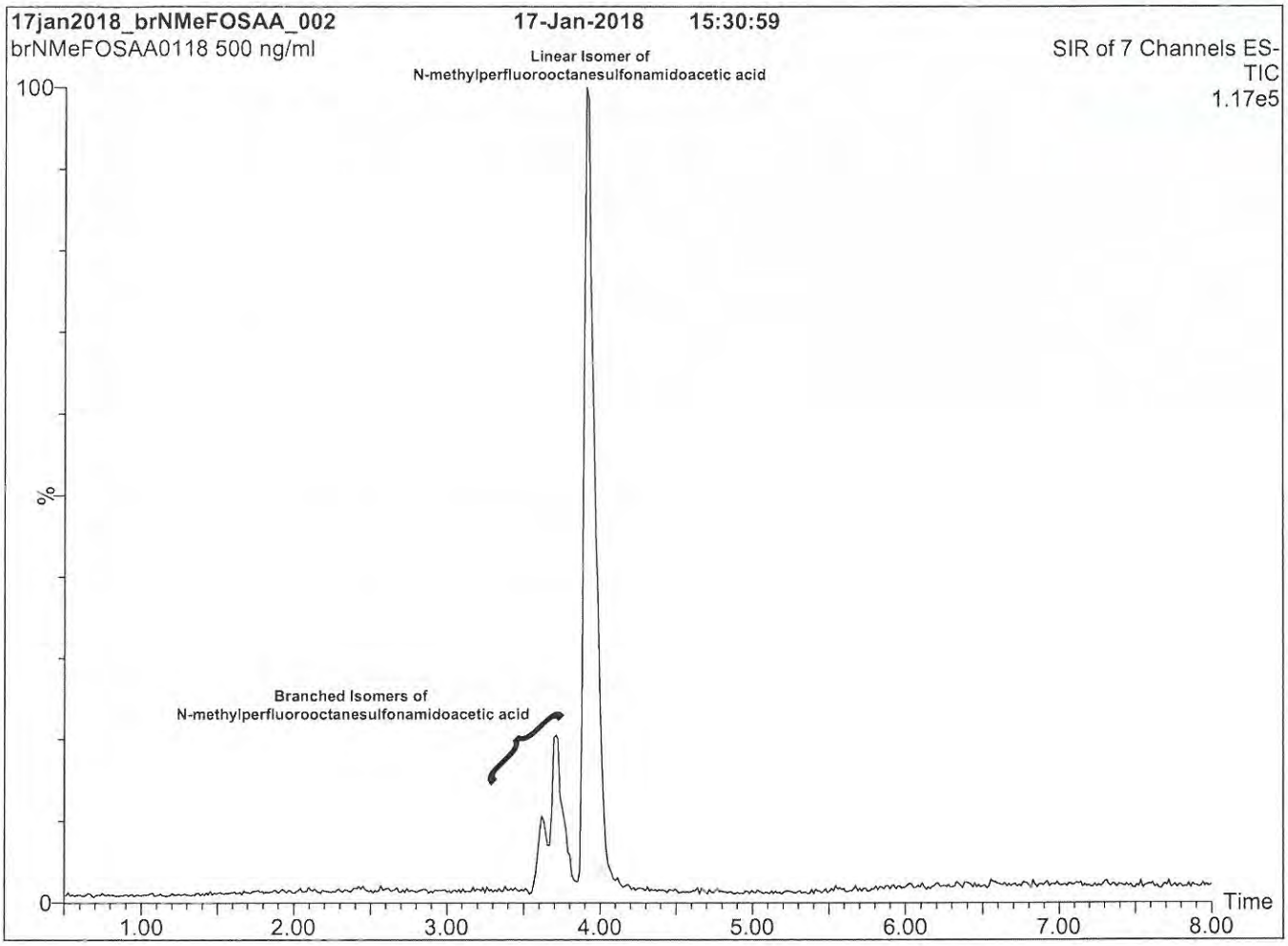
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18E0731

Figure 2: **br-NMeFOSAA; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

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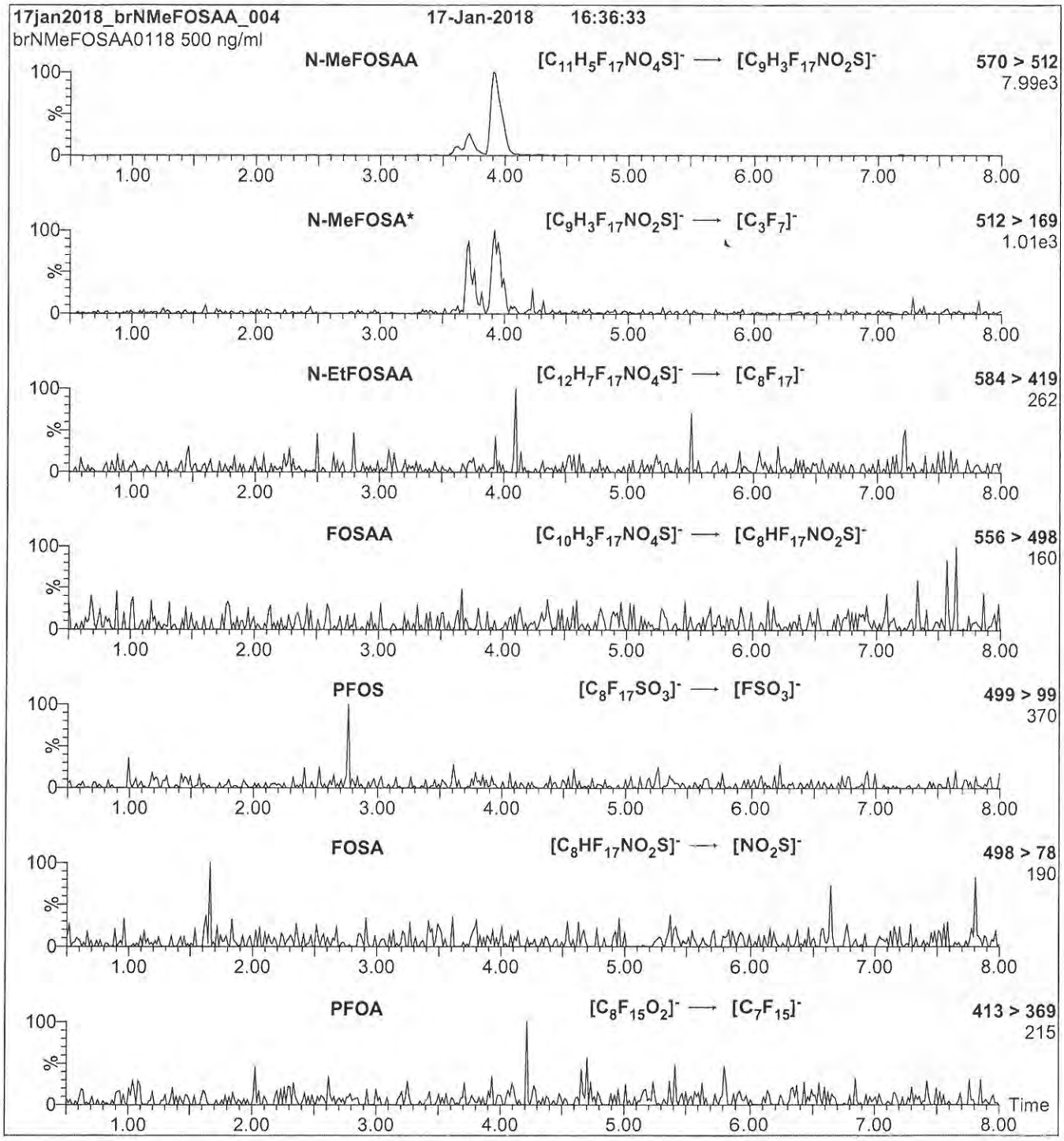
Figure 3: **br-NMeFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



***Note**: N-MeFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 11-40 (variable)

18E0732

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

br-NEtFOSAA

N-Ethylperfluorooctanesulfonamidoacetic Acid Solution/Mixture of Linear and Branched Isomers

PRODUCT CODE:	br-NEtFOSAA
LOT NUMBER:	brNEtFOSAA0118
CONCENTRATION:	50.0 ± 2.5 µg/ml
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/10/2018
LAST TESTED: (mm/dd/yyyy)	01/17/2018
EXPIRY DATE: (mm/dd/yyyy)	01/17/2023
RECOMMENDED STORAGE:	Refrigerate ampoule

DESCRIPTION:

The chemical purity has been determined to be ≥98% N-ethylperfluorooctanesulfonamidoacetic acid (linear and branched isomers). The full name, structure and percent composition for each of the identified isomeric components are given in Table A.

DOCUMENTATION/ DATA ATTACHED:

Table A: Isomeric Components and Percent Composition by ^{19}F-NMR
Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (SIR)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the acetic acid moiety to its respective methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

1 8E0732

Table A: **br-NEtFOSAA; Isomeric Components and Percent Composition (by ^{19}F-NMR)***

Isomer	Name	Structure	Percent Composition by ^{19}F-NMR
1	N-ethylperfluoro-1-octanesulfonamidoacetic acid	$CF_3(CF_2)_7SO_2N(C_2H_5)CH_2CO_2H$	77.5
2	N-ethylperfluoro-3-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_3CF(CF_3)(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	2.3
3	N-ethylperfluoro-4-methylheptanesulfonamidoacetic acid	$CF_3(CF_2)_2CF(CF_3)(CF_2)_3SO_2N(C_2H_5)CH_2CO_2H$	2.2
4	N-ethylperfluoro-5-methylheptanesulfonamidoacetic acid	$CF_3CF_2CF(CF_3)(CF_2)_4SO_2N(C_2H_5)CH_2CO_2H$	5.4
5	N-ethylperfluoro-6-methylheptanesulfonamidoacetic acid	$CF_3CF(CF_3)(CF_2)_5SO_2N(C_2H_5)CH_2CO_2H$	10.4
6	N-ethylperfluoro-5,5-dimethylhexanesulfonamidoacetic acid	$CF_3C(CF_3)_2(CF_2)_4SO_2N(C_2H_5)CH_2CO_2H$	0.3
7	N-ethylperfluoro-4,5-dimethylhexanesulfonamidoacetic acid	$CF_3CF(CF_3)CF(CF_2)_3SO_2N(C_2H_5)CH_2CO_2H$	0.3
8	N-ethylperfluoro-3,5-dimethylhexanesulfonamidoacetic acid	$CF_3CF(CF_3)CF_2CF(CF_2)_2SO_2N(C_2H_5)CH_2CO_2H$	0.3
9	Other Unidentified Isomers		1.3

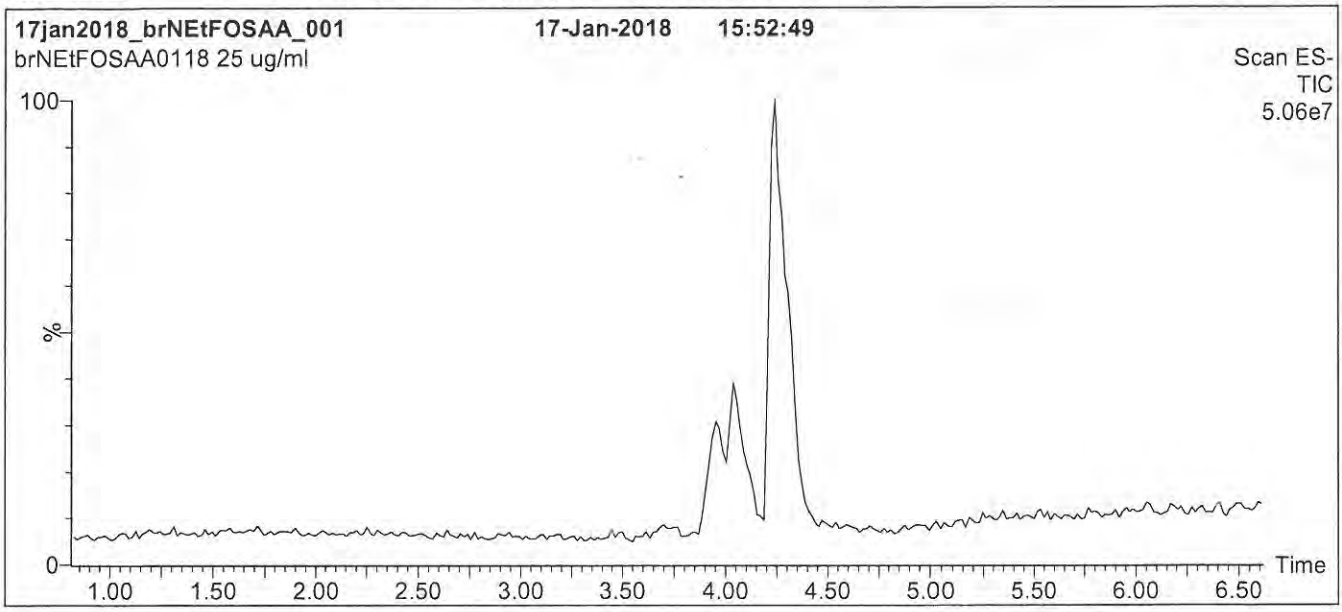
* Percent of total N-ethylperfluorooctanesulfonamidoacetic acid isomers only.

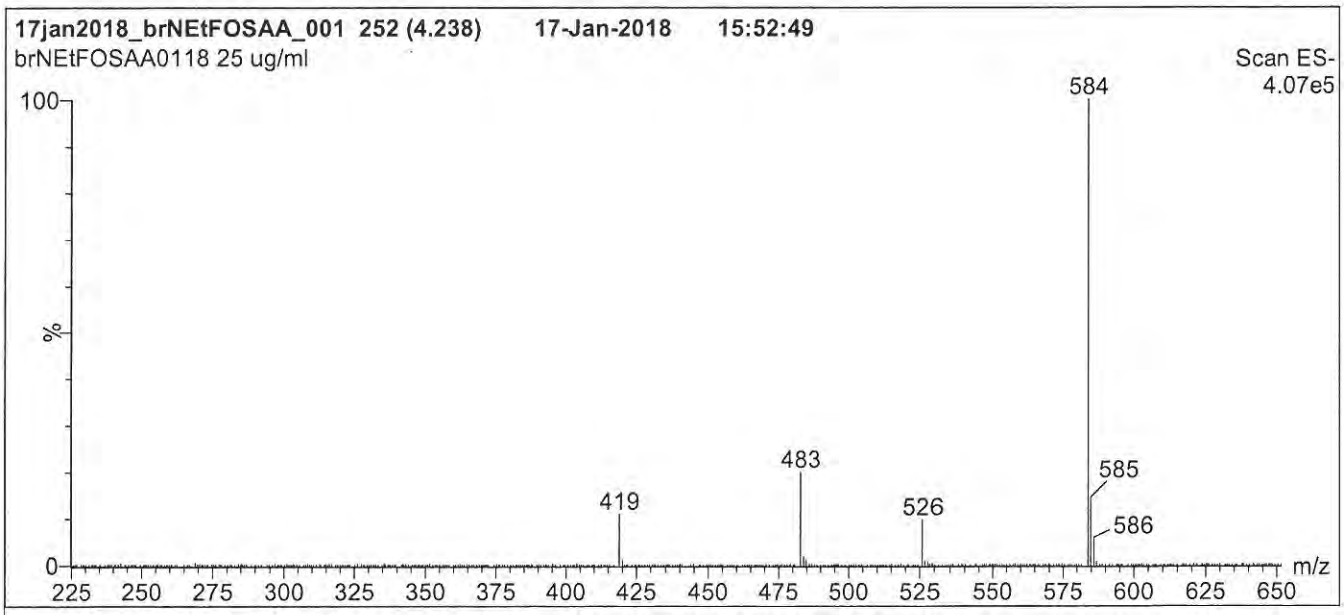
Certified By: _____ **Date:** 03/22/2018
(mm/dd/yyyy)

B.G. Chittim, General Manager

18E0732

Figure 1: **br-NEtFOSAA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

Flow: 300 µl/min

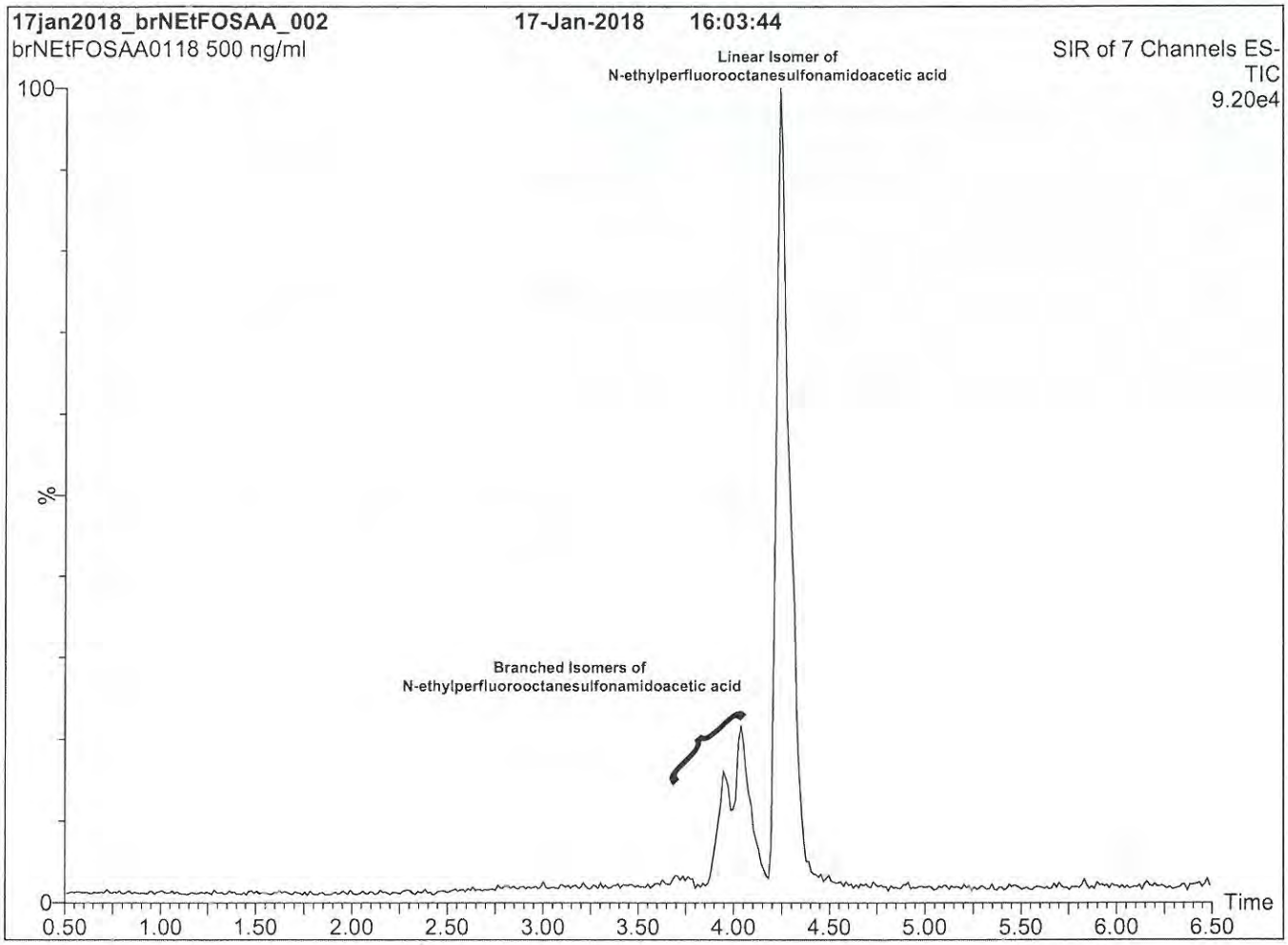
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 35.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

1803732

Figure 2: **br-NEtFOSAA; LC/MS Data (SIR)**



Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for
2 min before returning to initial conditions in 0.5 min.

Time: 10 min

Flow: 300 µl/min

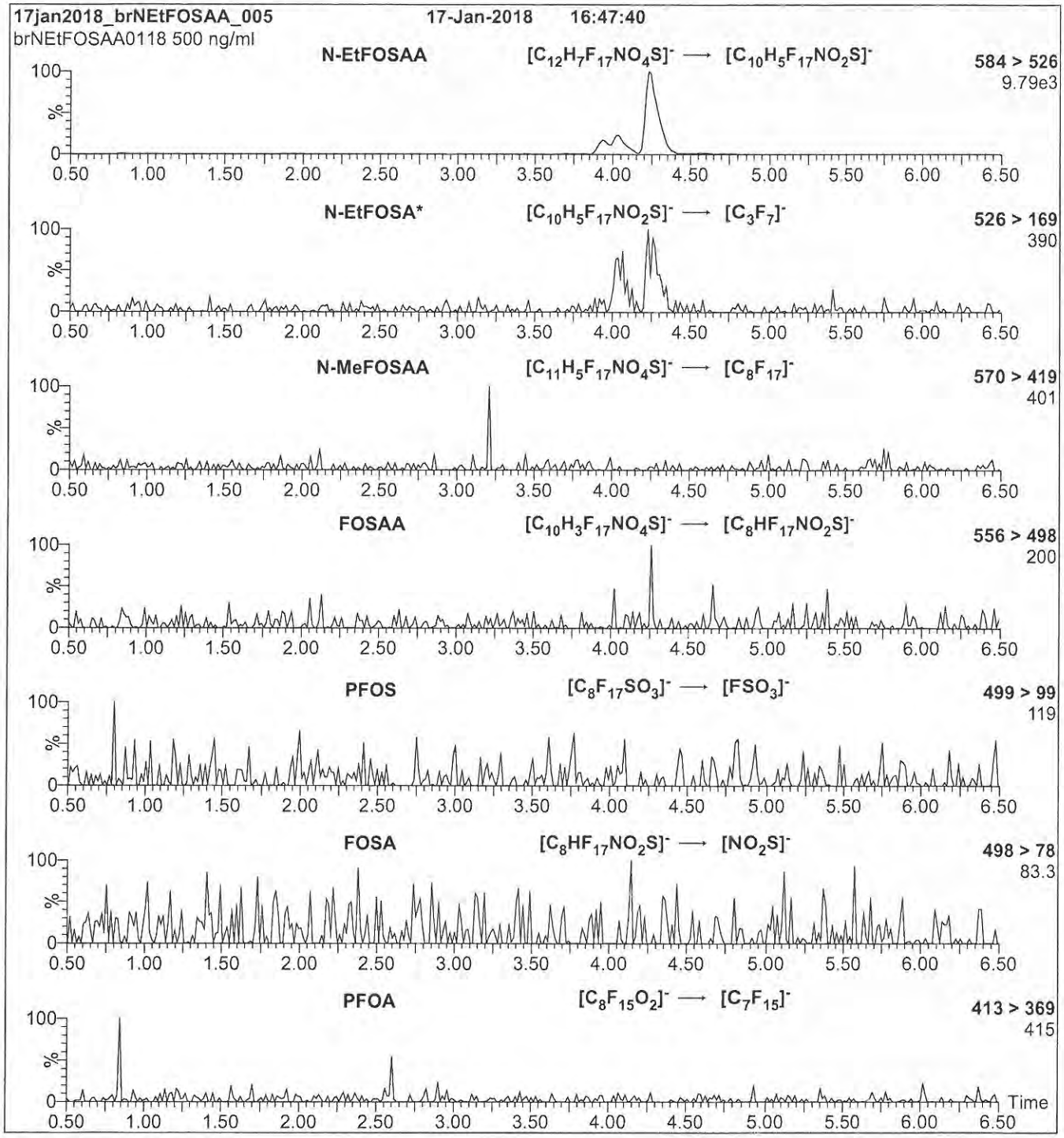
MS Parameters

Experiment: SIR (7 channels)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15-60
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18E0732

Figure 3: **br-NEtFOSAA; LC/MS/MS Data (Selected MRM Transitions)**



***Note**: N-EtFOSA is formed by in-source fragmentation.

Conditions for Figure 3:

Injection: On-column

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

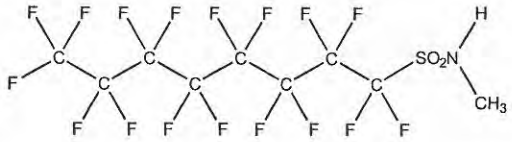
Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 11-40 (variable)

1810762

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-MeFOSA-M	**LOT NUMBER:**	NMeFOSA0518M
COMPOUND:	N-methylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	31506-32-8



MOLECULAR FORMULA:	$C_9H_4F_{17}NO_2S$	**MOLECULAR WEIGHT:**	513.17
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/07/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18I0762

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters x_1, x_2,...x_n on which it depends is:

$$u_c(y(x_1, x_2, ...x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

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LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

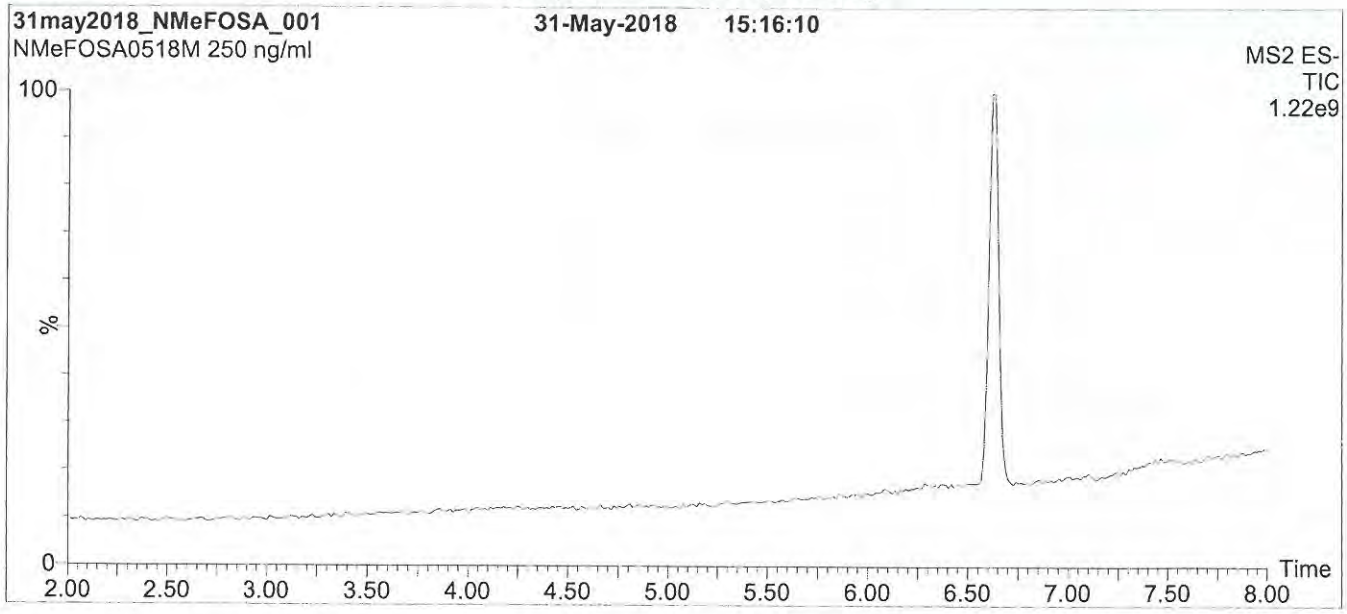
CALA Testing Accreditation No. A 1226

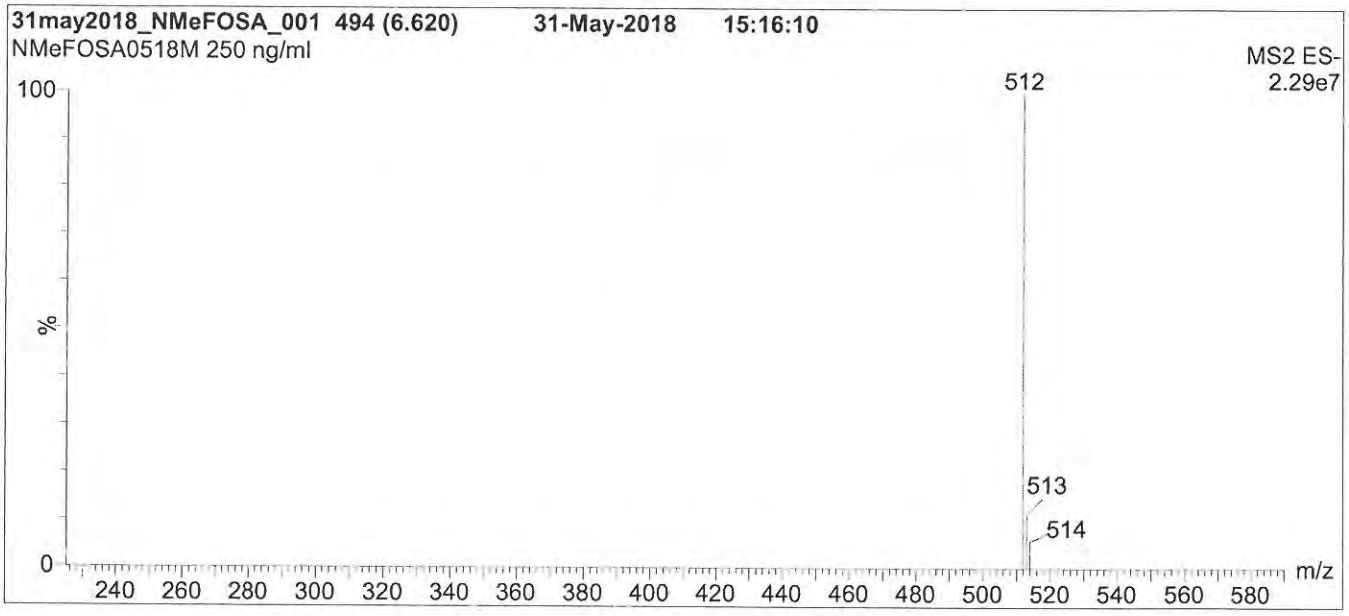
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18I0762

Figure 1: **N-MeFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH C_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

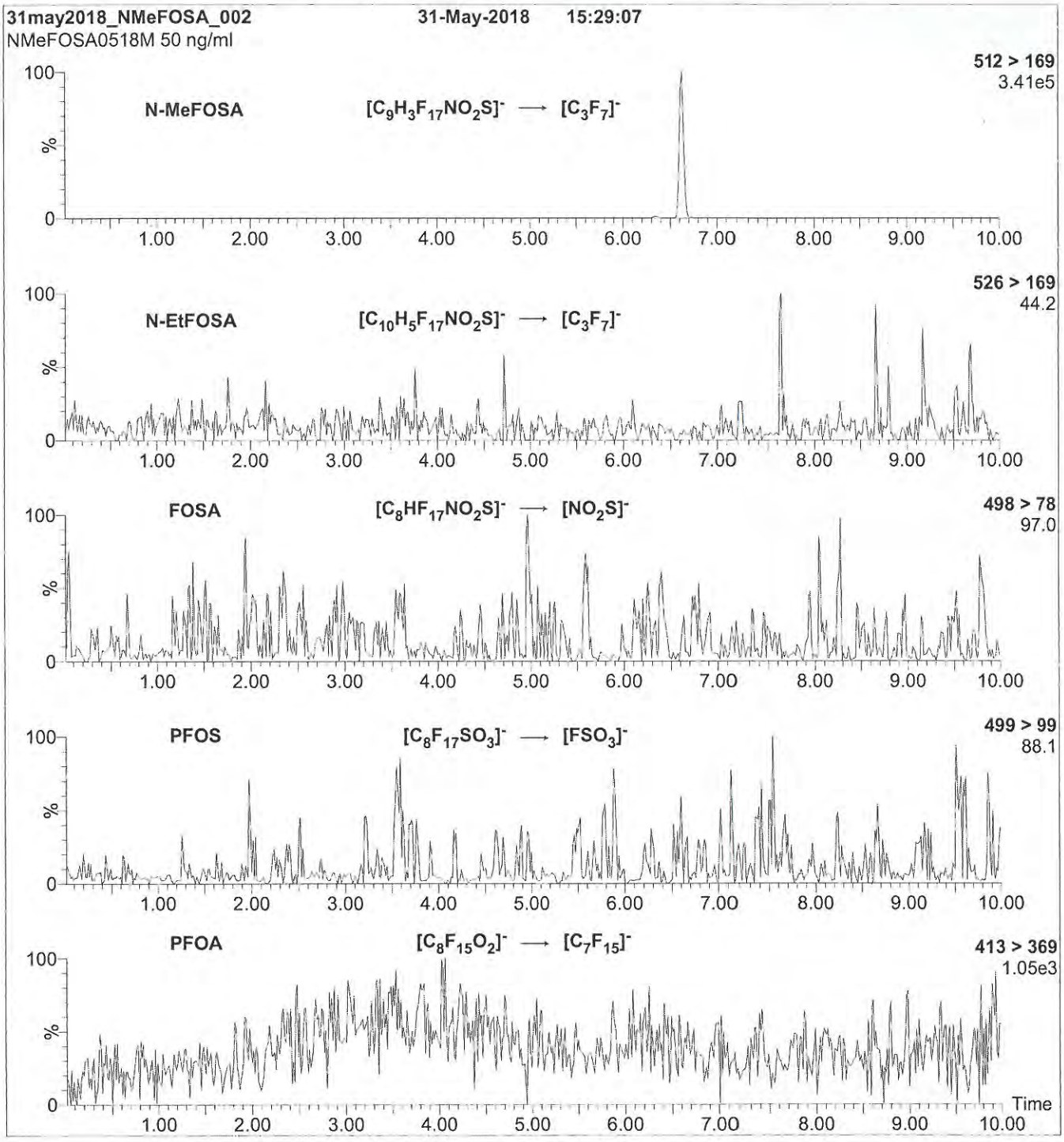
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

18I0762

Figure 2: **N-MeFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (N-MeFOSA-M)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

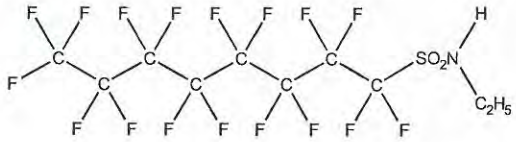
Collision Gas (mbar) = 3.37e-3
Collision Energy (eV) = 24

18I 0763

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	N-EtFOSA-M	**LOT NUMBER:**	NEtFOSA0518M
COMPOUND:	N-ethylperfluoro-1-octanesulfonamide		
STRUCTURE:		**CAS #:**	4151-50-2



MOLECULAR FORMULA:	$C_{10}H_6F_{17}NO_2S$	**MOLECULAR WEIGHT:**	527.20
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/31/2018		
EXPIRY DATE: (mm/dd/yyyy)	05/31/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.5% branched isomers of N-ethylperfluorooctanesulfonamide.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/12/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18I0763

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HANDLING:

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HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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TRACEABILITY:

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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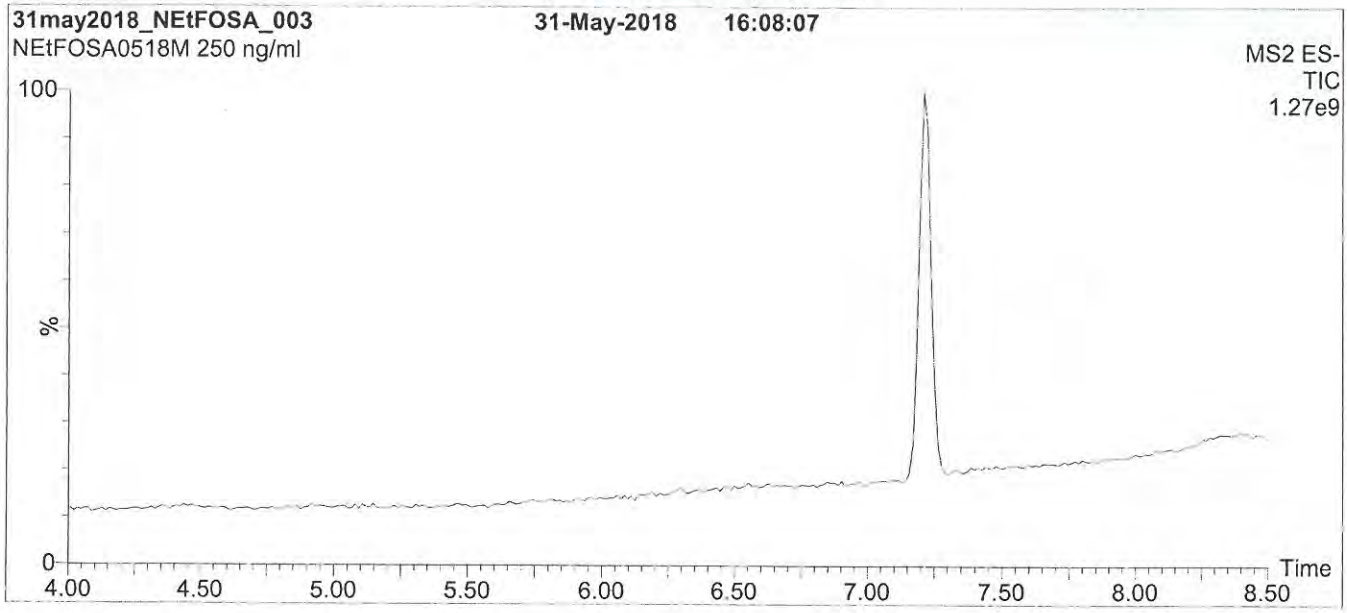
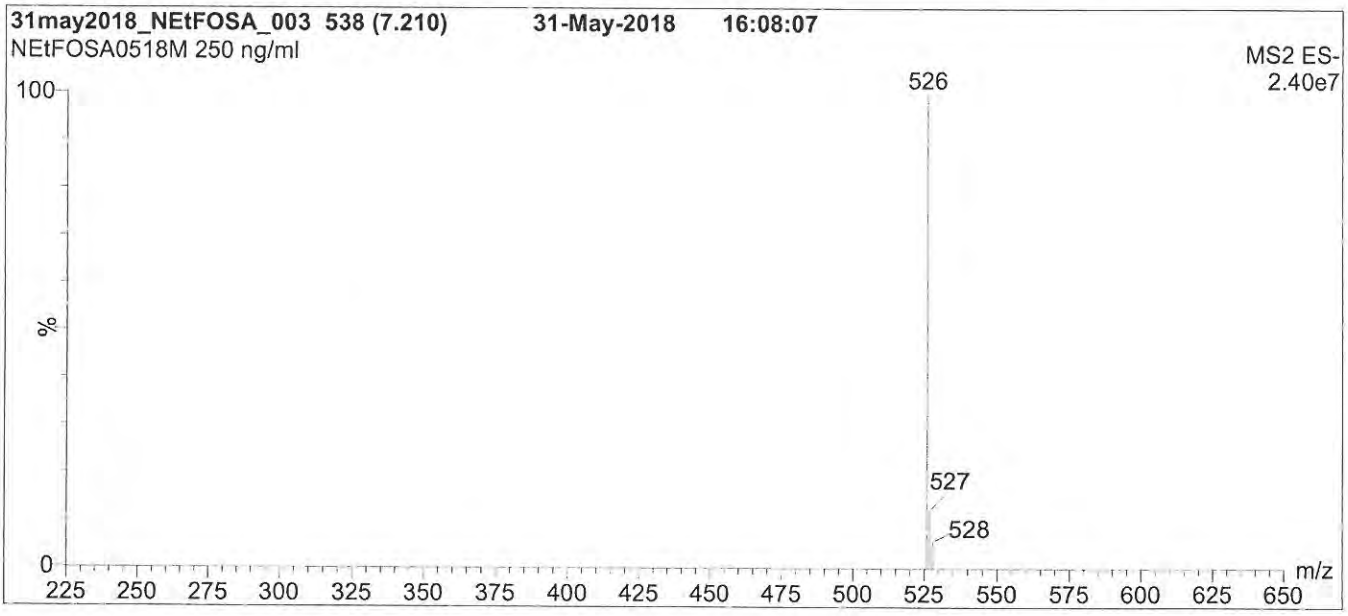
18I0763

Figure 1: **N-EtFOSA-M; LC/MS Data (TIC and Mass Spectrum)**





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MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

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1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 85% organic over 7 min and hold for
3 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

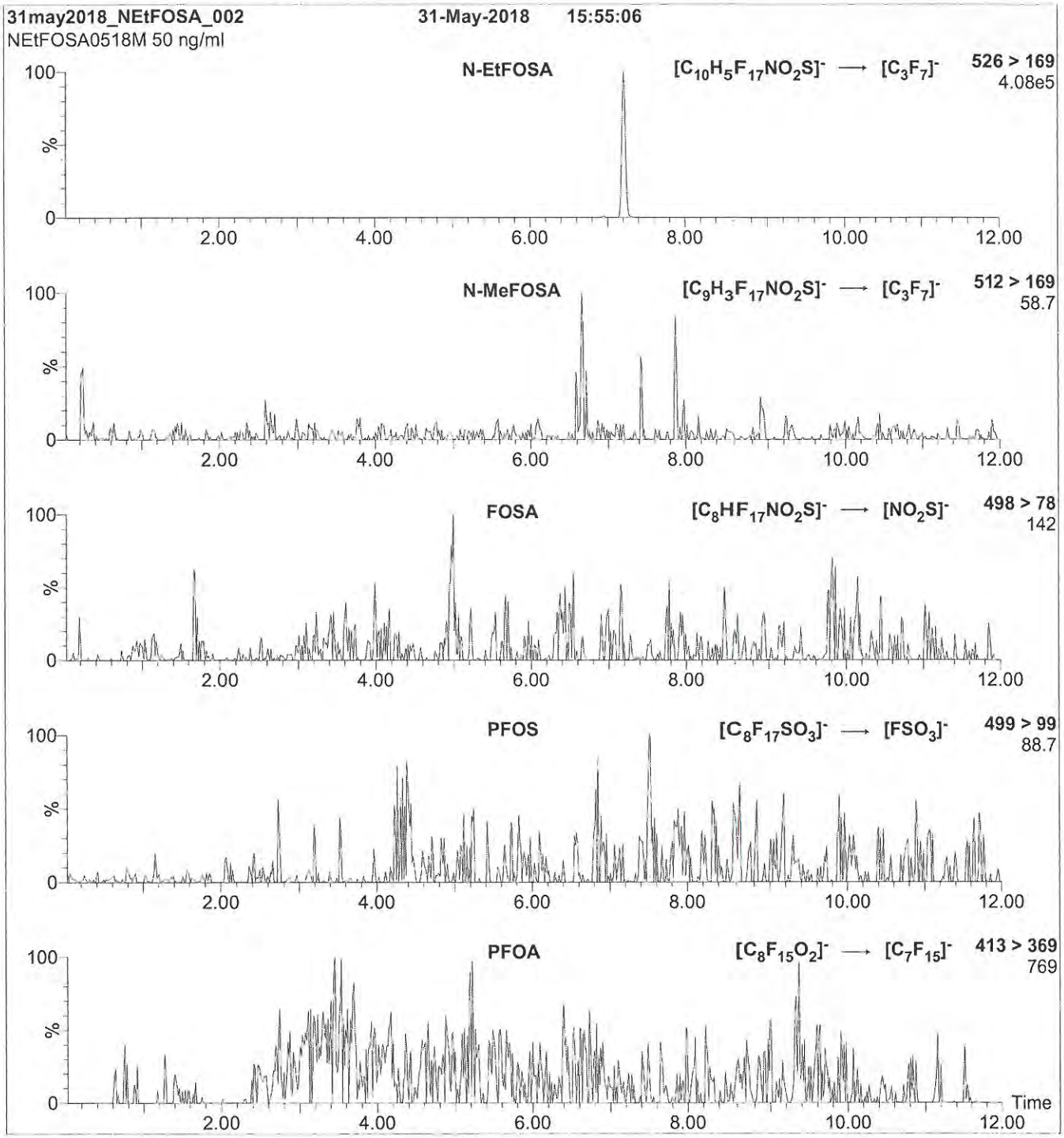
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 1.00
Cone Voltage (V) = 44.00
Desolvation Temperature (°C) = 500
Desolvation Gas Flow (l/hr) = 750

18I0763

Figure 2: **N-EtFOSA-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: On-column (N-EtFOSA-M)

Mobile phase: Same as Figure 1

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.37e-3
Collision Energy (eV) = 24

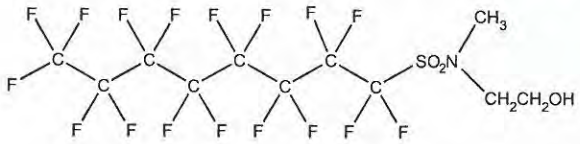
18I0764

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-MeFOSE-M **LOT NUMBER:** NMeFOSE0418M
COMPOUND: 2-(N-methylperfluoro-1-octanesulfonamido)-ethanol

STRUCTURE: **CAS #:** 24448-09-7



MOLECULAR FORMULA:	$C_{11}H_8F_{17}NO_3S$	**MOLECULAR WEIGHT:**	557.22
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/17/2018 (HRGC/LRMS) 05/03/2018 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	05/17/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (TIC and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18I0764

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CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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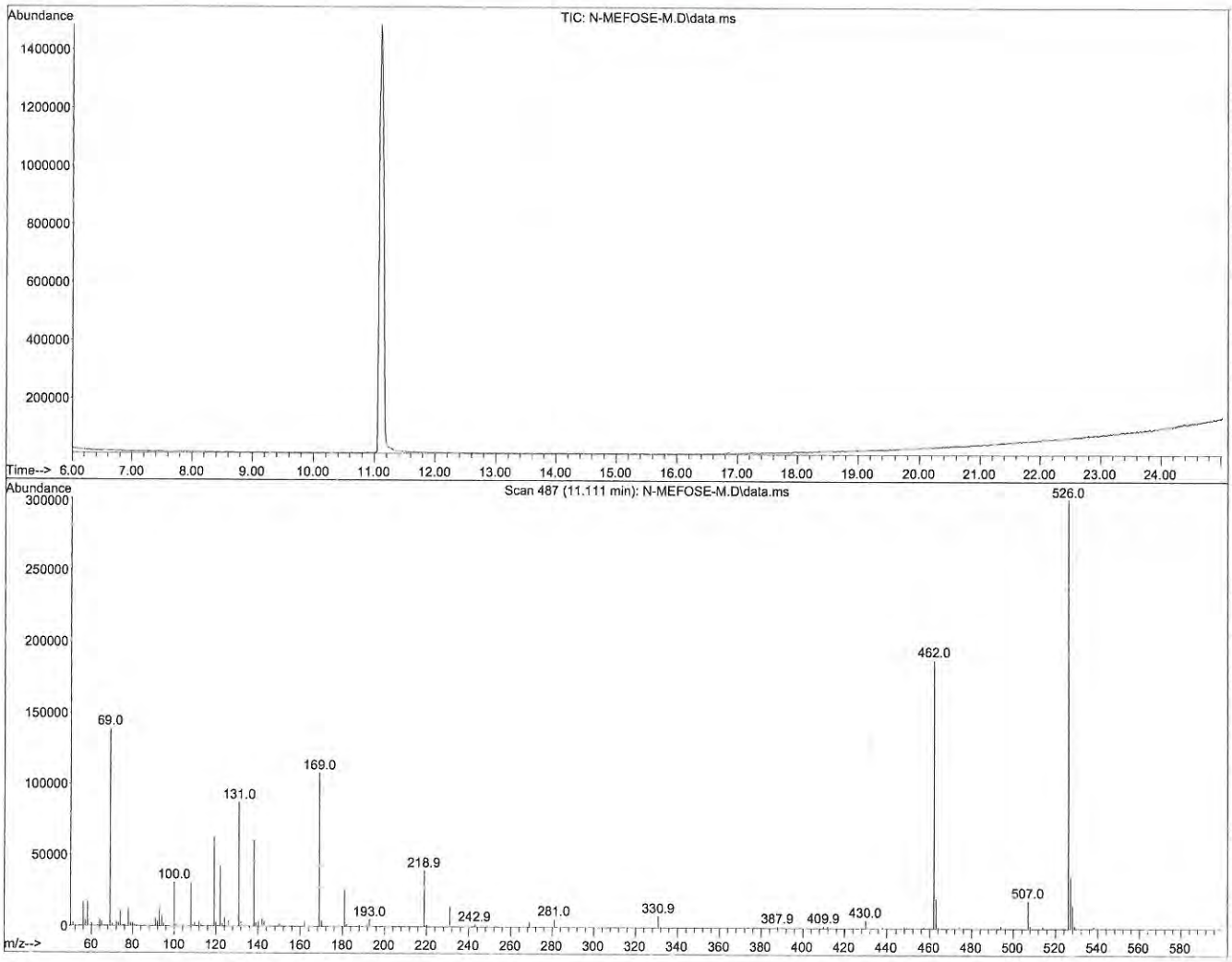
18I0764

Figure 1: **N-MeFOSE-M; HRGC/LRMS Data (TIC and Mass Spectrum)**



HRGC/LRMS:

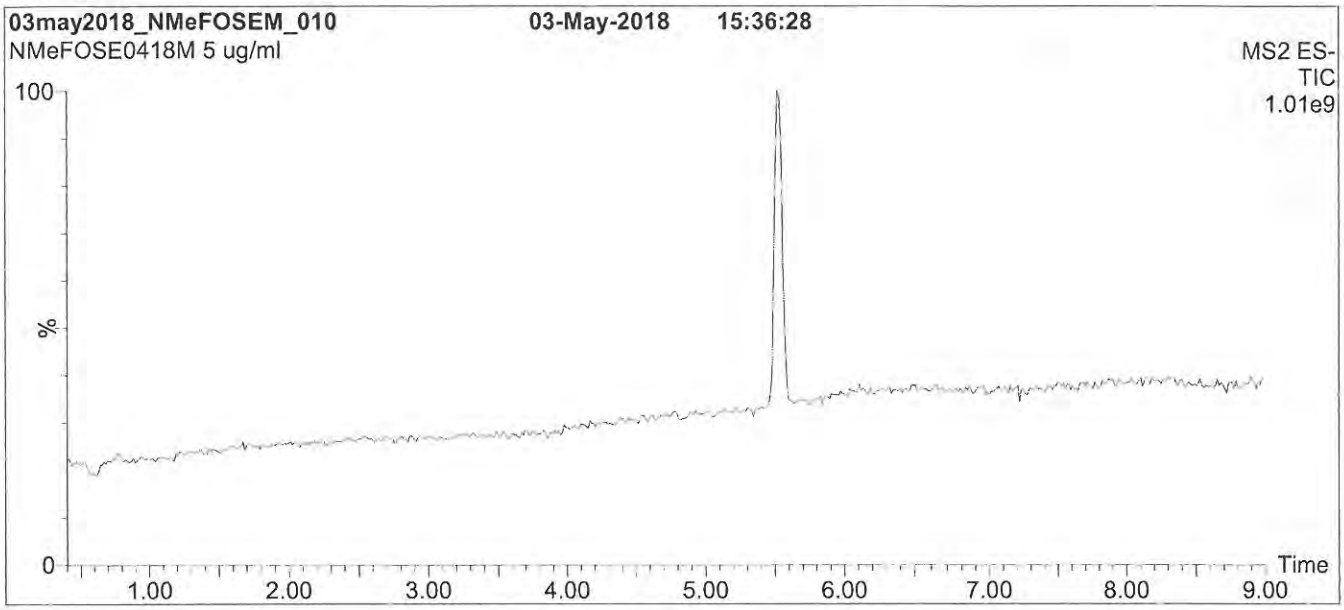
Agilent 7890A (HRGC)
Agilent 5975C (LRMS)

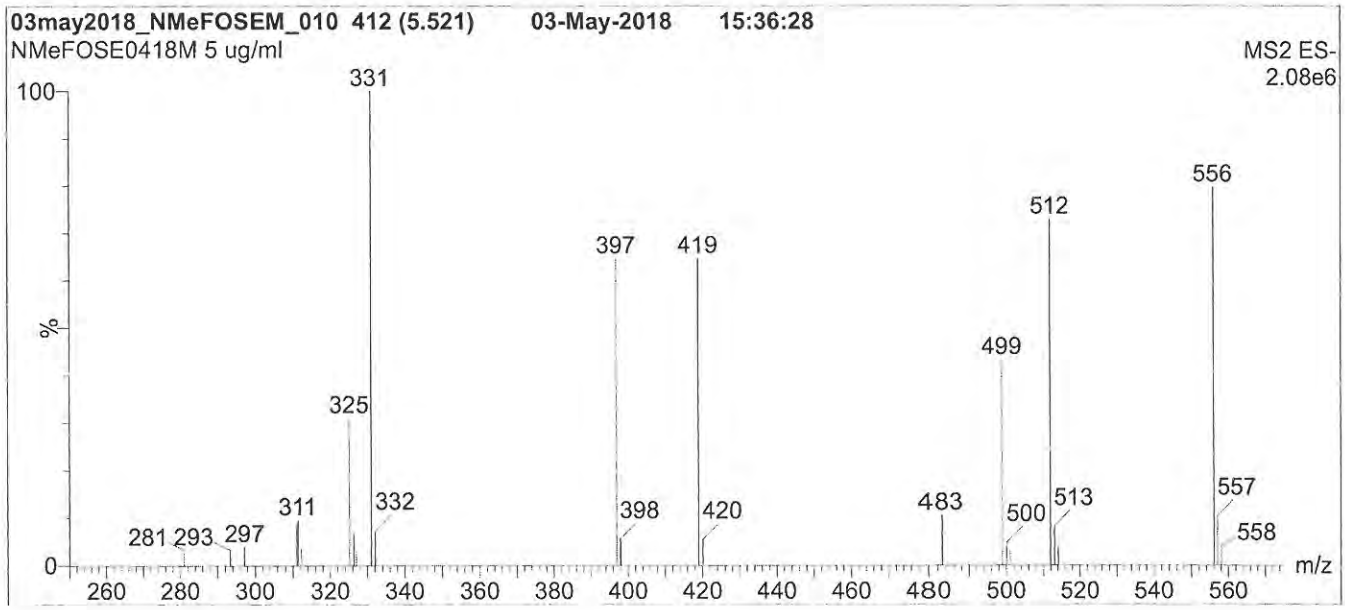
Chromatographic Conditions:

Column:	30 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W
Injector:	250 °C (Splitless Injection)
Oven:	100 °C (5 min) 10 °C/min to 325 °C 325 °C (20 min)
Ionization:	EI+
Detector:	250 °C Full Scan (50-1000 amu)

18I0764

Figure 2: **N-MeFOSE-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 65% MeOH / 35% H_2O
Ramp to 85% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

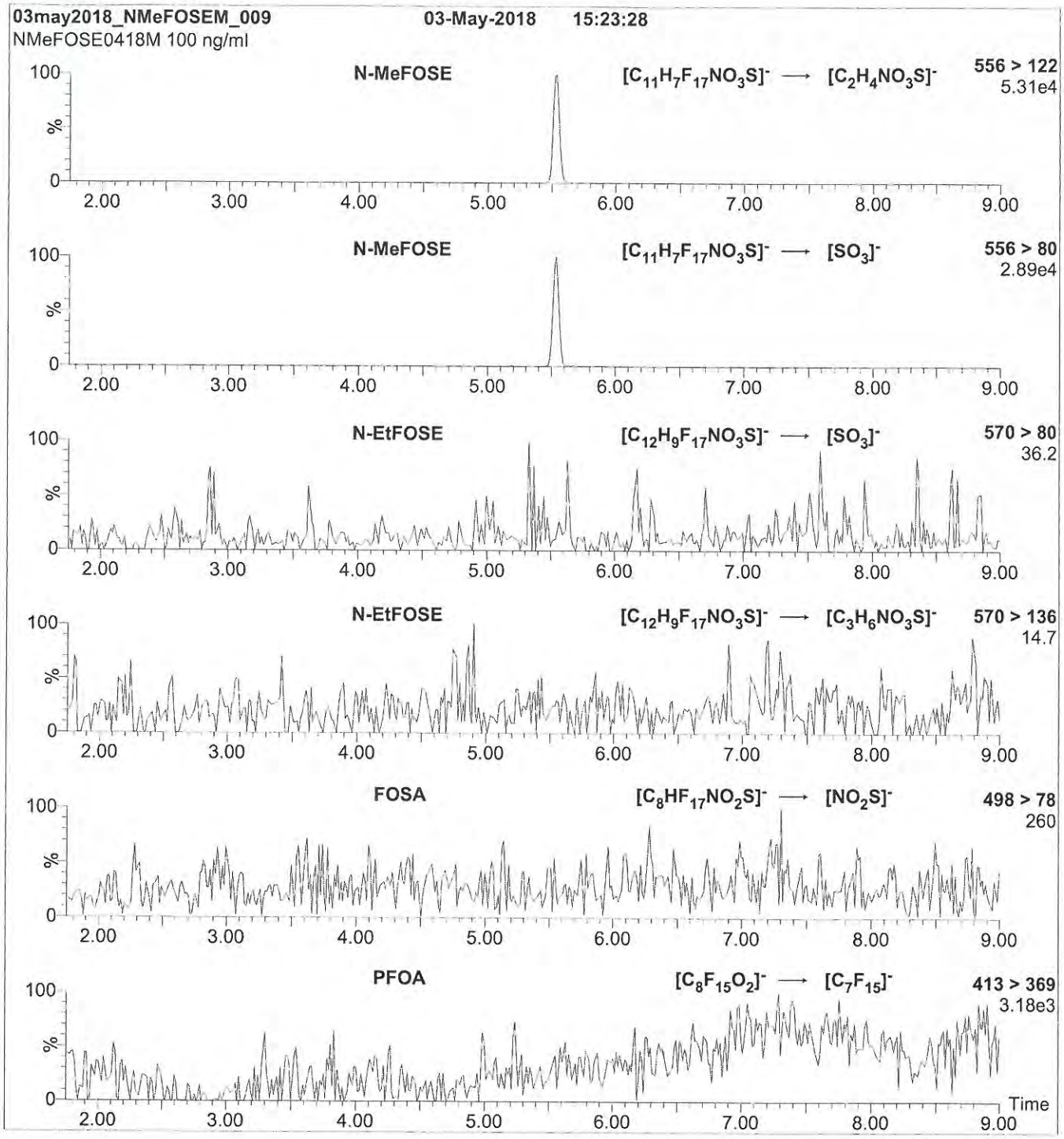
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Desolvation Temperature (°C) = 450
Desolvation Gas Flow (l/hr) = 750

18I0764

Figure 3: **N-MeFOSE-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column (N-MeFOSE-M)

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.47e-3
Collision Energy (eV) = 36

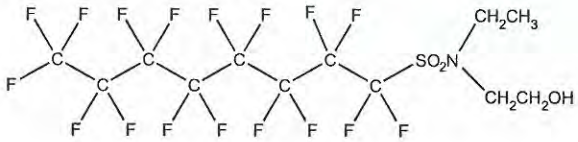
~~1801764~~ 1801765
GRB 9/12/18

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: N-EtFOSE-M **LOT NUMBER:** NEtFOSE0518M
COMPOUND: 2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol

STRUCTURE: **CAS #:** 1691-99-2



MOLECULAR FORMULA:	$C_{12}H_{10}F_{17}NO_3S$	**MOLECULAR WEIGHT:**	571.25
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	06/04/2018 (HRGC/LRMS) 05/30/2018 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	06/04/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (TIC and Mass Spectrum)
Figure 2: LC/MS Data (TIC and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- In order to see the molecular ion (adduct free), the LC mobile phase should be free of ammonium acetate buffer.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 06/04/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18I0765

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

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LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

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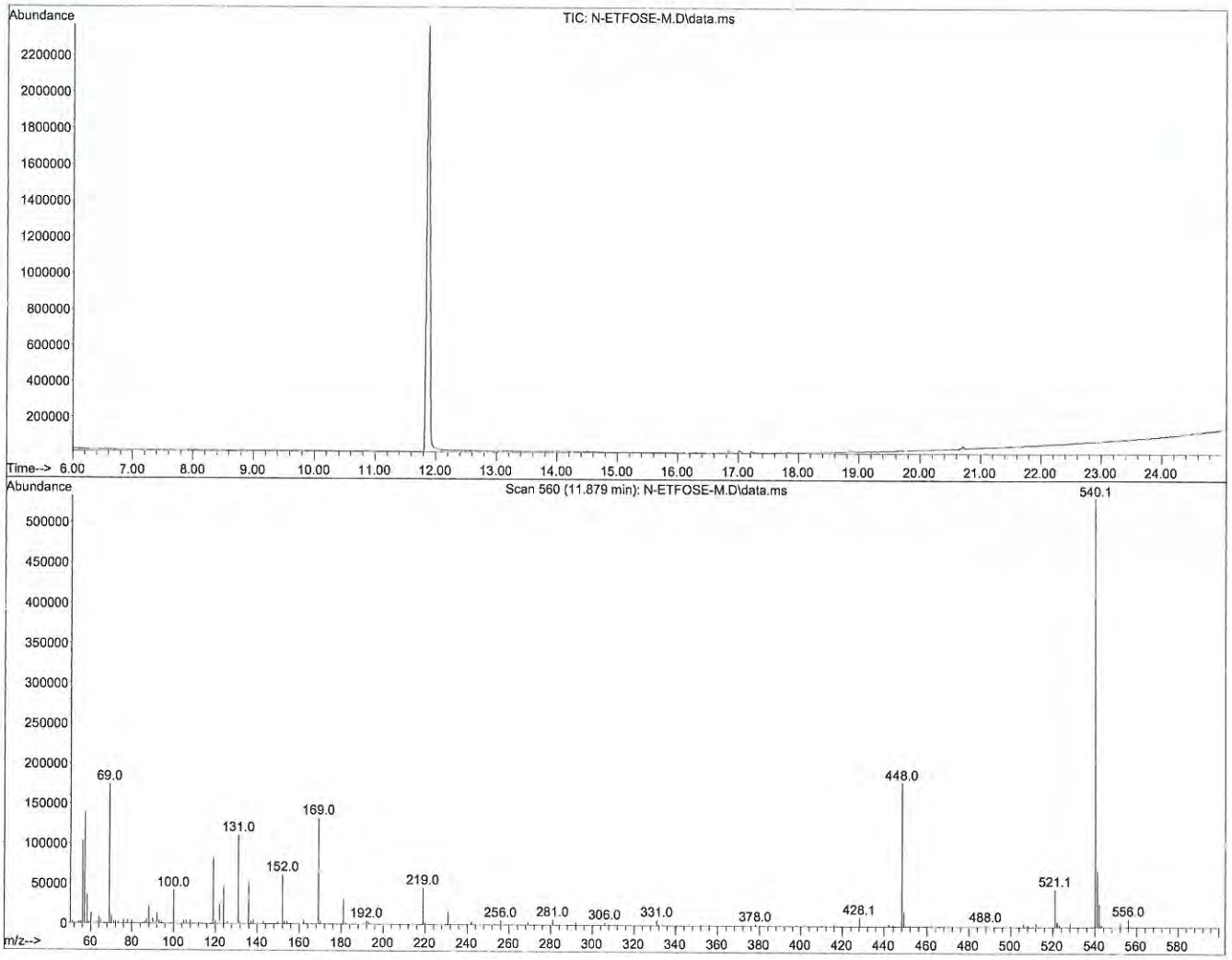
CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18I0765

Figure 1: **N-EtFOSE-M; HRGC/LRMS Data (TIC and Mass Spectrum)**



HRGC/LRMS:

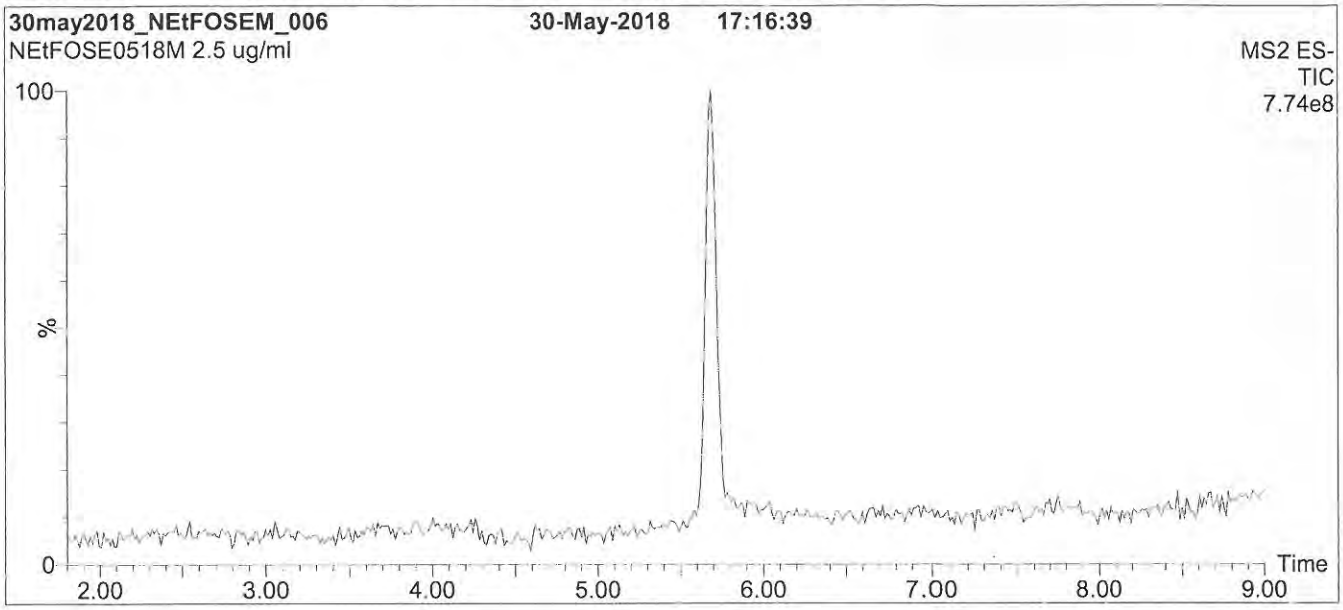
Agilent 7890A (HRGC)
Agilent 5975C (LRMS)

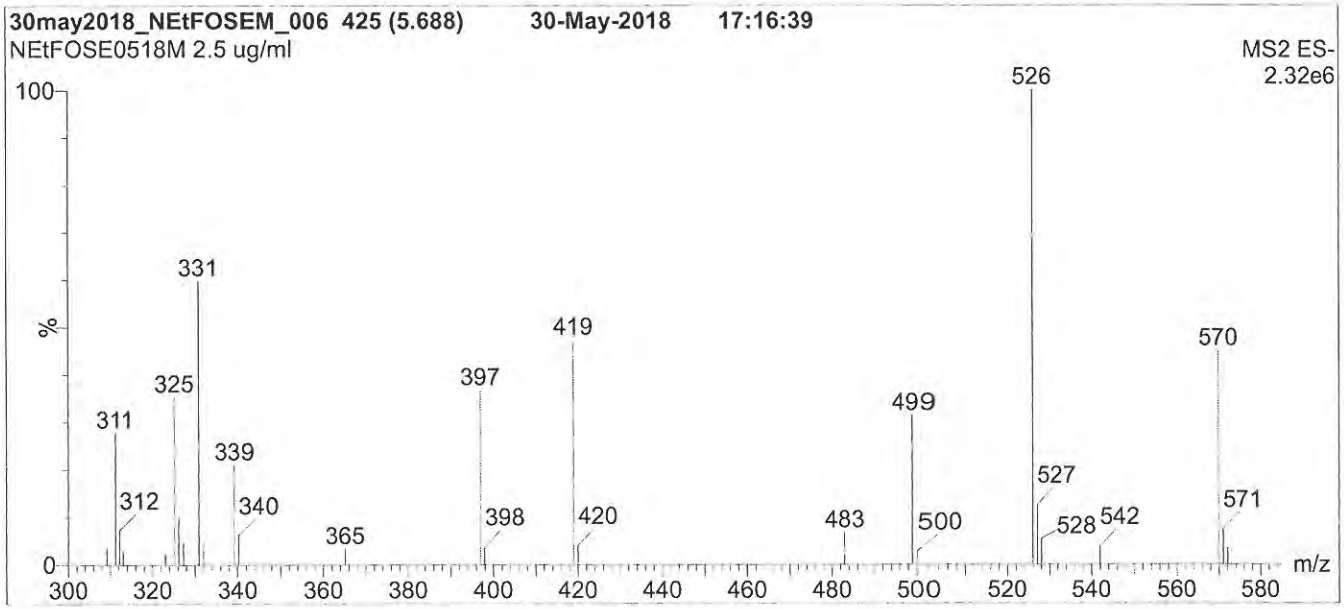
Chromatographic Conditions:

Column:	30 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W
Injector:	250 °C (Splitless Injection)
Oven:	100 °C (5 min) 10 °C/min to 325 °C 325 °C (20 min)
Ionization:	EI+
Detector:	250 °C Full Scan (50-1000 amu)

18I0765

Figure 2: **N-EtFOSE-M; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 2:

LC: **Waters Acquity Ultra Performance LC**
MS: **Waters Xevo TQ-S micro MS**

Chromatographic Conditions

Column: Acquity UPLC BEH C_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 70% MeOH / 30% H_2O
Ramp to 85% organic over 8 min and hold for
2 min before returning to initial conditions in 0.75 min.
Time: 12 min

Flow: 300 µl/min

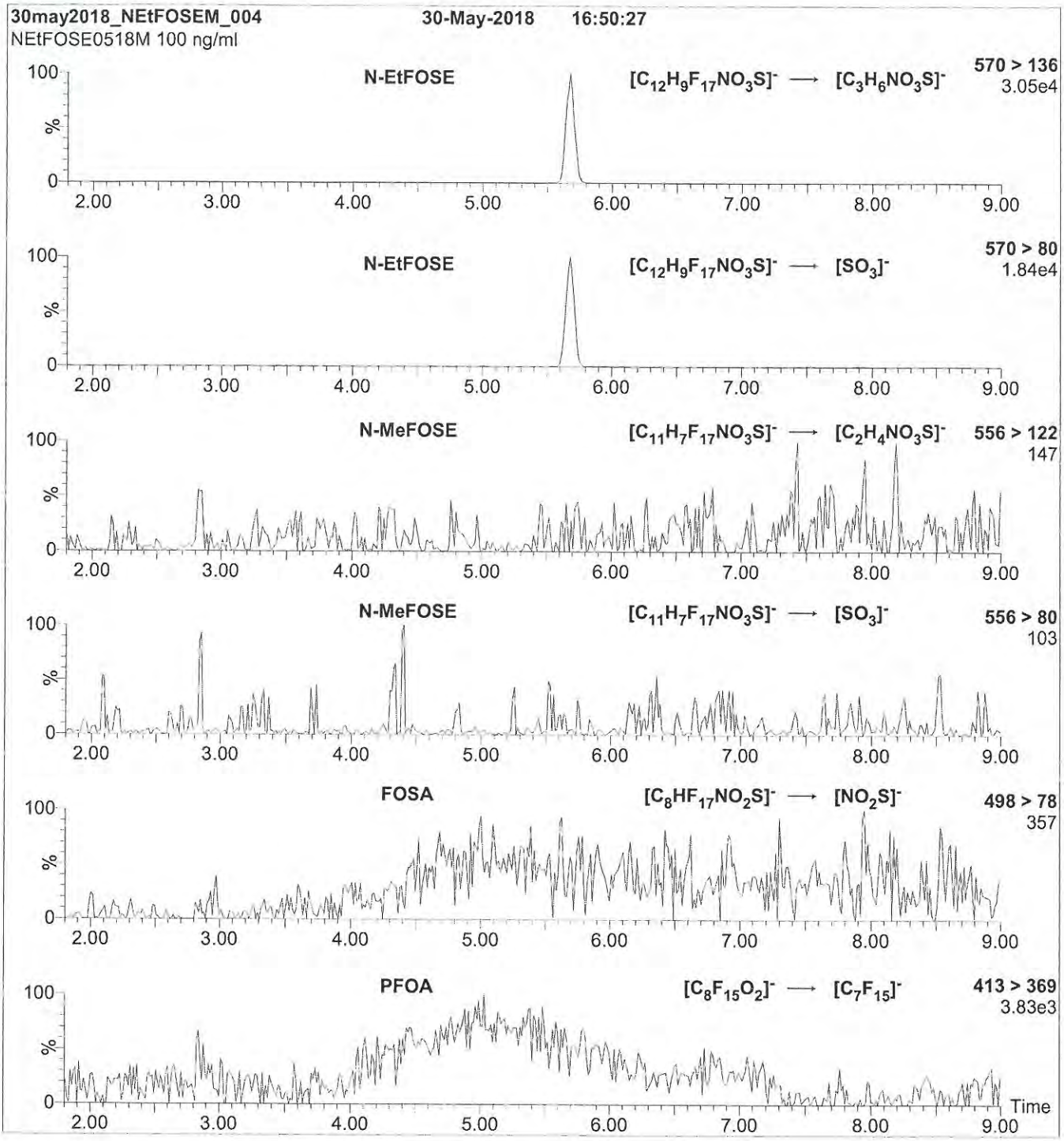
MS Parameters

Experiment: Full Scan (300 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 65.00
Desolvation Temperature (°C) = 450
Desolvation Gas Flow (l/hr) = 750

18I0765

Figure 3: **N-EtFOSE-M; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 3:

Injection: On-column (N-EtFOSE-M)

Mobile phase: Same as Figure 2

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.45e-3
Collision Energy (eV) = 32

Analytical Standard Record

Vista Analytical Laboratory

18J1503

Parent Standards used in this standard:

Standard	Description	Prepared	Prepared By	Expires	(mls)
18F2228	13C2-FOUEA	22-Jun-18	** Vendor **	14-Nov-19	1
18F2229	13C4-PFBA	22-Jun-18	** Vendor **	16-Feb-23	1
18F2230	13C6-PFDA	22-Jun-18	** Vendor **	17-Oct-22	1
18F2231	13C9-PFNA	22-Jun-18	** Vendor **	23-May-22	1
18F2232	13C7-PFUdA	22-Jun-18	** Vendor **	13-Jul-22	1
18F2233	13C5-PFHxA	22-Jun-18	** Vendor **	17-Oct-22	1
18F2234	13C3-PFHxS	22-Jun-18	** Vendor **	05-Jul-22	1.06
18F2235	13C4-PFOS	22-Jun-18	** Vendor **	15-Feb-23	1.05
18F2236	13C8-PFOA	22-Jun-18	** Vendor **	05-Jul-22	1.02

Description:	PFC-RS	Expires:	15-Oct-20
Standard Type:	Reagent	Prepared:	15-Oct-18
Solvent:	MeOH	Prepared By:	Giana R. Bilotta
Final Volume (mls):	40	Department:	LCMS
Vials:	1	Last Edit:	15-Oct-18 08:57 by GRB

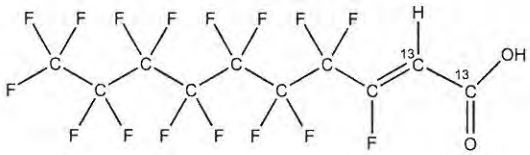
Analyte	CAS Number	Concentration	Units
13C9-PFNA		1.25	ug/mL
13C8-PFOA		1.25	ug/mL
13C7-PFUnA		1.25	ug/mL
13C6-PFDA		1.25	ug/mL
13C5-PFHxA		1.25	ug/mL
13C4-PFOS		1.25	ug/mL
13C4-PFBA		1.25	ug/mL
13C3-PFHxS		1.25	ug/mL
13C2-FOUEA		1.25	ug/mL

18F2228

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MFOUEA	**LOT NUMBER:**	MFOUEA1117
COMPOUND:	2H-Perfluoro-[1,2-$^{13}C_2$]-2-decenoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_2{}^{12}C_8H_2F_{16}O_2$	**MOLECULAR WEIGHT:**	460.08
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Anhydrous Isopropanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2\text{-}^{13}C_2$)
LAST TESTED: (mm/dd/yyyy)	11/14/2017		
EXPIRY DATE: (mm/dd/yyyy)	11/14/2019		
RECOMMENDED STORAGE:	Refrigerate ampoule		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Dilution of this standard in methanol may lead to the formation of 2H-3-methoxy-perfluoro-[1,2-$^{13}C_2$]-2-decenoic acid. This reaction can be catalyzed by the presence of acid or base. All dilutions should be routinely checked for degradation.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/15/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2228

INTENDED USE:

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HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

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QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

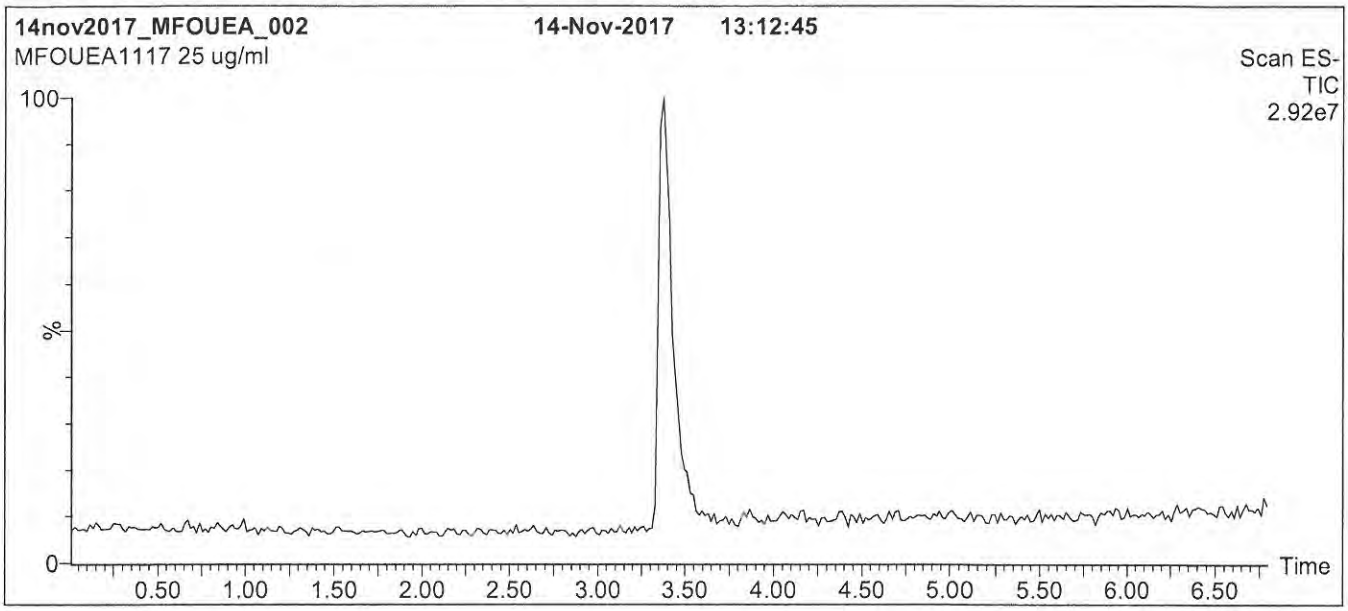
CALA

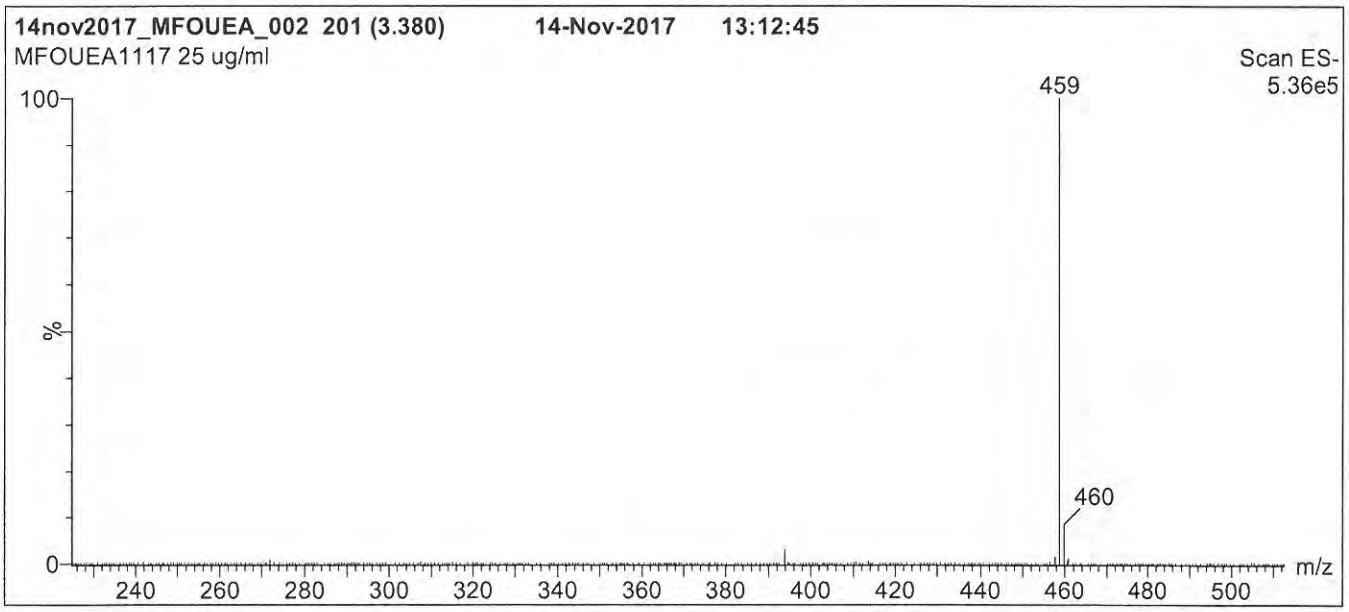
ANAB ACCREDITED

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2228

Figure 1: **MFOUEA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold
for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

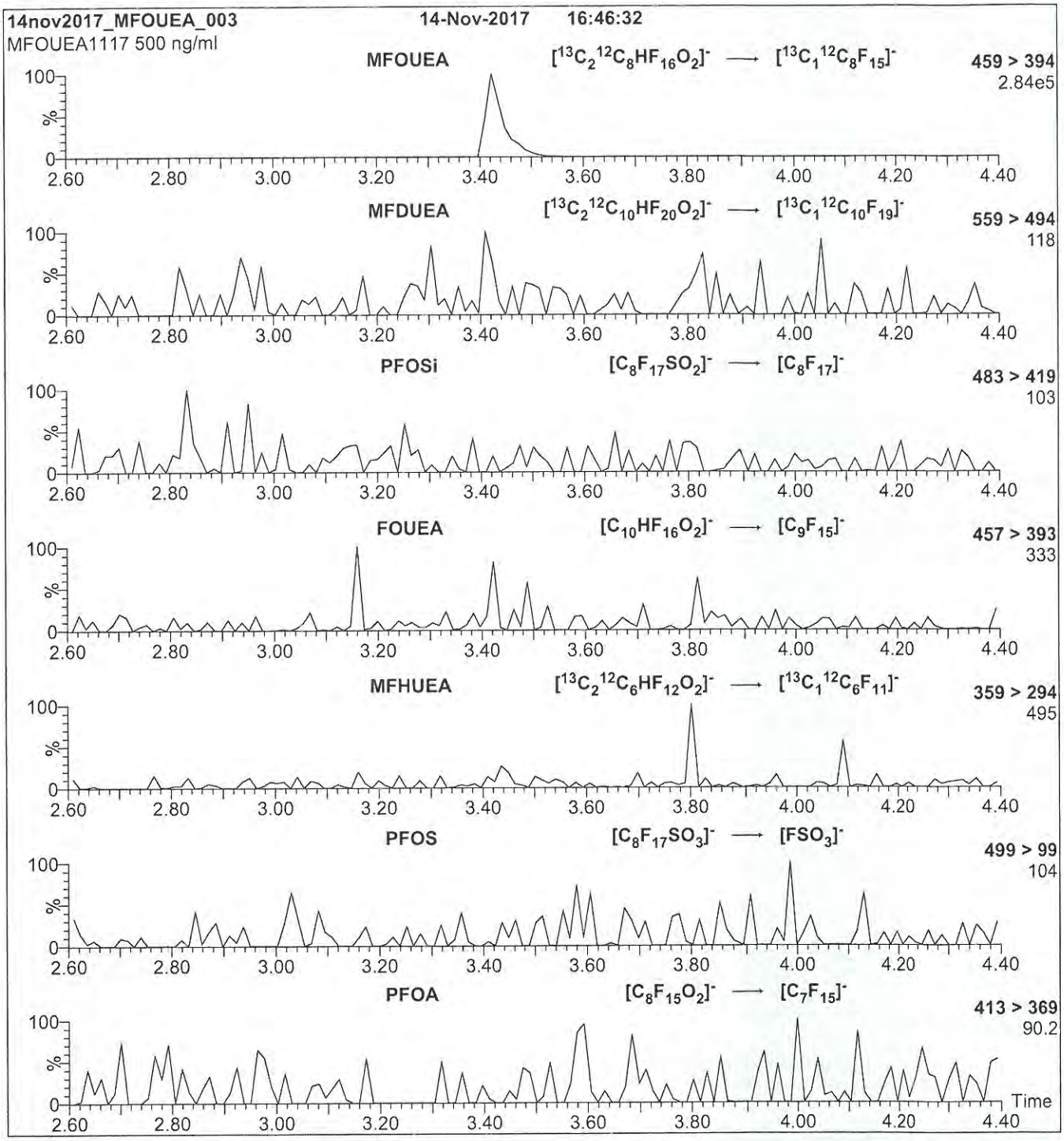
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 14.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

18F2228

Figure 2: **MFOUEA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MFOUEA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

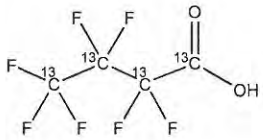
Collision Gas (mbar) = 3.39e-3
Collision Energy (eV) = 21

18F2229

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	MPFBA	**LOT NUMBER:**	MPFBA0218
COMPOUND:	Perfluoro-n-[1,2,3,4-$^{13}C_4$]butanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_4HF_7O_2$	**MOLECULAR WEIGHT:**	218.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	02/16/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/16/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/22/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2229

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CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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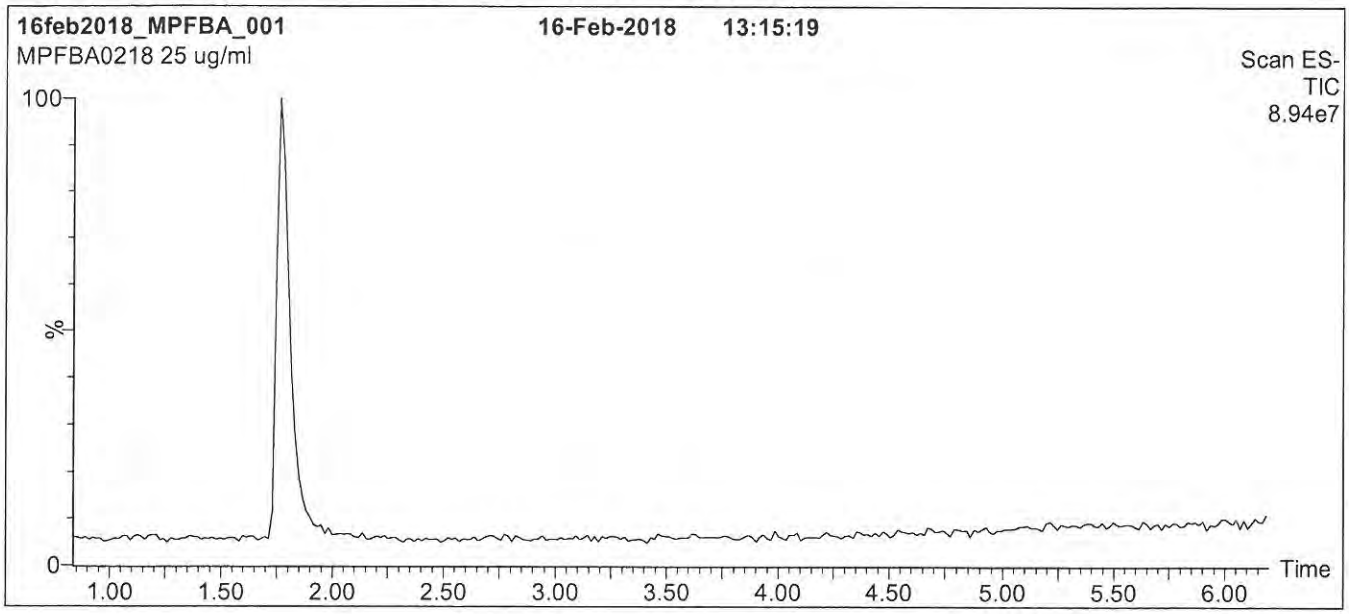
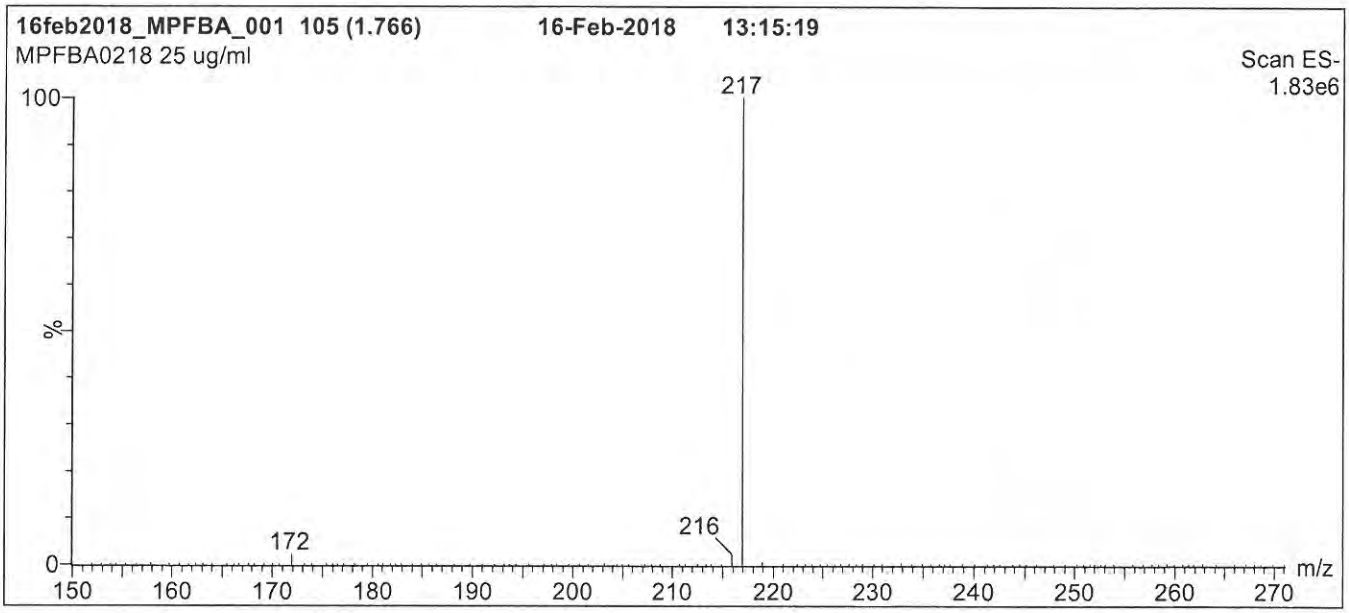
18F2229

Figure 1: **MPFBA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 30% (80:20 MeOH:ACN) / 70% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

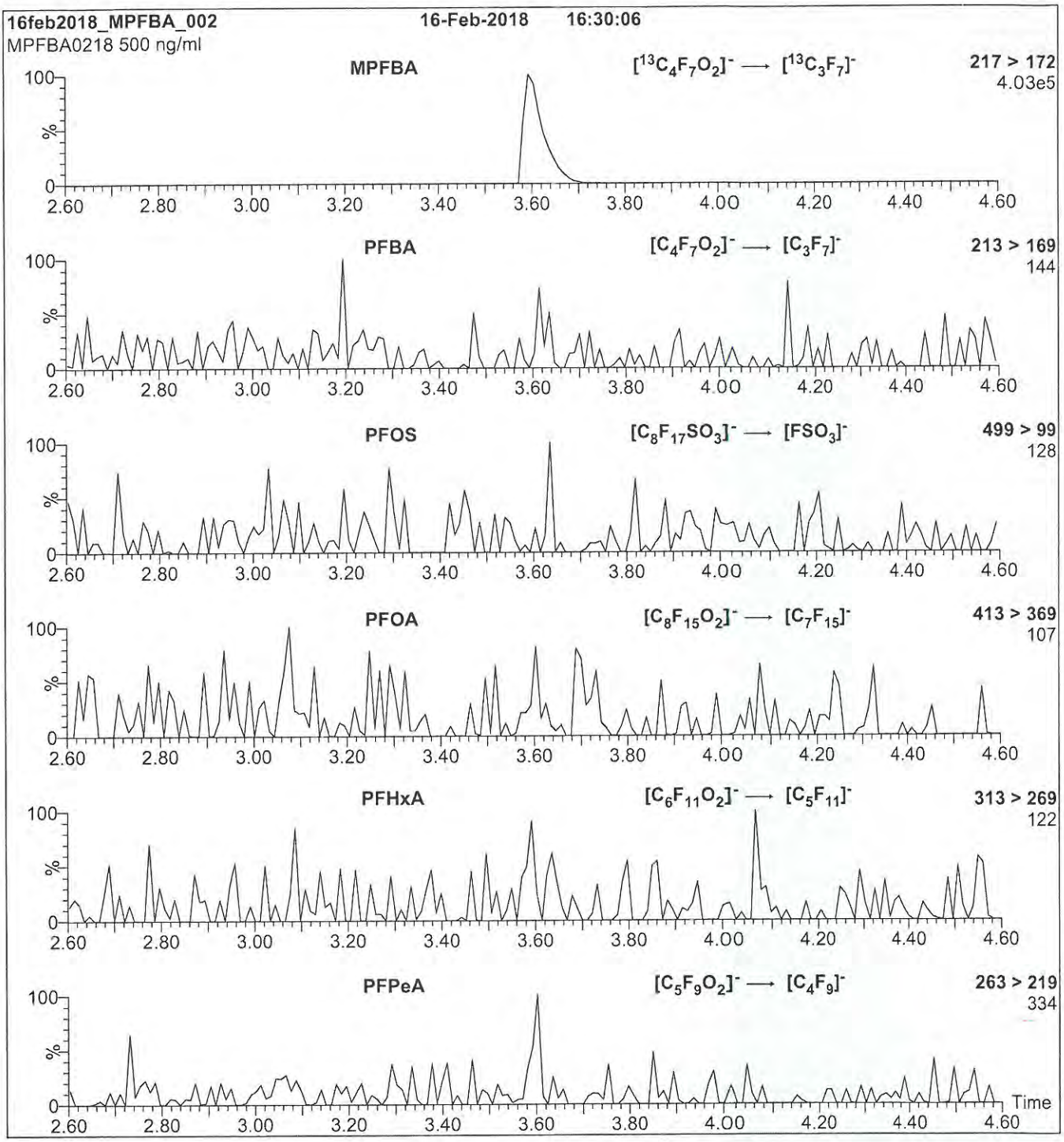
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 10.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18F2229

Figure 2: **MPFBA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFBA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 10

18F2230

WELLINGTON LABORATORIES

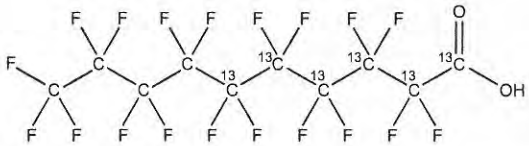
CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: M6PFDA
COMPOUND: Perfluoro-n-[1,2,3,4,5,6-$^{13}C_6$]decanoic acid

LOT NUMBER: M6PFDA1017

STRUCTURE:

CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_6{}^{12}C_4HF_{19}O_2$	**MOLECULAR WEIGHT:**	520.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4,5,6$-$^{13}C_6$)
LAST TESTED: (mm/dd/yyyy)	10/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/17/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/20/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2230

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products are compared to older lots in the same manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

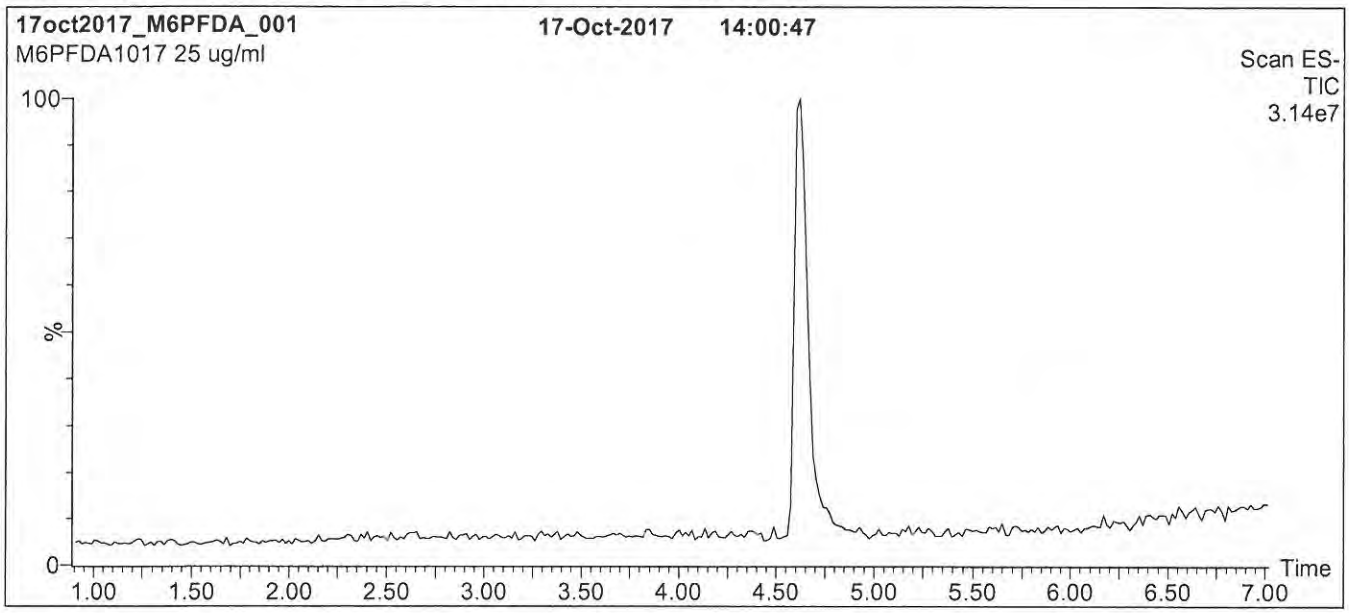
CALA

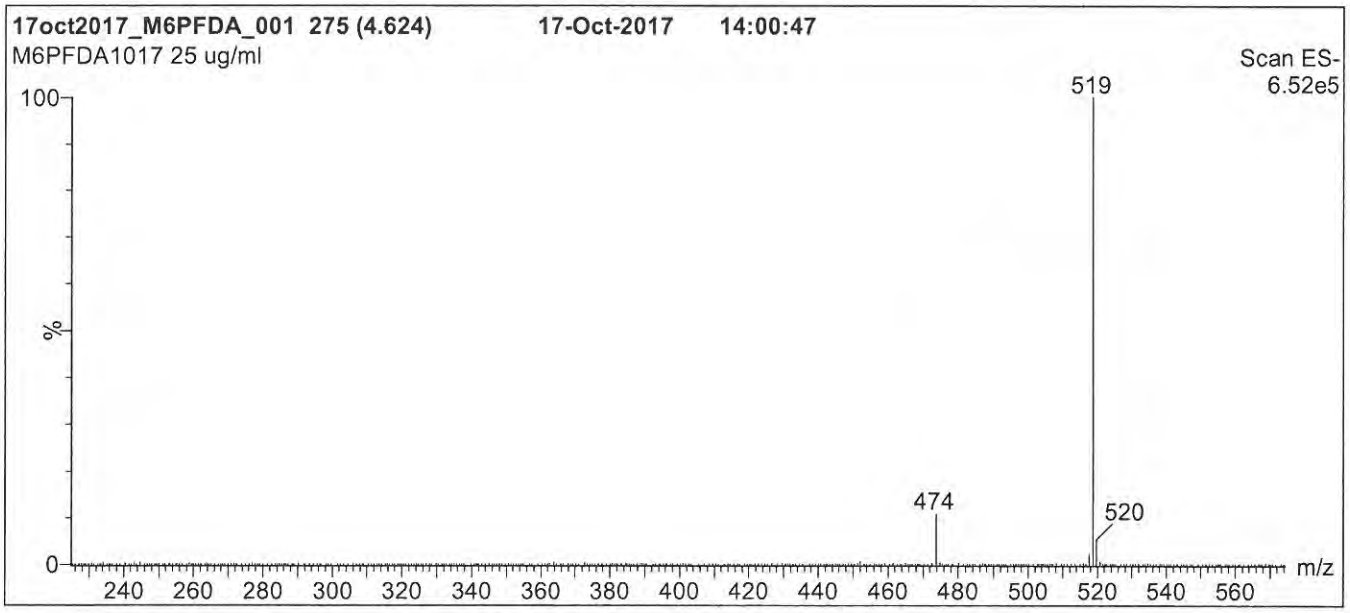
ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2230

Figure 1: **M6PFDA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

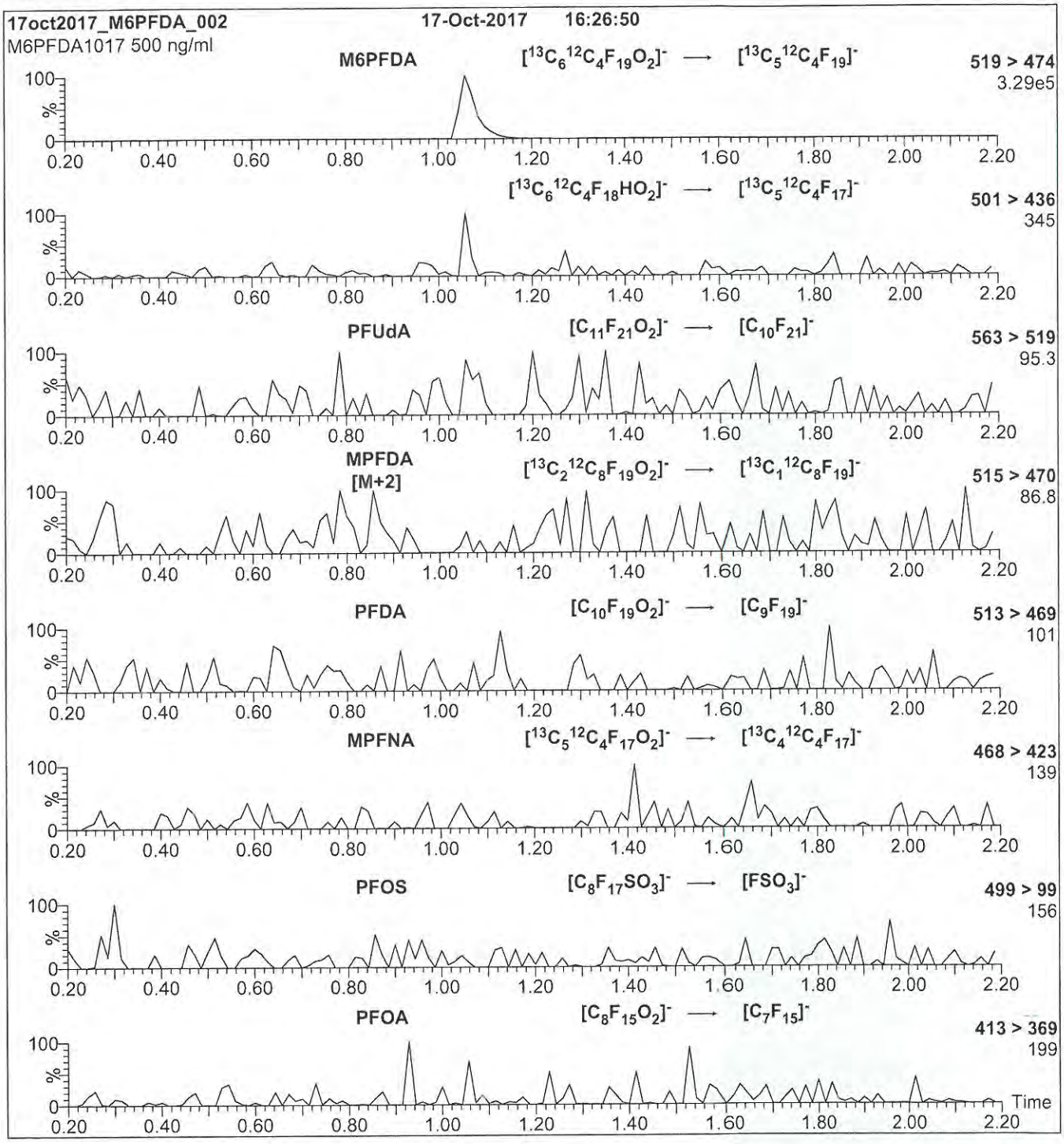
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2230

Figure 2: **M6PFDA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M6PFDA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

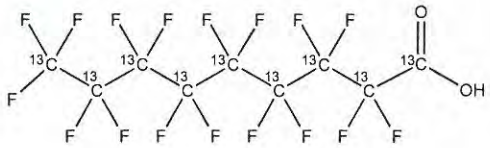
Collision Gas (mbar) = 3.24e-3
Collision Energy (eV) = 13

18F2231

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M9PFNA	**LOT NUMBER:**	M9PFNA0517
COMPOUND:	Perfluoro-n-[$^{13}C_9$]nonanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_9HF_{17}O_2$	**MOLECULAR WEIGHT:**	473.01
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_9$)
LAST TESTED: (mm/dd/yyyy)	05/23/2017		
EXPIRY DATE: (mm/dd/yyyy)	05/23/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains ~ 0.9% of $^{13}C_5{}^{12}C_4HF_{17}O_2$ (MPFNA).

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/25/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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INTENDED USE:

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SYNTHESIS / CHARACTERIZATION:

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HOMOGENEITY:

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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

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EXPIRY DATE / PERIOD OF VALIDITY:

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CALA

ANAB ACCREDITED

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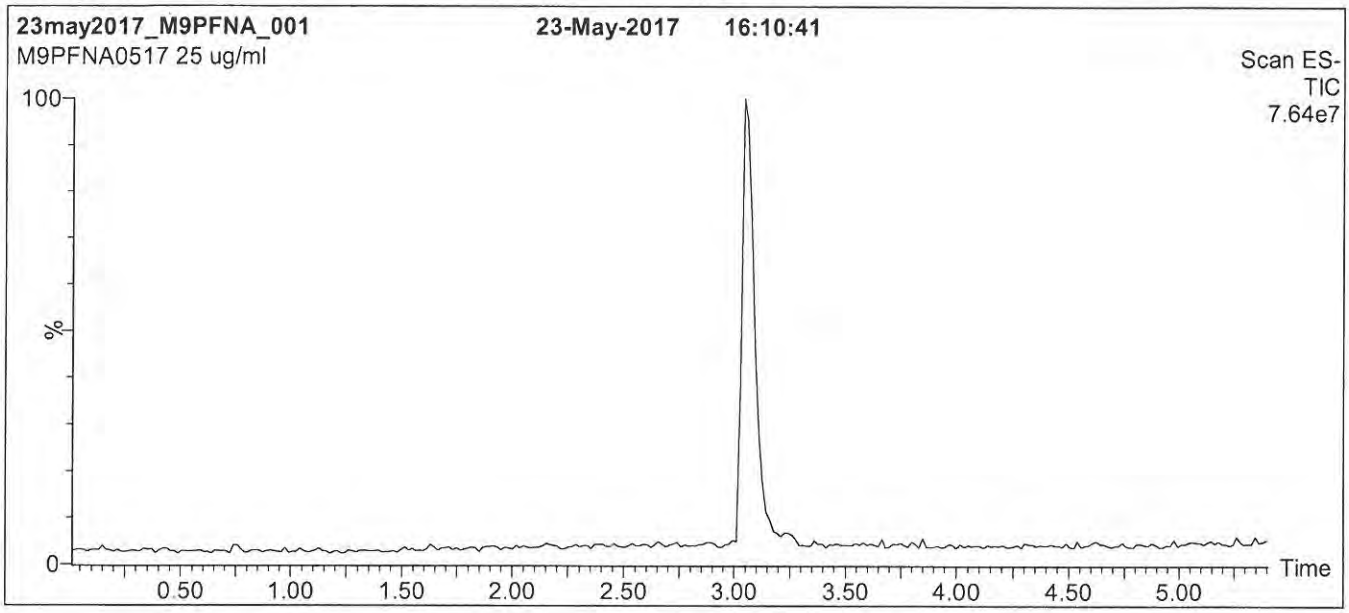
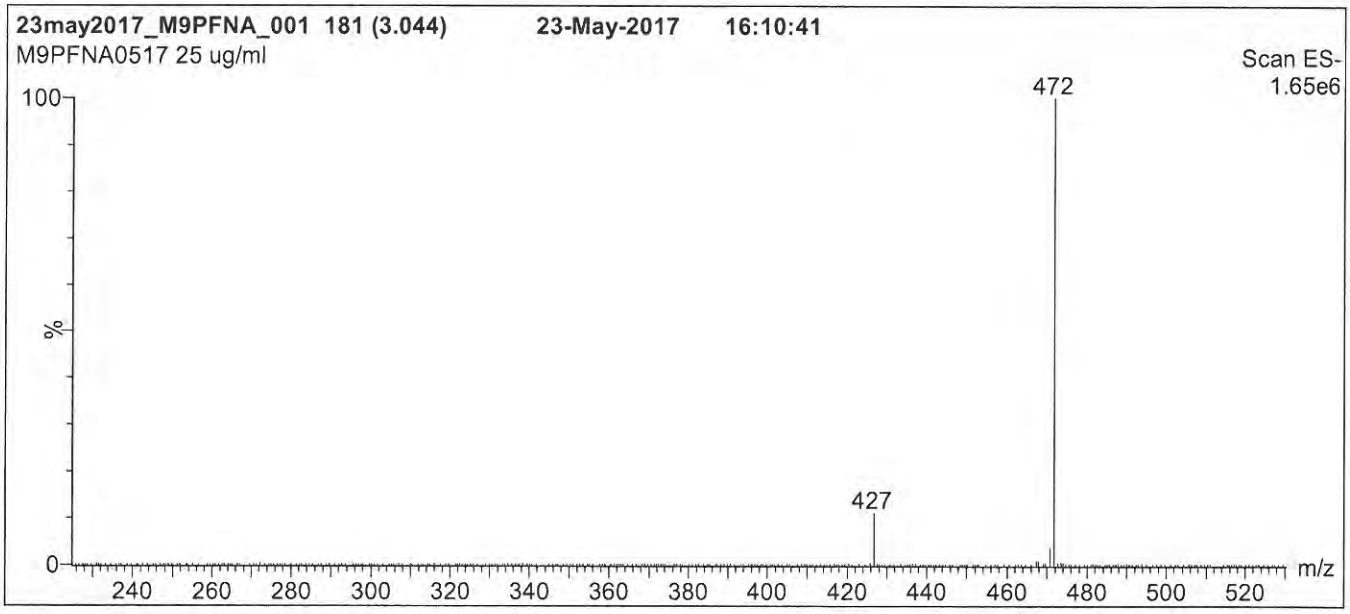
18F2231

Figure 1: **M9PFNA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 60% (80:20 MeOH:ACN) / 40% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 1.5 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

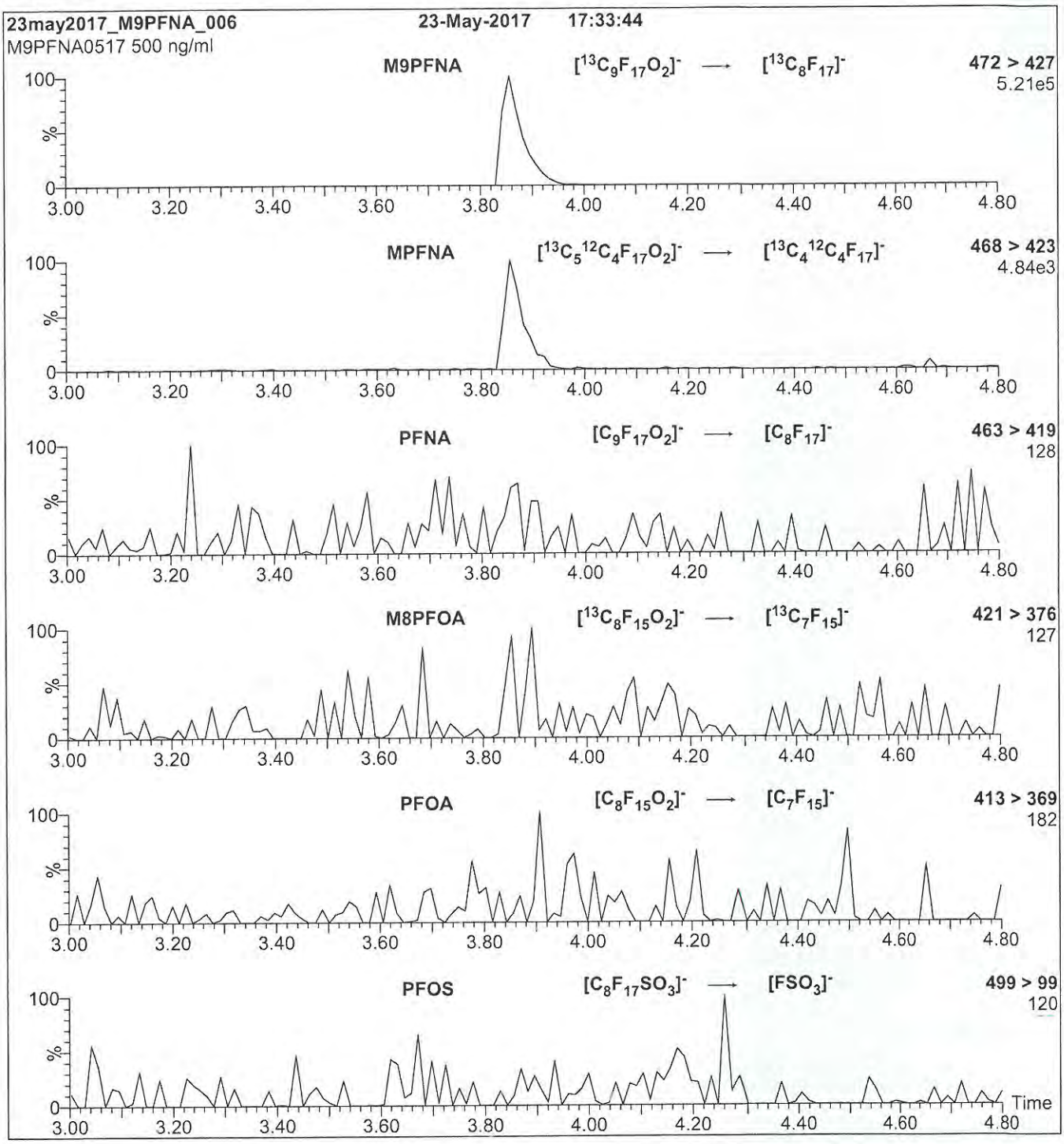
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2231

Figure 2: **M9PFNA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M9PFNA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

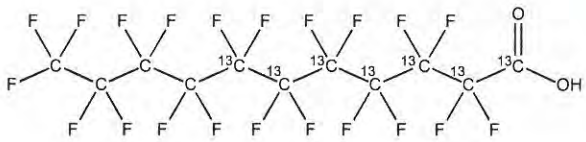
Collision Gas (mbar) = 3.20e-3
Collision Energy (eV) = 11

18F2232

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M7PFUdA	**LOT NUMBER:**	M7PFUdA0717
COMPOUND:	Perfluoro-n-[1,2,3,4,5,6,7-$^{13}C_7$]undecanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_7{}^{12}C_4HF_{21}O_2$	**MOLECULAR WEIGHT:**	571.04
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,5,6,7-$^{13}C_7$)
LAST TESTED: (mm/dd/yyyy)	07/13/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/13/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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CALA

ANAB ACCREDITED

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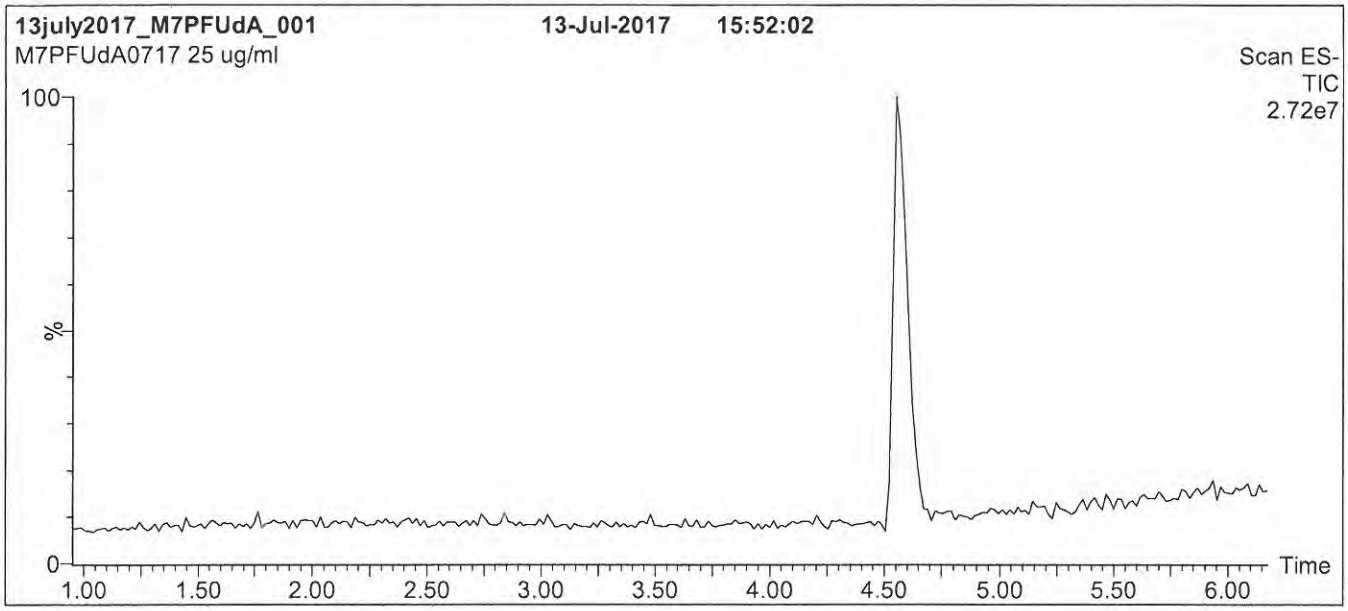
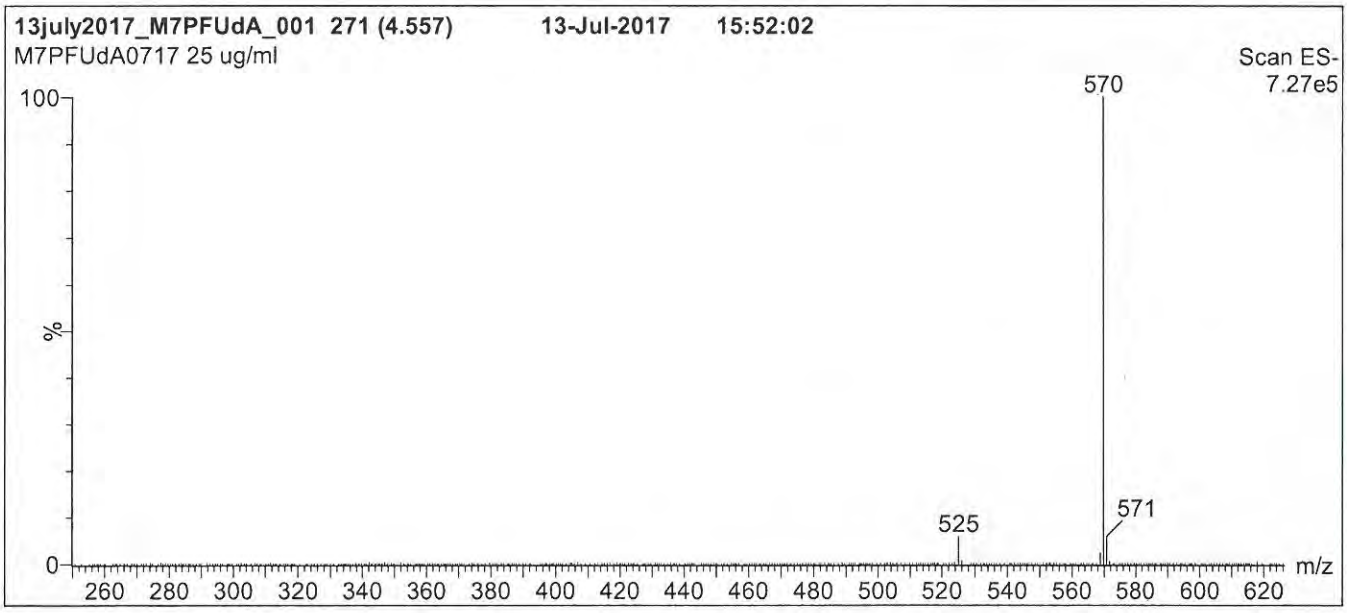
18F2232

Figure 1: **M7PFUdA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

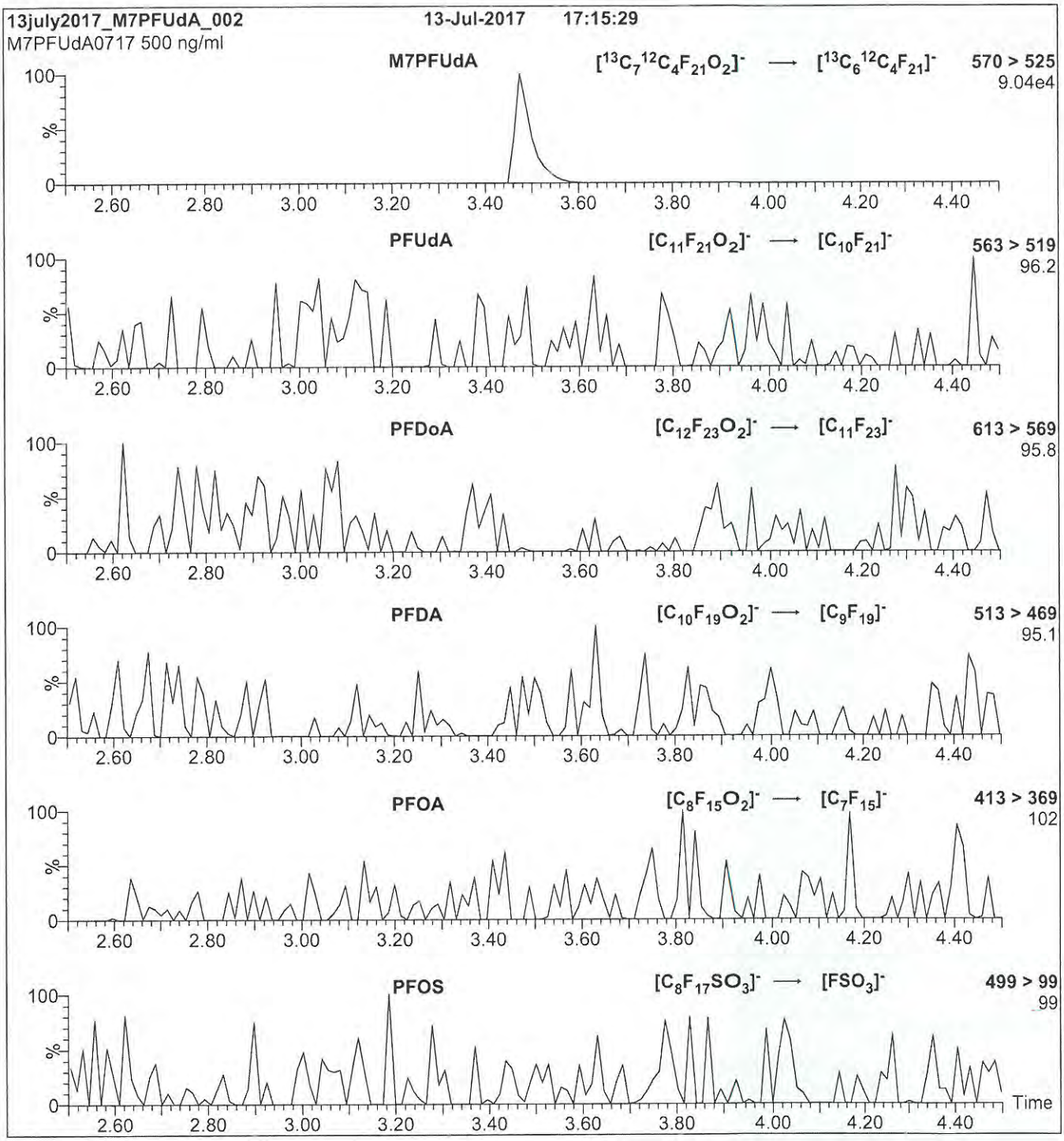
MS Parameters

Experiment: Full Scan (250 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 65
Desolvation Gas Flow (l/hr) = 750

18F2232

Figure 2: **M7PFUdA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M7PFUdA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

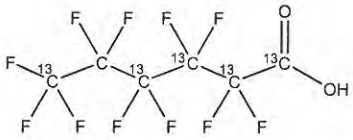
Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 11

18F2233

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M5PFHxA	**LOT NUMBER:**	M5PFHxA1017
COMPOUND:	Perfluoro-n-[1,2,3,4,6-$^{13}C_5$]hexanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_5{}^{12}C_1HF_{11}O_2$	**MOLECULAR WEIGHT:**	319.02
CONCENTRATION:	50 ± 2.5 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C (1,2,3,4,6-$^{13}C_5$)
LAST TESTED: (mm/dd/yyyy)	10/17/2017		
EXPIRY DATE: (mm/dd/yyyy)	10/17/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 10/18/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

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18F2233

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compound it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

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UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA

ANAB ACCREDITED

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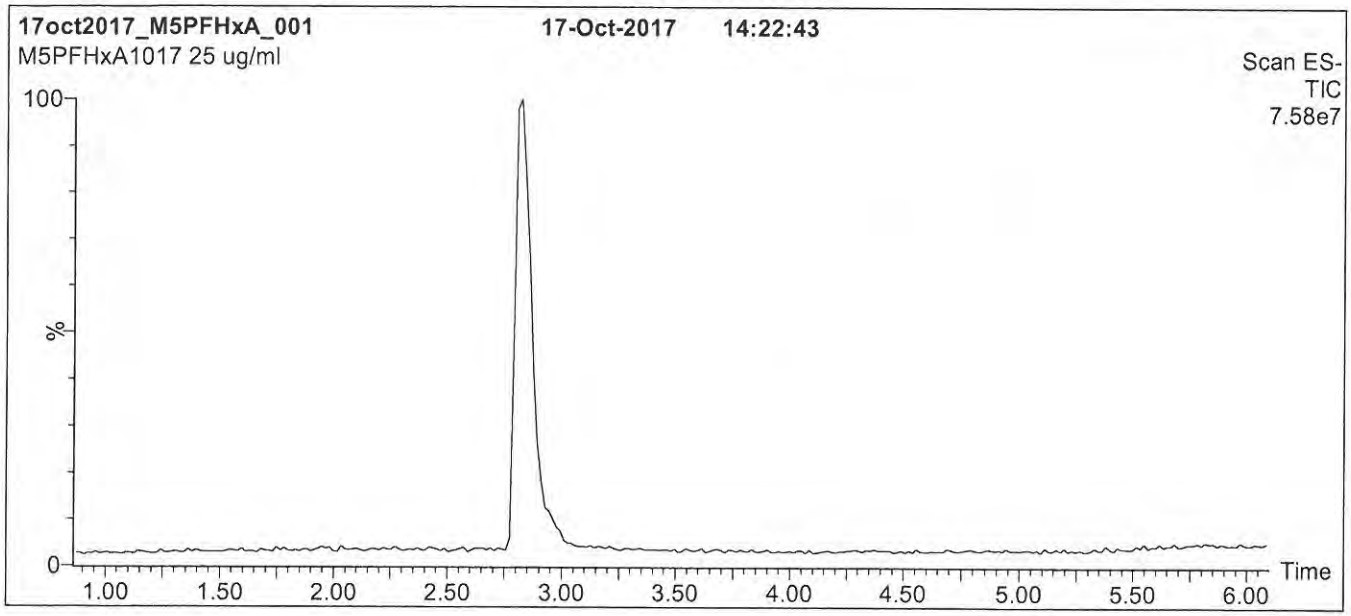
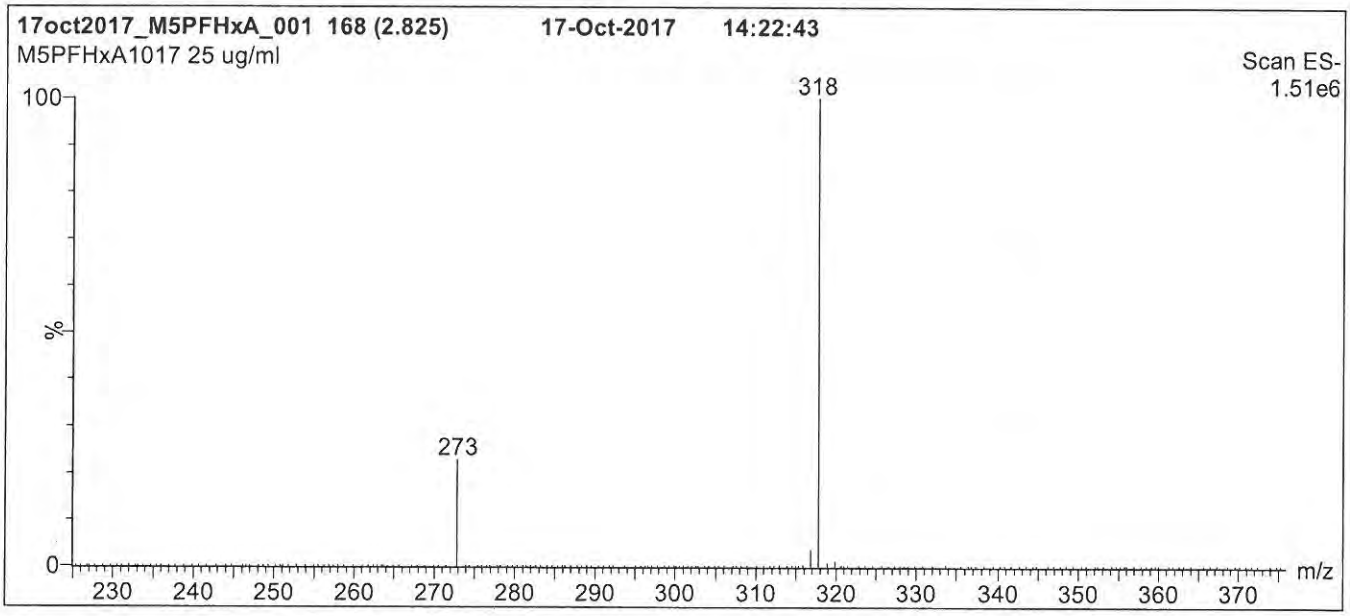
18F2233

Figure 1: **M5PFHxA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 40% (80:20 MeOH:ACN) / 60% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

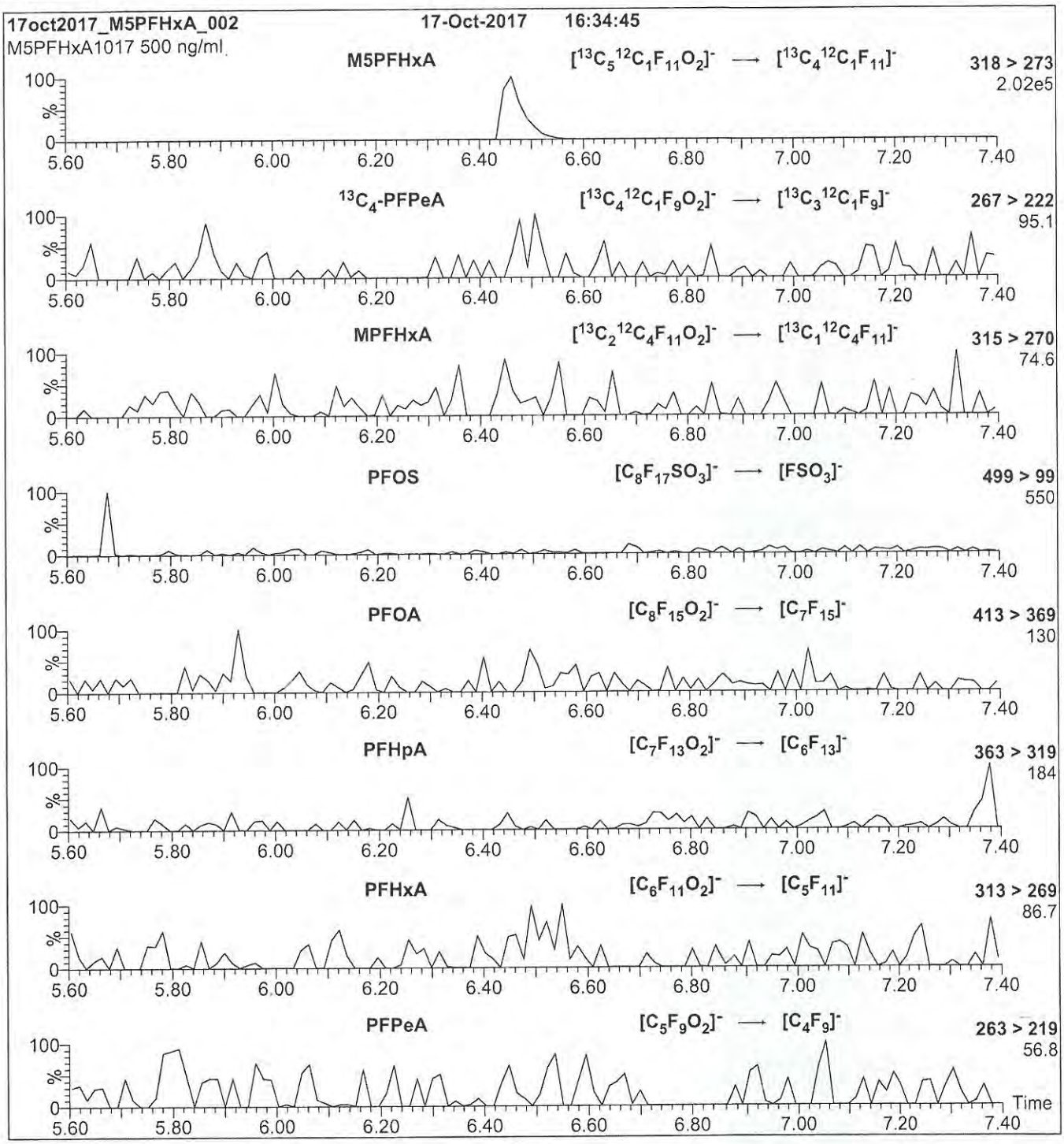
MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 2.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

18F2233

Figure 2: **M5PFHxA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M5PFHxA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.31e-3
Collision Energy (eV) = 9

18F2234

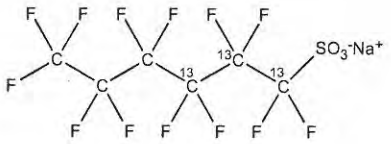
WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

PRODUCT CODE: M3PFHxS **LOT NUMBER:** M3PFHxS0717

COMPOUND: Sodium perfluoro-1-[1,2,3-$^{13}C_3$]hexanesulfonate

STRUCTURE: **CAS #:** Not available



MOLECULAR FORMULA:	$^{13}C_3{}^{12}C_3F_{13}SO_3Na$	**MOLECULAR WEIGHT:**	425.07
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.3 ± 2.4 µg/ml (M3PFHxS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3\text{-}^{13}C_3$)
LAST TESTED: (mm/dd/yyyy)	07/05/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/05/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2234

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CALA Testing

ANAB ACCREDITED

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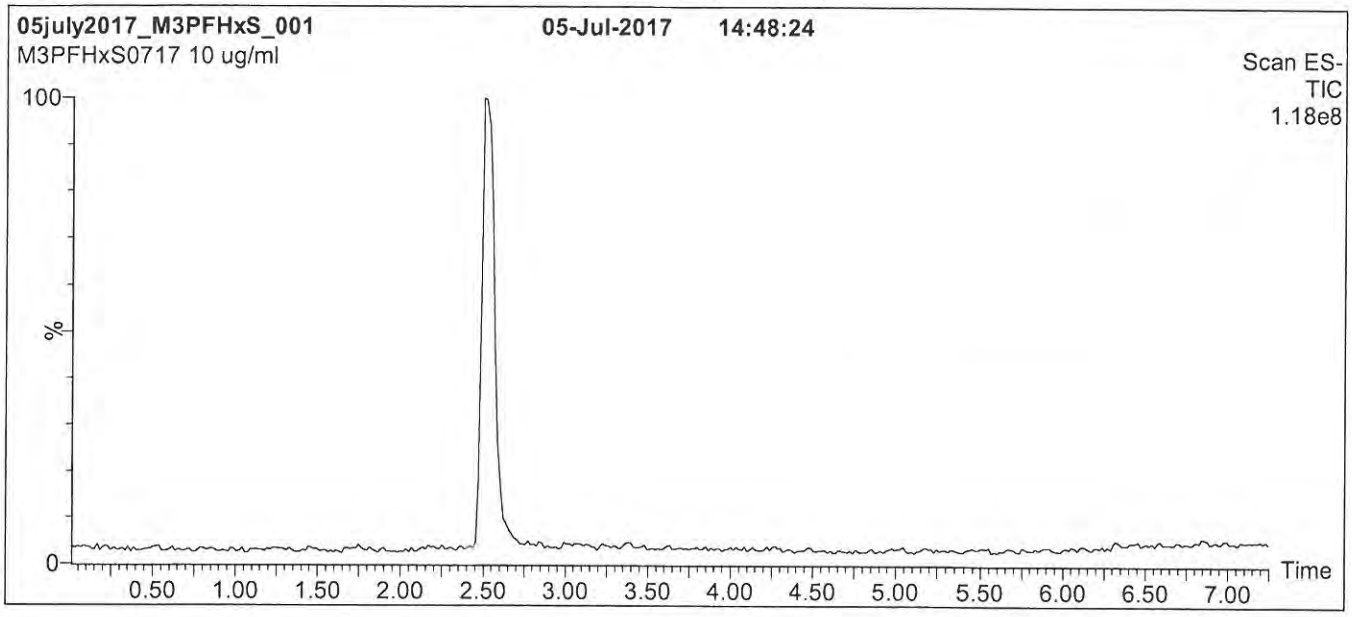
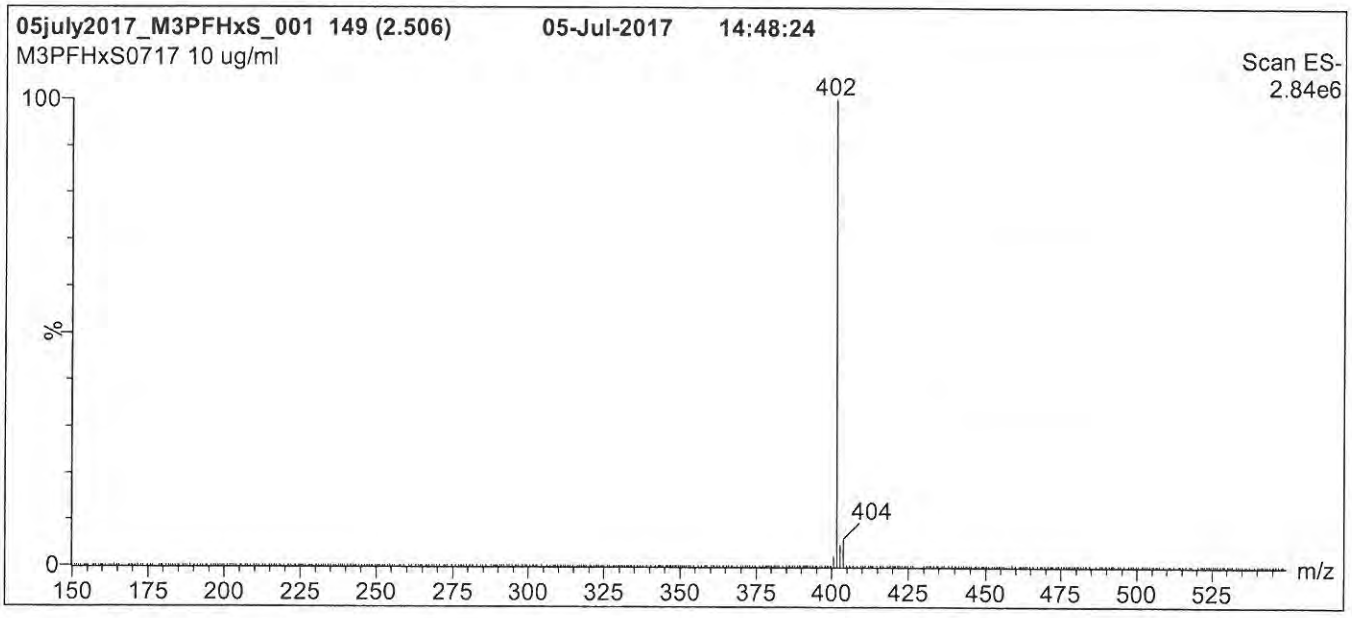
18F2234

Figure 1: **M3PFHxS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for
1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

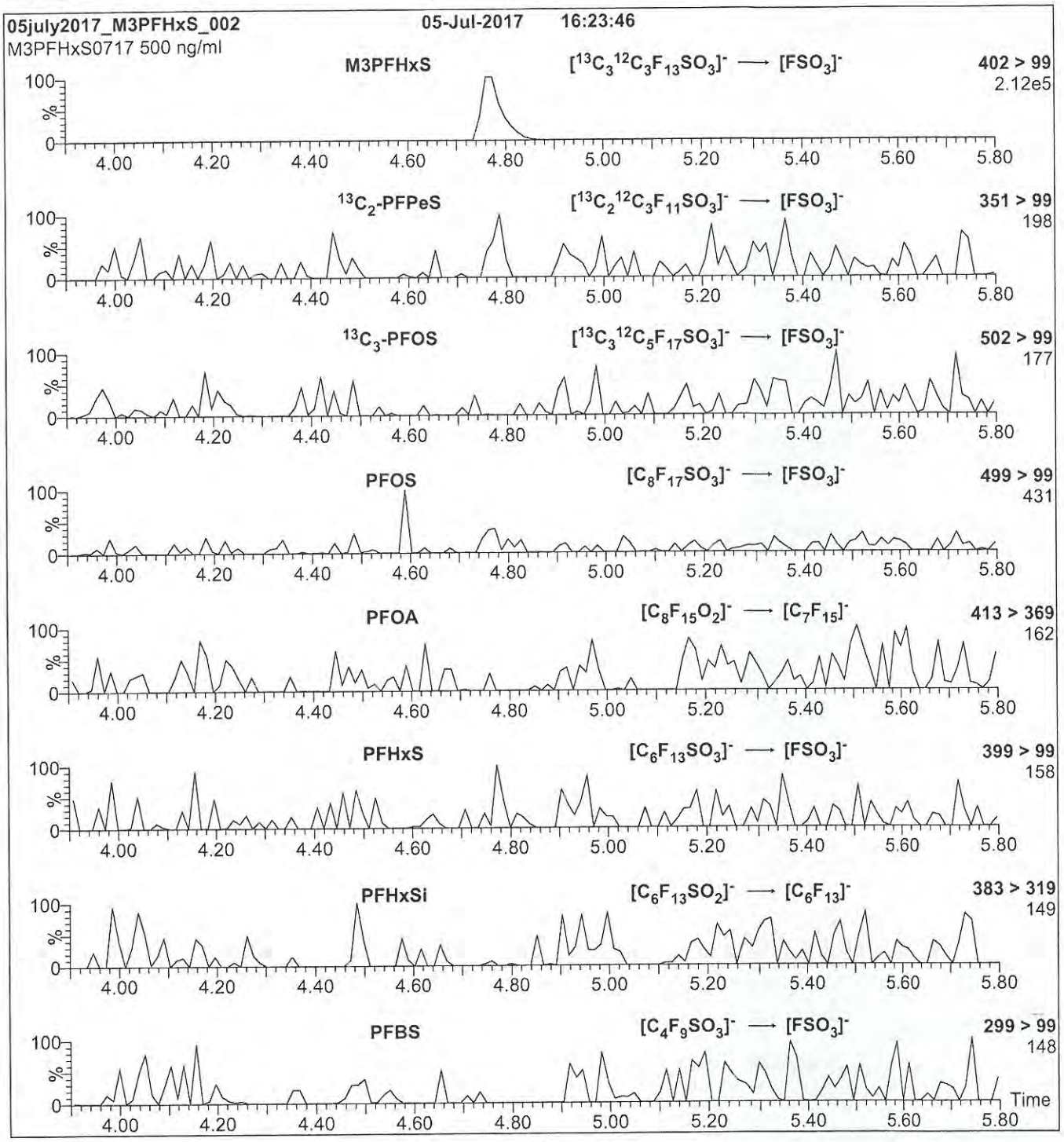
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 50.00
Cone Gas Flow (l/hr) = 60
Desolvation Gas Flow (l/hr) = 750

18F2234

Figure 2: **M3PFHxS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M3PFHxS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.43e-3
Collision Energy (eV) = 30

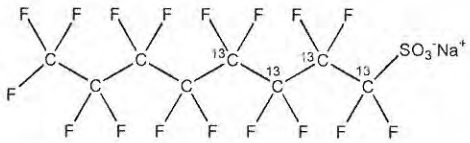
18F2235

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE: MPFOS
LOT NUMBER: MPFOS0218
COMPOUND: Sodium perfluoro-1-[1,2,3,4-$^{13}C_4$]octanesulfonate

STRUCTURE:
CAS #: Not available



MOLECULAR FORMULA:	$^{13}C_4{}^{12}C_4F_{17}SO_3Na$	**MOLECULAR WEIGHT:**	526.08
CONCENTRATION:	50.0 ± 2.5 µg/ml (Na salt) 47.8 ± 2.4 µg/ml (MPFOS anion)	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%	**ISOTOPIC PURITY:**	≥99% ^{13}C ($1,2,3,4$-$^{13}C_4$)
LAST TESTED: (mm/dd/yyyy)	02/15/2018		
EXPIRY DATE: (mm/dd/yyyy)	02/15/2023		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.6% Sodium perfluoro-1-[1,2,3-$^{13}C_3$]heptanesulfonate.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 02/20/2018 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

18F2235

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CALA

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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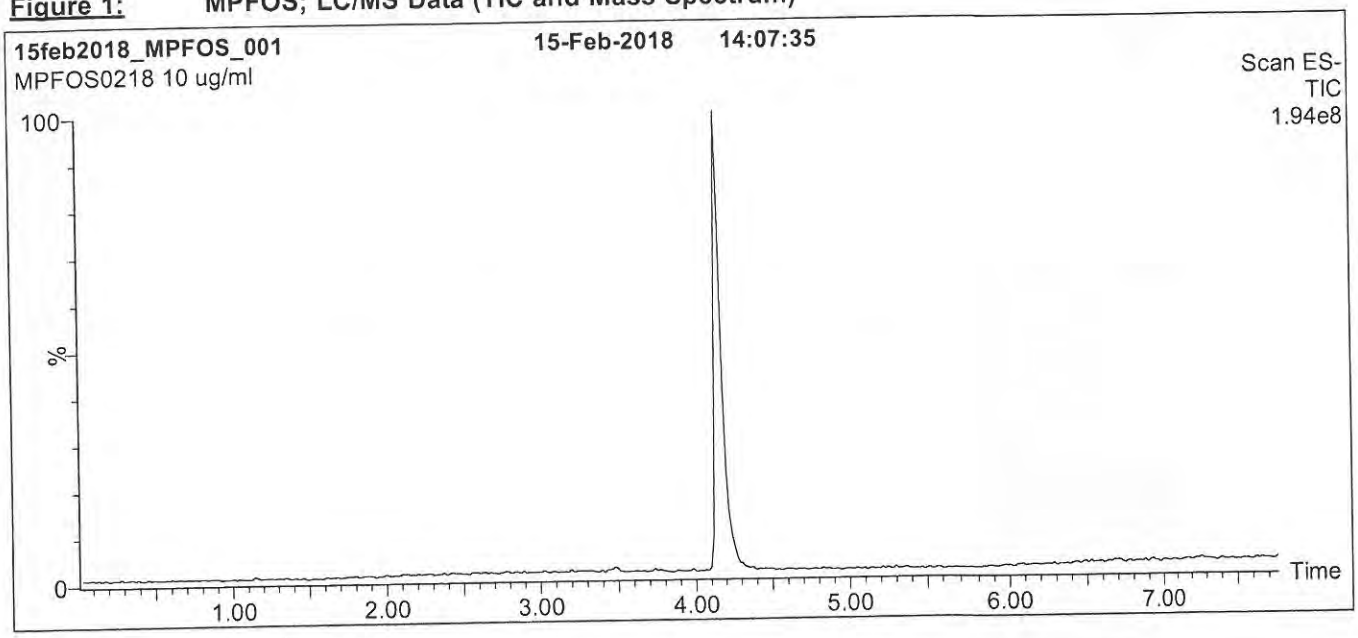
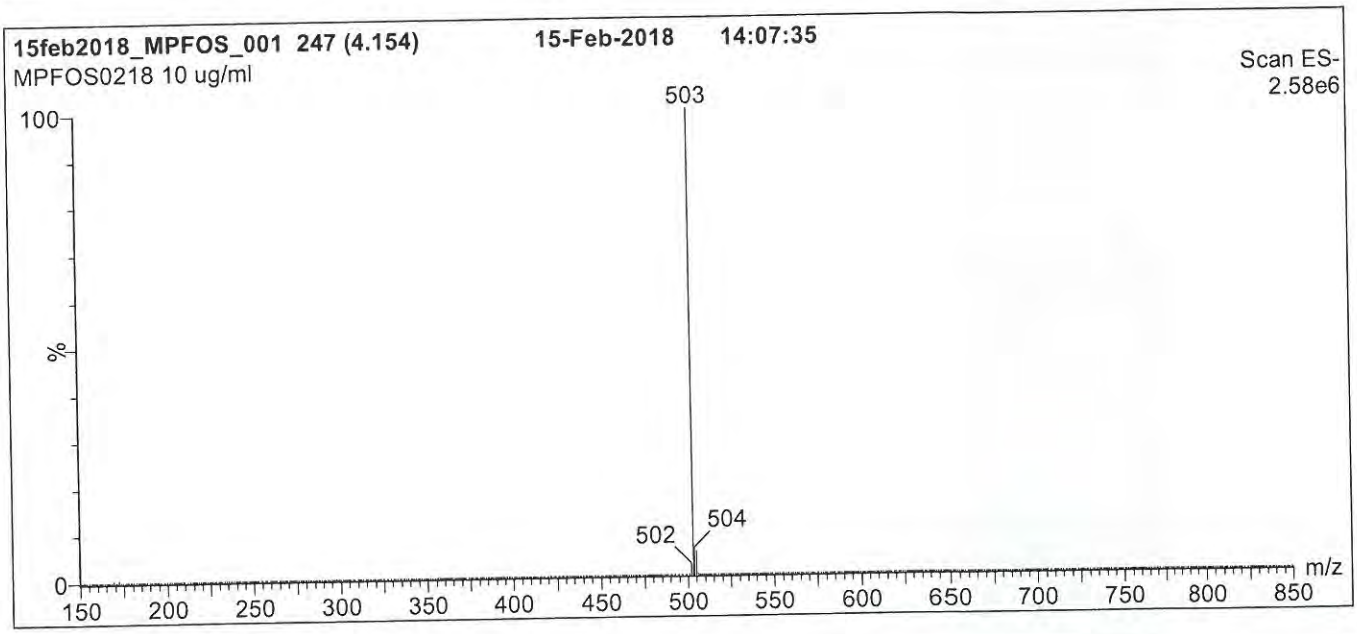
18F2235

Figure 1: **MPFOS; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 50% (80:20 MeOH:ACN) / 50% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7 min and hold for 2 min
before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

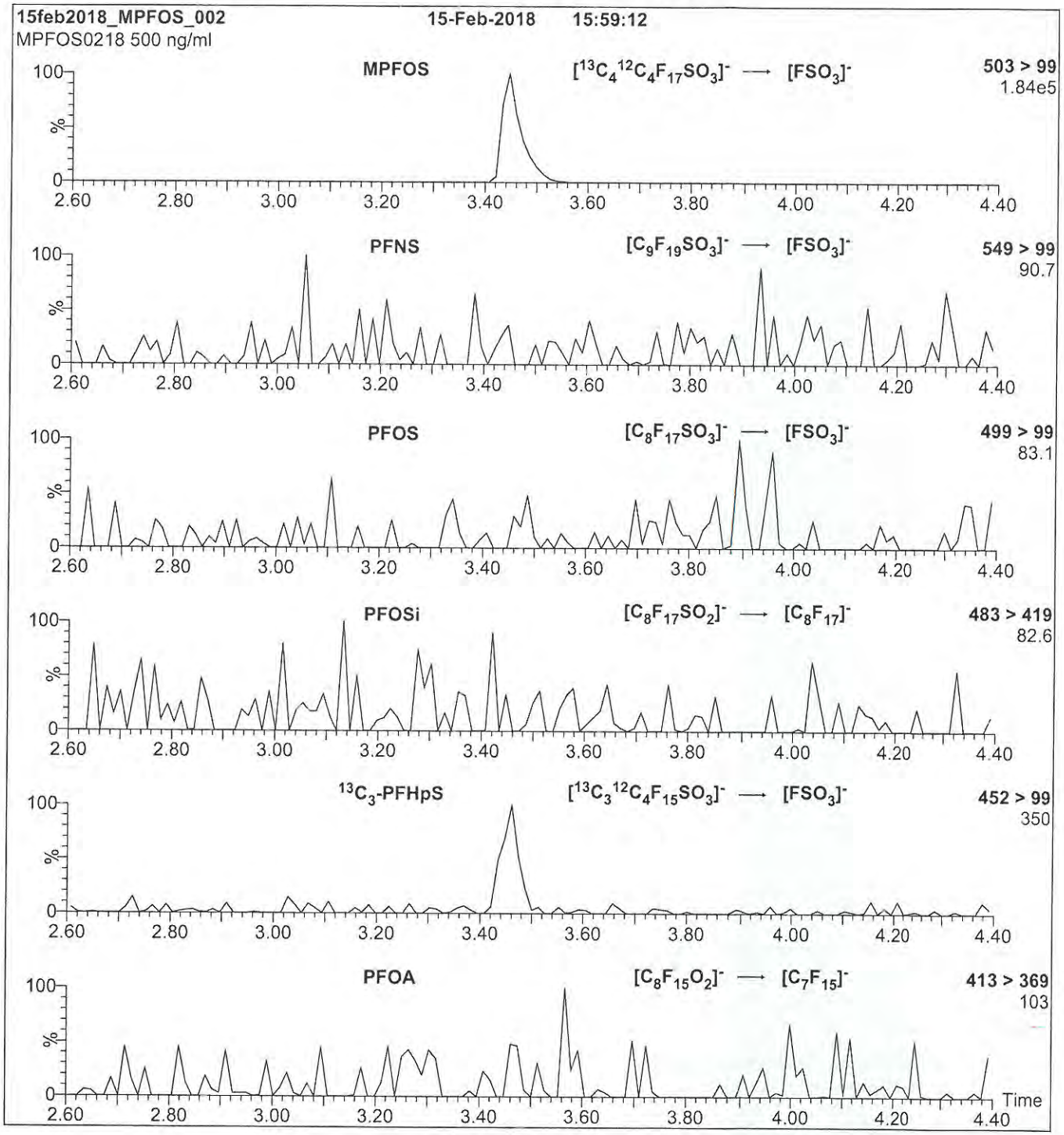
MS Parameters

Experiment: Full Scan (150 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 60.00
Cone Gas Flow (l/hr) = 50
Desolvation Gas Flow (l/hr) = 750

18F2235

Figure 2: **MPFOS; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml MPFOS)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

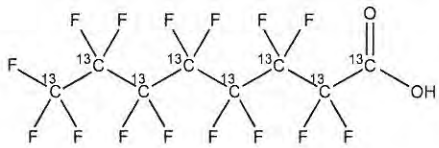
Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 40

18F2236

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

PRODUCT CODE:	M8PFOA	**LOT NUMBER:**	M8PFOA0717
COMPOUND:	Perfluoro-n-[$^{13}C_8$]octanoic acid		
STRUCTURE:		**CAS #:**	Not available



MOLECULAR FORMULA:	$^{13}C_8HF_{15}O_2$	**MOLECULAR WEIGHT:**	422.01
CONCENTRATION:	49 ± 2.45 µg/ml	**SOLVENT(S):**	Methanol Water (<1%)
CHEMICAL PURITY:	97.9% (M8PFOA) 2.1% (MPFOA [M+4])	**ISOTOPIC PURITY:**	≥99% ^{13}C ($^{13}C_8$)
LAST TESTED: (mm/dd/yyyy)	07/05/2017		
EXPIRY DATE: (mm/dd/yyyy)	07/05/2022		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (TIC and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.
- Contains < 0.1% of native perfluoro-n-octanoic acid (PFOA) and ~ 2.1% of [M+4] perfluoro-n-octanoic acid.

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Certified By: _____ **Date:** 07/14/2017 (mm/dd/yyyy)
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$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

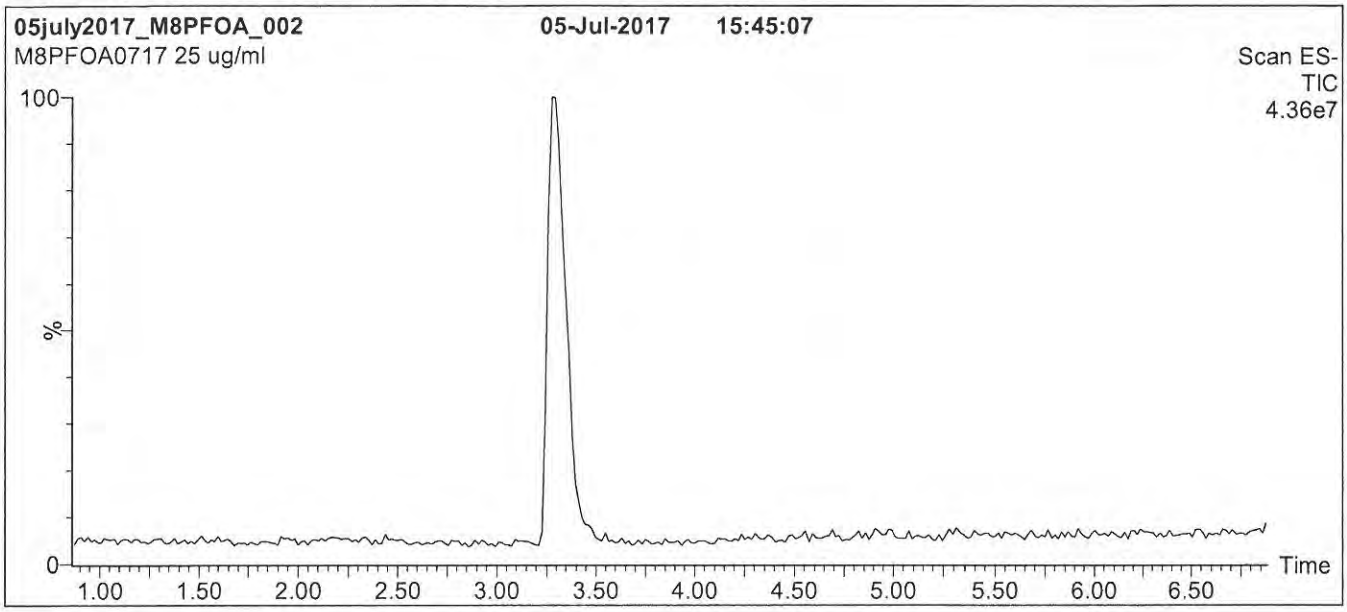
CALA Testing

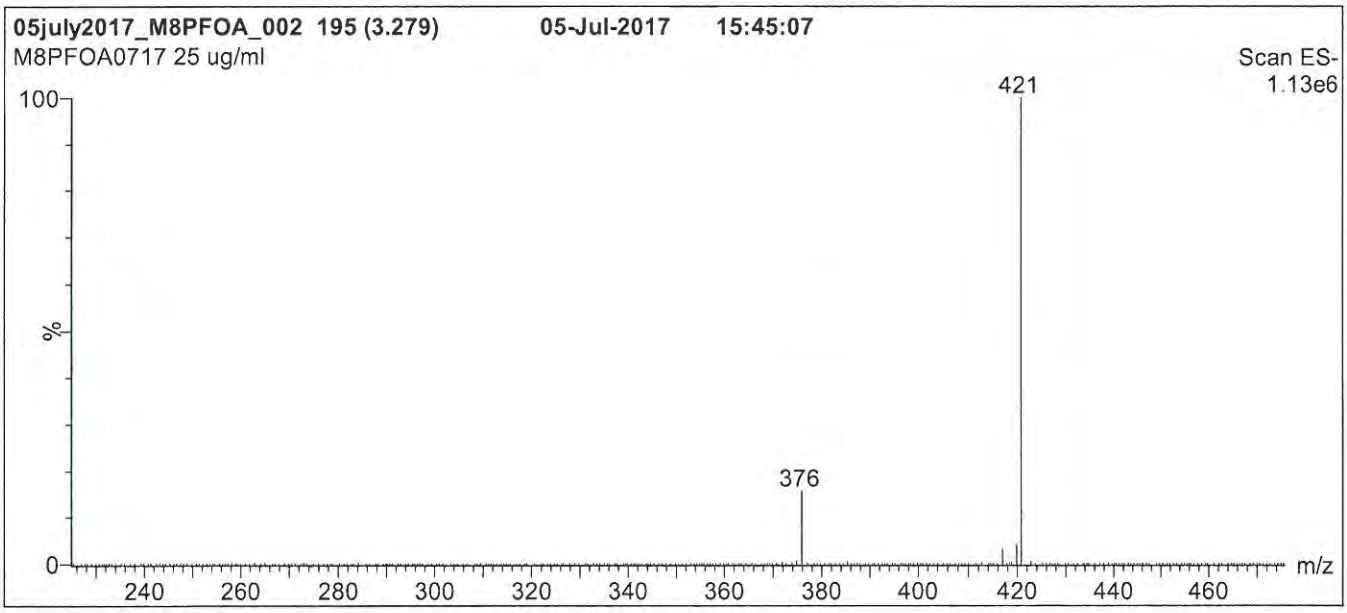
ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

18F2236

Figure 1: **M8PFOA; LC/MS Data (TIC and Mass Spectrum)**





Conditions for Figure 1:

LC: **Waters Acquity Ultra Performance LC**
MS: **Micromass Quattro *micro* API MS**

Chromatographic Conditions

Column: Acquity UPLC BEH Shield RP_{18}
1.7 µm, 2.1 x 100 mm

Mobile phase: Gradient
Start: 55% (80:20 MeOH:ACN) / 45% H_2O
(both with 10 mM NH_4OAc buffer)
Ramp to 90% organic over 7.5 min and hold for 1.5 min before returning to initial conditions in 0.5 min.
Time: 10 min

Flow: 300 µl/min

MS Parameters

Experiment: Full Scan (225 - 850 amu)

Source: Electrospray (negative)
Capillary Voltage (kV) = 3.00
Cone Voltage (V) = 15.00
Cone Gas Flow (l/hr) = 100
Desolvation Gas Flow (l/hr) = 750

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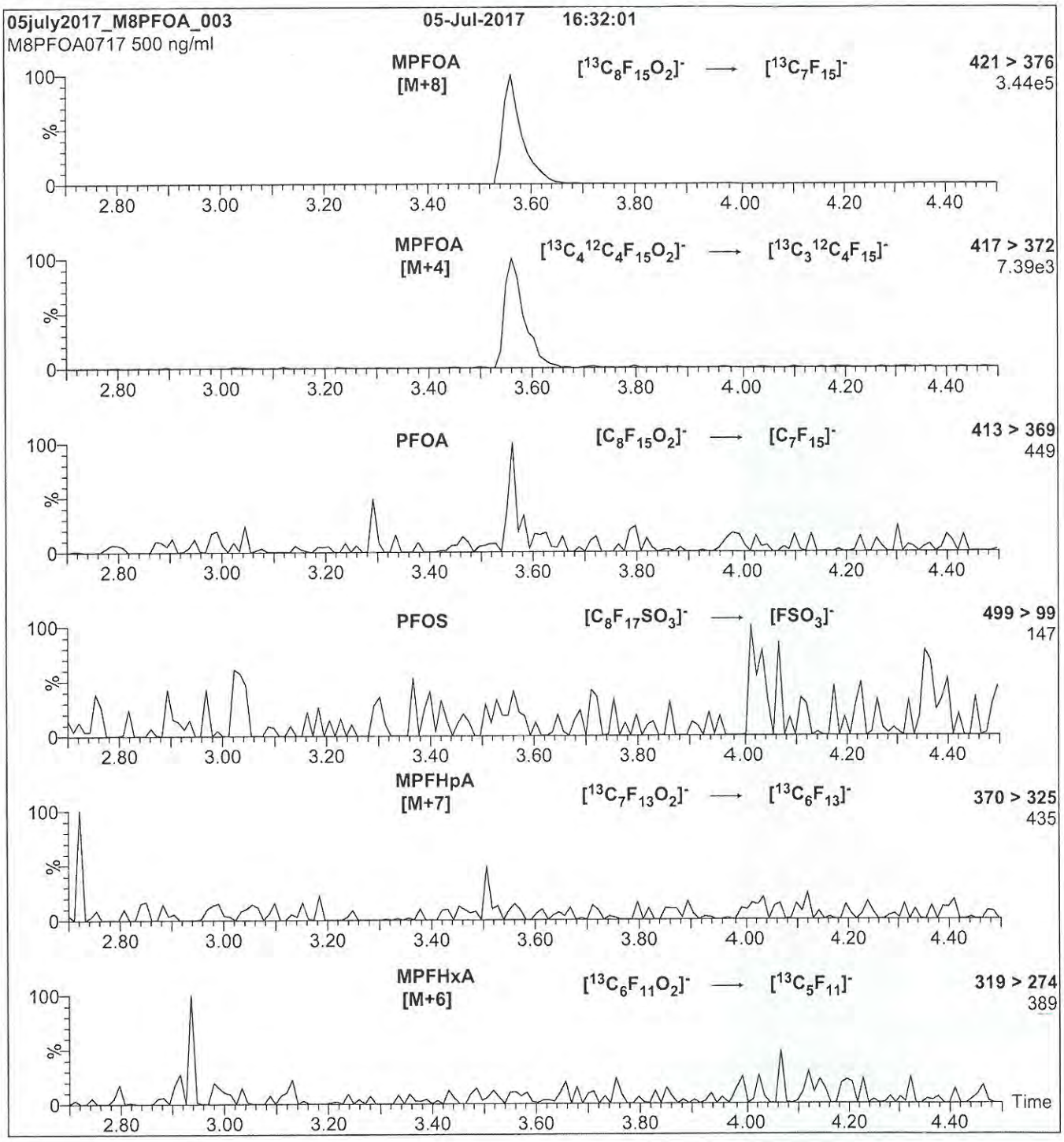
Figure 2: **M8PFOA; LC/MS/MS Data (Selected MRM Transitions)**



Conditions for Figure 2:

Injection: Direct loop injection
10 µl (500 ng/ml M8PFOA)

Mobile phase: Isocratic 80% (80:20 MeOH:ACN) / 20% H_2O
(both with 10 mM NH_4OAc buffer)

Flow: 300 µl/min

MS Parameters

Collision Gas (mbar) = 3.28e-3
Collision Energy (eV) = 10

"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","375-73-
5","PFBS","0.114","ug/L","","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","307-24-
4","PFHxA","0.366","ug/L","","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","375-85-
9","PFHpA","0.0448","ug/L","","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","355-46-
4","PFHxS","0.234","ug/L","","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","335-67-
1","PFOA","0.0488","ug/L","","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","375-95-
1","PFNA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","1763-23-
1","PFOS","0.0403","ug/L","","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","335-76-
2","PFDA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","2355-31-
9","NMeFOSAA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","2991-50-
6","NEtFOSAA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","2058-94-
8","PFUnA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","307-55-
1","PFDoA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","72629-94-
8","PFTrDA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","376-06-
7","PFTeDA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00854","CRDL","YES","0.00293"
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","13C3-PFBS","13C3-
PFBS","94.7","%R","","","CRDL","","IS","94.7","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","13C2-PFHxA","13C2-
PFHxA","88.8","%R","","","CRDL","","IS","88.8","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","13C4-PFHpA","13C4-
PFHpA","87.5","%R","","","CRDL","","IS","87.5","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","18O2-PFHxS","18O2-
PFHxS","97.5","%R","","","CRDL","","IS","97.5","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","13C2-PFOA","13C2-
PFOA","84.9","%R","","","CRDL","","IS","84.9","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","13C5-PFNA","13C5-
PFNA","82.6","%R","","","CRDL","","IS","82.6","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","13C8-PFOS","13C8-
PFOS","90.7","%R","","","CRDL","","IS","90.7","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","13C2-PFDA","13C2-
PFDA","77.4","%R","","","CRDL","","IS","77.4","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","d3-MeFOSAA","d3-
MeFOSAA","100","%R","","","CRDL","","IS","100","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","d5-EtFOSAA","d5-
EtFOSAA","107","%R","","","CRDL","","IS","107","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","13C2-PFUnA","13C2-
PFUnA","80.7","%R","","","CRDL","","IS","80.7","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","13C2-PFDoA","13C2-
PFDoA","90.3","%R","","","CRDL","","IS","90.3","","","CRDL","",""
"A1-MW-07-SA2","537 MOD","RES","1803659-01","Vista","13C2-PFTeDA","13C2-

PFTeDA","57.9","%R","","","CRDL","","IS","57.9","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","375-73-
5","PFBS","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","307-24-
4","PFHxA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","375-85-
9","PFHpA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
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4","PFHxS","0.00594","ug/L","J","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","335-67-
1","PFOA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","375-95-
1","PFNA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","1763-23-
1","PFOS","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
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2","PFDA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","2355-31-
9","NMeFOSAA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","2991-50-
6","NEtFOSAA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","2058-94-
8","PFUnA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","307-55-
1","PFDoA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","72629-94-
8","PFTrDA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","376-06-
7","PFTeDA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00849","CRDL","YES","0.00291"
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","13C3-PFBS","13C3-
PFBS","88.4","%R","","","CRDL","","IS","88.4","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","13C2-PFHxA","13C2-
PFHxA","90.8","%R","","","CRDL","","IS","90.8","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","13C4-PFHpA","13C4-
PFHpA","85.0","%R","","","CRDL","","IS","85.0","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","18O2-PFHxS","18O2-
PFHxS","93.5","%R","","","CRDL","","IS","93.5","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","13C2-PFOA","13C2-
PFOA","82.3","%R","","","CRDL","","IS","82.3","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","13C5-PFNA","13C5-
PFNA","82.0","%R","","","CRDL","","IS","82.0","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","13C8-PFOS","13C8-
PFOS","97.6","%R","","","CRDL","","IS","97.6","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","13C2-PFDA","13C2-
PFDA","73.4","%R","","","CRDL","","IS","73.4","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","d3-MeFOSAA","d3-
MeFOSAA","97.3","%R","","","CRDL","","IS","97.3","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","d5-EtFOSAA","d5-
EtFOSAA","99.9","%R","","","CRDL","","IS","99.9","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","13C2-PFUnA","13C2-
PFUnA","78.9","%R","","","CRDL","","IS","78.9","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","13C2-PFDoA","13C2-
PFDoA","94.5","%R","","","CRDL","","IS","94.5","","","CRDL","",""
"A1-MW-23-SA2","537 MOD","RES","1803659-02","Vista","13C2-PFTeDA","13C2-

PFTeDA","84.0","%R","","","CRDL","","IS","84.0","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","375-73-
5","PFBS","0.299","ug/L","","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","307-24-
4","PFHxA","1.20","ug/L","","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","375-85-
9","PFHpA","0.0780","ug/L","","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","355-46-
4","PFHxS","0.453","ug/L","","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","335-67-
1","PFOA","0.0612","ug/L","","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","375-95-
1","PFNA","0.00439","ug/L","U","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","1763-23-
1","PFOS","0.0195","ug/L","Q","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","335-76-
2","PFDA","0.00439","ug/L","U","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","2355-31-
9","NMeFOSAA","0.00439","ug/L","U","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","2991-50-
6","NEtFOSAA","0.00439","ug/L","U","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","2058-94-
8","PFUnA","0.00439","ug/L","U","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","307-55-
1","PFDoA","0.00439","ug/L","U","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","72629-94-
8","PFTrDA","0.00439","ug/L","U","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","376-06-
7","PFTeDA","0.00439","ug/L","U","0.00439","CRDL","","TRG","","","0.00875","CRDL","YES","0.00300"
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","13C3-PFBS","13C3-
PFBS","89.2","%R","","","CRDL","","IS","89.2","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","13C2-PFHxA","13C2-
PFHxA","93.4","%R","","","CRDL","","IS","93.4","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","13C4-PFHpA","13C4-
PFHpA","79.4","%R","","","CRDL","","IS","79.4","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","18O2-PFHxS","18O2-
PFHxS","87.0","%R","","","CRDL","","IS","87.0","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","13C2-PFOA","13C2-
PFOA","88.1","%R","","","CRDL","","IS","88.1","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","13C5-PFNA","13C5-
PFNA","87.8","%R","","","CRDL","","IS","87.8","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","13C8-PFOS","13C8-
PFOS","92.4","%R","","","CRDL","","IS","92.4","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","13C2-PFDA","13C2-
PFDA","72.6","%R","","","CRDL","","IS","72.6","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","d3-MeFOSAA","d3-
MeFOSAA","107","%R","","","CRDL","","IS","107","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","d5-EtFOSAA","d5-
EtFOSAA","114","%R","","","CRDL","","IS","114","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","13C2-PFUnA","13C2-
PFUnA","77.2","%R","","","CRDL","","IS","77.2","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","13C2-PFDoA","13C2-
PFDoA","94.7","%R","","","CRDL","","IS","94.7","","","CRDL","",""
"A1-MW-25-SA2","537 MOD","RES","1803659-03","Vista","13C2-PFTeDA","13C2-

PFTeDA","85.8","%R","","","CRDL","","IS","85.8","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","375-73-
5","PFBS","0.0730","ug/L","","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","307-24-
4","PFHxA","0.255","ug/L","","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","375-85-
9","PFHpA","0.0256","ug/L","","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","355-46-
4","PFHxS","0.136","ug/L","","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","335-67-
1","PFOA","0.0329","ug/L","","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","375-95-
1","PFNA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","1763-23-
1","PFOS","0.0136","ug/L","","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","335-76-
2","PFDA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","2355-31-
9","NMeFOSAA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","2991-50-
6","NEtFOSAA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","2058-94-
8","PFUnA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","307-55-
1","PFDoA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","72629-94-
8","PFTrDA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","376-06-
7","PFTeDA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00852","CRDL","YES","0.00292"
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","13C3-PFBS","13C3-
PFBS","93.3","%R","","","CRDL","","IS","93.3","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","13C2-PFHxA","13C2-
PFHxA","93.1","%R","","","CRDL","","IS","93.1","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","13C4-PFHpA","13C4-
PFHpA","87.2","%R","","","CRDL","","IS","87.2","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","18O2-PFHxS","18O2-
PFHxS","90.8","%R","","","CRDL","","IS","90.8","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","13C2-PFOA","13C2-
PFOA","87.9","%R","","","CRDL","","IS","87.9","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","13C5-PFNA","13C5-
PFNA","90.1","%R","","","CRDL","","IS","90.1","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","13C8-PFOS","13C8-
PFOS","96.3","%R","","","CRDL","","IS","96.3","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","13C2-PFDA","13C2-
PFDA","76.9","%R","","","CRDL","","IS","76.9","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","d3-MeFOSAA","d3-
MeFOSAA","87.0","%R","","","CRDL","","IS","87.0","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","d5-EtFOSAA","d5-
EtFOSAA","90.3","%R","","","CRDL","","IS","90.3","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","13C2-PFUnA","13C2-
PFUnA","78.1","%R","","","CRDL","","IS","78.1","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","13C2-PFDoA","13C2-
PFDoA","91.5","%R","","","CRDL","","IS","91.5","","","CRDL","",""
"A1-MW-27-SA2","537 MOD","RES","1803659-04","Vista","13C2-PFTeDA","13C2-

PFTeDA","74.4","%R","","","CRDL","","IS","74.4","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","375-73-
5","PFBS","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","307-24-
4","PFHxA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","375-85-
9","PFHpA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","355-46-
4","PFHxS","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","335-67-
1","PFOA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","375-95-
1","PFNA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","1763-23-
1","PFOS","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","335-76-
2","PFDA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","2355-31-
9","NMeFOSAA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","2991-50-
6","NEtFOSAA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","2058-94-
8","PFUnA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","307-55-
1","PFDoA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","72629-94-
8","PFTrDA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","376-06-
7","PFTeDA","0.00424","ug/L","U","0.00424","CRDL","","TRG","","","0.00844","CRDL","YES","0.00289"
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","13C3-PFBS","13C3-
PFBS","89.8","%R","","","CRDL","","IS","89.8","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","13C2-PFHxA","13C2-
PFHxA","91.6","%R","","","CRDL","","IS","91.6","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","13C4-PFHpA","13C4-
PFHpA","90.1","%R","","","CRDL","","IS","90.1","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","18O2-PFHxS","18O2-
PFHxS","89.4","%R","","","CRDL","","IS","89.4","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","13C2-PFOA","13C2-
PFOA","90.2","%R","","","CRDL","","IS","90.2","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","13C5-PFNA","13C5-
PFNA","84.8","%R","","","CRDL","","IS","84.8","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","13C8-PFOS","13C8-
PFOS","82.6","%R","","","CRDL","","IS","82.6","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","13C2-PFDA","13C2-
PFDA","81.2","%R","","","CRDL","","IS","81.2","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","d3-MeFOSAA","d3-
MeFOSAA","78.9","%R","","","CRDL","","IS","78.9","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","d5-EtFOSAA","d5-
EtFOSAA","88.0","%R","","","CRDL","","IS","88.0","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","13C2-PFUnA","13C2-
PFUnA","85.3","%R","","","CRDL","","IS","85.3","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","13C2-PFDoA","13C2-
PFDoA","86.4","%R","","","CRDL","","IS","86.4","","","CRDL","",""
"A1-MW-55-SA2","537 MOD","RES","1803659-05","Vista","13C2-PFTeDA","13C2-

PFTeDA","83.2","%R","","","CRDL","","IS","83.2","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","375-73-
5","PFBS","0.462","ug/L","","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","307-24-
4","PFHxA","1.51","ug/L","","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","375-85-
9","PFHpA","0.107","ug/L","","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","355-46-
4","PFHxS","0.899","ug/L","","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","335-67-
1","PFOA","0.230","ug/L","","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","375-95-
1","PFNA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","1763-23-
1","PFOS","0.0150","ug/L","Q","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","335-76-
2","PFDA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","2355-31-
9","NMeFOSAA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","2991-50-
6","NEtFOSAA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","2058-94-
8","PFUnA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","307-55-
1","PFDoA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","72629-94-
8","PFTrDA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","376-06-
7","PFTeDA","0.00427","ug/L","U","0.00427","CRDL","","TRG","","","0.00856","CRDL","YES","0.00293"
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","13C3-PFBS","13C3-
PFBS","95.2","%R","","","CRDL","","IS","95.2","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","13C2-PFHxA","13C2-
PFHxA","91.4","%R","","","CRDL","","IS","91.4","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","13C4-PFHpA","13C4-
PFHpA","89.2","%R","","","CRDL","","IS","89.2","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","18O2-PFHxS","18O2-
PFHxS","98.8","%R","","","CRDL","","IS","98.8","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","13C2-PFOA","13C2-
PFOA","94.5","%R","","","CRDL","","IS","94.5","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","13C5-PFNA","13C5-
PFNA","82.6","%R","","","CRDL","","IS","82.6","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","13C8-PFOS","13C8-
PFOS","89.5","%R","","","CRDL","","IS","89.5","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","13C2-PFDA","13C2-
PFDA","75.0","%R","","","CRDL","","IS","75.0","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","d3-MeFOSAA","d3-
MeFOSAA","65.3","%R","","","CRDL","","IS","65.3","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","d5-EtFOSAA","d5-
EtFOSAA","71.6","%R","","","CRDL","","IS","71.6","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","13C2-PFUnA","13C2-
PFUnA","67.6","%R","","","CRDL","","IS","67.6","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","13C2-PFDoA","13C2-
PFDoA","61.2","%R","","","CRDL","","IS","61.2","","","CRDL","",""
"A1-MW-54-SA2","537 MOD","RES","1803659-06","Vista","13C2-PFTeDA","13C2-

PFTeDA","58.0","%R","","","CRDL","","IS","58.0","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","375-73-
5","PFBS","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","307-24-
4","PFHxA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","375-85-
9","PFHpA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","355-46-
4","PFHxS","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","335-67-
1","PFOA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","375-95-
1","PFNA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","1763-23-
1","PFOS","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","335-76-
2","PFDA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","2355-31-
9","NMeFOSAA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","2991-50-
6","NEtFOSAA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","2058-94-
8","PFUnA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","307-55-
1","PFDoA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","72629-94-
8","PFTrDA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","376-06-
7","PFTeDA","0.00435","ug/L","U","0.00435","CRDL","","TRG","","","0.00866","CRDL","YES","0.00297"
"FRB-20181114","537 MOD","RES","1803659-07","Vista","13C3-PFBS","13C3-
PFBS","101","%R","","","CRDL","","IS","101","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","13C2-PFHxA","13C2-
PFHxA","92.4","%R","","","CRDL","","IS","92.4","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","13C4-PFHpA","13C4-
PFHpA","88.3","%R","","","CRDL","","IS","88.3","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","18O2-PFHxS","18O2-
PFHxS","97.0","%R","","","CRDL","","IS","97.0","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","13C2-PFOA","13C2-
PFOA","94.0","%R","","","CRDL","","IS","94.0","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","13C5-PFNA","13C5-
PFNA","88.6","%R","","","CRDL","","IS","88.6","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","13C8-PFOS","13C8-
PFOS","100","%R","","","CRDL","","IS","100","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","13C2-PFDA","13C2-
PFDA","80.7","%R","","","CRDL","","IS","80.7","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","d3-MeFOSAA","d3-
MeFOSAA","84.4","%R","","","CRDL","","IS","84.4","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","d5-EtFOSAA","d5-
EtFOSAA","86.7","%R","","","CRDL","","IS","86.7","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","13C2-PFUnA","13C2-
PFUnA","80.4","%R","","","CRDL","","IS","80.4","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","13C2-PFDoA","13C2-
PFDoA","82.1","%R","","","CRDL","","IS","82.1","","","CRDL","",""
"FRB-20181114","537 MOD","RES","1803659-07","Vista","13C2-PFTeDA","13C2-

PFTeDA","82.2","%R","","","CRDL","","IS","82.2","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","375-73-
5","PFBS","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","307-24-
4","PFHxA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","375-85-
9","PFHpA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","355-46-
4","PFHxS","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","335-67-
1","PFOA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","375-95-
1","PFNA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","1763-23-
1","PFOS","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","335-76-
2","PFDA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","2355-31-
9","NMeFOSAA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","2991-50-
6","NEtFOSAA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","2058-94-
8","PFUnA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","307-55-
1","PFDoA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","72629-94-
8","PFTrDA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","376-06-
7","PFTeDA","0.00400","ug/L","U","0.00400","CRDL","","TRG","","","0.00800","CRDL","YES","0.00274"
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","13C3-PFBS","13C3-
PFBS","93.8","%R","","","CRDL","","IS","93.8","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","13C2-PFHxA","13C2-
PFHxA","94.2","%R","","","CRDL","","IS","94.2","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","13C4-PFHpA","13C4-
PFHpA","96.2","%R","","","CRDL","","IS","96.2","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","18O2-PFHxS","18O2-
PFHxS","88.1","%R","","","CRDL","","IS","88.1","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","13C2-PFOA","13C2-
PFOA","93.9","%R","","","CRDL","","IS","93.9","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","13C5-PFNA","13C5-
PFNA","84.8","%R","","","CRDL","","IS","84.8","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","13C8-PFOS","13C8-
PFOS","91.0","%R","","","CRDL","","IS","91.0","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","13C2-PFDA","13C2-
PFDA","74.8","%R","","","CRDL","","IS","74.8","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","d3-MeFOSAA","d3-
MeFOSAA","76.7","%R","","","CRDL","","IS","76.7","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","d5-EtFOSAA","d5-
EtFOSAA","83.6","%R","","","CRDL","","IS","83.6","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","13C2-PFUnA","13C2-
PFUnA","76.0","%R","","","CRDL","","IS","76.0","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","13C2-PFDoA","13C2-
PFDoA","83.3","%R","","","CRDL","","IS","83.3","","","CRDL","",""
"B8K0144-BLK1","537 MOD","RES","B8K0144-BLK1","Vista","13C2-PFTeDA","13C2-

PFTeDA","84.1","%R","","","CRDL","","IS","84.1","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","375-73-
5","PFBS","0.0785","ug/L","","0.00400","CRDL","","SPK","98.2","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","307-24-
4","PFHxA","0.0819","ug/L","","0.00400","CRDL","","SPK","102","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","375-85-
9","PFHpA","0.0824","ug/L","","0.00400","CRDL","","SPK","103","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","355-46-
4","PFHxS","0.0837","ug/L","","0.00400","CRDL","","SPK","105","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","335-67-
1","PFOA","0.0829","ug/L","","0.00400","CRDL","","SPK","104","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","375-95-
1","PFNA","0.0810","ug/L","","0.00400","CRDL","","SPK","101","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","1763-23-
1","PFOS","0.0880","ug/L","","0.00400","CRDL","","SPK","110","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","335-76-
2","PFDA","0.0887","ug/L","","0.00400","CRDL","","SPK","111","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","2355-31-
9","NMeFOSAA","0.0828","ug/L","","0.00400","CRDL","","SPK","104","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","2991-50-
6","NEtFOSAA","0.0860","ug/L","","0.00400","CRDL","","SPK","108","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","2058-94-
8","PFUnA","0.0820","ug/L","","0.00400","CRDL","","SPK","103","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","307-55-
1","PFDoA","0.0797","ug/L","","0.00400","CRDL","","SPK","99.6","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","72629-94-
8","PFTrDA","0.0762","ug/L","","0.00400","CRDL","","SPK","95.2","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","376-06-
7","PFTeDA","0.0846","ug/L","","0.00400","CRDL","","SPK","106","","0.00800","CRDL","YES","0.00274"
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","13C3-PFBS","13C3-
PFBS","95.7","%R","","","CRDL","","IS","95.7","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","13C2-PFHxA","13C2-
PFHxA","92.1","%R","","","CRDL","","IS","92.1","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","13C4-PFHpA","13C4-
PFHpA","89.8","%R","","","CRDL","","IS","89.8","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","18O2-PFHxS","18O2-
PFHxS","93.9","%R","","","CRDL","","IS","93.9","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","13C2-PFOA","13C2-
PFOA","88.7","%R","","","CRDL","","IS","88.7","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","13C5-PFNA","13C5-
PFNA","85.3","%R","","","CRDL","","IS","85.3","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","13C8-PFOS","13C8-
PFOS","87.3","%R","","","CRDL","","IS","87.3","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","13C2-PFDA","13C2-
PFDA","73.6","%R","","","CRDL","","IS","73.6","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","d3-MeFOSAA","d3-
MeFOSAA","77.1","%R","","","CRDL","","IS","77.1","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","d5-EtFOSAA","d5-
EtFOSAA","84.7","%R","","","CRDL","","IS","84.7","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","13C2-PFUnA","13C2-
PFUnA","74.3","%R","","","CRDL","","IS","74.3","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","13C2-PFDoA","13C2-
PFDoA","74.1","%R","","","CRDL","","IS","74.1","","","CRDL","",""
"B8K0144-BS1","537 MOD","RES","B8K0144-BS1","Vista","13C2-PFTeDA","13C2-

PFTeDA","65.5","%R","","","CRDL","","IS","65.5","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","375-73-
5","PFBS","0.0834","ug/L","","0.00400","CRDL","","SPK","104","5.99","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","307-24-
4","PFHxA","0.0874","ug/L","","0.00400","CRDL","","SPK","109","6.51","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","375-85-
9","PFHpA","0.0849","ug/L","","0.00400","CRDL","","SPK","106","3.07","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","355-46-
4","PFHxS","0.0866","ug/L","","0.00400","CRDL","","SPK","108","3.42","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","335-67-
1","PFOA","0.0863","ug/L","","0.00400","CRDL","","SPK","108","4.12","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","375-95-
1","PFNA","0.0843","ug/L","","0.00400","CRDL","","SPK","105","3.94","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","1763-23-
1","PFOS","0.0866","ug/L","","0.00400","CRDL","","SPK","108","1.61","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","335-76-
2","PFDA","0.0812","ug/L","","0.00400","CRDL","","SPK","101","8.92","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","2355-31-
9","NMeFOSAA","0.0915","ug/L","","0.00400","CRDL","","SPK","114","9.97","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","2991-50-
6","NEtFOSAA","0.0923","ug/L","","0.00400","CRDL","","SPK","115","7.04","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","2058-94-
8","PFUnA","0.0824","ug/L","","0.00400","CRDL","","SPK","103","0.455","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","307-55-
1","PFDoA","0.0790","ug/L","","0.00400","CRDL","","SPK","98.7","0.851","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","72629-94-
8","PFTrDA","0.0865","ug/L","","0.00400","CRDL","","SPK","108","12.7","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","376-06-
7","PFTeDA","0.0850","ug/L","","0.00400","CRDL","","SPK","106","0.448","0.00800","CRDL","YES","0.00274"
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","13C3-PFBS","13C3-
PFBS","95.2","%R","","","CRDL","","IS","95.2","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","13C2-PFHxA","13C2-
PFHxA","91.6","%R","","","CRDL","","IS","91.6","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","13C4-PFHpA","13C4-
PFHpA","94.3","%R","","","CRDL","","IS","94.3","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","18O2-PFHxS","18O2-
PFHxS","94.4","%R","","","CRDL","","IS","94.4","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","13C2-PFOA","13C2-
PFOA","94.6","%R","","","CRDL","","IS","94.6","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","13C5-PFNA","13C5-
PFNA","82.3","%R","","","CRDL","","IS","82.3","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","13C8-PFOS","13C8-
PFOS","94.4","%R","","","CRDL","","IS","94.4","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","13C2-PFDA","13C2-
PFDA","78.4","%R","","","CRDL","","IS","78.4","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","d3-MeFOSAA","d3-
MeFOSAA","83.8","%R","","","CRDL","","IS","83.8","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","d5-EtFOSAA","d5-
EtFOSAA","89.5","%R","","","CRDL","","IS","89.5","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","13C2-PFUnA","13C2-
PFUnA","78.3","%R","","","CRDL","","IS","78.3","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","13C2-PFDoA","13C2-
PFDoA","92.5","%R","","","CRDL","","IS","92.5","","","CRDL","",""
"B8K0144-BSD1","537 MOD","RES","B8K0144-BSD1","Vista","13C2-PFTeDA","13C2-

PFTeDA","85.7","%R","","","CRDL","","IS","85.7","","","CRDL","",""
"4663.3803","CTO 17F3803 Yuma","A1-MW-07-SA2","11/14/2018 09:07","AQ","1803659-01","","","","537 MOD","Gen Prep","RES","11/22/2018 10:31","11/26/2018 16:02","Vista","COA","","","1","","","","","B8K0144","B8K0144","S8K0064","S8K0064","1803659","11/15/2018 13:29","11/29/2018 00:00"
"4663.3803","CTO 17F3803 Yuma","A1-MW-23-SA2","11/14/2018 10:03","AQ","1803659-02","","","","537 MOD","Gen Prep","RES","11/22/2018 10:31","11/27/2018 13:04","Vista","COA","","","1","","","","","B8K0144","B8K0144","S8K0064","S8K0064","1803659","11/15/2018 13:29","11/29/2018 00:00"
"4663.3803","CTO 17F3803 Yuma","A1-MW-25-SA2","11/14/2018 12:15","AQ","1803659-03","","","","537 MOD","Gen Prep","RES","11/22/2018 10:31","11/26/2018 16:23","Vista","COA","","","1","","","","","B8K0144","B8K0144","S8K0064","S8K0064","1803659","11/15/2018 13:29","11/29/2018 00:00"
"4663.3803","CTO 17F3803 Yuma","A1-MW-27-SA2","11/14/2018 13:03","AQ","1803659-04","","","","537 MOD","Gen Prep","RES","11/22/2018 10:31","11/26/2018 16:34","Vista","COA","","","1","","","","","B8K0144","B8K0144","S8K0064","S8K0064","1803659","11/15/2018 13:29","11/29/2018 00:00"
"4663.3803","CTO 17F3803 Yuma","A1-MW-55-SA2","11/14/2018 11:02","AQ","1803659-05","","","","537 MOD","Gen Prep","RES","11/22/2018 10:31","11/26/2018 16:44","Vista","COA","","","1","","","","","B8K0144","B8K0144","S8K0064","S8K0064","1803659","11/15/2018 13:29","11/29/2018 00:00"
"4663.3803","CTO 17F3803 Yuma","A1-MW-54-SA2","11/14/2018 15:17","AQ","1803659-06","","","","537 MOD","Gen Prep","RES","11/22/2018 10:31","11/26/2018 17:16","Vista","COA","","","1","","","","","B8K0144","B8K0144","S8K0064","S8K0064","1803659","11/15/2018 13:29","11/29/2018 00:00"
"4663.3803","CTO 17F3803 Yuma","FRB-20181114","11/14/2018 14:20","AQ","1803659-07","","","","537 MOD","Gen Prep","RES","11/22/2018 10:31","11/26/2018 17:27","Vista","COA","","","1","","","","","B8K0144","B8K0144","S8K0064","S8K0064","1803659","11/15/2018 13:29","11/29/2018 00:00"
"4663.3803","CTO 17F3803 Yuma","B8K0144-BLK1","","AQ","B8K0144-BLK1","MB","","","537 MOD","Gen Prep","RES","11/22/2018 10:31","11/26/2018 15:51","Vista","COA","","","1","","","","","B8K0144","B8K0144","S8K0064","S8K0064","1803659","","11/29/2018 00:00"
"4663.3803","CTO 17F3803 Yuma","B8K0144-BS1","","AQ","B8K0144-BS1","LCS","","","537 MOD","Gen Prep","RES","11/22/2018 10:31","11/26/2018 15:29","Vista","COA","","","1","","","","","B8K0144","B8K0144","S8K0064","S8K0064","1803659","","11/29/2018 00:00"
"4663.3803","CTO 17F3803 Yuma","B8K0144-BSD1","","AQ","B8K0144-BSD1","LCSD","","","537 MOD","Gen Prep","RES","11/22/2018 10:31","11/26/2018 15:41","Vista","COA","","","1","","","","","B8K0144","B8K0144","S8K0064","S8K0064","1803659","","11/29/2018 00:00"

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Tetra Tech EC, Inc.
17885 Von Karman Avenue, Suite 500
Irvine, CA 92614
ATTN: Ms. Sabina Sudoko

July 24, 2018

SUBJECT: MCAS Yuma, CTO 17F3803, Data Validation

Dear Ms. Sudoko,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on July 6, 2018. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #42613:

SDG #	Fraction
280-110058-1, 280-110112-1 280-110226-1, 280-110291-1 280-110353-1, L1818881 L1819087, L1819352 L1819562, L1820050 L1820175, 1801024 1801037, 1801039 1801054, 1801071 1801084	Volatiles, 1,4-Dioxane, Wet Chemistry, Perfluorinated Alkyl Acids

The data validation was performed under Stage 2B & 4 guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona; April 2018
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017
- USEPA National Functional Guidelines for Superfund Organic Methods Data Review; January 2017
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Shauna McKellar
Project Manager/Chemist

ADR/Stage 4 NEDD 80/20 **LDC #42613 (Tetra Tech-EC, Inc.-Irvine, CA / MCAS Yuma, CTO 17F3803)** **PO# 1153059**

LDC	SDG#	DATE REC'D	(3) DATE DUE	(3) VOA (8260B)		1,4-Diox (8270D -SIM)		PFAs (537)		Cl,SO_4 NO_3-N (9056A)		Fe II (3500 -Fe B)		pH (9040C)																							
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	280-110058-1	07/06/18	07/27/18	6	0	-	-	-	-	5	0	5	0	5	0																				
B	280-110112-1	07/06/18	07/27/18	7	0	-	-	-	-	6	0	6	0	6	0																				
C	280-110226-1	07/06/18	07/27/18	9	0	-	-	-	-	6	0	6	0	6	0																				
D	280-110291-1	07/06/18	07/27/18	7	0	-	-	-	-	6	0	6	0	6	0																				
E	280-110353-1	07/06/18	07/27/18	5	0	-	-	-	-	3	0	3	0	3	0																				
F	L1818881	07/06/18	07/27/18	-	-	5	0	-	-	-	-	-	-	-	-																				
G	L1819087	07/06/18	07/27/18	-	-	6	0	-	-	-	-	-	-	-	-																				
H	L1819352	07/06/18	07/27/18	-	-	5	0	-	-	-	-	-	-	-	-																				
I	L1819562	07/06/18	07/27/18	-	-	8	0	-	-	-	-	-	-	-	-																				
J	L1820050	07/06/18	07/27/18	-	-	4	0	-	-	-	-	-	-	-	-																				
K	L1820175	07/06/18	07/27/18	-	-	1	0	-	-	-	-	-	-	-	-																				
L	1801024	07/06/18	07/27/18	-	-	-	-	6	0	-	-	-	-	-	-																				
M	1801037	07/06/18	07/27/18	-	-	-	-	1	0	-	-	-	-	-	-																				
M	1801037	07/06/18	07/27/18	-	-	-	-	8	0	-	-	-	-	-	-																				
N	1801039	07/06/18	07/27/18	-	-	-	-	6	0	-	-	-	-	-	-																				
O	1801054	07/06/18	07/27/18	-	-	-	-	9	0	-	-	-	-	-	-																				
P	1801071	07/06/18	07/27/18	-	-	-	-	5	0	-	-	-	-	-	-																				
Q	1801084	07/06/18	07/27/18	-	-	-	-	1	0	-	-	-	-	-	-																				
Total	T/SM			34	0	29	0	36	0	26	0	26	0	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	177

Shaded cells indicate Stage 4 validation (all other cells are ADR/Stage 2B validation).

Data Validation Report
MCAS Yuma, CTO 17F3803

SDGs: 280-110058-1, 280-110112-1, 280-110226-1, 280-110291-1, 280-110353-1, L1818881, L1819087, L1819352, L1819562, L1820050, L1820175, 1801024, 1801037, 1801039, 1801054, 1801071, and 1801084

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July 24, 2018

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2B and Stage 4 data validation results for samples collected during the May 2018 sampling period. Data validation was performed in accordance with the Final Sampling and Analysis Plan (SAP) for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), a modified outline of the US EPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017), and a modified outline of the US EPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B
1,4-Dioxane by EPA SW 846 Method 8270D utilizing Selective Ion Monitoring (SIM)
Perfluorinated Alkyl Acids (PFAs) by EPA Method 537 Modified

Wet Chemistry:
Chloride, Nitrate as Nitrogen, and Sulfate by EPA SW 846 Method 9056A
Ferrous Iron by Standard Method 3500-Fe B
pH by EPA SW 846 Method 9040C

For samples reviewed by automated data review, the sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2B Automated Data Review outliers are presented in Enclosure I. DVRs for samples on which Stage 4 validation was performed are presented in Enclosure II. Validation for 1,4-Dioxane was performed manually and DVRs for Stage 2B and Stage 4 manual validation are also presented in Enclosure II.

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, initial and continuing calibrations, laboratory blanks, initial and continuing calibration blanks (ICB/CCBs), surrogates, matrix spike/matrix spike duplicates (MS/MSD), laboratory control sample/laboratory control sample duplicates (LCS/LCSD), ongoing precision recovery (OPR), internal standards, trip blanks, equipment blanks, field rinsate blanks, and field duplicates. Approximately 20 percent of samples were subjected to Stage 4 evaluation as indicated in Attachment 1, which comprises a review of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013) with the exception of the calibrations, ICB/CCBs, and internal standards, and all QC for 1,4-Dioxane, which were validated manually. Quality assurance (QA)/QC criteria specified in the SAP, DoD QSM, and NFGs were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detect): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not applicable): Data did not warrant qualification since detected results only are affected and the compound was not detected in the associated samples.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt & Technical Holding Times

All samples were received in good condition with the following exceptions:

SDG/ Method	Sample	Compound	Finding	Criteria	Flag	A or P
280-110291-1/ 8260B	A1-MW-23-SA1	All compounds	A headspace of >6 mm was apparent in the sample containers.	There should be no headspace in the sample containers.	J (all detects) UJ (all non-detects)	A

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures upon receipt by the laboratory met validation criteria with the exception of one cooler in SDG L1818881 that was reported at 7.9°C. No data was qualified based on the cooler temperature.

All technical holding time requirements were met with the exception of twenty-five samples for pH and twenty-one samples for ferrous iron. Due to grossly exceeded holding times (e.g., >2x recommended holding time), 15 ferrous iron results were qualified as rejected (R). Additionally, the remainder of the data were qualified as detected estimated (J) or non-detected estimated (UJ) as applicable. The details regarding the qualification of data are provided in Enclosures I and II.

II. Instrument Performance Check

A tune was performed at 12 hour intervals as required by the methods.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

All criteria for the initial calibration and initial calibration verifications of each method were met.

IV. Continuing Calibration

All criteria for the continuing calibration of each method were met with the exception of one continuing calibration for PFAs. Since the outlier was associated with laboratory QC and there were no associated client samples, no data were qualified.

V. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program with the exception of one blank for chloride and sulfate. The associated sample results were not detected or were significantly greater than the concentrations found in the blanks, therefore no data were qualified. The details are presented in Enclosure I.

No contaminant concentrations were detected in the initial or continuing calibration blanks with the following exceptions:

SDG/ Method	Laboratory Blank ID	Analyte	Maximum Concentration	Associated Samples
280-110226-1/ 9056A	ICB/CCB	Nitrate as Nitrogen	0.04663 mg/L	A1-MW-42-SA1 A1-MW-54-SA1 A1-PZ-19-SA1 A1-MW-52-SA1 A1-MW-01-SA1 A1-MW-31-SA1
280-110291-1/ 9056A	ICB/CCB	Sulfate	0.2460 mg/L	A1-MW-14-SA1 A1-MW-23-SA1 A1-MW-55-SA1
280-110353-1/ 9056A	ICB/CCB	Chloride Sulfate	0.5385 mg/L 0.6554 mg/L	A1-MW-13-SA1 A1-MW-11-SA1 A1-MW-15-SA1

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were not detected or were significantly greater than the concentrations found in the associated blanks.

VI. Field Blank Samples

Five trip blanks were collected and analyzed for VOCs. No contaminants were found.

One equipment blank was collected and analyzed for VOCs and PFAs. No contaminants were found.

Five field rinsate blanks were collected and analyzed for PFAs. No contaminants were found.

VII. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the exception of sample 16-HS-03-SA1 in SDG 280-110112-1 for VOCs. The associated sample results were qualified as detected estimated (J) or non-detected estimated (UJ) as applicable. The details regarding the qualification of data are provided in Enclosure I.

IX. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the exception of one MS/MSD pair for 1,1-dichloroethene, two MS/MSD pairs for several PFAs, three MS/MSD pairs for chloride and sulfate, and three MS/MSD pairs for ferrous iron. The ferrous iron results in samples 16-HS-03-SA1 and A1-MW-31-SA1 were qualified as rejected (R) due to MS/MSD %Rs grossly outside QC limits (i.e., ≤ 30%). The remainder of the associated sample results were qualified as detected estimated (J) or non-detected estimated (UJ) as applicable. No data were qualified where sample concentrations were significantly greater (>4x) than the spike amount. The details regarding the qualification of data are provided in Enclosures I and II.

X. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

XII. Laboratory Control Samples/Ongoing Precision Recovery

Laboratory control samples (LCS) and laboratory control sample duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

Ongoing precision recovery (OPR) samples were analyzed as required by Method 537 Mod. Percent recoveries (%R) were within QC limits with the exception of two OPR for PFTrDA. No data were qualified due to high %Rs since the associated results were non-detected. The details are presented in Enclosures I and II.

XIII. Field Duplicate Samples

Two field duplicate pairs were collected and analyzed for all methods. All RPDs were within QC limits. RPDs were not calculated when sample results in one or both samples were less than 5X the limit of quantitation (LOQ). The field duplicate result comparisons are provided in Enclosures I and II.

XIV. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

SDG/ Method	Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
1801024/ 537	A1-MW-51-SA1	^{13}C3-PFBS	247 (50-150)	PFBS	J (all detects)	P
1801024/ 537	A1-MW-51-SA1	^{13}C3-NEtFOSAA	151 (50-150)	NEtFOSAA	UJ (all non-detects)	P
1801037/ 537	A1-MW-18-SA1	^{13}C3-PFBS	170 (50-150)	PFBS	J (all detects)	P
1801037/ 537	16-MW-08-SA1	^{13}C3-PFBS	187 (50-150)	PFBS	J (all detects)	P
1801037/ 537	A1-MW-19-SA1	^{13}C3-PFBS	214 (50-150)	PFBS	J (all detects)	P
1801037/ 537	A1-MW-37-SA1	^{13}C3-PFBS	228 (50-150)	PFBS	J (all detects)	P
1801037/ 537	A1-MW-37-SA1D	^{13}C3-PFBS	161 (50-150)	PFBS	J (all detects)	P

SDG/ Method	Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
1801037/ 537	16-HS-03-SA1	^{13}C3-PFBS	154 (50-150)	PFBS	J (all detects)	P
1801037/ 537	16-MW-09-SA1	^{13}C3-PFBS	153 (50-150)	PFBS	J (all detects)	P
1801037/ 537	16-MW-06-SA1	^{13}C3-PFBS	214 (50-150)	PFBS	J (all detects)	P
1801039/ 537	A1-MW-13-SA1	^{13}C3-PFBS	419 (50-150)	PFBS	J (all detects)	P
1801039/ 537	A1-MW-11-SA1	^{13}C3-PFBS	271 (50-150)	PFBS	J (all detects)	P
1801039/ 537	A1-MW-14-SA1	^{13}C3-PFBS	527 (50-150)	PFBS	J (all detects)	P
1801039/ 537	A1-MW-15-SA1	^{13}C3-PFBS	235 (50-150)	PFBS	J (all detects)	P
1801039/ 537	A1-MW-25-SA1	^{13}C3-PFBS	428 (50-150)	PFBS	J (all detects)	P
1801054/ 537	A1-MW-42-SA1	^{13}C3-PFBS	310 (50-150)	PFBS	J (all detects)	P
1801054/ 537	A1-MW-54-SA1	^{13}C3-PFBS	175 (50-150)	PFBS	J (all detects)	P
1801054/ 537	A1-MW-53-SA1	^{13}C3-PFBS	154 (50-150)	PFBS	J (all detects)	P
1801054/ 537	A1-PZ-19-SA1	^{13}C3-PFBS	182 (50-150)	PFBS	J (all detects)	P
1801054/ 537	A1-MW-52-SA1	^{13}C3-PFBS	211 (50-150)	PFBS	J (all detects)	P
1801054/ 537	A1-MW-01-SA1	^{13}C3-PFBS	192 (50-150)	PFBS	J (all detects)	P
1801054/ 537	A1-MW-01-SA1D	^{13}C3-PFBS	204 (50-150)	PFBS	J (all detects)	P
1801054/ 537	A1-MW-31-SA1	^{13}C3-PFBS	254 (50-150)	PFBS	J (all detects)	P
1801071/ 537	A1-MW-27-SA1	^{13}C3-PFBS	174 (50-150)	PFBS	J (all detects)	P

SDG/ Method	Sample	Internal Standards	%R (Limits)	Compound	Flag	A or P
1801071/ 537	A1-MW-07-SA1	^{13}C3-PFBS	209 (50-150)	PFBS	J (all detects)	P
1801071/ 537	A1-MW-55-SA1	^{13}C3-PFBS	165 (50-150)	PFBS	UJ (all non-detects)	P

XV. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

All compounds reported below the LOQ as detected by the laboratory were qualified as detected estimated (J). The details regarding the qualification of data are provided in Enclosures I and II.

XVI. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to severe holding time exceedances and MS/MSD %Rs, data were qualified as rejected in fifteen samples.

Due to headspace, data were qualified as estimated in one sample.

Due to holding time exceedances, data were qualified as estimated in twenty-five samples.

Due to surrogate %R, data were qualified as estimated in one sample.

Due to MS/MSD %R and RPD, data were qualified as estimated in three samples.

Due to internal standard %R, data were qualified as estimated in twenty-five samples.

Due to results below the LOQ, data were qualified as estimated in twenty-six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

Data flags are summarized and are presented as Attachment 2.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
22-May-2018	TB-20180522	280-110058-1	TB	METHOD	8260B	Stage 2B
22-May-2018	A1-MW-51-SA1	1801024-01	N	Gen Prep	537 MOD	Stage 2B
22-May-2018	A1-MW-51-SA1	280-110058-2	N	METHOD	8260B	Stage 2B
22-May-2018	A1-MW-51-SA1	280-110058-2	N	METHOD	9040C	Stage 2B
22-May-2018	A1-MW-51-SA1	280-110058-2	N	METHOD	9056A	Stage 2B
22-May-2018	A1-MW-51-SA1	280-110058-2	N	METHOD	SM3500 Fe B D	Stage 2B
22-May-2018	A1-MW-51-SA1DUP	280-110058-2DUP	DUP	METHOD	SM3500 Fe B D	Stage 2B
22-May-2018	A1-MW-51-SA1MS	280-110058-2MS	MS	METHOD	8260B	Stage 2B
22-May-2018	A1-MW-51-SA1MS	280-110058-2MS	MS	METHOD	SM3500 Fe B D	Stage 2B
22-May-2018	A1-MW-51-SA1MSD	280-110058-2MSD	MSD	METHOD	8260B	Stage 2B
22-May-2018	A1-MW-51-SA1MSD	280-110058-2MSD	MSD	METHOD	SM3500 Fe B D	Stage 2B
22-May-2018	A1-MW-50-SA1	1801024-02	N	Gen Prep	537 MOD	Stage 2B
22-May-2018	A1-MW-50-SA1	280-110058-3	N	METHOD	8260B	Stage 2B
22-May-2018	A1-MW-50-SA1	280-110058-3	N	METHOD	9040C	Stage 2B
22-May-2018	A1-MW-50-SA1	280-110058-3	N	METHOD	9056A	Stage 2B
22-May-2018	A1-MW-50-SA1	280-110058-3	N	METHOD	SM3500 Fe B D	Stage 2B
22-May-2018	A1-MW-50-SA1DUP	280-110058-3DUP	DUP	METHOD	9040C	Stage 2B
22-May-2018	A1-MW-49-SA1	1801024-03	N	Gen Prep	537 MOD	Stage 2B
22-May-2018	A1-MW-49-SA1	280-110058-4	N	METHOD	8260B	Stage 2B
22-May-2018	A1-MW-49-SA1	280-110058-4	N	METHOD	9040C	Stage 2B
22-May-2018	A1-MW-49-SA1	280-110058-4	N	METHOD	9056A	Stage 2B
22-May-2018	A1-MW-49-SA1	280-110058-4	N	METHOD	SM3500 Fe B D	Stage 2B
22-May-2018	A1-MW-05-SA1	1801024-04	N	Gen Prep	537 MOD	Stage 2B
22-May-2018	A1-MW-05-SA1	280-110058-5	N	METHOD	8260B	Stage 2B
22-May-2018	A1-MW-05-SA1	280-110058-5	N	METHOD	9040C	Stage 2B
22-May-2018	A1-MW-05-SA1	280-110058-5	N	METHOD	9056A	Stage 2B

N = Normal Sample
FD = Field Duplicate
TB = Trip Blank
MS = Matrix Spike
MSD = Matrix Spike Duplicate
EB = Equipment Blank
DUP = Laboratory Duplicate
FRB = Field Rinsate Blank

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
22-May-2018	A1-MW-05-SA1	280-110058-5	N	METHOD	SM3500 Fe B D	Stage 2B
22-May-2018	A1-MW-04-SA1	1801024-05	N	Gen Prep	537 MOD	Stage 2B
22-May-2018	A1-MW-04-SA1	280-110058-6	N	METHOD	8260B	Stage 2B
22-May-2018	A1-MW-04-SA1	280-110058-6	N	METHOD	9040C	Stage 2B
22-May-2018	A1-MW-04-SA1	280-110058-6	N	METHOD	9056A	Stage 2B
22-May-2018	A1-MW-04-SA1	280-110058-6	N	METHOD	SM3500 Fe B D	Stage 2B
22-May-2018	FRB-20180522	1801024-06	FRB	Gen Prep	537 MOD	Stage 2B
23-May-2018	TB-20180523	280-110112-1	TB	METHOD	8260B	Stage 4
23-May-2018	A1-MW-18-SA1	1801037-01	N	Gen Prep	537 MOD	Stage 4
23-May-2018	A1-MW-18-SA1	280-110112-2	N	METHOD	8260B	Stage 4
23-May-2018	A1-MW-18-SA1	280-110112-2	N	METHOD	9040C	Stage 4
23-May-2018	A1-MW-18-SA1	280-110112-2	N	METHOD	9056A	Stage 4
23-May-2018	A1-MW-18-SA1	280-110112-2	N	METHOD	SM3500 Fe B D	Stage 4
23-May-2018	A1-MW-18-SA1DUP	280-110112-2DUP	DUP	METHOD	9056A	Stage 4
23-May-2018	A1-MW-18-SA1MS	280-110112-2MS	MS	METHOD	9056A	Stage 4
23-May-2018	A1-MW-18-SA1MSD	280-110112-2MSD	MSD	METHOD	9056A	Stage 4
23-May-2018	16-MW-06-SA1	1801037-08	N	Gen Prep	537 MOD	Stage 4
23-May-2018	16-MW-09-SA1	1801037-07	N	Gen Prep	537 MOD	Stage 4
23-May-2018	16-MW-08-SA1	1801037-02	N	Gen Prep	537 MOD	Stage 4
23-May-2018	16-MW-08-SA1	280-110112-3	N	METHOD	8260B	Stage 4
23-May-2018	16-MW-08-SA1	280-110112-3	N	METHOD	9040C	Stage 4
23-May-2018	16-MW-08-SA1	280-110112-3	N	METHOD	9056A	Stage 4
23-May-2018	16-MW-08-SA1	280-110112-3	N	METHOD	SM3500 Fe B D	Stage 4
23-May-2018	A1-MW-19-SA1	1801037-03	N	Gen Prep	537 MOD	Stage 4
23-May-2018	A1-MW-19-SA1	280-110112-4	N	METHOD	8260B	Stage 4
23-May-2018	A1-MW-19-SA1	280-110112-4	N	METHOD	9040C	Stage 4

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MSD = Matrix Spike Duplicate
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DUP = Laboratory Duplicate
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Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
23-May-2018	A1-MW-19-SA1	280-110112-4	N	METHOD	9056A	Stage 4
23-May-2018	A1-MW-19-SA1	280-110112-4	N	METHOD	SM3500 Fe B D	Stage 4
23-May-2018	A1-MW-37-SA1	1801037-04	N	Gen Prep	537 MOD	Stage 4
23-May-2018	A1-MW-37-SA1	280-110112-6	N	METHOD	8260B	Stage 4
23-May-2018	A1-MW-37-SA1	280-110112-6	N	METHOD	9040C	Stage 4
23-May-2018	A1-MW-37-SA1	280-110112-6	N	METHOD	9056A	Stage 4
23-May-2018	A1-MW-37-SA1	280-110112-6	N	METHOD	SM3500 Fe B D	Stage 4
23-May-2018	A1-MW-37-SA1D	1801037-05	FD	Gen Prep	537 MOD	Stage 4
23-May-2018	A1-MW-37-SA1D	280-110112-5	FD	METHOD	8260B	Stage 4
23-May-2018	16-HS-03-SA1	1801037-06	N	Gen Prep	537 MOD	Stage 4
23-May-2018	16-HS-03-SA1	280-110112-7	N	METHOD	8260B	Stage 4
23-May-2018	16-HS-03-SA1	280-110112-7	N	METHOD	9040C	Stage 4
23-May-2018	16-HS-03-SA1	280-110112-7	N	METHOD	9056A	Stage 4
23-May-2018	16-HS-03-SA1	280-110112-7	N	METHOD	SM3500 Fe B D	Stage 4
23-May-2018	16-HS-03-SA1DUP	280-110112-7DUP	DUP	METHOD	9056A	Stage 4
23-May-2018	16-HS-03-SA1DUP	280-110112-7DUP	DUP	METHOD	SM3500 Fe B D	Stage 4
23-May-2018	16-HS-03-SA1MS	280-110112-7MS	MS	METHOD	8260B	Stage 4
23-May-2018	16-HS-03-SA1MS	280-110112-7MS	MS	METHOD	9056A	Stage 4
23-May-2018	16-HS-03-SA1MS	280-110112-7MS	MS	METHOD	SM3500 Fe B D	Stage 4
23-May-2018	16-HS-03-SA1MSD	280-110112-7MSD	MSD	METHOD	8260B	Stage 4
23-May-2018	16-HS-03-SA1MSD	280-110112-7MSD	MSD	METHOD	9056A	Stage 4
23-May-2018	16-HS-03-SA1MSD	280-110112-7MSD	MSD	METHOD	SM3500 Fe B D	Stage 4
23-May-2018	FRB-20180523	1801037-09	FRB	Gen Prep	537 MOD	Stage 2B
24-May-2018	A1-MW-13-SA1	1801039-01	N	Gen Prep	537 MOD	Stage 2B
24-May-2018	A1-MW-11-SA1	1801039-02	N	Gen Prep	537 MOD	Stage 2B
24-May-2018	A1-MW-14-SA1	1801039-03	N	Gen Prep	537 MOD	Stage 2B

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MSD = Matrix Spike Duplicate
EB = Equipment Blank
DUP = Laboratory Duplicate
FRB = Field Rinsate Blank

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
24-May-2018	A1-MW-15-SA1	1801039-04	N	Gen Prep	537 MOD	Stage 2B
24-May-2018	A1-MW-25-SA1	1801039-07	N	Gen Prep	537 MOD	Stage 2B
24-May-2018	FRB-20180524	1801039-08	FRB	Gen Prep	537 MOD	Stage 2B
25-May-2018	TB-20180525	280-110226-12	TB	METHOD	8260B	Stage 2B
25-May-2018	A1-MW-42-SA1	1801054-01	N	Gen Prep	537 MOD	Stage 2B
25-May-2018	A1-MW-42-SA1	280-110226-1	N	METHOD	8260B	Stage 2B
25-May-2018	A1-MW-42-SA1	280-110226-1	N	METHOD	9040C	Stage 2B
25-May-2018	A1-MW-42-SA1	280-110226-1	N	METHOD	9056A	Stage 2B
25-May-2018	A1-MW-42-SA1	280-110226-1	N	METHOD	SM3500 Fe B D	Stage 2B
25-May-2018	A1-MW-54-SA1	1801054-02	N	Gen Prep	537 MOD	Stage 2B
25-May-2018	A1-MW-54-SA1	280-110226-2	N	METHOD	8260B	Stage 2B
25-May-2018	A1-MW-54-SA1	280-110226-2	N	METHOD	9040C	Stage 2B
25-May-2018	A1-MW-54-SA1	280-110226-2	N	METHOD	9056A	Stage 2B
25-May-2018	A1-MW-54-SA1	280-110226-2	N	METHOD	SM3500 Fe B D	Stage 2B
25-May-2018	A1-MW-53-SA1	1801054-03	N	Gen Prep	537 MOD	Stage 2B
25-May-2018	A1-MW-53-SA1	280-110226-3	N	METHOD	8260B	Stage 2B
25-May-2018	A1-MW-53-SA1MS	280-110226-3MS	MS	METHOD	8260B	Stage 2B
25-May-2018	A1-MW-53-SA1MSD	280-110226-3MSD	MSD	METHOD	8260B	Stage 2B
25-May-2018	A1-PZ-19-SA1	1801054-04	N	Gen Prep	537 MOD	Stage 2B
25-May-2018	A1-PZ-19-SA1	280-110226-4	N	METHOD	8260B	Stage 2B
25-May-2018	A1-PZ-19-SA1	280-110226-4	N	METHOD	9040C	Stage 2B
25-May-2018	A1-PZ-19-SA1	280-110226-4	N	METHOD	9056A	Stage 2B
25-May-2018	A1-PZ-19-SA1	280-110226-4	N	METHOD	SM3500 Fe B D	Stage 2B
25-May-2018	A1-MW-52-SA1	1801054-05	N	Gen Prep	537 MOD	Stage 2B
25-May-2018	A1-MW-52-SA1	280-110226-5	N	METHOD	8260B	Stage 2B
25-May-2018	A1-MW-52-SA1	280-110226-5	N	METHOD	9040C	Stage 2B

N = Normal Sample
FD = Field Duplicate
TB = Trip Blank
MS = Matrix Spike
MSD = Matrix Spike Duplicate
EB = Equipment Blank
DUP = Laboratory Duplicate
FRB = Field Rinsate Blank

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
25-May-2018	A1-MW-52-SA1	280-110226-5	N	METHOD	9056A	Stage 2B
25-May-2018	A1-MW-52-SA1	280-110226-5	N	METHOD	SM3500 Fe B D	Stage 2B
25-May-2018	A1-MW-52-SA1DUP	280-110226-5DUP	DUP	METHOD	9056A	Stage 2B
25-May-2018	A1-MW-52-SA1MS	280-110226-5MS	MS	METHOD	9056A	Stage 2B
25-May-2018	A1-MW-52-SA1MSD	280-110226-5MSD	MSD	METHOD	9056A	Stage 2B
25-May-2018	A1-MW-01-SA1	1801054-06	N	Gen Prep	537 MOD	Stage 2B
25-May-2018	A1-MW-01-SA1	280-110226-6	N	METHOD	8260B	Stage 2B
25-May-2018	A1-MW-01-SA1	280-110226-6	N	METHOD	9040C	Stage 2B
25-May-2018	A1-MW-01-SA1	280-110226-6	N	METHOD	9056A	Stage 2B
25-May-2018	A1-MW-01-SA1	280-110226-6	N	METHOD	SM3500 Fe B D	Stage 2B
25-May-2018	A1-MW-01-SA1D	1801054-07	FD	Gen Prep	537 MOD	Stage 2B
25-May-2018	A1-MW-01-SA1D	280-110226-7	FD	METHOD	8260B	Stage 2B
25-May-2018	A1-MW-31-SA1	1801054-08	N	Gen Prep	537 MOD	Stage 2B
25-May-2018	A1-MW-31-SA1	280-110226-8	N	METHOD	8260B	Stage 2B
25-May-2018	A1-MW-31-SA1	280-110226-8	N	METHOD	9040C	Stage 2B
25-May-2018	A1-MW-31-SA1	280-110226-8	N	METHOD	9056A	Stage 2B
25-May-2018	A1-MW-31-SA1	280-110226-8	N	METHOD	SM3500 Fe B D	Stage 2B
25-May-2018	A1-MW-31-SA1DUP	280-110226-8DUP	DUP	METHOD	SM3500 Fe B D	Stage 2B
25-May-2018	A1-MW-31-SA1MS	280-110226-8MS	MS	METHOD	SM3500 Fe B D	Stage 2B
25-May-2018	A1-MW-31-SA1MSD	280-110226-8MSD	MSD	METHOD	SM3500 Fe B D	Stage 2B
25-May-2018	FRB-20180525	1801054-09	FRB	Gen Prep	537 MOD	Stage 2B
30-May-2018	TB-20180530	280-110291-1	TB	METHOD	8260B	Stage 2B
30-May-2018	A1-MW-27-SA1	1801071-01	N	Gen Prep	537 MOD	Stage 2B
30-May-2018	A1-MW-27-SA1	280-110291-6	N	METHOD	8260B	Stage 2B
30-May-2018	A1-MW-27-SA1	280-110291-6	N	METHOD	9040C	Stage 2B
30-May-2018	A1-MW-27-SA1	280-110291-6	N	METHOD	9056A	Stage 2B

N = Normal Sample
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MSD = Matrix Spike Duplicate
EB = Equipment Blank
DUP = Laboratory Duplicate
FRB = Field Rinsate Blank

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
30-May-2018	A1-MW-27-SA1	280-110291-6	N	METHOD	SM3500 Fe B D	Stage 2B
30-May-2018	A1-MW-25-SA1	280-110291-5	N	METHOD	8260B	Stage 2B
30-May-2018	A1-MW-25-SA1	280-110291-5	N	METHOD	9040C	Stage 2B
30-May-2018	A1-MW-25-SA1	280-110291-5	N	METHOD	9056A	Stage 2B
30-May-2018	A1-MW-25-SA1	280-110291-5	N	METHOD	SM3500 Fe B D	Stage 2B
30-May-2018	A1-MW-55-SA1	1801071-02	N	Gen Prep	537 MOD	Stage 2B
30-May-2018	A1-MW-55-SA1	280-110291-4	N	METHOD	8260B	Stage 2B
30-May-2018	A1-MW-55-SA1	280-110291-4	N	METHOD	9040C	Stage 2B
30-May-2018	A1-MW-55-SA1	280-110291-4	N	METHOD	9056A	Stage 2B
30-May-2018	A1-MW-55-SA1	280-110291-4	N	METHOD	SM3500 Fe B D	Stage 2B
30-May-2018	A1-MW-23-SA1	1801071-03	N	Gen Prep	537 MOD	Stage 2B
30-May-2018	A1-MW-23-SA1	280-110291-3	N	METHOD	8260B	Stage 2B
30-May-2018	A1-MW-23-SA1	280-110291-3	N	METHOD	9040C	Stage 2B
30-May-2018	A1-MW-23-SA1	280-110291-3	N	METHOD	9056A	Stage 2B
30-May-2018	A1-MW-23-SA1	280-110291-3	N	METHOD	SM3500 Fe B D	Stage 2B
30-May-2018	A1-MW-07-SA1	1801071-04	N	Gen Prep	537 MOD	Stage 2B
30-May-2018	A1-MW-07-SA1	280-110291-7	N	METHOD	8260B	Stage 2B
30-May-2018	A1-MW-07-SA1	280-110291-7	N	METHOD	9040C	Stage 2B
30-May-2018	A1-MW-07-SA1	280-110291-7	N	METHOD	9056A	Stage 2B
30-May-2018	A1-MW-07-SA1	280-110291-7	N	METHOD	SM3500 Fe B D	Stage 2B
30-May-2018	A1-MW-14-SA1	280-110291-2	N	METHOD	8260B	Stage 2B
30-May-2018	A1-MW-14-SA1	280-110291-2	N	METHOD	9040C	Stage 2B
30-May-2018	A1-MW-14-SA1	280-110291-2	N	METHOD	9056A	Stage 2B
30-May-2018	A1-MW-14-SA1	280-110291-2	N	METHOD	SM3500 Fe B D	Stage 2B
30-May-2018	A1-MW-14-SA1DUP	280-110291-2DUP	DUP	METHOD	9056A	Stage 2B
30-May-2018	A1-MW-14-SA1MS	280-110291-2MS	MS	METHOD	9056A	Stage 2B

N = Normal Sample
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MSD = Matrix Spike Duplicate
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DUP = Laboratory Duplicate
FRB = Field Rinsate Blank

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
30-May-2018	A1-MW-14-SA1MSD	280-110291-2MSD	MSD	METHOD	9056A	Stage 2B
30-May-2018	FRB-20180530	1801071-05	FRB	Gen Prep	537 MOD	Stage 2B
31-May-2018	TB-20180531	280-110353-1	TB	METHOD	8260B	Stage 2B
31-May-2018	A1-MW-13-SA1	280-110353-2	N	METHOD	8260B	Stage 2B
31-May-2018	A1-MW-13-SA1	280-110353-2	N	METHOD	9040C	Stage 2B
31-May-2018	A1-MW-13-SA1	280-110353-2	N	METHOD	9056A	Stage 2B
31-May-2018	A1-MW-13-SA1	280-110353-2	N	METHOD	SM3500 Fe B D	Stage 2B
31-May-2018	A1-MW-11-SA1	280-110353-3	N	METHOD	8260B	Stage 2B
31-May-2018	A1-MW-11-SA1	280-110353-3	N	METHOD	9040C	Stage 2B
31-May-2018	A1-MW-11-SA1	280-110353-3	N	METHOD	9056A	Stage 2B
31-May-2018	A1-MW-11-SA1	280-110353-3	N	METHOD	SM3500 Fe B D	Stage 2B
31-May-2018	A1-MW-11-SA1DUP	280-110353-3DUP	DUP	METHOD	9040C	Stage 2B
31-May-2018	A1-MW-15-SA1	280-110353-4	N	METHOD	8260B	Stage 2B
31-May-2018	A1-MW-15-SA1	280-110353-4	N	METHOD	9040C	Stage 2B
31-May-2018	A1-MW-15-SA1	280-110353-4	N	METHOD	9056A	Stage 2B
31-May-2018	A1-MW-15-SA1	280-110353-4	N	METHOD	SM3500 Fe B D	Stage 2B
31-May-2018	EB-20180531	1801084-01	EB	Gen Prep	537 MOD	Stage 2B
31-May-2018	EB-20180531	280-110353-5	EB	METHOD	8260B	Stage 2B
31-May-2018	16-HS-03-SA1MS	B8E0244-MS1	MS	Gen Prep	537 MOD	Stage 4
31-May-2018	A1-MW-53-SA1MS	B8E0244-MS2	MS	Gen Prep	537 MOD	Stage 2B
31-May-2018	16-HS-03-SA1MSD	B8E0244-MSD1	MSD	Gen Prep	537 MOD	Stage 4
31-May-2018	A1-MW-53-SA1MSD	B8E0244-MSD2	MSD	Gen Prep	537 MOD	Stage 2B

N = Normal Sample
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MSD = Matrix Spike Duplicate
EB = Equipment Blank
DUP = Laboratory Duplicate
FRB = Field Rinsate Blank

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1, **Laboratory: TA DEN**

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-110058-1

Method Category: EM

Method: 9040C **Matrix: AQ**

Sample ID: A1-MW-04-SA1 **Collected:** 5/22/2018 2:06:00 PM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-05-SA1 **Collected:** 5/22/2018 1:19:00 PM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-49-SA1 **Collected:** 5/22/2018 12:20:00 PM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.8	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-50-SA1 **Collected:** 5/22/2018 11:30:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.7	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-51-SA1 **Collected:** 5/22/2018 10:14:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Method Category: GENCHEM

Method: 9056A **Matrix: AQ**

Sample ID: A1-MW-49-SA1 **Collected:** 5/22/2018 12:20:00 PM **Analysis Type:** RE/TOT **Dilution:** 10

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NITRATE	2.82	J	1.00	LOD	5.00	LOQ	mg/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1,

Laboratory: TA DEN

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

SDG: 280-110058-1

Method Category: **GENCHEM**

Method: **SM3500 Fe B D** ***Matrix:*** **AQ**

Sample ID: **A1-MW-04-SA1** ***Collected:*** **5/22/2018 2:06:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0751	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI, StoA

Sample ID: **A1-MW-05-SA1** ***Collected:*** **5/22/2018 1:19:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0617	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI, StoA

Sample ID: **A1-MW-49-SA1** ***Collected:*** **5/22/2018 12:20:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	UJ	StoA

Sample ID: **A1-MW-50-SA1** ***Collected:*** **5/22/2018 11:30:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: **A1-MW-51-SA1** ***Collected:*** **5/22/2018 10:14:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0563	J HF F1	0.0500	LOD	0.200	LOQ	mg/L	J	RI, Ms, StoA

Method Category: **VOA**

Method: **8260B** ***Matrix:*** **AQ**

Sample ID: **A1-MW-50-SA1** ***Collected:*** **5/22/2018 11:30:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.643	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.903	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1,

Laboratory: TA DEN

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

SDG: 280-110058-1

Method Category: VOA

Method: 8260B ***Matrix:*** AQ

Sample ID: A1-MW-51-SA1 ***Collected:*** 5/22/2018 10:14:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.629	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.571	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

SDG: 280-110112-1

Method Category: EM

Method: 9040C ***Matrix:*** AQ

Sample ID: 16-HS-03-SA1 ***Collected:*** 5/23/2018 2:19:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.2	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: 16-MW-08-SA1 ***Collected:*** 5/23/2018 11:09:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-18-SA1 ***Collected:*** 5/23/2018 9:00:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.7	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-19-SA1 ***Collected:*** 5/23/2018 12:03:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.7	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1,

Laboratory: TA DEN

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

SDG: 280-110112-1

Method Category: EM

Method: 9040C ***Matrix:*** AQ

Sample ID: A1-MW-37-SA1 ***Collected:*** 5/23/2018 1:16:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.7	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Method Category: GENCHEM

Method: 9056A ***Matrix:*** AQ

Sample ID: 16-HS-03-SA1 ***Collected:*** 5/23/2018 2:19:00 PM ***Analysis Type:*** RE2/TOT ***Dilution:*** 50

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Sulfate	2120	F1	25.0	LOD	250	LOQ	mg/L	J	Ms

Method Category: GENCHEM

Method: SM3500 Fe B D ***Matrix:*** AQ

Sample ID: 16-HS-03-SA1 ***Collected:*** 5/23/2018 2:19:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	Ms

Sample ID: 16-MW-08-SA1 ***Collected:*** 5/23/2018 11:09:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0403	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI

Sample ID: A1-MW-18-SA1 ***Collected:*** 5/23/2018 9:00:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0215	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI, StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1,

Laboratory: TA DEN

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

SDG: 280-110112-1

Method Category: **GENCHEM**

Method: **SM3500 Fe B D** ***Matrix:*** **AQ**

Sample ID: **A1-MW-37-SA1** ***Collected:*** **5/23/2018 1:16:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.166	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI

Method Category: **VOA**

Method: **8260B** ***Matrix:*** **AQ**

Sample ID: **16-HS-03-SA1** ***Collected:*** **5/23/2018 2:19:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.800	U F1 F2	0.800	LOD	1.00	LOQ	ug/L	UJ	Ms, Surr
TETRACHLOROETHENE	0.400	U	0.400	LOD	1.00	LOQ	ug/L	UJ	Surr
TRICHLOROETHENE	0.400	U	0.400	LOD	1.00	LOQ	ug/L	UJ	Surr

Sample ID: **16-MW-08-SA1** ***Collected:*** **5/23/2018 11:09:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TETRACHLOROETHENE	0.669	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: **A1-MW-18-SA1** ***Collected:*** **5/23/2018 9:00:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.452	J	0.800	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: **A1-MW-19-SA1** ***Collected:*** **5/23/2018 12:03:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.424	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1,

Laboratory: TA DEN

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

SDG: 280-110112-1

Method Category: VOA

Method: 8260B ***Matrix:*** AQ

Sample ID: A1-MW-37-SA1 ***Collected:*** 5/23/2018 1:16:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.624	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-MW-37-SA1D ***Collected:*** 5/23/2018 1:26:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.652	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

SDG: 280-110226-1

Method Category: EM

Method: 9040C ***Matrix:*** AQ

Sample ID: A1-MW-01-SA1 ***Collected:*** 5/25/2018 1:56:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-31-SA1 ***Collected:*** 5/25/2018 2:49:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-42-SA1 ***Collected:*** 5/25/2018 7:56:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-52-SA1 ***Collected:*** 5/25/2018 1:00:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1, **Laboratory: TA DEN**

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-110226-1

Method Category: **EM**

Method: **9040C** ***Matrix:*** **AQ**

Sample ID: **A1-MW-54-SA1** ***Collected:*** **5/25/2018 9:09:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: **A1-PZ-19-SA1** ***Collected:*** **5/25/2018 11:59:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Method Category: **GENCHEM**

Method: **9056A** ***Matrix:*** **AQ**

Sample ID: **A1-MW-52-SA1** ***Collected:*** **5/25/2018 1:00:00 PM** ***Analysis Type:*** **RE/TOT** ***Dilution:*** **5**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CHLORIDE	500	F1	2.50	LOD	15.0	LOQ	mg/L	J	Ms

Sample ID: **A1-MW-54-SA1** ***Collected:*** **5/25/2018 9:09:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NITRATE	0.343	J	0.100	LOD	0.500	LOQ	mg/L	J	RI

Method Category: **GENCHEM**

Method: **SM3500 Fe B D** ***Matrix:*** **AQ**

Sample ID: **A1-MW-01-SA1** ***Collected:*** **5/25/2018 1:56:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1,

Laboratory: TA DEN

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

SDG: 280-110226-1

Method Category: **GENCHEM**

Method: **SM3500 Fe B D** ***Matrix:*** **AQ**

Sample ID: **A1-MW-31-SA1** ***Collected:*** **5/25/2018 2:49:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	Ms, StoA

Sample ID: **A1-MW-42-SA1** ***Collected:*** **5/25/2018 7:56:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: **A1-MW-52-SA1** ***Collected:*** **5/25/2018 1:00:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: **A1-MW-54-SA1** ***Collected:*** **5/25/2018 9:09:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: **A1-PZ-19-SA1** ***Collected:*** **5/25/2018 11:59:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.198	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI, StoA

Method Category: **VOA**

Method: **8260B** ***Matrix:*** **AQ**

Sample ID: **A1-MW-31-SA1** ***Collected:*** **5/25/2018 2:49:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.353	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1, **Laboratory: TA DEN**

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-110226-1

Method Category: VOA

Method: 8260B **Matrix:** AQ

Sample ID: A1-MW-42-SA1 **Collected:** 5/25/2018 7:56:00 AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.298	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.415	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-MW-52-SA1 **Collected:** 5/25/2018 1:00:00 PM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.507	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.627	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-PZ-19-SA1 **Collected:** 5/25/2018 11:59:00 AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.269	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

SDG: 280-110291-1

Method Category: EM

Method: 9040C **Matrix:** AQ

Sample ID: A1-MW-07-SA1 **Collected:** 5/30/2018 12:06:00 PM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-14-SA1 **Collected:** 5/30/2018 1:38:00 PM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1, **Laboratory: TA DEN**

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-110291-1

Method Category: **EM**

Method: **9040C** ***Matrix:*** **AQ**

Sample ID: **A1-MW-23-SA1** ***Collected:*** **5/30/2018 11:10:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: **A1-MW-25-SA1** ***Collected:*** **5/30/2018 9:12:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: **A1-MW-27-SA1** ***Collected:*** **5/30/2018 8:18:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: **A1-MW-55-SA1** ***Collected:*** **5/30/2018 10:16:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Method Category: **GENCHEM**

Method: **SM3500 Fe B D** ***Matrix:*** **AQ**

Sample ID: **A1-MW-07-SA1** ***Collected:*** **5/30/2018 12:06:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: **A1-MW-14-SA1** ***Collected:*** **5/30/2018 1:38:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1,

Laboratory: TA DEN

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

SDG: 280-110291-1

Method Category: GENCHEM

Method: SM3500 Fe B D ***Matrix:*** AQ

Sample ID: A1-MW-23-SA1 ***Collected:*** 5/30/2018 11:10:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-25-SA1 ***Collected:*** 5/30/2018 9:12:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.123	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI, StoA

Sample ID: A1-MW-27-SA1 ***Collected:*** 5/30/2018 8:18:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-55-SA1 ***Collected:*** 5/30/2018 10:16:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Method Category: VOA

Method: 8260B ***Matrix:*** AQ

Sample ID: A1-MW-07-SA1 ***Collected:*** 5/30/2018 12:06:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.405	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.797	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-MW-14-SA1 ***Collected:*** 5/30/2018 1:38:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.898	J	0.800	LOD	1.00	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1,

Laboratory: TA DEN

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

SDG: 280-110291-1

Method Category: VOA

Method: 8260B **Matrix:** AQ

Sample ID: A1-MW-14-SA1 **Collected:** 5/30/2018 1:38:00 PM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.876	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-MW-23-SA1 **Collected:** 5/30/2018 11:10:00 AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.800	U	0.800	LOD	1.00	LOQ	ug/L	UJ	Headspace
TETRACHLOROETHENE	0.400	U	0.400	LOD	1.00	LOQ	ug/L	UJ	Headspace
TRICHLOROETHENE	0.400	U	0.400	LOD	1.00	LOQ	ug/L	UJ	Headspace

Sample ID: A1-MW-25-SA1 **Collected:** 5/30/2018 9:12:00 AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.204	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.418	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

SDG: 280-110353-1

Method Category: EM

Method: 9040C **Matrix:** AQ

Sample ID: A1-MW-11-SA1 **Collected:** 5/31/2018 8:24:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.1	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-13-SA1 **Collected:** 5/31/2018 7:43:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1,

Laboratory: TA DEN

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

SDG: 280-110353-1

Method Category: EM

Method: 9040C ***Matrix:*** AQ

Sample ID: A1-MW-15-SA1 ***Collected:*** 5/31/2018 9:16:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.1	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Method Category: GENCHEM

Method: SM3500 Fe B D ***Matrix:*** AQ

Sample ID: A1-MW-11-SA1 ***Collected:*** 5/31/2018 8:24:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-13-SA1 ***Collected:*** 5/31/2018 7:43:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-15-SA1 ***Collected:*** 5/31/2018 9:16:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Method Category: VOA

Method: 8260B ***Matrix:*** AQ

Sample ID: A1-MW-15-SA1 ***Collected:*** 5/31/2018 9:16:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.321	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-110058-1, 280-110112-1,

Laboratory: TA DEN

EDD Filename: Prep280-110058-1, Prep280-110112-1, Prep280-110226-1, Prep280-110291-1, Prep280-110353-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

Reason Code Legend

Reason Code	*Description*
Headspace	Preservation
Mb	Method Blank Contamination
Ms	Matrix Spike Lower Estimation
Ms	Matrix Spike Lower Rejection
Ms	Matrix Spike Precision
Preservation	Preservation
RI	Reporting Limit Trace Value
StoA	Sampling to Analysis Estimation
StoA	Sampling to Analysis Rejection
Surr	Surrogate/Tracer Recovery Lower Estimation

* denotes a non-reportable result

Data Qualifier Summary

Lab Reporting Batch ID: 1801024, 1801037, 1801039,

Laboratory: Vista

EDD Filename: 1801024, 1801037, 1801039, 1801054, 1801071, 1801084

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

SDG: 1801024

Method Category: SVOA

Method: 537 MOD ***Matrix:*** AQ

Sample ID: A1-MW-04-SA1 ***Collected:*** 5/22/2018 2:06:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFOA	0.00333	J	0.00508	LOD	0.00812	LOQ	ug/L	J	RI
PFOS	0.00161	J	0.00508	LOD	0.00812	LOQ	ug/L	J	RI

Sample ID: A1-MW-05-SA1 ***Collected:*** 5/22/2018 1:19:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFHpA	0.000917	J	0.00525	LOD	0.00842	LOQ	ug/L	J	RI
PFHxS	0.00278	J	0.00525	LOD	0.00842	LOQ	ug/L	J	RI

Sample ID: A1-MW-49-SA1 ***Collected:*** 5/22/2018 12:20:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.00627	J	0.00508	LOD	0.00812	LOQ	ug/L	J	RI

Sample ID: A1-MW-51-SA1 ***Collected:*** 5/22/2018 10:14:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NEtFOSAA	0.00521	U	0.00521	LOD	0.00836	LOQ	ug/L	UJ	Is
PFBS	0.0613		0.00521	LOD	0.00836	LOQ	ug/L	J	Is
PFOS	0.00303	J	0.00521	LOD	0.00836	LOQ	ug/L	J	RI

SDG: 1801037

Method Category: SVOA

Method: 537 MOD ***Matrix:*** AQ

Sample ID: 16-HS-03-SA1 ***Collected:*** 5/23/2018 2:19:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.582		0.00500	LOD	0.00803	LOQ	ug/L	J	Is
PFHxS	0.150		0.00500	LOD	0.00803	LOQ	ug/L	J	Ms

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 1801024, 1801037, 1801039,

Laboratory: Vista

EDD Filename: 1801024, 1801037, 1801039, 1801054, 1801071, 1801084

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

SDG: 1801037

Method Category: SVOA

Method: 537 MOD ***Matrix:*** AQ

Sample ID: 16-HS-03-SA1 ***Collected:*** 5/23/2018 2:19:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFOA	0.0218		0.00500	LOD	0.00803	LOQ	ug/L	J	Ms
PFHpA	0.198		0.00500	LOD	0.00803	LOQ	ug/L	J	Ms, Ms

Sample ID: 16-MW-06-SA1 ***Collected:*** 5/23/2018 9:50:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.112		0.00563	LOD	0.00897	LOQ	ug/L	J	Is
PFOS	0.00227	J	0.00563	LOD	0.00897	LOQ	ug/L	J	RI

Sample ID: 16-MW-08-SA1 ***Collected:*** 5/23/2018 11:09:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	1.29		0.00543	LOD	0.00870	LOQ	ug/L	J	Is
PFNA	0.00102	J	0.00543	LOD	0.00870	LOQ	ug/L	J	RI

Sample ID: 16-MW-09-SA1 ***Collected:*** 5/23/2018 10:15:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.124		0.00543	LOD	0.00871	LOQ	ug/L	J	Is
PFDA	0.00440	J	0.00543	LOD	0.00871	LOQ	ug/L	J	RI
PFNA	0.00326	J	0.00543	LOD	0.00871	LOQ	ug/L	J	RI

Sample ID: A1-MW-18-SA1 ***Collected:*** 5/23/2018 9:00:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.0244		0.00553	LOD	0.00888	LOQ	ug/L	J	Is
PFOA	0.00187	J	0.00553	LOD	0.00888	LOQ	ug/L	J	RI
PFOS	0.00437	J	0.00553	LOD	0.00888	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 1801024, 1801037, 1801039, **Laboratory: Vista**

EDD Filename: 1801024, 1801037, 1801039, 1801054, 1801071, 1801084 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

SDG: 1801037

Method Category: **SVOA**

Method: **537 MOD** ***Matrix:*** **AQ**

Sample ID: **A1-MW-19-SA1** ***Collected:*** **5/23/2018 12:03:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.0166		0.00530	LOD	0.00846	LOQ	ug/L	J	Is
PFDA	0.00727	J	0.00530	LOD	0.00846	LOQ	ug/L	J	RI

Sample ID: **A1-MW-37-SA1** ***Collected:*** **5/23/2018 1:16:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.230		0.00525	LOD	0.00839	LOQ	ug/L	J	Is
PFNA	0.00170	J	0.00525	LOD	0.00839	LOQ	ug/L	J	RI

Sample ID: **A1-MW-37-SA1D** ***Collected:*** **5/23/2018 1:26:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.252		0.00539	LOD	0.00862	LOQ	ug/L	J	Is
PFNA	0.00210	J	0.00539	LOD	0.00862	LOQ	ug/L	J	RI
PFUnA	0.00135	J	0.00539	LOD	0.00862	LOQ	ug/L	J	RI

SDG: 1801039

Method Category: **SVOA**

Method: **537 MOD** ***Matrix:*** **AQ**

Sample ID: **A1-MW-11-SA1** ***Collected:*** **5/24/2018 8:51:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFOS	0.00359	J	0.00539	LOD	0.00860	LOQ	ug/L	J	RI
PFBS	0.109		0.00539	LOD	0.00860	LOQ	ug/L	J	Is

Sample ID: **A1-MW-13-SA1** ***Collected:*** **5/24/2018 7:44:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.318		0.00568	LOD	0.00912	LOQ	ug/L	J	Is

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 1801024, 1801037, 1801039, **Laboratory: Vista**

EDD Filename: 1801024, 1801037, 1801039, 1801054, 1801071, 1801084 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

SDG: 1801039

Method Category: **SVOA**

Method: **537 MOD** ***Matrix:*** **AQ**

Sample ID: **A1-MW-14-SA1** ***Collected:*** **5/24/2018 10:05:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.118		0.00558	LOD	0.00893	LOQ	ug/L	J	ls

Sample ID: **A1-MW-15-SA1** ***Collected:*** **5/24/2018 11:11:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.523		0.00558	LOD	0.00889	LOQ	ug/L	J	ls

Sample ID: **A1-MW-25-SA1** ***Collected:*** **5/24/2018 2:18:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.355		0.00553	LOD	0.00889	LOQ	ug/L	J	ls

SDG: 1801054

Method Category: **SVOA**

Method: **537 MOD** ***Matrix:*** **AQ**

Sample ID: **A1-MW-01-SA1** ***Collected:*** **5/25/2018 1:56:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.0524		0.00568	LOD	0.00907	LOQ	ug/L	J	ls
PFHpA	0.00225	J	0.00568	LOD	0.00907	LOQ	ug/L	J	RI

Sample ID: **A1-MW-01-SA1D** ***Collected:*** **5/25/2018 2:06:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.0557		0.00534	LOD	0.00854	LOQ	ug/L	J	ls
PFHpA	0.00273	J	0.00534	LOD	0.00854	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 1801024, 1801037, 1801039,

Laboratory: Vista

EDD Filename: 1801024, 1801037, 1801039, 1801054, 1801071, 1801084

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

SDG: 1801054

Method Category: **SVOA**

Method: **537 MOD** ***Matrix:*** **AQ**

Sample ID: **A1-MW-31-SA1** ***Collected:*** **5/25/2018 2:49:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.0634		0.00553	LOD	0.00887	LOQ	ug/L	J	Is
PFHpA	0.00851	J	0.00553	LOD	0.00887	LOQ	ug/L	J	RI

Sample ID: **A1-MW-42-SA1** ***Collected:*** **5/25/2018 7:56:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.292		0.00553	LOD	0.00887	LOQ	ug/L	J	Is
PFOS	0.00186	J	0.00553	LOD	0.00887	LOQ	ug/L	J	RI

Sample ID: **A1-MW-52-SA1** ***Collected:*** **5/25/2018 1:00:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.146		0.00543	LOD	0.00869	LOQ	ug/L	J	Is

Sample ID: **A1-MW-53-SA1** ***Collected:*** **5/25/2018 10:14:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.551		0.00548	LOD	0.00878	LOQ	ug/L	J	Is
PFOS	0.00188	J	0.00548	LOD	0.00878	LOQ	ug/L	J	RI

Sample ID: **A1-MW-54-SA1** ***Collected:*** **5/25/2018 9:09:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.536		0.00558	LOD	0.00892	LOQ	ug/L	J	Is
PFOS	0.00652	J	0.00558	LOD	0.00892	LOQ	ug/L	J	RI

Sample ID: **A1-PZ-19-SA1** ***Collected:*** **5/25/2018 11:59:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.0152		0.00534	LOD	0.00852	LOQ	ug/L	J	Is

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 1801024, 1801037, 1801039, **Laboratory: Vista**

EDD Filename: 1801024, 1801037, 1801039, 1801054, 1801071, 1801084 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

SDG: 1801054

Method Category: **SVOA**

Method: **537 MOD** ***Matrix:*** **AQ**

Sample ID: **A1-PZ-19-SA1** ***Collected:*** **5/25/2018 11:59:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFHpA	0.00326	J	0.00534	LOD	0.00852	LOQ	ug/L	J	RI
PFOA	0.00756	J	0.00534	LOD	0.00852	LOQ	ug/L	J	RI
PFOS	0.00115	J	0.00534	LOD	0.00852	LOQ	ug/L	J	RI

SDG: 1801071

Method Category: **SVOA**

Method: **537 MOD** ***Matrix:*** **AQ**

Sample ID: **A1-MW-07-SA1** ***Collected:*** **5/30/2018 12:06:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.112		0.00525	LOD	0.00840	LOQ	ug/L	J	Is

Sample ID: **A1-MW-23-SA1** ***Collected:*** **5/30/2018 11:10:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFHxS	0.00581	J	0.00548	LOD	0.00874	LOQ	ug/L	J	RI

Sample ID: **A1-MW-27-SA1** ***Collected:*** **5/30/2018 8:18:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.0819		0.00534	LOD	0.00854	LOQ	ug/L	J	Is

Sample ID: **A1-MW-55-SA1** ***Collected:*** **5/30/2018 10:16:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFBS	0.00548	U	0.00548	LOD	0.00875	LOQ	ug/L	UJ	Is

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 1801024, 1801037, 1801039,

Laboratory: Vista

EDD Filename: 1801024, 1801037, 1801039, 1801054, 1801071, 1801084

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

Reason Code Legend

Reason Code	*Description*
Is	Internal Standard Estimation
Lcs	Laboratory Control Spike Upper Estimation
Ms	Matrix Spike Lower Estimation
Ms	Matrix Spike Lower Rejection
Ms	Matrix Spike Precision
Ms	Matrix Spike Upper Estimation
RI	Reporting Limit Trace Value

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Enclosure I

Stage 2B ADR Outliers

(Including Manual Review Outliers)

Quality Control
Outlier Reports

280-110058-1

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 280-110058-1 **Laboratory: TA DEN**

EDD Filename: 280-110058-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9040C **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-04-SA1 (RES/TOT)	Sampling To Analysis	226.00	24.00	HOURS	J (all detects)
A1-MW-05-SA1 (RES/TOT)		319.25	24.00	HOURS	
A1-MW-49-SA1 (RES/TOT)		227.75	24.00	HOURS	
A1-MW-50-SA1 (RES/TOT)		228.25	24.00	HOURS	
A1-MW-50-SA1DUP (RES/TOT)		228.50	24.00	HOURS	
A1-MW-51-SA1 (RES/TOT)		229.25	24.00	HOURS	

Method: SM3500 Fe B D **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-04-SA1 (RES/TOT)	Sampling To Analysis	45.75	24.00	HOURS	J(all detects)
A1-MW-05-SA1 (RES/TOT)		46.50	24.00	HOURS	UJ(all non-detects)
A1-MW-49-SA1 (RES/TOT)		47.50	24.00	HOURS	
A1-MW-50-SA1 (RES/TOT)	Sampling To Analysis	48.25	24.00	HOURS	J(all detects)
A1-MW-51-SA1 (RES/TOT)		49.50	24.00	HOURS	R(all non-detects)
A1-MW-51-SA1DUP (RES/TOT)		49.50	24.00	HOURS	
A1-MW-51-SA1MS (RES/TOT)		49.50	24.00	HOURS	
A1-MW-51-SA1MSD (RES/TOT)		49.50	24.00	HOURS	

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 280-110058-1 **Laboratory: TA DEN**

EDD Filename: 280-110058-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **SM3500 Fe B D**
Matrix: **AQ**

QC Sample ID (Associated Samples)	*Compound*	*MS %R*	*MSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
A1-MW-51-SA1MS A1-MW-51-SA1MSD (A1-MW-51-SA1)	Ferrous Iron	38	39	85.00-113.00	-	Ferrous Iron	J (all detects) UJ (all non-detects)

Reporting Limit Outliers

Lab Reporting Batch ID: 280-110058-1 **Laboratory: TA DEN**

EDD Filename: 280-110058-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 8260B

Matrix: AQ

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-50-SA1	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.643 0.903	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-51-SA1	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.629 0.571	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)

Method: 9056A

Matrix: AQ

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-49-SA1	NITRATE	J	2.82	5.00	LOQ	mg/L	J (all detects)

Method: SM3500 Fe B D

Matrix: AQ

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-04-SA1	Ferrous Iron	J HF	0.0751	0.200	LOQ	mg/L	J (all detects)
A1-MW-05-SA1	Ferrous Iron	J HF	0.0617	0.200	LOQ	mg/L	J (all detects)
A1-MW-51-SA1	Ferrous Iron	J HF F1	0.0563	0.200	LOQ	mg/L	J (all detects)

LDC #: 42613A1
SDG #: 280-110058-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
ADR

Date: 7/13/18
Page: 1 of 1
Reviewer: Q
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD≤15%. ICV≤20%
IV.	Continuing calibration	A	CCV≤20/60%
V.	Laboratory Blanks	N	
VI.	Field blanks	ND	TB=1.
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	TB-20180522	280-110058-1	Water	05/22/18
2	A1-MW-51-SA1	280-110058-2	Water	05/22/18
3	A1-MW-50-SA1	280-110058-3	Water	05/22/18
4	A1-MW-49-SA1	280-110058-4	Water	05/22/18
5	A1-MW-05-SA1	280-110058-5	Water	05/22/18
6	A1-MW-04-SA1	280-110058-6	Water	05/22/18
7	A1-MW-51-SA1MS	280-110058-2MS	Water	05/22/18
8	A1-MW-51-SA1MSD	280-110058-2MSD	Water	05/22/18
9				
10				

Notes:

LDC #: 42613A6
SDG #: 280-110058-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
ADR

Date: 7/18/19
Page: 1 of 1
Reviewer: a
2nd Reviewer: KC

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B) pH (EPA SW846 Method (9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	—	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	—	
X.	Sample result verification	N	
XI	Overall assessment of data	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-51-SA1	280-110058-2	Water	05/22/18
2	A1-MW-50-SA1	280-110058-3	Water	05/22/18
3	A1-MW-49-SA1	280-110058-4	Water	05/22/18
4	A1-MW-05-SA1	280-110058-5	Water	05/22/18
5	A1-MW-04-SA1	280-110058-6	Water	05/22/18
6	A1-MW-51-SA1MS	280-110058-2MS	Water	05/22/18
7	A1-MW-51-SA1MSD	280-110058-2MSD	Water	05/22/18
8	A1-MW-51-SA1DUP	280-110058-2DUP	Water	05/22/18
9	A1-MW-50-SA1DUP	280-110058-3DUP	Water	05/22/18
10				
11				
12				
13				
14				
15				

Notes:

LDC #: 426136

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer: KW

All circled methods are applicable to each sample.

Sample ID	Parameter
1-5	(pH) TDS (Cl) F (NO3) NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe3+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC:6,7	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
8	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
9	(pH) TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

Quality Control
Outlier Reports

280-110112-1

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 280-110112-1 **Laboratory: TA DEN**

EDD Filename: 280-110112-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9040C **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
16-HS-03-SA1 (RES/TOT)	Sampling To Analysis	201.25	24.00	HOURS	J (all detects)
16-MW-08-SA1 (RES/TOT)		204.25	24.00	HOURS	
A1-MW-18-SA1 (RES/TOT)		206.25	24.00	HOURS	
A1-MW-19-SA1 (RES/TOT)		203.25	24.00	HOURS	
A1-MW-37-SA1 (RES/TOT)		202.25	24.00	HOURS	

Method: SM3500 Fe B D **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-18-SA1 (RES/TOT)	Sampling To Analysis	26.85	24.00	HOURS	J(all detects) UJ(all non-detects)

Surrogate Outlier Report

Lab Reporting Batch ID: 280-110112-1 **Laboratory: TA DEN**

EDD Filename: 280-110112-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **8260B**
Matrix: **AQ**

Sample ID (Analysis Type)	*Surrogate*	*Sample % Recovery*	*% Recovery Limits*	*Affected Compounds*	*Flag*
16-HS-03-SA1	TOLUENE-D8	75	89.00-112.00	All Target Analytes	J (all detects) UJ (all non-detects)

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 280-110112-1 **Laboratory: TA DEN**

EDD Filename: 280-110112-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: SM3500 Fe B D
Matrix: AQ

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
16-HS-03-SA1MS 16-HS-03-SA1MSD (16-HS-03-SA1)	Ferrous Iron	1	0	85.00-113.00	-	Ferrous Iron	J (all detects) R (all non-detects)

Method: 8260B
Matrix: AQ

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
16-HS-03-SA1MS 16-HS-03-SA1MSD (16-HS-03-SA1)	1,1-DICHLOROETHENE	56	33	71.00-131.00	53 (20.00)	1,1-DICHLOROETHENE	J(all detects) UJ(all non-detects)

Method: 9056A
Matrix: AQ

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
16-HS-03-SA1MSD (16-HS-03-SA1)	Sulfate	-	86	87.00-112.00	-	Sulfate	J(all detects) UJ(all non-detects)
A1-MW-18-SA1MS A1-MW-18-SA1MSD (A1-MW-18-SA1)	CHLORIDE Sulfate	50 73	45 72	87.00-111.00 87.00-112.00	- -	CHLORIDE Sulfate	No Qual, >4x

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Reporting Limit Outliers

Lab Reporting Batch ID: 280-110112-1 **Laboratory: TA DEN**

EDD Filename: 280-110112-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **8260B**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
16-MW-08-SA1	TETRACHLOROETHENE	J	0.669	1.00	LOQ	ug/L	J (all detects)
A1-MW-18-SA1	1,1-DICHLOROETHENE	J	0.452	1.00	LOQ	ug/L	J (all detects)
A1-MW-19-SA1	TRICHLOROETHENE	J	0.424	1.00	LOQ	ug/L	J (all detects)
A1-MW-37-SA1	TRICHLOROETHENE	J	0.624	1.00	LOQ	ug/L	J (all detects)
A1-MW-37-SA1D	TRICHLOROETHENE	J	0.652	1.00	LOQ	ug/L	J (all detects)

Method: **SM3500 Fe B D**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
16-MW-08-SA1	Ferrous Iron	J HF	0.0403	0.200	LOQ	mg/L	J (all detects)
A1-MW-18-SA1	Ferrous Iron	J HF	0.0215	0.200	LOQ	mg/L	J (all detects)
A1-MW-37-SA1	Ferrous Iron	J HF	0.166	0.200	LOQ	mg/L	J (all detects)

Field Duplicate RPD Report

Lab Reporting Batch ID: 280-110112-1 **Laboratory: TA DEN**

EDD Filename: 280-110112-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 8260B
Matrix: AQ

Analyte	*Concentration (ug/L)*		*Sample RPD*	*eQAPP RPD*	*Flag*
	A1-MW-37-SA1	A1-MW-37-SA1D			
TRICHLOROETHENE	0.624	0.652	NC	30.00	No Qualifiers Applied

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Quality Control
Outlier Reports

280-110226-1

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 280-110226-1 **Laboratory: TA DEN**

EDD Filename: 280-110226-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9040C **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-01-SA1 (RES/TOT)	Sampling To Analysis	154.50	24.00	HOURS	J (all detects)
A1-MW-31-SA1 (RES/TOT)		154.00	24.00	HOURS	
A1-MW-42-SA1 (RES/TOT)		160.25	24.00	HOURS	
A1-MW-52-SA1 (RES/TOT)		155.50	24.00	HOURS	
A1-MW-54-SA1 (RES/TOT)		159.25	24.00	HOURS	
A1-PZ-19-SA1 (RES/TOT)		156.50	24.00	HOURS	

Method: SM3500 Fe B D **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-01-SA1 (RES/TOT)	Sampling To Analysis	452.25	24.00	HOURS	J(all detects)
A1-MW-31-SA1 (RES/TOT)		451.25	24.00	HOURS	R(all non-detects)
A1-MW-31-SA1DUP (RES/TOT)		451.25	24.00	HOURS	
A1-MW-31-SA1DUP (RE/TOT)		452.25	24.00	HOURS	
A1-MW-31-SA1MS (RES/TOT)		451.25	24.00	HOURS	
A1-MW-31-SA1MS (RE/TOT)		452.25	24.00	HOURS	
A1-MW-31-SA1MSD (RES/TOT)		451.50	24.00	HOURS	
A1-MW-31-SA1MSD (RE/TOT)		452.25	24.00	HOURS	
A1-MW-42-SA1 (RES/TOT)		458.25	24.00	HOURS	
A1-MW-52-SA1 (RES/TOT)		453.25	24.00	HOURS	
A1-MW-54-SA1 (RES/TOT)		457.00	24.00	HOURS	
A1-PZ-19-SA1 (RES/TOT)		454.25	24.00	HOURS	

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 280-110226-1 **Laboratory: TA DEN**

EDD Filename: 280-110226-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9056A
Matrix: AQ

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
A1-MW-52-SA1MS A1-MW-52-SA1MSD (A1-MW-52-SA1)	CHLORIDE Sulfate	- 75	84 70	87.00-111.00 87.00-112.00	- -	CHLORIDE Sulfate**	J (all detects) ** No Qual, >4x

Method: SM3500 Fe B D
Matrix: AQ

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
A1-MW-31-SA1MS A1-MW-31-SA1MSD (A1-MW-31-SA1)	Ferrous Iron	21	21	85.00-113.00	-	Ferrous Iron	J(all detects) R(all non-detects)

Reporting Limit Outliers

Lab Reporting Batch ID: 280-110226-1 **Laboratory: TA DEN**

EDD Filename: 280-110226-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 8260B
Matrix: AQ

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-31-SA1	TRICHLOROETHENE	J	0.353	1.00	LOQ	ug/L	J (all detects)
A1-MW-42-SA1	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.298 0.415	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-52-SA1	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.507 0.627	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-PZ-19-SA1	TRICHLOROETHENE	J	0.269	1.00	LOQ	ug/L	J (all detects)

Method: 9056A
Matrix: AQ

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-54-SA1	NITRATE	J	0.343	0.500	LOQ	mg/L	J (all detects)

Method: SM3500 Fe B D
Matrix: AQ

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-PZ-19-SA1	Ferrous Iron	J HF	0.198	0.200	LOQ	mg/L	J (all detects)

LDC #: 42613C1
SDG #: 280-110226-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
ADR

Date: 7/19/18
Page: 1 of 1
Reviewer: 1
2nd Reviewer: RW

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/20%
V.	Laboratory Blanks	N	
VI.	Field blanks	ND	TB = 9
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	ND	D = 6+7
XI.	Internal standards	A	(MS/MSD - FSault)
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-42-SA1	280-110226-1	Water	05/25/18
2	A1-MW-54-SA1	280-110226-2	Water	05/25/18
3	A1-MW-53-SA1	280-110226-3	Water	05/25/18
4	A1-PZ-19-SA1	280-110226-4	Water	05/25/18
5	A1-MW-52-SA1	280-110226-5	Water	05/25/18
6	A1-MW-01-SA1	280-110226-6	Water	05/25/18
7	A1-MW-01-SA1D	280-110226-7	Water	05/25/18
8	A1-MW-31-SA1	280-110226-8	Water	05/25/18
9	TB-20180525	280-110226-12	Water	05/25/18
10	A1-MW-53-SA1MS	280-110226-3MS	Water	05/25/18
11	A1-MW-53-SA1MSD	280-110226-3MSD	Water	05/25/18
12				
13				

LDC #: 42613C6
SDG #: 280-110226-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
ADR

Date: 7/18/18
Page: 1 of 1
Reviewer: G
2nd Reviewer: KLR

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B)
pH (EPA SW846 Method (9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/-	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	ASW	
V	Field blanks	-	
VI.	Matrix Spike/Matrix Spike Duplicates	N	7/8: 50,74x
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	-	
X.	Sample result verification	N	
XI	Overall assessment of data	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-42-SA1	280-110226-1	Water	05/25/18
2	A1-MW-54-SA1	280-110226-2	Water	05/25/18
3	A1-PZ-19-SA1	280-110226-4	Water	05/25/18
4	A1-MW-52-SA1	280-110226-5	Water	05/25/18
5	A1-MW-01-SA1	280-110226-6	Water	05/25/18
6	A1-MW-31-SA1	280-110226-8	Water	05/25/18
7	A1-MW-52-SA1MS	280-110226-5MS	Water	05/25/18
8	A1-MW-52-SA1MSD	280-110226-5MSD	Water	05/25/18
9	A1-MW-52-SA1DUP	280-110226-5DUP	Water	05/25/18
10	A1-MW-31-SA1MS1	280-110226-8MS1	Water	05/25/18
11	A1-MW-31-SA1MSD1	280-110226-8MSD1	Water	05/25/18
12	A1-MW-31-SA1DUP1	280-110226-8DUP2	Water	05/25/18
13	A1-MW-31-SA1MS2	280-110226-8MS2	Water	05/25/18
14	A1-MW-31-SA1MSD2	280-110226-8MSD2	Water	05/25/18
15	A1-MW-31-SA1DUP2	280-110226-8DUP2	Water	05/25/18
16				

Notes:

LDC #: 42613C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer: KK

All circled methods are applicable to each sample.

Sample ID	Parameter
1-6	(pH) TDS (Cl) F (NO3) NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC:7,8	pH TDS (Cl) F NO3 NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
9	pH TDS (Cl) F NO3 NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
10,11	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
12	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
13,14	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
15	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 42613C6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: G
2nd Reviewer: KK

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** All

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No qual (>5x)								
NO3-N		0.04663	0.23315									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Quality Control
Outlier Reports

280-110291-1

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 280-110291-1 **Laboratory: TA DEN**

EDD Filename: 280-110291-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9040C **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-07-SA1 (RES/TOT)	Sampling To Analysis	78.25	24.00	HOURS	J (all detects)
A1-MW-14-SA1 (RES/TOT)		76.25	24.00	HOURS	
A1-MW-23-SA1 (RES/TOT)		79.00	24.00	HOURS	
A1-MW-25-SA1 (RES/TOT)		81.00	24.00	HOURS	
A1-MW-27-SA1 (RES/TOT)		82.00	24.00	HOURS	
A1-MW-55-SA1 (RES/TOT)		79.75	24.00	HOURS	

Method: SM3500 Fe B D **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-07-SA1 (RES/TOT)	Sampling To Analysis	334.25	24.00	HOURS	J(all detects)
A1-MW-14-SA1 (RES/TOT)		332.50	24.00	HOURS	R(all non-detects)
A1-MW-23-SA1 (RES/TOT)		335.00	24.00	HOURS	
A1-MW-25-SA1 (RES/TOT)		337.00	24.00	HOURS	
A1-MW-27-SA1 (RES/TOT)		338.00	24.00	HOURS	
A1-MW-55-SA1 (RES/TOT)		336.00	24.00	HOURS	

Reporting Limit Outliers

Lab Reporting Batch ID: 280-110291-1 **Laboratory: TA DEN**

EDD Filename: 280-110291-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **8260B**

Matrix: **AQ**

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-07-SA1	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.405 0.797	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-14-SA1	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.898 0.876	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-25-SA1	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.204 0.418	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)

Method: **SM3500 Fe B D**

Matrix: **AQ**

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-25-SA1	Ferrous Iron	J HF	0.123	0.200	LOQ	mg/L	J (all detects)

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

LDC #: 42613D1

SDG #: 280-110291-1

Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

ADR

Date: 7/18/18

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration / Endings	A	CCV ≤ 20/50%
V.	Laboratory Blanks	N	
VI.	Field blanks	ND	TB = 1
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	TB-20180530	280-110291-1	Water	05/30/18
2	A1-MW-14-SA1	280-110291-2	Water	05/30/18
3	A1-MW-23-SA1	280-110291-3	Water	05/30/18
4	A1-MW-55-SA1	280-110291-4	Water	05/30/18
5	A1-MW-25-SA1	280-110291-5	Water	05/30/18
6	A1-MW-27-SA1	280-110291-6	Water	05/30/18
7	A1-MW-07-SA1	280-110291-7	Water	05/30/18
8				
9				

Notes:

LDC #: 43613D1

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: 9
2nd Reviewer: KK

All circled dates have exceeded the technical holding times.
N N/A Were all cooler temperatures within validation criteria?
N N/A Were air bubbles > 1/4 inch or was headspace present in the vials?

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
3 (ND)	Headspace		> 6 mm				J (ND)

TECHNICAL HOLDING TIME CRITERIA

Water unpreserved:	Aromatic within 7 days, non-aromatic within 14 days of sample collection.
Water preserved:	Within 14 days of sample collection.
Soil:	Within 14 days of sample collection.

LDC #: 42613D6
SDG #: 280-110291-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
ADR

Date: 7/18/18
Page: 1 of 1
Reviewer: a
2nd Reviewer: KK

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B) pH (EPA SW846 Method (9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/-	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	—	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	—	
X.	Sample result verification	N	
XI	Overall assessment of data	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-14-SA1	280-110291-2	Water	05/30/18
2	A1-MW-23-SA1	280-110291-3	Water	05/30/18
3	A1-MW-55-SA1	280-110291-4	Water	05/30/18
4	A1-MW-25-SA1	280-110291-5	Water	05/30/18
5	A1-MW-27-SA1	280-110291-6	Water	05/30/18
6	A1-MW-07-SA1	280-110291-7	Water	05/30/18
7	A1-MW-14-SA1MS	280-110291-2MS	Water	05/30/18
8	A1-MW-14-SA1MSD	280-110291-2MSD	Water	05/30/18
9	A1-MW-14-SA1DUP	280-110291-2DUP	Water	05/30/18
10				
11				
12				
13				
14				
15				
16				

Notes:

LDC #: 42613O6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer: RLE

All circled methods are applicable to each sample.

Sample ID	Parameter
1-6	(pH) TDS (Cl) F (NO3) NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC: 7,8	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
9	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 42613D6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: G
2nd Reviewer: KK

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 1-3

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No qual (>5x)								
SO4		0.2460	1.23									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Quality Control
Outlier Reports

280-110353-1

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 280-110353-1 **Laboratory: TA DEN**

EDD Filename: 280-110353-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9040C **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-11-SA1 (RES/TOT)	Sampling To Analysis	111.75	24.00	HOURS	J (all detects)
A1-MW-11-SA1DUP (RES/TOT)		111.75	24.00	HOURS	
A1-MW-13-SA1 (RES/TOT)		112.50	24.00	HOURS	
A1-MW-15-SA1 (RES/TOT)		110.50	24.00	HOURS	

Method: SM3500 Fe B D **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-11-SA1 (RES/TOT)	Sampling To Analysis	313.75	24.00	HOURS	J(all detects)
A1-MW-13-SA1 (RES/TOT)		314.50	24.00	HOURS	R(all non-detects)
A1-MW-15-SA1 (RES/TOT)		313.00	24.00	HOURS	

Method Blank Outlier Report

Lab Reporting Batch ID: 280-110353-1 **Laboratory: TA DEN**

EDD Filename: 280-110353-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **9056A**
Matrix: **AQ**

Method Blank Sample ID	Analysis Date	Analyte	Result	Associated Samples
MB 280-417070/6	6/1/2018 12:10:00 PM	CHLORIDE Sulfate	0.5189 mg/L 0.6146 mg/L	A1-MW-11-SA1 A1-MW-13-SA1 A1-MW-15-SA1

Reporting Limit Outliers

Lab Reporting Batch ID: 280-110353-1 **Laboratory: TA DEN**

EDD Filename: 280-110353-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **8260B**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
A1-MW-15-SA1	TRICHLOROETHENE	J	0.321	1.00	LOQ	ug/L	J (all detects)

LDC #: 42613E1 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/12/18
SDG #: 280-110353-1 ADR Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	N	
VI.	Field blanks	ND	TB = 1. EB = 5
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	TB-20180531	280-110353-1	Water	05/31/18
2	A1-MW-13-SA1	280-110353-2	Water	05/31/18
3	A1-MW-11-SA1	280-110353-3	Water	05/31/18
4	A1-MW-15-SA1	280-110353-4	Water	05/31/18
5	EB-20180531	280-110353-5	Water	05/31/18
6				
7				
8				

Notes:

LDC #: 42613E6
SDG #: 280-110353-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
ADR

Date: 7/8/18
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B) pH (EPA SW846 Method (9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/—	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	—	
VI.	Matrix Spike/Matrix Spike Duplicates	N	
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	—	
X.	Sample result verification	N	
XI	Overall assessment of data	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-13-SA1	280-110353-2	Water	05/31/18
2	A1-MW-11-SA1	280-110353-3	Water	05/31/18
3	A1-MW-15-SA1	280-110353-4	Water	05/31/18
4	A1-MW-11-SA1DUP	280-110353-3DUP	Water	05/31/18
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				

Notes:

LDC #: 42613E6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer: RW

All circled methods are applicable to each sample.

Sample ID	Parameter
1-3	(pH) TDS (Cl) F (NO3) NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC:4	(pH) TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 42613E6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: G
2nd Reviewer: KK

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** All

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		No qual (>5x)									
Cl		0.5385	2.6925										
SO4		0.6554	3.277										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Quality Control
Outlier Reports

1801024

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 1801024 **Laboratory: Vista**

EDD Filename: 1801024 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**
Matrix: **AQ**

QC Sample ID (Associated Samples)	*Compound*	*LCS %R*	*LCSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
B8E0250-BS1 (A1-MW-04-SA1 A1-MW-05-SA1 A1-MW-49-SA1 A1-MW-50-SA1 A1-MW-51-SA1 FRB-20180522)	PFTrDA	138	-	70.00-130.00	-	PFTrDA	J (all detects)

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Reporting Limit Outliers

Lab Reporting Batch ID: 1801024 **Laboratory: Vista**

EDD Filename: 1801024 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
A1-MW-04-SA1	PFOA PFOS	J J	0.00333 0.00161	0.00812 0.00812	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-05-SA1	PFHpA PFHxS	J J	0.000917 0.00278	0.00842 0.00842	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-49-SA1	PFBS	J	0.00627	0.00812	LOQ	ug/L	J (all detects)
A1-MW-51-SA1	PFOS	J	0.00303	0.00836	LOQ	ug/L	J (all detects)

LDC #: 42613L96 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/13/18
SDG #: 1801024 ADR Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: 9
2nd Reviewer: KK

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537 Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A A	RSD<20% r². True/ICV = 30%
IV.	Continuing calibration	A	CCV = 30%
V.	Laboratory Blanks	N	
VI.	Field blanks	ND	FRB = 6
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	A N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-51-SA1	1801024-01	Water	05/22/18
2	A1-MW-50-SA1	1801024-02	Water	05/22/18
3	A1-MW-49-SA1	1801024-03	Water	05/22/18
4	A1-MW-05-SA1	1801024-04	Water	05/22/18
5	A1-MW-04-SA1	1801024-05	Water	05/22/18
6	FRB-20180522	1801024-06	Water	05/22/18
7				
8				
9				

Notes:

	BBE0250-BK1						

LDC #: 26132L96

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: 9
2nd Reviewer: KK

METHOD: LC/MS PFCs

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were all internal standard area counts within 50-150% limits?

Y (N) N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		BBE0250-BS	13C2-PFUnA	AT. 6 (50-150)		Y/N/A
		1 (dets)	13C3-PFBS	247		(PFBS)
		(ND)	d5-Et FOSAA	151		(Et FOSAA)

Privileged and Confidential

Quality Control Outlier Reports

1801037

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 1801037 **Laboratory: Vista**

EDD Filename: 1801037 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**
Matrix: **AQ**

QC Sample ID (Associated Samples)	*Compound*	*MS %R*	*MSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
16-HS-03-SA1MS 16-HS-03-SA1MSD (16-HS-03-SA1)	NMeFOSAA	-	-	70.00-130.00	41.1 (30.00)	NMeFOSAA	
	PFDA	132	-	70.00-130.00	-	PFDA	
	PFDoA	136	-	70.00-130.00	-	PFDoA	
	PFHpA	140	-	70.00-130.00	49.6 (30.00)	PFHpA	J (all detects)
	PFHxS	146	-	70.00-130.00	-	PFHxS	
	PFOA	131	-	70.00-130.00	-	PFOA	
	PFTrDA	136	133	70.00-130.00	-	PFTrDA	
16-HS-03-SA1MS 16-HS-03-SA1MSD (16-HS-03-SA1)	PFHxA	-21	-	70.00-130.00	329 (30.00)	PFHxA	No Qual, >4x
	PFBS	182	-	70.00-130.00	45.9 (30.00)	PFBS	

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 1801037 **Laboratory: Vista**

EDD Filename: 1801037 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**
Matrix: **AQ**

QC Sample ID (Associated Samples)	*Compound*	*LCS %R*	*LCSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
B8E0244-BS1 (16-HS-03-SA1 16-MW-06-SA1 16-MW-08-SA1 16-MW-09-SA1 A1-MW-18-SA1 A1-MW-19-SA1 A1-MW-37-SA1 A1-MW-37-SA1D FRB-20180523)	PFTrDA	153	-	70.00-130.00	-	PFTrDA	J (all detects)

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Reporting Limit Outliers

Lab Reporting Batch ID: 1801037 **Laboratory: Vista**

EDD Filename: 1801037 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
16-MW-06-SA1	PFOS	J	0.00227	0.00897	LOQ	ug/L	J (all detects)
16-MW-08-SA1	PFNA	J	0.00102	0.00870	LOQ	ug/L	J (all detects)
16-MW-09-SA1	PFDA PFNA	J J	0.00440 0.00326	0.00871 0.00871	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-18-SA1	PFOA PFOS	J J	0.00187 0.00437	0.00888 0.00888	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-19-SA1	PFDA	J	0.00727	0.00846	LOQ	ug/L	J (all detects)
A1-MW-37-SA1	PFNA	J	0.00170	0.00839	LOQ	ug/L	J (all detects)
A1-MW-37-SA1D	PFNA PFUnA	J J	0.00210 0.00135	0.00862 0.00862	LOQ LOQ	ug/L ug/L	J (all detects)

Field Duplicate RPD Report

Lab Reporting Batch ID: 1801037 **Laboratory: Vista**

EDD Filename: 1801037 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: 537 MOD
Matrix: AQ

Analyte	*Concentration (ug/L)*		*Sample RPD*	*eQAPP RPD*	*Flag*
	A1-MW-37-SA1	A1-MW-37-SA1D			
PFBS	0.230	0.252	9	30.00	No Qualifiers Applied
PFHpA	0.0328	0.0322	NC	30.00	
PFHxA	1.66	1.71	3	30.00	
PFHxS	0.155	0.152	2	30.00	
PFNA	0.00170	0.00210	NC	30.00	
PFOA	0.0196	0.0203	NC	30.00	
PFOS	0.0458	0.0416	NC	30.00	
PFUnA	0.00839 U	0.00135	NC	30.00	

LDC #: 42613M96 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/13/18
SDG #: 1801037 ADR/Stage 4 Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: 1
2nd Reviewer: KC

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537 Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	
IV.	Continuing calibration	A	
V.	Laboratory Blanks	N	Not reviewed for ADR validation
VI.	Field blanks	ND	FRB = 9
VII.	Surrogate spikes	N	Not reviewed for ADR validation
VIII.	Matrix spike/Matrix spike duplicates		Not reviewed for ADR validation
IX.	Laboratory control samples		Not reviewed for ADR validation
X.	Field duplicates	SW	D = 4+5
XI.	Internal standards	SW	Not reviewed for ADR validation
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for ADR validation
XIII.	Target compound identification		Not reviewed for ADR validation
XIV.	System performance		Not reviewed for ADR validation
XV.	Overall assessment of data		Not reviewed for ADR validation

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	A1-MW-18-SA1**	1801037-01**	Water	05/23/18
2	16-MW-08-SA1**	1801037-02**	Water	05/23/18
3	A1-MW-19-SA1**	1801037-03**	Water	05/23/18
4	A1-MW-37-SA1**	1801037-04**	Water	05/23/18
5	A1-MW-37-SA1D**	1801037-05**	Water	05/23/18
6	16-HS-03-SA1**	1801037-06**	Water	05/23/18
7	16-MW-09-SA1**	1801037-07**	Water	05/23/18
8	16-MW-06-SA1**	1801037-08**	Water	05/23/18
9	FRB-20180523	1801037-09	Water	05/23/18
10	16-HS-03-SA1MS	1801037-06MS	Water	05/23/18
11	16-HS-03-SA1MSD	1801037-06MSD	Water	05/23/18
12				
13	BSD 244-Batch			
14				

LDC #: 43496

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [illegible]

METHOD: LC/MS PFCs

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all internal standard area counts within 50-150% limits?

(Y) N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		1 (lab)	13C3-PFBS	170 (50-150)		J (PFBS)
		2		187		
		3		214		
		4		228		
		5		161		
		6		154		
		7		153		
		8		214		
		10 (MS)		167		No Qual
		11 (MSD)		165		

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LDC#: 42613M96

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: MK

METHOD: PFCs

Compound	Concentration (ug/L)		(≤30) RPD	Qual
	4	5		
PFBS	0.230	0.252	9	
PFHxA	1.66	1.71	3	
PFHpA	0.0328	0.0322	~~2~~ NC	
PFHxS	0.155	0.152	2	
PFOA	0.0196	0.0203	~~4~~ NC	
PFNA	0.00170	0.00210	~~21~~ NC	
PFOS	0.0458	0.0416	~~10~~ NC	
PFUnA	0.00525U	0.00135	NC	

Quality Control
Outlier Reports

1801039

Reporting Limit Outliers

Lab Reporting Batch ID: 1801039 **Laboratory: Vista**

EDD Filename: 1801039 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
A1-MW-11-SA1	PFOS	J	0.00359	0.00860	LOQ	ug/L	J (all detects)

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

LDC #: 42613N96 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/12/18
SDG #: 1801039 ADR Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: 9
2nd Reviewer: KK

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537 Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	
IV.	Continuing calibration	A	
V.	Laboratory Blanks	N	
VI.	Field blanks	ND	FRB=6
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	SW	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-13-SA1	1801039-01	Water	05/24/18
2	A1-MW-11-SA1	1801039-02	Water	05/24/18
3	A1-MW-14-SA1	1801039-03	Water	05/24/18
4	A1-MW-15-SA1	1801039-04	Water	05/24/18
5	A1-MW-25-SA1	1801039-07	Water	05/24/18
6	FRB-20180524	1801039-08	Water	05/24/18
7				
8				
9				

Notes:

	BBF0004-BK1						

LDC #: 26363N96

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: 9
2nd Reviewer: MK

METHOD: LC/MS PFCs

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all internal standard area counts within 50-150% limits?

Y N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		1 (lab)	13C3-PFBS	419 (50-150)		Y/N/A (PFBS)
		2		271		
		3		527		
		4		235		
		5 (~~MB~~) (Ref)		428		

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Quality Control Outlier Reports

1801054

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 1801054 **Laboratory: Vista**

EDD Filename: 1801054 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**
Matrix: **AQ**

QC Sample ID (Associated Samples)	*Compound*	*MS %R*	*MSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
A1-MW-53-SA1MS A1-MW-53-SA1MSD (A1-MW-53-SA1)	NMeFOSAA PFTrDA	- 141	- 148	70.00-130.00 70.00-130.00	32.9 (30.00) -	NMeFOSAA PFTrDA	J (all detects)
A1-MW-53-SA1MS A1-MW-53-SA1MSD (A1-MW-53-SA1)	PFBS PFHxS PFHxA	- 141 232	37.7 58.4 175	70.00-130.00 70.00-130.00 70.00-130.00	96.5 (30.00) 82.8 (30.00) -	PFBS PFHxS PFHxA	No Qual, >4x

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 1801054 **Laboratory: Vista**

EDD Filename: 1801054 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**
Matrix: **AQ**

QC Sample ID (Associated Samples)	*Compound*	*LCS %R*	*LCSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
B8E0244-BS1 (A1-MW-01-SA1 A1-MW-01-SA1D A1-MW-31-SA1 A1-MW-42-SA1 A1-MW-52-SA1 A1-MW-53-SA1 A1-MW-54-SA1 A1-PZ-19-SA1 FRB-20180525)	PFTrDA	153	-	70.00-130.00	-	PFTrDA	J (all detects)

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Reporting Limit Outliers

Lab Reporting Batch ID: 1801054 **Laboratory: Vista**

EDD Filename: 1801054 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
A1-MW-01-SA1	PFHpA	J	0.00225	0.00907	LOQ	ug/L	J (all detects)
A1-MW-01-SA1D	PFHpA	J	0.00273	0.00854	LOQ	ug/L	J (all detects)
A1-MW-31-SA1	PFHpA	J	0.00851	0.00887	LOQ	ug/L	J (all detects)
A1-MW-42-SA1	PFOS	J	0.00186	0.00887	LOQ	ug/L	J (all detects)
A1-MW-53-SA1	PFOS	J	0.00188	0.00878	LOQ	ug/L	J (all detects)
A1-MW-54-SA1	PFOS	J	0.00652	0.00892	LOQ	ug/L	J (all detects)
A1-PZ-19-SA1	PFHpA	J	0.00326	0.00852	LOQ	ug/L	J (all detects)
	PFOA	J	0.00756	0.00852	LOQ	ug/L	
	PFOS	J	0.00115	0.00852	LOQ	ug/L	

Field Duplicate RPD Report

Lab Reporting Batch ID: 1801054 **Laboratory: Vista**

EDD Filename: 1801054 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: 537 MOD
Matrix: AQ

Analyte	*Concentration (ug/L)*		*Sample RPD*	*eQAPP RPD*	*Flag*
	A1-MW-01-SA1	A1-MW-01-SA1D			
PFBS	0.0524	0.0557	6	30.00	No Qualifiers Applied
PFHpA	0.00225	0.00273	NC	30.00	
PFHxA	0.101	0.0971	4	30.00	
PFHxS	0.0230	0.0238	NC	30.00	

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

LDC #: 42613O96 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/13/18
SDG #: 1801054 ADR Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: 9
2nd Reviewer: KW

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537 Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD≤20% . r^2 ≥ TMU/ICV = 30%
IV.	Continuing calibration	A	CCV ≤ 30%
V.	Laboratory Blanks	N	
VI.	Field blanks	ND	FRB = 9
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	SW	A = 6+7
XI.	Internal standards	SW	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-42-SA1	1801054-01	Water	05/25/18
2	A1-MW-54-SA1	1801054-02	Water	05/25/18
3	A1-MW-53-SA1	1801054-03	Water	05/25/18
4	A1-PZ-19-SA1	1801054-04	Water	05/25/18
5	A1-MW-52-SA1	1801054-05	Water	05/25/18
6	A1-MW-01-SA1	1801054-06	Water	05/25/18
7	A1-MW-01-SA1D	1801054-07	Water	05/25/18
8	A1-MW-31-SA1	1801054-08	Water	05/25/18
9	FRB-20180525	1801054-09	Water	05/25/18
10	A1-MW-53-SA1MS	1801054-03MS	Water	05/25/18
11	A1-MW-53-SA1MSD	1801054-03MSD	Water	05/25/18
12				
13				
14	BBE0244-BK1			

LDC#: 42613096

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 9
2nd Reviewer: WK

METHOD: PFCs

Compound	Concentration (ug/L)		(≤30) RPD	Qual
	6	7		
PFBS	0.0524	0.0557	6	
PFHxA	0.101	0.0971	4	
PFHpA	0.00225	0.00273	~~19~~ NC	
PFHxS	0.0230	0.0238	~~3~~ NC	

LDC #: 42613096

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: MK

METHOD: LC/MS PFCs

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were all internal standard area counts within 50-150% limits?

Y (N) N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		1 (dets)	13C3-PFBS	310 (50-150)		J (all dets) UJ (PFBS)
		2 (dets)		175		
		3		154		
		10 (MS)		169		No qual
		11 (MSD)		161		
		4 (dets)		182		J (all dets) UJ (PFBS)
		5		211		
		6		192		
		7		204		
		8		254		

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Quality Control Outlier Reports

1801071

Reporting Limit Outliers

Lab Reporting Batch ID: 1801071 **Laboratory: Vista**

EDD Filename: 1801071 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
A1-MW-23-SA1	PFHxS	J	0.00581	0.00874	LOQ	ug/L	J (all detects)

LDC #: 42613P96 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/13/18
SDG #: 1801071 ADR Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537 Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	
IV.	Continuing calibration	A	
V.	Laboratory Blanks	N	
VI.	Field blanks	ND	FRB = 5
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-27-SA1	1801071-01	Water	05/30/18
2	A1-MW-55-SA1	1801071-02	Water	05/30/18
3	A1-MW-23-SA1	1801071-03	Water	05/30/18
4	A1-MW-07-SA1	1801071-04	Water	05/30/18
5	FRB-20180530	1801071-05	Water	05/30/18
6				
7				
8				
9				

Notes:

TARGET COMPOUND WORKSHEET

METHOD: PFOS/PFOAs

A. Perfluorohexanoic acid (PFHxA)			
B. Perfluoroheptanoic acid (PFHpA)			
C. Perfluorooctanoic acid (PFOA)			
D. Perfluorononanoic acid (PFNA)			
E. Perfluorodecanoic acid (PFDA)			
F. Perfluoroundecanoic acid (PFUnA)			
G. Perfluorododecanoic acid (PFDoA)			
H. Perfluorotridecanoic acid (PFTriDA)			
I. Perfluorotetradecanoic acid (PFTeDA)			
J. Perfluorobutanesulfonic acid (PFBS)			
K. Perfluorohexanesulfonic acid (PFHxS)			
L. Perfluoroheptanesulfonic acid (PFHpS)			
M. Perfluorooctanesulfonic acid (PFOS)			
N.Perfluorodecanesulfonic acid (PFDS)			
O. Perfluorooctane Sulfonamide (FOSA)			
P. Perfluorobutanoic acid (PFBA)			
Q. Perfluoropentanoic acis (PFPeA)			
R. 6:2FTS			
S. 8:2 FTS			
T. N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)			
U. N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)			

LDC #: 42613P96

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: KK

METHOD: LC/MS PFCs

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all internal standard area counts within 50-150% limits?

Y N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		1 (dets)	13C8-PFBS	174 (50-150)		~~J (PFBS)~~
		2 (ND)	↓	165		↓
		4 (dets)	↓	209		↓

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Quality Control Outlier Reports

1801084

LDC #: 42613Q96 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/13/18
SDG #: 1801084 ADR Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537 Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A A	~~RSD≤20%~~. r^2 TMO / ICV = 30%
IV.	Continuing calibration	SW	CCV = 30% ~~25%~~
V.	Laboratory Blanks	N	
VI.	Field blanks	ND	EB=1
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	EB-20180531	1801084-01	Water	05/31/18
2				
3				
4				
5				
6				
7				
8				
9				

Notes:

	RBF0069-BLK1						

TARGET COMPOUND WORKSHEET

METHOD: PFOS/PFOAs

A. Perfluorohexanoic acid (PFHxA)			
B. Perfluoroheptanoic acid (PFHpA)			
C. Perfluorooctanoic acid (PFOA)			
D. Perfluorononanoic acid (PFNA)			
E. Perfluorodecanoic acid (PFDA)			
F. Perfluoroundecanoic acid (PFUnA)			
G. Perfluorododecanoic acid (PFDoA)			
H. Perfluorotridecanoic acid (PFTriDA)			
I. Perfluorotetradecanoic acid (PFTeDA)			
J. Perfluorobutanesulfonic acid (PFBS)			
K. Perfluorohexanesulfonic acid (PFHxS)			
L. Perfluoroheptanesulfonic acid (PFHpS)			
M. Perfluorooctanesulfonic acid (PFOS)			
N.Perfluorodecanesulfonic acid (PFDS)			
O. Perfluorooctane Sulfonamide (FOSA)			
P. Perfluorobutanoic acid (PFBA)			
Q. Perfluoropentanoic acis (PFPeA)			
R. 1H, 1H, 2H, 2H-perfluorooctane sulfonate (6:2FTS)			
S. 1H, 1H, 2H, 2H-perfluorodecane sulfonate (8:2 FTS)			
T. N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)			
U. N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)			

LDC #: ~~42638~~96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: Q
2nd Reviewer: KK

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a continuing calibration standard analyzed after every 10 injections for each instrument?

Y (N) N/A Were all continuing calibration percent differences (%D) ≤30 %?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Finding RRF (Limit:)	Associated Samples	Qualifications
	6/18/18	180617M1-10	d3-T	55.2 (~~>50%~~)		MB	J/UJ/P (T)

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Enclosure II

Manual Stage 2B and Stage 4 Data Validation Reports

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: July 16, 2018

Parameters: Volatiles

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-110112-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
TB-20180523	280-110112-1	Water	05/23/18
A1-MW-18-SA1	280-110112-2	Water	05/23/18
16-MW-08-SA1	280-110112-3	Water	05/23/18
A1-MW-19-SA1	280-110112-4	Water	05/23/18
A1-MW-37-SA1D	280-110112-5	Water	05/23/18
A1-MW-37-SA1	280-110112-6	Water	05/23/18
16-HS-03-SA1	280-110112-7	Water	05/23/18
16-HS-03-SA1MS	280-110112-7MS	Water	05/23/18
16-HS-03-SA1MSD	280-110112-7MSD	Water	05/23/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-20180523 was identified as a trip blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
16-HS-03-SA1	Toluene-d8	75 (89-112)	All compounds	UJ (all non-detects)	A

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
16-HS-03-SA1MS/MSD (16-HS-03-SA1)	1,1-Dichloroethene	56 (71-131)	33 (71-131)	UJ (all non-detects)	A

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
16-HS-03-SA1MS/MSD (16-HS-03-SA1)	1,1-Dichloroethene	53 (≤20)	NA	-

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples A1-MW-37-SA1 and A1-MW-37-SA1D were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Flag	A or P
	A1-MW-37-SA1D	A1-MW-37-SA1			
Trichloroethene	0.652	0.624	Not calculable	-	-

RPDs were not calculated when sample results in one or both samples were less than 5x the limit of quantitation (LOQ).

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
A1-MW-18-SA1 16-MW-08-SA1 A1-MW-19-SA1 A1-MW-37-SA1D A1-MW-37-SA1	All compounds reported below the LOQ.	J (all detects)	A

XIII. Target Compound Identifications

All target compound identifications met validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to surrogate %R, MS/MSD %R, and results below the LOQ, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
Volatiles - Data Qualification Summary - SDG 280-110112-1

Sample	Compound	Flag	A or P	Reason
16-HS-03-SA1	All compounds	UJ (all non-detects)	A	Surrogates (%R)
16-HS-03-SA1	1,1-Dichloroethene	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)
A1-MW-18-SA1 16-MW-08-SA1 A1-MW-19-SA1 A1-MW-37-SA1D A1-MW-37-SA1	All compounds reported below the LOQ.	J (all detects)	A	Compound quantitation

MCAS Yuma, CTO 17F3803
Volatiles - Laboratory Blank Data Qualification Summary - SDG 280-110112-1

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Volatiles - Field Blank Data Qualification Summary - SDG 280-110112-1

No Sample Data Qualified in this SDG

LDC #: 42613B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/13/18
SDG #: 280-110112-1 Stage 4 Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: Q
2nd Reviewer: KLC

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB = 1
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	D = 5+6
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	TB-20180523	280-110112-1	Water	05/23/18
2	A1-MW-18-SA1	280-110112-2	Water	05/23/18
3	16-MW-08-SA1	280-110112-3	Water	05/23/18
4	A1-MW-19-SA1	280-110112-4	Water	05/23/18
5	A1-MW-37-SA1D	280-110112-5	Water	05/23/18
6	A1-MW-37-SA1	280-110112-6	Water	05/23/18
7	16-HS-03-SA1	280-110112-7	Water	05/23/18
8	16-HS-03-SA1MS	280-110112-7MS	Water	05/23/18
9	16-HS-03-SA1MSD	280-110112-7MSD	Water	05/23/18
10				
11				
12				
13				

LDC #: 42613B1

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: RW

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were all percent relative standard deviations (%RSD) ≤ 30%/15% and relative response factors (RRF) ≥ 0.05?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?		✓		
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?	✓			

LDC #: 42613B1

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: KK

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data	✓			
Overall assessment of data was found to be acceptable.				

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 42613B1

VALIDATION FINDINGS WORKSHEET
Surrogate Spikes

Page: 1 of 1
Reviewer:
2nd Reviewer: KK

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were all surrogate %R within QC limits?

Y N N/A If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R out of outside of criteria?

#	Date	Sample ID	Surrogate	%Recovery (Limits)	Qualifications
		7	TOL	75 (89-112)	J/UH/A (ND)
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

(TOL) = Toluene-d8 (DCE) = 1,2-Dichloroethane-d4
(BFB) = Bromofluorobenzene (DFM) = Dibromofluoromethane

LDC #: 43633

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: 9
2nd Reviewer: KK

METHOD : GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		8/9	H	56 (71-131)	33 (71-131)	( )	7 (ND)	J (H) / A
			H	( )	( )	53 (≤20)		Refer / A
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

LDC#: 42613B1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: KK

METHOD: GCMS VOA 8260B

Compound	Concentration (ug/L)		(≤30) RPD	Qual
	5	6		
S	0.652	0.624	4 NC	

V:\FIELD DUPLICATES\Field Duplicates\FD_Organics\2018\42613B1.wpd

LDC #: ~~42643B~~

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: KK

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs
X = Mean of the RRFs

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (10 std)	Recalculated RRF (10 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL (R1)	5/16/18	H (1st internal standard)	0.3187	0.3187	0.3149	0.3149	4.8	4.8
			AA (2nd internal standard)	1.3348	1.3348	1.3251	1.3251	3.5	3.5
			(3rd internal standard)						
			(4th internal standard)						
2			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
3			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						
4			(1st internal standard)						
			(2nd internal standard)						
			(3rd internal standard)						
			(4th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 42613B1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: KK

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	R1735	6/4/18	H (1st internal standard)	0.3149	0.3312	0.3312	5.2	5.2
			AA (2nd internal standard)	1.325	1.401	1.401	5.7	5.7
			(3rd internal standard)					
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 40413B1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: KK

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane	11.5	12.2	106	106	0
1,2-Dichloroethane-d4	↓	12.4	108	108	↓
Toluene-d8		11.5	100	100	
Bromofluorobenzene		11.6	100	102	

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 42438J

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: KK

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = | MSC - MSC | * 2/(MSC + MSDC)

MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 8/9

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	5.00	5.00	ND	2.795	1.629	56	56	33	33	53	53
Trichloroethene	V	V	V	4.863	4.489	97	97	90	90	8	8
Benzene											
Toluene											
Chlorobenzene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 42613B1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: 9
2nd Reviewer: KK

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: 280-417198/4

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	5.00	NA	5.615	NA	112	112				
Trichloroethene	↓	↓	5.111	↓	102	102				
Benzene										
Toluene										
Chlorobenzene										

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 26138

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: A
2nd reviewer: KK

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 2, H:

Conc. = $\frac{(2988)(12.5)(1)}{(201941)(0.3149)(\quad)(\quad)}$

= 0.452 µg/L

#	Sample ID	Compound	Reported Concentration (µg/L)	Calculated Concentration ( )	Qualification
	2	H	0.452		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: July 19, 2018

Parameters: Wet Chemistry

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-110112-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-18-SA1	280-110112-2	Water	05/23/18
16-MW-08-SA1	280-110112-3	Water	05/23/18
A1-MW-19-SA1	280-110112-4	Water	05/23/18
A1-MW-37-SA1	280-110112-6	Water	05/23/18
16-HS-03-SA1	280-110112-7	Water	05/23/18
A1-MW-18-SA1MS	280-110112-2MS	Water	05/23/18
A1-MW-18-SA1MSD	280-110112-2MSD	Water	05/23/18
A1-MW-18-SA1DUP	280-110112-2DUP	Water	05/23/18
16-HS-03-SA1MS	280-110112-7MS	Water	05/23/18
16-HS-03-SA1MSD	280-110112-7MSD	Water	05/23/18
16-HS-03-SA1DUP	280-110112-7DUP	Water	05/23/18
16-HS-03-SA1DLMS	280-110112-7DLMS	Water	05/23/18
16-HS-03-SA1DLMSD	280-110112-7DLMSD	Water	05/23/18
16-HS-03-SA1DLDUP	280-110112-7DLDUP	Water	05/23/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) SW 846 Method 9056A
Ferrous Iron by Standard Method 3500-Fe B
pH by EPA SW 846 Method 9040C

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
A1-MW-18-SA1 16-MW-08-SA1 A1-MW-19-SA1 A1-MW-37-SA1 16-HS-03-SA1	pH	8 days	24 hours	J (all detects)	P
A1-MW-18-SA1	Ferrous Iron	26.85 hours	24 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
16-HS-03-SA1MS/MSD (16-HS-03-SA1)	Sulfate	88 (87-112)	86 (87-112)	J (all detects)	A
16-HS-03-SA1MS/MSD (16-HS-03-SA1)	Ferrous Iron	1 (85-113)	0 (85-113)	R (all non-detects)	A

For A1-MW-18-SA1MS/MSD, no data were qualified for Chloride and Sulfate percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All sample result verifications were acceptable.

All analytes reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
A1-MW-18-SA1 16-MW-08-SA1 A1-MW-37-SA1	All analytes reported below the LOQ.	J (all detects)	A

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to MS/MSD %R, data were rejected in one sample.

Due to technical holding time, MS/MSD %R, and results below the LOQ, data were qualified as estimated in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
Wet Chemistry - Data Qualification Summary - SDG 280-110112-1

Sample	Analyte	Flag	A or P	Reason
A1-MW-18-SA1 16-MW-08-SA1 A1-MW-19-SA1 A1-MW-37-SA1 16-HS-03-SA1	pH	J (all detects)	P	Technical holding times
A1-MW-18-SA1	Ferrous Iron	J (all detects)	P	Technical holding times
16-HS-03-SA1	Sulfate	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
16-HS-03-SA1	Ferrous Iron	R (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)
A1-MW-18-SA1 16-MW-08-SA1 A1-MW-37-SA1	All analytes reported below the LOQ.	J (all detects)	A	Sample result verification

MCAS Yuma, CTO 17F3803
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 280-110112-1

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Wet Chemistry - Field Blank Data Qualification Summary - SDG 280-110112-1

No Sample Data Qualified in this SDG

LDC #: 42613B6
SDG #: 280-110112-1
Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET
Statge 4

Date: 7/18/18
Page: 1 of 1
Reviewer: CL
2nd Reviewer: KK

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B)
pH (EPA SW846 Method (9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	SW	~~1of1~~ Cl, SO4 : 7/8 >4x
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	(4,5) a
X.	Sample result verification	A	
XI	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-18-SA1	280-110112-2	Water	05/23/18
2	16-MW-08-SA1	280-110112-3	Water	05/23/18
3	A1-MW-19-SA1	280-110112-4	Water	05/23/18
~~4~~	~~A1-MW-37-SA1D~~	~~280-110112-5~~	~~Water~~	~~05/23/18~~ 02
5	A1-MW-37-SA1	280-110112-6	Water	05/23/18
6	16-HS-03-SA1	280-110112-7	Water	05/23/18
7	A1-MW-18-SA1MS	280-110112-2MS	Water	05/23/18
8	A1-MW-18-SA1MSD	280-110112-2MSD	Water	05/23/18
9	A1-MW-18-SA1DUP	280-110112-2DUP	Water	05/23/18
10	16-HS-03-SA1MS	280-110112-7MS	Water	05/23/18
11	16-HS-03-SA1MSD	280-110112-7MSD	Water	05/23/18
12	16-HS-03-SA1DUP	280-110112-7DUP	Water	05/23/18
13	#6 DL MS			
14	↓ MSD			
15	↓ DUP			

Notes:

LDC #: 42613B6

VALIDATION FINDINGS CHECKLIST

Reviewer: 01
2nd Reviewer: KK

Method: Inorganics (EPA Method Sel cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.		✓		
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓	✓	
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

LDC #: 4296B86

VALIDATION FINDINGS CHECKLIST

Reviewer: 02
2nd Reviewer: KK

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 42683B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer: KK

All circled methods are applicable to each sample.

Sample ID	Parameter
1-3,5,6	(pH) TDS (Cl) F (NO3) NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC: 7,8	pH TDS (Cl) F NO3 NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
9	pH TDS (Cl) F NO3 NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
10,11	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
12	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Fe2+)
13,14	pH TDS (Cl) F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
15	pH TDS (Cl) F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4

Comments:

LDC #: 42613B6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: CA
2nd reviewer: KK

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:	9040C				SM 3500 FE B		
Parameters:	pH				Ferrous Iron		
Technical holding time:	~~48 HRS~~ 24 hrs				24 hrs		
Sample ID	Sampling date	Analysis date	Time ~~Exceeded~~	Qualifier	Analysis date	Time Exceeded	Qualifier
All (Det)	5/23/18	5/31/18	8 days	J/UJ/P			
1 (Det)	5/23/18				5/24/18	26.85 hrs	J/UJ/P
	(09:00)				(11:51)		

LDC #: 42613B6

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer: KK

METHOD: Inorganics, EPA Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	10/11		SO_4	88(87-112)	86		6	J/UJ/A (Det)
			~~Ferrous Fe~~	1(85-113)	0		6	J/R/A (MD)
			Ferrous Iron					

Comments: 7/8: Cl, SO_4 74X

LDC #: 42683B6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: G
2nd Reviewer: KK

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of Cl was recalculated. Calibration date: 3/21/18

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found X 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution

True = concentration of each analyte in the ICV or CCV source

Type of analysis	Analyte	Standard	Conc. (mg/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	Cl	s1	1.0	16911296	*1.000*	*1.000*	Y
		s2	2.5	43759132			
		s3	5	85841374			
		s4	60	1053445301			
		s5	120	2068634717			
		s6	200	3433898767			
Calibration verification	NO_3N	ICV	4	3.93	98	98	
Calibration verification	SO_4	~~S~~CCV	100	102.1	102	102	
Calibration verification	Fe^{2+}	CCV	1.0	10686	107	107	

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 42613 B6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: OR
2nd Reviewer: KK

METHOD: Inorganics, Method See cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Ferrous Iron	2.2416	2.00	112	112	Y
10	Matrix spike sample	NO3N	(SSR-SR) 10.0	10	100	100	↓
12	Duplicate sample	SO4	42.4	38.4	10	10	↓

Comments: _____

LDC #: 42613 B6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CR
2nd reviewer: KK

METHOD: Inorganics, Method See cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments?
Y N N/A Are all detection limits below the CRQL?

Compound (analyte) results for Cl reported with a positive detect were recalculated and verified using the following equation:

Concentration = $y = 1655360x - 440112$

Recalculation: $\frac{1079969301 + 440112}{1655360} \times 50 = 3263.3 mg/L$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	1	pH (SU)	7.7	7.7	Y
	2	Ferrous Iron	0.0403	0.0403	↓
	3	Cl	3260	3260	↓
	5	NO_3N	7.26	7.26	↓
	6	SO_4	2120	2120	✓

RECALC.6

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: July 19, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1818881

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-51-SA1	L1818881-01	Water	05/22/18
A1-MW-50-SA1	L1818881-02	Water	05/22/18
A1-MW-49-SA1	L1818881-03	Water	05/22/18
A1-MW-05-SA1	L1818881-04	Water	05/22/18
A1-MW-04-SA1	L1818881-05	Water	05/22/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

The chain-of-custodies were reviewed for documentation of cooler temperatures. Cooler temperatures for all samples were reported at 7.9°C upon receipt by the laboratory. No data was qualified based on the cooler temperature.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1818881

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1818881

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1818881

No Sample Data Qualified in this SDG

LDC #: 42613F2b

SDG #: L1818881

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 7/13/18

Page: 1 of 1

Reviewer:

2nd Reviewer: KW

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	Temp @ 7.9°C
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-51-SA1	L1818881-01	Water	05/22/18
2	A1-MW-50-SA1	L1818881-02	Water	05/22/18
3	A1-MW-49-SA1	L1818881-03	Water	05/22/18
4	A1-MW-05-SA1	L1818881-04	Water	05/22/18
5	A1-MW-04-SA1	L1818881-05	Water	05/22/18
6				
7				
8				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: July 16, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 4

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1819087

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-18-SA	L1819087-01	Water	05/23/18
16-MW-08-SA1	L1819087-02	Water	05/23/18
A1-MW-19-SA1	L1819087-03	Water	05/23/18
A1-MW-37-SA1	L1819087-04	Water	05/23/18
A1-MW-37-SA1D	L1819087-05	Water	05/23/18
16-HS-03-SA1	L1819087-06	Water	05/23/18
16-HS-03-SA1MS	L1819087-06MS	Water	05/23/18
16-HS-03-SA1MSD	L1819087-06MSD	Water	05/23/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples A1-MW-37-SA1 and A1-MW-37-SA1D were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentration (ng/L)				
Compound	A1-MW-37-SA1	A1-MW-37-SA1D	RPD (Limits)	Flag	A or P
1,4-Dioxane	7780	7500	4 (≤30)	-	-

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations were within validation criteria.

XIII. Target Compound Identifications

All target compound identifications were within validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1819087

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1819087

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1819087

No Sample Data Qualified in this SDG

LDC #: 42613G2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/13/18
SDG #: L1819087 Stage 4 Page: 1 of 1
Laboratory: Alpha Analytical, Inc. Reviewer: Q
2nd Reviewer: KK

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A A	RSD≤ 15%. ICV≤ 20%
IV.	Continuing calibration / Endrin	A	CCV≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D=4+5
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	A1-MW-18-SA	L1819087-01	Water	05/23/18
2	16-MW-08-SA1	L1819087-02	Water	05/23/18
3	A1-MW-19-SA1	L1819087-03	Water	05/23/18
4	A1-MW-37-SA1	L1819087-04	Water	05/23/18
5	A1-MW-37-SA1D	L1819087-05	Water	05/23/18
6	16-HS-03-SA1	L1819087-06	Water	05/23/18
7	16-HS-03-SA1MS	L1819087-06MS	Water	05/23/18
8	16-HS-03-SA1MSD	L1819087-06MSD	Water	05/23/18
9				

Notes:

LDC #: 42613F3b

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: O
2nd Reviewer: MC

Method: Semivolatiles (EPA SW 846 Method 8270C-SIM)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check (Not required)				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 15% and relative response factors (RRF) ≥ 0.05?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes				
Were all surrogate percent differences (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	

LDC #: 42613F6

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: MK

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data	✓			
Overall assessment of data was found to be acceptable.				

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	AA. 2-Chloronaphthalene	AAA. Butylbenzylphthalate	AAAA. Dibenzothiophene	A1.
B. Bis (2-chloroethyl) ether	BB. 2-Nitroaniline	BBB. 3,3'-Dichlorobenzidine	BBBB. Benzo(a)fluoranthene	B1.
C. 2-Chlorophenol	CC. Dimethylphthalate	CCC. Benzo(a)anthracene	CCCC. Benzo(b)fluorene	C1.
D. 1,3-Dichlorobenzene	DD. Acenaphthylene	DDD. Chrysene	DDDD. cis/trans-Decalin	D1.
E. 1,4-Dichlorobenzene	EE. 2,6-Dinitrotoluene	EEE. Bis(2-ethylhexyl)phthalate	EEEE. Biphenyl	E1.
F. 1,2-Dichlorobenzene	FF. 3-Nitroaniline	FFF. Di-n-octylphthalate	FFFF. Retene	F1.
G. 2-Methylphenol	GG. Acenaphthene	GGG. Benzo(b)fluoranthene	GGGG. C30-Hopane	G1.
H. 2,2'-Oxybis(1-chloropropane)	HH. 2,4-Dinitrophenol	HHH. Benzo(k)fluoranthene	HHHH. 1-Methylphenanthrene	H1.
I. 4-Methylphenol	II. 4-Nitrophenol	III. Benzo(a)pyrene	IIII. 1,4-Dioxane	I1.
J. N-Nitroso-di-n-propylamine	JJ. Dibenzofuran	JJJ. Indeno(1,2,3-cd)pyrene	JJJJ. Acetophenone	J1.
K. Hexachloroethane	KK. 2,4-Dinitrotoluene	KKK. Dibenz(a,h)anthracene	KKKK. Atrazine	K1.
L. Nitrobenzene	LL. Diethylphthalate	LLL. Benzo(g,h,i)perylene	LLLL. Benzaldehyde	L1.
M. Isophorone	MM. 4-Chlorophenyl-phenyl ether	MMM. Bis(2-Chloroisopropyl)ether	MMMM. Caprolactam	M1.
N. 2-Nitrophenol	NN. Fluorene	NNN. Aniline	NNNN. 2,6-Dichlorophenol	N1.
O. 2,4-Dimethylphenol	OO. 4-Nitroaniline	OOO. N-Nitrosodimethylamine	OOOO. 1,2-Diphenylhydrazine	O1.
P. Bis(2-chloroethoxy)methane	PP. 4,6-Dinitro-2-methylphenol	PPP. Benzoic Acid	PPPP. 3-Methylphenol	P1.
Q. 2,4-Dichlorophenol	QQ. N-Nitrosodiphenylamine	QQQ. Benzyl alcohol	QQQQ. 3&4-Methylphenol	Q1.
R. 1,2,4-Trichlorobenzene	RR. 4-Bromophenyl-phenylether	RRR. Pyridine	RRRR. 4-Dimethyldibenzothiophene (4MDT)	R1.
S. Naphthalene	SS. Hexachlorobenzene	SSS. Benzidine	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	S1.
T. 4-Chloroaniline	TT. Pentachlorophenol	TTT. 1-Methylnaphthalene	TTTT. 1-Methyldibenzothiophene (1MDT)	T1.
U. Hexachlorobutadiene	UU. Phenanthrene	UUU.Benzo(b)thiophene	UUUU.	U1.
V. 4-Chloro-3-methylphenol	VV. Anthracene	VVV.Benzonaphthothiophene	VVVV.	V1.
W. 2-Methylnaphthalene	WW. Carbazole	WWW.Benzo(e)pyrene	WWWW.	W1.
X. Hexachlorocyclopentadiene	XX. Di-n-butylphthalate	XXX. 2,6-Dimethylnaphthalene	XXXX.	X1.
Y. 2,4,6-Trichlorophenol	YY. Fluoranthene	YYY. 2,3,5-Trimethylnaphthalene	YYYY.	Y1.
Z. 2,4,5-Trichlorophenol	ZZ. Pyrene	ZZZ. Perylene	ZZZZ.	Z1.

LDC#: 42613G2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 9
2nd Reviewer: KK

METHOD: GCMS SVOA 8270D-SIM

Compound	Concentration (ng/L)		(≤30) RPD	Qual
	4	5		
1,4-Dioxane	7780	7500	4	

LDC #: [illegible]

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: Q
2nd Reviewer: KK

METHOD: GC/MS BNA (EPA SW 846 Method 8270C-SIM)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

A_x = Area of compound,
C_x = Concentration of compound,
S = Standard deviation of the RRFs,

A_{is} = Area of associated internal standard
C_{is} = Concentration of internal standard
X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (500 std)	Recalculated RRF (500 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	5/29/18	IIII (1st internal standard)	1.618	1.618	1.686	1.686	7.57	7.57
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Phenanthrene (4th internal standard)						
			Chrysene (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
2	ICAL	6/1/18	IIII (1st internal standard)	1.471	1.471	1.437	1.437	4.02	4.02
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Phenanthrene (4th internal standard)						
			Chrysene (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			(1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Phenanthrene (4th internal standard)						
			Chrysene (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						

Comments: Refer to Initial Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: ~~46613~~6

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: A
2nd Reviewer: KK

METHOD: GC/MS BNA (EPA SW 846 Method 8270C-SIM)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	F6060118-02	6/1/18	1111 (1st internal standard)	1.686	1.767	1.767	4.8	4.8
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Phenanthrene (4th internal standard)					
			Chrysene (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
2	F1606058-07	6/5/18	1111 (1st internal standard)	1.437	1.538	1.538	7	7
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Phenanthrene (4th internal standard)					
			Chrysene (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3	~~F~~		(1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Phenanthrene (4th internal standard)					
			Chrysene (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 42436-b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: Q
2nd reviewer: KK

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C-SIM)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
1,4-Dioxane-d8	500	98.32	20	20	0

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					

LDC #: ~~36154-D~~

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: KK

METHOD: GC/MS (EPA SW 846 Method 8270C-SIM)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 7/8

Compound	Spike Added (NS/L)		Sample Concentration (NS/L)	Spiked Sample Concentration (NS/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Acenaphthene											
Pyrene											
1,4-Dioxane	5100	5100	3270	8340	8660	99	99	106	106	4	4

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C-SIM)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA) Where: SSC = Spike concentration
SA = Spike added

RPD = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: NG1120650-1/-3

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Acenaphthene										
Pyrene										
1,4-Dioxane	5000	5000	5640	5660	113	113	113	113	0	0

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 42613F6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd reviewer: KK

METHOD: GC/MS PAHs (EPA SW 846 Method 8270D-SIM)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1, 1.4-Dioxane

Conc. = $\frac{(2376)(500)(5)(1)(\quad)}{(5587)(1.686)(0.5)(\quad)(\quad)}$

= 1261.1 ng/L

#	Sample ID	Compound	Reported Concentration (ng/L)	Calculated Concentration ( )	Qualification
	1	1.4-Dioxane	1260		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: July 19, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1819352

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-13-SA1	L1819352-01	Water	05/24/18
A1-MW-11-SA1	L1819352-02	Water	05/24/18
A1-MW-14-SA1	L1819352-03	Water	05/24/18
A1-MW-15-SA1	L1819352-04	Water	05/24/18
A1-MW-25-SA1	L1819352-07	Water	05/24/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1819352

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1819352

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1819352

No Sample Data Qualified in this SDG

LDC #: 42613H2b **VALIDATION COMPLETENESS WORKSHEET** Date: 7/13/18
SDG #: L1819352 Stage 2B Page: 1 of 1
Laboratory: Alpha Analytical, Inc. Reviewer: [illegible]
2nd Reviewer: KK

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCSB
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-13-SA1	L1819352-01	Water	05/24/18
2	A1-MW-11-SA1	L1819352-02	Water	05/24/18
3	A1-MW-14-SA1	L1819352-03	Water	05/24/18
4	A1-MW-15-SA1	L1819352-04	Water	05/24/18
5	A1-MW-25-SA1	L1819352-07	Water	05/24/18
6				
7				
8				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: July 19, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1819562

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-42-SA1	L1819562-01	Water	05/25/18
A1-MW-54-SA1	L1819562-02	Water	05/25/18
A1-MW-53-SA1	L1819562-03	Water	05/25/18
A1-PZ-19-SA1	L1819562-04	Water	05/25/18
A1-MW-52-SA1	L1819562-05	Water	05/25/18
A1-MW-01-SA1	L1819562-06	Water	05/25/18
A1-MW-01-SA1D	L1819562-07	Water	05/25/18
A1-MW-31-SA1	L1819562-08	Water	05/25/18
A1-MW-53-SA1MS	L1819562-03MS	Water	05/25/18
A1-MW-53-SA1MSD	L1819562-03MSD	Water	05/25/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples A1-MW-01-SA1 and A1-MW-01-SA1D were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentration (ug/L)				
Compound	A1-MW-01-SA1	A1-MW-01-SA1D	RPD (Limits)	Flag	A or P
1,4-Dioxane	1840	1880	2 (≤30)	-	-

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1819562

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1819562

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1819562

No Sample Data Qualified in this SDG

LDC #: 42613I2b

SDG #: L1819562

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 7/13/18

Page: 1 of 1

Reviewer:

2nd Reviewer: KK

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D = 6+7
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-42-SA1	L1819562-01	Water	05/25/18
2	A1-MW-54-SA1	L1819562-02	Water	05/25/18
3	A1-MW-53-SA1	L1819562-03	Water	05/25/18
4	A1-PZ-19-SA1	L1819562-04	Water	05/25/18
5	A1-MW-52-SA1	L1819562-05	Water	05/25/18
6	A1-MW-01-SA1	L1819562-06	Water	05/25/18
7	A1-MW-01-SA1D	L1819562-07	Water	05/25/18
8	A1-MW-31-SA1	L1819562-08	Water	05/25/18
9	A1-MW-53-SA1MS	L1819562-03MS	Water	05/25/18
10	A1-MW-53-SA1MSD	L1819562-03MSD	Water	05/25/18
11				
12				
13				

LDC#: 42613I2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: Q
2nd Reviewer: KK

METHOD: GCMS SVOA 8270D-SIM

Compound	Concentration (ng/L)		(≤30) RPD	Qual
	6	7		
1,4-Dioxane	1840	1880	2	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: July 19, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1820050

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-27-SA1	L1820050-01	Water	05/30/18
A1-MW-55-SA1	L1820050-02	Water	05/30/18
A1-MW-23-SA1	L1820050-03	Water	05/30/18
A1-MW-07-SA1	L1820050-04	Water	05/30/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compounds reported below the reporting limit (RL) were qualified as follows:

Sample	Finding	Flag	A or P
A1-MW-23-SA1	All compounds reported below the RL.	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results below the RL, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1820050

Sample	Compound	Flag	A or P	Reason
A1-MW-23-SA1	All compounds reported below the RL.	J (all detects)	A	Compound quantitation

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1820050

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1820050

No Sample Data Qualified in this SDG

LDC #: 42613J2b

SDG #: L1820050

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 7/13/18

Page: 1 of 1

Reviewer: EQ

2nd Reviewer: KK

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD≤15%. ICV≤20%
IV.	Continuing calibration	A	CCV≤20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	N	
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-27-SA1	L1820050-01	Water	05/30/18
2	A1-MW-55-SA1	L1820050-02	Water	05/30/18
3	A1-MW-23-SA1	L1820050-03	Water	05/30/18
4	A1-MW-07-SA1	L1820050-04	Water	05/30/18
5				
6				
7				
8				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: July 19, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1820175

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
EB-20180531	L1820175-01	Water	05/31/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-20180531 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1820175

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1820175

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1820175

No Sample Data Qualified in this SDG

LDC #: 42613K2b

SDG #: L1820175

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 7/13/18

Page: 1 of 1

Reviewer: 2

2nd Reviewer: RK

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	LCS/6
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	EB-20180531	L1820175-01	Water	05/31/18
2				
3				
4				
5				
6				
7				
8				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: July 16, 2018

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1801037

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-18-SA1	1801037-01	Water	05/23/18
16-MW-08-SA1	1801037-02	Water	05/23/18
A1-MW-19-SA1	1801037-03	Water	05/23/18
A1-MW-37-SA1	1801037-04	Water	05/23/18
A1-MW-37-SA1D	1801037-05	Water	05/23/18
16-HS-03-SA1	1801037-06	Water	05/23/18
16-MW-09-SA1	1801037-07	Water	05/23/18
16-MW-06-SA1	1801037-08	Water	05/23/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perfluorinated Alkyl Acids by Environmental Protection Agency (EPA) Method 537 Modified

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked as applicable.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

Initial calibration was performed as required by the method.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 20.0%.

In the case where the laboratory used a calibration curve to evaluate the compounds, all coefficients of determination (r^2) were greater than or equal to 0.990.

For each calibration point, the percent differences (%D) for their true value were less than or equal to 30.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample FRB-20180523 was identified as a field rinsate blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
16-HS-03-SA1MS/MSD (16-HS-03-SA1)	PFHpA PFHxS PFOA	140 (70-130) 146 (70-130) 131 (70-130)	- - -	J (all detects) J (all detects) J (all detects)	A
16-HS-03-SA1MS/MSD (16-HS-03-SA1)	PFDA PFDoA PFTrDA	132 (70-130) 136 (70-130) 136 (70-130)	- - 133 (70-130)	NA	-

Relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
16-HS-03-SA1MS/MSD (16-HS-03-SA1)	PFHpA	49.6 (≤30)	J (all detects)	A
16-HS-03-SA1MS/MSD (16-HS-03-SA1)	NMeFOSAA	41.1 (≤30)	NA	-

For 16-HS-03-SA1MS/MSD, no data were qualified for PFBS and PFHxA percent recoveries (%R) and relative percent differences (RPD) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

VIII. Ongoing Precision Recovery

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

OPR ID (Associated Samples)	Compound	%R (Limits)	Flag	A or P
B8E0244-BS1 (All samples in SDG 1801037)	PFTrDA	153 (70-130)	NA	-

IX. Field Duplicates

Samples A1-MW-37-SA1 and A1-MW-37-SA1D were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Flag	A or P
	A1-MW-37-SA1	A1-MW-37-SA1D			
PFBS	0.230	0.252	9 (≤30)	-	-
PFHxA	1.66	1.71	3 (≤30)	-	-
PFHpA	0.0328	0.0322	Not calculable	-	-
PFHxS	0.155	0.152	2 (≤30)	-	-
PFOA	0.0196	0.0203	Not calculable	-	-
PFNA	0.00170	0.00210	Not calculable	-	-
PFOS	0.0458	0.0416	Not calculable	-	-
PFUnA	0.00525U	0.00135	Not calculable	-	-

RPDs were not calculated when sample results in one or both samples were less than 5x the limit of quantitation (LOQ).

X. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Affected Compound	Flag	A or P
A1-MW-18-SA1	^{13}C3-PFBS	170 (50-150)	PFBS	J (all detects)	P
16-MW-08-SA1	^{13}C3-PFBS	187 (50-150)	PFBS	J (all detects)	P
A1-MW-19-SA1	^{13}C3-PFBS	214 (50-150)	PFBS	J (all detects)	P
A1-MW-37-SA1	^{13}C3-PFBS	228 (50-150)	PFBS	J (all detects)	P
A1-MW-37-SA1D	^{13}C3-PFBS	161 (50-150)	PFBS	J (all detects)	P
16-HS-03-SA1	^{13}C3-PFBS	154 (50-150)	PFBS	J (all detects)	P
16-MW-09-SA1	^{13}C3-PFBS	153 (50-150)	PFBS	J (all detects)	P
16-MW-06-SA1	^{13}C3-PFBS	214 (50-150)	PFBS	J (all detects)	P

XI. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
A1-MW-18-SA1 16-MW-08-SA1 A1-MW-19-SA1 A1-MW-37-SA1 A1-MW-37-SA1D 16-MW-09-SA1 16-MW-06-SA1	All compounds reported below the LOQ.	J (all detects)	A

XII. Target Compound Identifications

All target compound identifications met validation criteria.

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and RPD, internal standard %R, and results below the LOQ, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1801037

Sample	Compound	Flag	A or P	Reason
16-HS-03-SA1	PFHpA PFHxS PFOA	J (all detects) J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
16-HS-03-SA1	PFHpA	J (all detects)	A	Matrix spike/Matrix spike duplicate (RPD)
A1-MW-18-SA1 16-MW-08-SA1 A1-MW-19-SA1 A1-MW-37-SA1 A1-MW-37-SA1D 16-HS-03-SA1 16-MW-09-SA1 16-MW-06-SA1	PFBS	J (all detects)	P	Internal standards (%R)
A1-MW-18-SA1 16-MW-08-SA1 A1-MW-19-SA1 A1-MW-37-SA1 A1-MW-37-SA1D 16-MW-09-SA1 16-MW-06-SA1	All compounds reported below the LOQ.	J (all detects)	A	Compound quantitation

MCAS Yuma, CTO 17F3803
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 1801037

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 1801037

No Sample Data Qualified in this SDG

LDC #: 42613M96 **VALIDATION COMPLETENESS WORKSHEET** Date: 7/13/18
SDG #: 1801037 Stage 4 Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: [illegible]
2nd Reviewer: IKK

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537 Modified)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A A	RSD ≤ 20% or r^2 True value/ICV ≤ 30%
IV.	Continuing calibration	A	CCV ≤ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FRB = 9
~~VII.~~	~~Surrogate spikes~~	N	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	SW	OPR
X.	Field duplicates	SW	D = 1-5
XI.	Internal standards	SW	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	A1-MW-18-SA1**	1801037-01**	Water	05/23/18
2	16-MW-08-SA1**	1801037-02**	Water	05/23/18
3	A1-MW-19-SA1**	1801037-03**	Water	05/23/18
4	A1-MW-37-SA1**	1801037-04**	Water	05/23/18
5	A1-MW-37-SA1D**	1801037-05**	Water	05/23/18
6	16-HS-03-SA1**	1801037-06**	Water	05/23/18
7	16-MW-09-SA1**	1801037-07**	Water	05/23/18
8	16-MW-06-SA1**	1801037-08**	Water	05/23/18
9	FRB-20180523	1801037-09	Water	05/23/18
10	16-HS-03-SA1MS	1801037-06MS	Water	05/23/18
11	16-HS-03-SA1MSD	1801037-06MSD	Water	05/23/18
12				
13				
14				

LDC #: 42613496

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: WC

Method: LC/MS PFOS/PFOAs (EPA Method 537M)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?				
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were the S/N ratio for all compounds within validation criteria?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard?	✓			
IIIb.Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 30%	✓			
Were the S/N ratio for all compounds within validation criteria?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Laboratory Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank analyzed for each matrix and concentration?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target compounds were detected in the field blanks.		✓		
VII. Surrogate spikes				
Were all surrogate %R within the QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				

LDC #: 42613M96

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: KK

Validation Area	Yes	No	NA	Findings/Comments
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IV. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target compounds were detected in the field duplicates.	✓			
XI. Internal standards				
Were internal standard area counts within acceptance limits?	✓			
XII. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Compound quantitation/CRQLs				
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: PFOS/PFOAs

A. Perfluorohexanoic acid (PFHxA)			
B. Perfluoroheptanoic acid (PFHpA)			
C. Perfluorooctanoic acid (PFOA)			
D. Perfluorononanoic acid (PFNA)			
E. Perfluorodecanoic acid (PFDA)			
F. Perfluoroundecanoic acid (PFUnA)			
G. Perfluorododecanoic acid (PFDoA)			
H. Perfluorotridecanoic acid (PFTriDA)			
I. Perfluorotetradecanoic acid (PFTeDA)			
J. Perfluorobutanesulfonic acid (PFBS)			
K. Perfluorohexanesulfonic acid (PFHxS)			
L. Perfluoroheptanesulfonic acid (PFHpS)			
M. Perfluorooctanesulfonic acid (PFOS)			
N.Perfluorodecanesulfonic acid (PFDS)			
O. Perfluorooctane Sulfonamide (FOSA)			
P. Perfluorobutanoic acid (PFBA)			
Q. Perfluoropentanoic acis (PFPeA)			
R. 6:2FTS			
S. 8:2 FTS			
T. N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)			
U. N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)			

LDC #: 42613M96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates/Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: KK

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) or duplicate sample analyzed for each matrix in this SDG?
Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?
Y N N/A Were all duplicate sample relative percent differences (RPD) or differences within QC limits?

#	Date	MS/MSD/DUP ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		10/11	PFBS	180 (70-130)		45.9 (≤30)	6 (dets)	No qual ~~J/UJ~~
			PFHxA	-210 (↓)		329 (↓)	↓	↓
			PFHpA	140 (70-130)				dets/A
			PFHxS	146 (			↓	
			PFOA	131 (				↓
			PFDA	132 (			(ND)	
			PFDoA	86 (			↓	
			PFTeDA	136 (↓)	133 (70-130)			
			PFHpA			49.6 (≤30)	(dets)	dets/A
			MeFOSAA			41.1 (↓)	(ND)	d

Privileged and Confidential

LDC #: 42623M96

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: KK

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a LCS required?

Y (N) N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	BSE0244-BS1		( )	( )	( )		
	B		( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	BSE0244-BS1	PFTeDA	153 (70-130)	( )	( )	All (ND)	J- (all detects) / A
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )	

LDC#: 42613M96

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: KK

METHOD: PFCs

Compound	Concentration (ug/L)		(≤30) RPD	Qual
	4	5		
PFBS	0.230	0.252	9	
PFHxA	1.66	1.71	3	
PFHpA	0.0328	0.0322	~~2~~ NC	
PFHxS	0.155	0.152	2	
PFOA	0.0196	0.0203	~~4~~ NC	
PFNA	0.00170	0.00210	~~21~~ NC	
PFOS	0.0458	0.0416	~~10~~ NC	
PFUnA	0.00525U	0.00135	NC	

V:\FIELD DUPLICATES\Field Duplicates\FD_Organics\2018\42613M96.wpd

LDC #: 4-163496

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: 9
2nd Reviewer: KK

METHOD: LC/MS PFCs

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were all internal standard area counts within 50-150% limits?

(Y) N N/A Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		1 (dets)	13C3-PFBS	170 (50-150)		J (MPFBS)
		2		187		
		3		214		
		4		228		
		5		161		
		6		154		
		7		153		
		8		214		
		10 (MS)		167		No qual
		11 (MSD)		165		

Privileged and Confidential

LDC #: 46634 96

Validation Findings Worksheet
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: KK

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
6/6/2018	M2	PFBS	0	0.51953	0.25	0.0625
			s1	0.9040925	0.5	0.25
			s2	1.9572675	1	1
			s3	3.7049862	2	4
			s4	10.06541	5	25
			s5	19.886856	10	100
			s6	99.722347	50	2500
			s7	204.60758	100	10000
			s8	513.09516	250	62500
			s9	1017.3084	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	-0.63805	c	-0.0700934
Std Err of Y Est				
R Squared		0.9999897		0.9999340
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	2.063159148	-5.34413E-05	2.03725	2.30679E-06
Std Err of Coef.				
Correlation Coefficient		0.999995		
Coefficient of Determination (r^2)		0.999990		

LDC #: 42613A96

Validation Findings Worksheet
Initial Calibration Calculation Verification

Reviewer: Q
2nd Reviewer: KK

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
6/6/2018	M2	PFOA	0	0.2482712	0.25	0.0625
			s1	0.5747737	0.5	0.25
			s2	1.0592625	1	1
			s3	1.846235	2	4
			s4	4.6900387	5	25
			s5	10.243193	10	100
			s6	51.521462	50	2500
			s7	93.85144027	100	10000
			s8	228.044994	250	62500
			s9	451.7265496	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	0.76340	c	0.0441882
Std Err of Y Est				
R Squared		0.9998726		0.9994240
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	0.931889278	-6.1517E-05	0.964706	-0.000132122
Std Err of Coef.				
Correlation Coefficient		0.999936		
Coefficient of Determination (r^2)		0.999873		

Validation Findings Worksheet
Initial Calibration Calculation Verification

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
6/13/2018	M2	PFHxA	0	0.4266035	0.25	0.0625
			s1	0.97093	0.5	0.25
			s2	1.9639255	1	1
			s3	3.6634565	2	4
			s4	8.4481905	5	25
			s5	15.881127	10	100
			s6	85.352945	50	2500
			s7	154.4073192	100	10000
			s8	412.8312447	250	62500
			s9	789.7483287	500	250000

Regression Output	Calculated		*Reported*	
Constant	c	-0.57068	c	0.0713566
Std Err of Y Est				
R Squared		0.9997320		0.9993330
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.676648676	-0.000187679	1.64736	-0.000124659
Std Err of Coef.				
Correlation Coefficient		0.999866		
Coefficient of Determination (r^2)		0.999732		

LDC #: 26BU96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: KK

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	18060TM2_3	6/7/18	PFBS (1st internal standard)	1.0	0.913	0.911	8.7	8.9
			PFOA (2nd internal standard)	1.0	1.05	1.06	5.4	5.8
			(3rd internalstandard)					
2	18060TM2_28	6/7/18	PFBS (1st internal standard)	10.0	9.27	9.27	7.3	7.3
			PFOA (2nd internal standard)	10.0	9.52	9.53	4.8	4.7
			(3rd internalstandard)					
3	18060TM2_45	6/7/18	PFBS (1st internal standard)	1.0	0.885	0.884	11.5	11.8
			PFOA (2nd internal standard)	1.0	1.10	1.10	9.8	10.1
			(3rd internalstandard)					
4	18061TM2_40	6/13/18	PFHxA (1st internal standard)	10.0	10.4	10.4	4.2	4.5
			(2nd internal standard)					
			(3rd internalstandard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

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LDC #: 4963M90

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: KK

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 10/11

Compound	Spike Added (ng/L)		Sample Concentration (ng/L)	Spiked Sample Concentration (ng/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
PFBS	0.0907	0.0883	0.582	0.746	0.682	182	181	114	113	~~45.9~~	45.9
PFOA	↓	↓	0.0218	0.141	0.113	131	131	103	103	23.9	23.9

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

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LDC #: 42631A96

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: KK

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: BBE0244-BS1

Compound	Spike Added (ng/L)		Spike Concentration (ng/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
PFBS	0.0800	NA	0.0918	NA	115	115				
PFOA	↓	↓	0.0941	↓	118	118				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

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LDC #: 42683M96

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: KK

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
(Y) N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

V_i = Volume of extract injected in microliters (ul)

V_t = Volume of the concentrated extract in microliters (ul)

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

2.0 = Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1, PFOA:

Conc. = $\frac{(0.964(06) + \sqrt{(0.964(06)^2 - 4 \times (-0.000132)(-0)}) \left(\frac{1180 \times 10^5}{9070}\right) + 0.0448}{(2)(-0.000132)(2)(0.113)}$

$= 1.87 \text{ ng/L}$

$= 0.00187 \text{ ug/L}$

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Qualification
	1	PFOA	0.00187		

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LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Tetra Tech EC, Inc.
17885 Von Karman Avenue, Suite 500
Irvine, CA 92614
ATTN: Ms. Sabina Sudoko

January 2, 2019

SUBJECT: MCAS Yuma, CTO 3803, Data Validation

Dear Ms. Sudoko,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on December 10, 2018. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #43888:

SDG #	Fraction
280-116898-1, 280-116942-1 280-117007-1, 280-117103-1 280-117110-1, L1846366 L1846592, L1846856 L1847243, L1847316 1803615, 1803626 1803659, 1803676 1803678	Volatiles, 1,4-Dioxane, Wet Chemistry, Perfluoroalkyl and Polyfluoroalkyl Substances

The data validation was performed under Stage 2B & 4 guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona; April 2018
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.1; 2017
- USEPA National Functional Guidelines for Superfund Organic Methods Data Review; January 2017
- USEPA National Functional Guidelines for Inorganic Superfund Data Review; January 2017
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Shauna McKellar
Project Manager/Chemist

5,417 pages-ADV

Attachment 1

Stage 2B/4 ADR/NEDD 80/20

LDC #43888 (Tetra Tech-EC, Inc.-Irvine, CA / MCAS Yuma, CTO 3803)

PO# 1153059

LDC	SDG#	DATE REC'D	(3) DATE DUE	(3) VOA (8260B)		1,4-Diox (8270D -SIM)		PFAs (537)		Cl,SO_4 NO_3-N (9056A)		Fe II (3500 -Fe B)		pH (9040C)																							
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	280-116898-1	12/10/18	01/02/19	1	0	-	-	-	-	1	0	1	0	1	0																				
A	280-116898-1	12/10/18	01/02/19	8	0	-	-	-	-	6	0	6	0	6	0																				
B	280-116942-1	12/10/18	01/02/19	9	0	-	-	-	-	7	0	7	0	7	0																				
C	280-117007-1	12/10/18	01/02/19	7	0	-	-	-	-	6	0	6	0	6	0																				
D	280-117103-1	12/10/18	01/02/19	8	0	-	-	-	-	6	0	6	0	6	0																				
E	280-117110-1	12/10/18	01/02/19	4	0	-	-	-	-	2	0	2	0	2	0																				
F	L1846366	12/10/18	01/02/19	-	-	1	0	-	-	-	-	-	-	-	-																				
F	L1846366	12/10/18	01/02/19	-	-	7	0	-	-	-	-	-	-	-	-																				
G	L1846592	12/10/18	01/02/19	-	-	8	0	-	-	-	-	-	-	-	-																				
H	L1846856	12/10/18	01/02/19	-	-	6	0	-	-	-	-	-	-	-	-																				
I	L1847243	12/10/18	01/02/19	-	-	7	0	-	-	-	-	-	-	-	-																				
J	L1847316	12/10/18	01/02/19	-	-	3	0	-	-	-	-	-	-	-	-																				
K	1803615	12/10/18	01/02/19	-	-	-	-	1	0	-	-	-	-	-	-																				
K	1803615	12/10/18	01/02/19	-	-	-	-	8	0	-	-	-	-	-	-																				
L	1803626	12/10/18	01/02/19	-	-	-	-	9	0	-	-	-	-	-	-																				
M	1803659	12/10/18	01/02/19	-	-	-	-	7	0	-	-	-	-	-	-																				
N	1803676	12/10/18	01/02/19	-	-	-	-	8	0	-	-	-	-	-	-																				
O	1803678	12/10/18	01/02/19	-	-	-	-	4	0	-	-	-	-	-	-																				
Total	T/SM			37	0	32	0	37	0	28	0	28	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	190

Shaded cells indicate Stage 4 validation (all other cells are ADR validation).

L:\TTEMI-Irvine\Yuma\43888ST-3803.wpd

Data Validation Report
MCAS Yuma, CTO 3803

SDGs: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1, L1846366, L1846592, L1846856, L1847243, L1847316, 1803615, 1803626, 1803659, 1803676, and 1803678

Prepared for

Tetra Tech EC, Inc.
17885 Von Karman Avenue, Suite 500
Irvine, CA 92614

Prepared by

Laboratory Data Consultants, Inc
2701 Loker Ave West, Suite 220
Carlsbad, CA 92010

January 2, 2019

INTRODUCTION

This Data Validation Report (DVR) presents Stage 2B and Stage 4 data validation results for samples collected during the November 2018 sampling period. Data validation was performed in accordance with the Final Sampling and Analysis Plan (SAP) for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), a modified outline of the US EPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017), and a modified outline of the US EPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance is not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B
1,4-Dioxane by EPA SW 846 Method 8270D utilizing Selective Ion Monitoring (SIM)
Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by EPA Method 537 Modified

Wet Chemistry:
Chloride, Nitrate as Nitrogen, and Sulfate by EPA SW 846 Method 9056A
Ferrous Iron by Standard Method 3500-Fe B
pH by EPA SW 846 Method 9040C

For samples reviewed by automated data review, the sample identification and methods of analyses performed on each sample is presented in Attachment 1. Overall data qualification summary is presented in Attachment 2. Stage 2B Automated Data Review outliers are presented in Enclosure I. DVRs for samples on which Stage 4 validation was performed are presented in Enclosure II. Validation for 1,4-Dioxane was performed manually and DVRs for Stage 2B and Stage 4 manual validation are also presented in Enclosure II.

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results for sample holding times, initial and continuing calibrations, laboratory blanks, initial and continuing calibration blanks (ICB/CCBs), surrogates, matrix spike/matrix spike duplicates (MS/MSD), laboratory control sample/laboratory control sample duplicates (LCS/LCSD), ongoing precision recovery (OPR), internal standards, trip blanks, equipment blanks, field rinsate blanks, and field duplicates. Approximately 20 percent of samples were subjected to Stage 4 evaluation as indicated in Attachment 1, which comprises a review of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

Automated data review was performed on all QC summary results using the Automated Data Review (ADR) software program (LDC, 2013) with the exception of the calibrations, ICB/CCBs, and internal standards, and all QC for 1,4-Dioxane, which were validated manually. Quality assurance (QA)/QC criteria specified in the SAP, DoD QSM, and NFGs were incorporated with the program's reference library to assess compliance with project requirements.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detect): The compound or analyte was analyzed for and positively identified by the laboratory; however the analyte should be considered non-detect at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not applicable): Data did not warrant qualification since detected results only are affected and the compound was not detected in the associated samples.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt & Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met with the exception of eight samples for PFAs, twenty-eight samples for pH, one sample for nitrate as N, and twenty-eight samples for ferrous iron. Due to grossly exceeded holding times (e.g., >2x recommended holding time), 23 ferrous iron results were qualified as rejected (R). The remainder of the data were qualified as detected estimated (J) and non-detected estimated (UJ) as applicable. The details regarding the qualification of data are provided in Enclosures I and II.

II. Instrument Performance Check

A tune was performed at 12 hour intervals as required by the methods.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

All criteria for the initial calibration and initial calibration verifications of each method were met.

IV. Continuing Calibration

All criteria for the continuing calibration verifications of each method were met with the following exceptions:

SDG/ Method	Date	Compound	%D (Limits)	Associated Samples	Flag	A or P
1803676/ 537 Mod.	12/03/18	PFTeDA	42.4 (≤30)	A1-MW-11-SA2 A1-MW-13-SA2 A1-MW-14-SA2 A1-MW-15-SA2 A1-MW-37-SA2 A1-MW-37-SA2D FRB-20181115 A1-MW-31-SA2	UJ (all non-detects)	A
1803678/ 537 Mod.	12/03/18	PFTeDA	42.4 (≤30)	A1-MW-01-SA2 A1-MW-42-SA2 FRB-20181116 EB-20181116	UJ (all non-detects)	A

V. Laboratory Blanks

Laboratory blanks were performed as required by the methods. No contaminant concentrations were detected in the laboratory blanks reviewed by the ADR software program with the exception of several blanks for chloride, nitrate as N, and sulfate. The associated sample results were not detected or were significantly greater than the concentrations found in the blanks, therefore no data were qualified. The details are presented in Enclosures I and II.

No contaminant concentrations were detected in the initial or continuing calibration blanks with the following exceptions:

SDG/ Method	Laboratory Blank ID	Analyte	Maximum Concentration	Associated Samples
280-116898-1/ 9056A	ICB/CCB	Nitrate as Nitrogen Sulfate	0.04526 mg/L 0.3841 mg/L	A1-MW-04-SA2 A1-MW-05-SA2 A1-MW-49-SA2 A1-MW-50-SA2 A1-MW-51-SA2 A1-PZ-19-SA2 A1-MW-52-SA2
280-116942-1/ 9056A	ICB/CCB	Sulfate	0.6931 mg/L	16-HS-03-SA2 16-MW-06-SA2 16-MW-08-SA2 16-MW-09-SA2 A1-MW-19-SA2
280-116942-1/ 9056A	ICB/CCB	Chloride	0.3086 mg/L	16-MW-06-SA2 16-MW-08-SA2 16-MW-09-SA2 A1-MW-53-SA2
280-117007-1/ 9056A	ICB/CCB	Chloride	0.2558 mg/L	A1-MW-07-SA2 A1-MW-23-SA2 A1-MW-25-SA2 A1-MW-27-SA2 A1-MW-55-SA2
280-117007-1/ 9056A	ICB/CCB	Chloride	0.2618 mg/L	A1-MW-54-SA2
280-117103-1/ 9056A	ICB/CCB	Chloride Sulfate	0.2982 mg/L 0.4094 mg/L	A1-MW-11-SA2 A1-MW-13-SA2 A1-MW-14-SA2 A1-MW-15-SA2 A1-MW-37-SA2 A1-MW-31-SA2
280-117103-1/ 9056A	ICB/CCB	Nitrate as N	0.04805 mg/L	A1-MW-11-SA2 A1-MW-13-SA2 A1-MW-14-SA2 A1-MW-15-SA2 A1-MW-37-SA2
280-117103-1/ 9056A	ICB/CCB	Nitrate as N	0.04749 mg/L	A1-MW-31-SA2
280-117110-1/ 9056A	ICB/CCB	Chloride Sulfate	0.6147 mg/L 0.3987 mg/L	A1-MW-42-SA2

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were not detected or were significantly greater than the concentrations found in the associated blanks.

VI. Field Blank Samples

Five trip blanks were collected and analyzed for VOCs. No contaminants were found.
One equipment blank was collected and analyzed for VOCs and PFAs. No contaminants were found.

Five field rinsate blanks were collected and analyzed for PFAs. No contaminants were found.

VII. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the exception of sample EB-20181116 in SDG 280-117110-1 for VOCs. No data were qualified due to high %Rs since the associated results were non-detected.

IX. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the exception of one MS/MSD pair for 1,1-dichloroethene, one MS/MSD pair for PFTeDA, one MS/MSD pair for sulfate, three MS/MSD pairs for ferrous iron. The ferrous iron results in sample A1-MW-42-SA2 was qualified as rejected (R) due to MS/MSD %Rs grossly outside QC limits (i.e., < 30%). The remainder of the associated sample results were qualified as detected estimated (J) or non-detected estimated (UJ) as applicable. The details regarding the qualification of data are provided in Enclosures I and II.

X. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

XII. Laboratory Control Samples/Ongoing Precision Recovery

Laboratory control samples (LCS) and laboratory control sample duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

Ongoing precision recovery (OPR) samples were analyzed as required by Method 537 Mod. Percent recoveries (%R) were within QC limits with the exception of two OPR samples for PFTeDA. No data were qualified due to high %Rs since the associated results were non-detected. The details are presented in Enclosure I.

XIII. Field Duplicate Samples

Three field duplicate pairs were collected and analyzed for all methods. All RPDs were within QC limits. RPDs were not calculated when sample results in one or both samples were less than 5X the limit of quantitation (LOQ). The field duplicate result comparisons are provided in Enclosures I and II.

XIV. Internal Standards/Labeled Compounds

All internal standard areas and retention times were within QC limits. All percent recoveries (%R) for labeled compounds used to quantitate target compounds were within QC limits.

XV. Compound Quantitation

The laboratory reporting limits were evaluated. All laboratory reporting limits met the specified requirements.

The laboratory indicated that the parent/product transition ion ratios met laboratory requirements with the following exceptions:

SDG/Method	Sample	Compound	Finding
1803615/537M	A1-MW-05-SA2 A1-MW-50-SA2 A1-PZ-19-SA2	All compounds qualified 'Q' by the laboratory	The parent/product transition ion ratio was outside of the 70-130% laboratory limits.
1803626/537M	A1-MW-53-SA2	All compounds qualified 'Q' by the laboratory	The parent/product transition ion ratio was outside of the 70-130% laboratory limits.
1803659/537M	A1-MW-25-SA2 A1-MW-54-SA2	All compounds qualified 'Q' by the laboratory	The parent/product transition ion ratio was outside of the 70-130% laboratory limits.
1803678/537M	A1-MW-01-SA2	All compounds qualified 'Q' by the laboratory	The parent/product transition ion ratio was outside of the 70-130% laboratory limits.

Since there are no established transition ion ratio requirements in the validation documents for this project, using professional judgment, no data were qualified.

All compounds reported below the LOQ as detected by the laboratory were qualified as detected estimated (J). The details regarding the qualification of data are provided in Enclosures I and II.

XVI. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to severe holding time exceedances, data were qualified as rejected in twenty-three samples.

Due to gross MS/MSD %R exceedance, data were qualified as rejected in one sample.

Due to holding time exceedances, data were qualified as estimated in thirty samples.

Due to CCV %D, data were qualified as estimated in twelve samples.

Due to MS/MSD %R, data were qualified as estimated in one sample.

Due to results below the LOQ, data were qualified as estimated in twenty-two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Data flags are summarized and are presented as Attachment 2.

Attachment 1

Sample Cross Reference

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
12-Nov-2018	TB-20181112	280-116898-7	TB	METHOD	8260B	Stage 2B
12-Nov-2018	A1-MW-49-SA2	1803615-03	N	Gen Prep	537 MOD	Stage 4
12-Nov-2018	A1-MW-49-SA2	280-116898-3	N	METHOD	8260B	Stage 4
12-Nov-2018	A1-MW-49-SA2	280-116898-3	N	METHOD	9040C	Stage 4
12-Nov-2018	A1-MW-49-SA2	280-116898-3	N	METHOD	9056A	Stage 4
12-Nov-2018	A1-MW-49-SA2	280-116898-3	N	METHOD	SM3500 Fe B D	Stage 4
12-Nov-2018	A1-MW-50-SA2	1803615-04	N	Gen Prep	537 MOD	Stage 4
12-Nov-2018	A1-MW-50-SA2	280-116898-4	N	METHOD	8260B	Stage 4
12-Nov-2018	A1-MW-50-SA2	280-116898-4	N	METHOD	9040C	Stage 4
12-Nov-2018	A1-MW-50-SA2	280-116898-4	N	METHOD	9056A	Stage 4
12-Nov-2018	A1-MW-50-SA2	280-116898-4	N	METHOD	SM3500 Fe B D	Stage 4
12-Nov-2018	A1-MW-50-SA2DUP	280-116898-4DUP	DUP	METHOD	9056A	Stage 4
12-Nov-2018	A1-MW-50-SA2MS	280-116898-4MS	MS	METHOD	8260B	Stage 4
12-Nov-2018	A1-MW-50-SA2MS	280-116898-4MS	MS	METHOD	9056A	Stage 4
12-Nov-2018	A1-MW-50-SA2MSD	280-116898-4MSD	MSD	METHOD	8260B	Stage 4
12-Nov-2018	A1-MW-50-SA2MSD	280-116898-4MSD	MSD	METHOD	9056A	Stage 4
12-Nov-2018	A1-MW-50-SA2D	1803615-05	FD	Gen Prep	537 MOD	Stage 4
12-Nov-2018	A1-MW-50-SA2D	280-116898-5	FD	METHOD	8260B	Stage 4
12-Nov-2018	A1-MW-51-SA2	1803615-06	N	Gen Prep	537 MOD	Stage 4
12-Nov-2018	A1-MW-51-SA2	280-116898-6	N	METHOD	8260B	Stage 4
12-Nov-2018	A1-MW-51-SA2	280-116898-6	N	METHOD	9040C	Stage 2B
12-Nov-2018	A1-MW-51-SA2	280-116898-6	N	METHOD	9056A	Stage 2B
12-Nov-2018	A1-MW-51-SA2	280-116898-6	N	METHOD	SM3500 Fe B D	Stage 2B
12-Nov-2018	A1-MW-04-SA2	1803615-01	N	Gen Prep	537 MOD	Stage 4
12-Nov-2018	A1-MW-04-SA2	280-116898-1	N	METHOD	8260B	Stage 4
12-Nov-2018	A1-MW-04-SA2	280-116898-1	N	METHOD	9040C	Stage 4

N = Normal Sample
FD = Field Duplicate
TB = Trip Blank
MS = Matrix Spike
MSD = Matrix Spike Duplicate
EB = Equipment Blank
DUP = Laboratory Duplicate
FRB = Field Rinsate Blank

Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
12-Nov-2018	A1-MW-04-SA2	280-116898-1	N	METHOD	9056A	Stage 4
12-Nov-2018	A1-MW-04-SA2	280-116898-1	N	METHOD	SM3500 Fe B D	Stage 4
12-Nov-2018	A1-PZ-19-SA2	1803615-09	N	Gen Prep	537 MOD	Stage 4
12-Nov-2018	A1-PZ-19-SA2	280-116898-8	N	METHOD	8260B	Stage 4
12-Nov-2018	A1-PZ-19-SA2	280-116898-8	N	METHOD	9040C	Stage 4
12-Nov-2018	A1-PZ-19-SA2	280-116898-8	N	METHOD	9056A	Stage 4
12-Nov-2018	A1-PZ-19-SA2	280-116898-8	N	METHOD	SM3500 Fe B D	Stage 4
12-Nov-2018	A1-MW-52-SA2	1803615-07	N	Gen Prep	537 MOD	Stage 4
12-Nov-2018	A1-MW-52-SA2	280-116898-9	N	METHOD	8260B	Stage 4
12-Nov-2018	A1-MW-52-SA2	280-116898-9	N	METHOD	9040C	Stage 4
12-Nov-2018	A1-MW-52-SA2	280-116898-9	N	METHOD	9056A	Stage 4
12-Nov-2018	A1-MW-52-SA2	280-116898-9	N	METHOD	SM3500 Fe B D	Stage 4
12-Nov-2018	A1-MW-05-SA2	1803615-02	N	Gen Prep	537 MOD	Stage 4
12-Nov-2018	A1-MW-05-SA2	280-116898-2	N	METHOD	8260B	Stage 4
12-Nov-2018	A1-MW-05-SA2	280-116898-2	N	METHOD	9040C	Stage 4
12-Nov-2018	A1-MW-05-SA2	280-116898-2	N	METHOD	9056A	Stage 4
12-Nov-2018	A1-MW-05-SA2	280-116898-2	N	METHOD	SM3500 Fe B D	Stage 4
12-Nov-2018	FRB-20181112	1803615-08	FRB	Gen Prep	537 MOD	Stage 2B
13-Nov-2018	TB-20181113	280-116942-7	TB	METHOD	8260B	Stage 2B
13-Nov-2018	16-MW-06-SA2	1803626-02	N	Gen Prep	537 MOD	Stage 2B
13-Nov-2018	16-MW-06-SA2	280-116942-2	N	METHOD	8260B	Stage 2B
13-Nov-2018	16-MW-06-SA2	280-116942-2	N	METHOD	9040C	Stage 2B
13-Nov-2018	16-MW-06-SA2	280-116942-2	N	METHOD	9056A	Stage 2B
13-Nov-2018	16-MW-06-SA2	280-116942-2	N	METHOD	SM3500 Fe B D	Stage 2B
13-Nov-2018	16-MW-06-SA2DUP	280-116942-2DUP	DUP	METHOD	9056A	Stage 2B
13-Nov-2018	16-MW-06-SA2MS	280-116942-2MS	MS	METHOD	9056A	Stage 2B

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Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
13-Nov-2018	16-MW-06-SA2MSD	280-116942-2MSD	MSD	METHOD	9056A	Stage 2B
13-Nov-2018	A1-MW-18-SA2	1803626-05	N	Gen Prep	537 MOD	Stage 2B
13-Nov-2018	A1-MW-18-SA2	280-116942-5	N	METHOD	8260B	Stage 2B
13-Nov-2018	A1-MW-18-SA2	280-116942-5	N	METHOD	9040C	Stage 2B
13-Nov-2018	A1-MW-18-SA2	280-116942-5	N	METHOD	9056A	Stage 2B
13-Nov-2018	A1-MW-18-SA2	280-116942-5	N	METHOD	SM3500 Fe B D	Stage 2B
13-Nov-2018	A1-MW-19-SA2	1803626-06	N	Gen Prep	537 MOD	Stage 2B
13-Nov-2018	A1-MW-19-SA2	280-116942-6	N	METHOD	8260B	Stage 2B
13-Nov-2018	A1-MW-19-SA2	280-116942-6	N	METHOD	9040C	Stage 2B
13-Nov-2018	A1-MW-19-SA2	280-116942-6	N	METHOD	9056A	Stage 2B
13-Nov-2018	A1-MW-19-SA2	280-116942-6	N	METHOD	SM3500 Fe B D	Stage 2B
13-Nov-2018	16-HS-03-SA2	1803626-01	N	Gen Prep	537 MOD	Stage 2B
13-Nov-2018	16-HS-03-SA2	280-116942-1	N	METHOD	8260B	Stage 2B
13-Nov-2018	16-HS-03-SA2	280-116942-1	N	METHOD	9040C	Stage 2B
13-Nov-2018	16-HS-03-SA2	280-116942-1	N	METHOD	9056A	Stage 2B
13-Nov-2018	16-HS-03-SA2	280-116942-1	N	METHOD	SM3500 Fe B D	Stage 2B
13-Nov-2018	16-HS-03-SA2D	1803626-09	FD	Gen Prep	537 MOD	Stage 2B
13-Nov-2018	16-HS-03-SA2D	280-116942-9	FD	METHOD	8260B	Stage 2B
13-Nov-2018	16-MW-08-SA2	1803626-03	N	Gen Prep	537 MOD	Stage 2B
13-Nov-2018	16-MW-08-SA2	280-116942-3	N	METHOD	8260B	Stage 2B
13-Nov-2018	16-MW-08-SA2	280-116942-3	N	METHOD	9040C	Stage 2B
13-Nov-2018	16-MW-08-SA2	280-116942-3	N	METHOD	9056A	Stage 2B
13-Nov-2018	16-MW-08-SA2	280-116942-3	N	METHOD	SM3500 Fe B D	Stage 2B
13-Nov-2018	16-MW-09-SA2	1803626-04	N	Gen Prep	537 MOD	Stage 2B
13-Nov-2018	16-MW-09-SA2	280-116942-4	N	METHOD	8260B	Stage 2B
13-Nov-2018	16-MW-09-SA2	280-116942-4	N	METHOD	9040C	Stage 2B

N = Normal Sample *MS = Matrix Spike* *DUP = Laboratory Duplicate*
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Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
13-Nov-2018	16-MW-09-SA2	280-116942-4	N	METHOD	9056A	Stage 2B
13-Nov-2018	16-MW-09-SA2	280-116942-4	N	METHOD	SM3500 Fe B D	Stage 2B
13-Nov-2018	16-MW-09-SA2DUP	280-116942-4DUP	DUP	METHOD	SM3500 Fe B D	Stage 2B
13-Nov-2018	16-MW-09-SA2MS	280-116942-4MS	MS	METHOD	SM3500 Fe B D	Stage 2B
13-Nov-2018	16-MW-09-SA2MSD	280-116942-4MSD	MSD	METHOD	SM3500 Fe B D	Stage 2B
13-Nov-2018	A1-MW-53-SA2	1803626-08	N	Gen Prep	537 MOD	Stage 2B
13-Nov-2018	A1-MW-53-SA2	280-116942-8	N	METHOD	8260B	Stage 2B
13-Nov-2018	A1-MW-53-SA2	280-116942-8	N	METHOD	9040C	Stage 2B
13-Nov-2018	A1-MW-53-SA2	280-116942-8	N	METHOD	9056A	Stage 2B
13-Nov-2018	A1-MW-53-SA2	280-116942-8	N	METHOD	SM3500 Fe B D	Stage 2B
13-Nov-2018	FRB-20181113	1803626-07	FRB	Gen Prep	537 MOD	Stage 2B
14-Nov-2018	TB-20181114	280-117007-6	TB	METHOD	8260B	Stage 2B
14-Nov-2018	A1-MW-07-SA2	1803659-01	N	Gen Prep	537 MOD	Stage 2B
14-Nov-2018	A1-MW-07-SA2	280-117007-1	N	METHOD	8260B	Stage 2B
14-Nov-2018	A1-MW-07-SA2	280-117007-1	N	METHOD	9040C	Stage 2B
14-Nov-2018	A1-MW-07-SA2	280-117007-1	N	METHOD	9056A	Stage 2B
14-Nov-2018	A1-MW-07-SA2	280-117007-1	N	METHOD	SM3500 Fe B D	Stage 2B
14-Nov-2018	A1-MW-07-SA2MS	280-117007-1MS	MS	METHOD	8260B	Stage 2B
14-Nov-2018	A1-MW-07-SA2MSD	280-117007-1MSD	MSD	METHOD	8260B	Stage 2B
14-Nov-2018	A1-MW-23-SA2	1803659-02	N	Gen Prep	537 MOD	Stage 2B
14-Nov-2018	A1-MW-23-SA2	280-117007-2	N	METHOD	8260B	Stage 2B
14-Nov-2018	A1-MW-23-SA2	280-117007-2	N	METHOD	9040C	Stage 2B
14-Nov-2018	A1-MW-23-SA2	280-117007-2	N	METHOD	9056A	Stage 2B
14-Nov-2018	A1-MW-23-SA2	280-117007-2	N	METHOD	SM3500 Fe B D	Stage 2B
14-Nov-2018	A1-MW-55-SA2	1803659-05	N	Gen Prep	537 MOD	Stage 2B
14-Nov-2018	A1-MW-55-SA2	280-117007-5	N	METHOD	8260B	Stage 2B

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DUP = Laboratory Duplicate
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Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
14-Nov-2018	A1-MW-55-SA2	280-117007-5	N	METHOD	9040C	Stage 2B
14-Nov-2018	A1-MW-55-SA2	280-117007-5	N	METHOD	9056A	Stage 2B
14-Nov-2018	A1-MW-55-SA2	280-117007-5	N	METHOD	SM3500 Fe B D	Stage 2B
14-Nov-2018	A1-MW-25-SA2	1803659-03	N	Gen Prep	537 MOD	Stage 2B
14-Nov-2018	A1-MW-25-SA2	280-117007-3	N	METHOD	8260B	Stage 2B
14-Nov-2018	A1-MW-25-SA2	280-117007-3	N	METHOD	9040C	Stage 2B
14-Nov-2018	A1-MW-25-SA2	280-117007-3	N	METHOD	9056A	Stage 2B
14-Nov-2018	A1-MW-25-SA2	280-117007-3	N	METHOD	SM3500 Fe B D	Stage 2B
14-Nov-2018	A1-MW-27-SA2	1803659-04	N	Gen Prep	537 MOD	Stage 2B
14-Nov-2018	A1-MW-27-SA2	280-117007-4	N	METHOD	8260B	Stage 2B
14-Nov-2018	A1-MW-27-SA2	280-117007-4	N	METHOD	9040C	Stage 2B
14-Nov-2018	A1-MW-27-SA2	280-117007-4	N	METHOD	9056A	Stage 2B
14-Nov-2018	A1-MW-27-SA2	280-117007-4	N	METHOD	SM3500 Fe B D	Stage 2B
14-Nov-2018	FRB-20181114	1803659-07	FRB	Gen Prep	537 MOD	Stage 2B
14-Nov-2018	A1-MW-54-SA2	1803659-06	N	Gen Prep	537 MOD	Stage 2B
14-Nov-2018	A1-MW-54-SA2	280-117007-7	N	METHOD	8260B	Stage 2B
14-Nov-2018	A1-MW-54-SA2	280-117007-7	N	METHOD	9040C	Stage 2B
14-Nov-2018	A1-MW-54-SA2	280-117007-7	N	METHOD	9056A	Stage 2B
14-Nov-2018	A1-MW-54-SA2	280-117007-7	N	METHOD	SM3500 Fe B D	Stage 2B
14-Nov-2018	A1-MW-54-SA2DUP	280-117007-7DUP	DUP	METHOD	SM3500 Fe B D	Stage 2B
14-Nov-2018	A1-MW-54-SA2MS	280-117007-7MS	MS	METHOD	SM3500 Fe B D	Stage 2B
14-Nov-2018	A1-MW-54-SA2MSD	280-117007-7MSD	MSD	METHOD	SM3500 Fe B D	Stage 2B
15-Nov-2018	TB-20181115	280-117103-7	TB	METHOD	8260B	Stage 2B
15-Nov-2018	A1-MW-13-SA2	1803676-02	N	Gen Prep	537 MOD	Stage 2B
15-Nov-2018	A1-MW-13-SA2	280-117103-2	N	METHOD	8260B	Stage 2B
15-Nov-2018	A1-MW-13-SA2	280-117103-2	N	METHOD	9040C	Stage 2B

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DUP = Laboratory Duplicate
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Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
15-Nov-2018	A1-MW-13-SA2	280-117103-2	N	METHOD	9056A	Stage 2B
15-Nov-2018	A1-MW-13-SA2	280-117103-2	N	METHOD	SM3500 Fe B D	Stage 2B
15-Nov-2018	A1-MW-11-SA2	1803676-01	N	Gen Prep	537 MOD	Stage 2B
15-Nov-2018	A1-MW-11-SA2	280-117103-1	N	METHOD	8260B	Stage 2B
15-Nov-2018	A1-MW-11-SA2	280-117103-1	N	METHOD	9040C	Stage 2B
15-Nov-2018	A1-MW-11-SA2	280-117103-1	N	METHOD	9056A	Stage 2B
15-Nov-2018	A1-MW-11-SA2	280-117103-1	N	METHOD	SM3500 Fe B D	Stage 2B
15-Nov-2018	A1-MW-15-SA2	1803676-04	N	Gen Prep	537 MOD	Stage 2B
15-Nov-2018	A1-MW-15-SA2	280-117103-4	N	METHOD	8260B	Stage 2B
15-Nov-2018	A1-MW-15-SA2	280-117103-4	N	METHOD	9040C	Stage 2B
15-Nov-2018	A1-MW-15-SA2	280-117103-4	N	METHOD	9056A	Stage 2B
15-Nov-2018	A1-MW-15-SA2	280-117103-4	N	METHOD	SM3500 Fe B D	Stage 2B
15-Nov-2018	A1-MW-14-SA2	1803676-03	N	Gen Prep	537 MOD	Stage 2B
15-Nov-2018	A1-MW-14-SA2	280-117103-3	N	METHOD	8260B	Stage 2B
15-Nov-2018	A1-MW-14-SA2	280-117103-3	N	METHOD	9040C	Stage 2B
15-Nov-2018	A1-MW-14-SA2	280-117103-3	N	METHOD	9056A	Stage 2B
15-Nov-2018	A1-MW-14-SA2	280-117103-3	N	METHOD	SM3500 Fe B D	Stage 2B
15-Nov-2018	A1-MW-14-SA2DUP	280-117103-3DUP	DUP	METHOD	9040C	Stage 2B
15-Nov-2018	A1-MW-37-SA2	1803676-05	N	Gen Prep	537 MOD	Stage 2B
15-Nov-2018	A1-MW-37-SA2	280-117103-5	N	METHOD	8260B	Stage 2B
15-Nov-2018	A1-MW-37-SA2	280-117103-5	N	METHOD	9040C	Stage 2B
15-Nov-2018	A1-MW-37-SA2	280-117103-5	N	METHOD	9056A	Stage 2B
15-Nov-2018	A1-MW-37-SA2	280-117103-5	N	METHOD	SM3500 Fe B D	Stage 2B
15-Nov-2018	A1-MW-37-SA2D	1803676-06	FD	Gen Prep	537 MOD	Stage 2B
15-Nov-2018	A1-MW-37-SA2D	280-117103-6	FD	METHOD	8260B	Stage 2B
15-Nov-2018	A1-MW-31-SA2	1803676-08	N	Gen Prep	537 MOD	Stage 2B

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Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
15-Nov-2018	A1-MW-31-SA2	280-117103-8	N	METHOD	8260B	Stage 2B
15-Nov-2018	A1-MW-31-SA2	280-117103-8	N	METHOD	9040C	Stage 2B
15-Nov-2018	A1-MW-31-SA2	280-117103-8	N	METHOD	9056A	Stage 2B
15-Nov-2018	A1-MW-31-SA2	280-117103-8	N	METHOD	SM3500 Fe B D	Stage 2B
15-Nov-2018	FRB-20181115	1803676-07	FRB	Gen Prep	537 MOD	Stage 2B
16-Nov-2018	TB-20181116	280-117110-3	TB	METHOD	8260B	Stage 2B
16-Nov-2018	A1-MW-01-SA2	1803678-01	N	Gen Prep	537 MOD	Stage 2B
16-Nov-2018	A1-MW-01-SA2	280-117110-1	N	METHOD	8260B	Stage 2B
16-Nov-2018	A1-MW-01-SA2	280-117110-1	N	METHOD	9040C	Stage 2B
16-Nov-2018	A1-MW-01-SA2	280-117110-1	N	METHOD	9056A	Stage 2B
16-Nov-2018	A1-MW-01-SA2	280-117110-1	N	METHOD	SM3500 Fe B D	Stage 2B
16-Nov-2018	A1-MW-01-SA2MS	280-117110-1MS	MS	METHOD	8260B	Stage 2B
16-Nov-2018	A1-MW-01-SA2MSD	280-117110-1MSD	MSD	METHOD	8260B	Stage 2B
16-Nov-2018	A1-MW-42-SA2	1803678-02	N	Gen Prep	537 MOD	Stage 2B
16-Nov-2018	A1-MW-42-SA2	280-117110-2	N	METHOD	8260B	Stage 2B
16-Nov-2018	A1-MW-42-SA2	280-117110-2	N	METHOD	9040C	Stage 2B
16-Nov-2018	A1-MW-42-SA2	280-117110-2	N	METHOD	9056A	Stage 2B
16-Nov-2018	A1-MW-42-SA2	280-117110-2	N	METHOD	SM3500 Fe B D	Stage 2B
16-Nov-2018	A1-MW-42-SA2DUP	280-117110-2DUP	DUP	METHOD	SM3500 Fe B D	Stage 2B
16-Nov-2018	A1-MW-42-SA2MS	280-117110-2MS	MS	METHOD	SM3500 Fe B D	Stage 2B
16-Nov-2018	A1-MW-42-SA2MSD	280-117110-2MSD	MSD	METHOD	SM3500 Fe B D	Stage 2B
16-Nov-2018	FRB-20181116	1803678-03	FRB	Gen Prep	537 MOD	Stage 2B
16-Nov-2018	EB-20181116	1803678-04	EB	Gen Prep	537 MOD	Stage 2B
16-Nov-2018	EB-20181116	280-117110-4	EB	METHOD	8260B	Stage 2B
19-Nov-2018	A1-MW-50-SA2MS	B8K0091-MS1	MS	Gen Prep	537 MOD	Stage 4
19-Nov-2018	A1-MW-50-SA2MSD	B8K0091-MSD1	MSD	Gen Prep	537 MOD	Stage 4

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MSD = Matrix Spike Duplicate
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DUP = Laboratory Duplicate
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Sample Cross Reference

Date Collected	Field Sample ID	Lab Sample ID	Sample Type	Prep Method	Analytical Method	Review Level
30-Nov-2018	A1-MW-01-SA2MS	B8K0153-MS1	MS	Gen Prep	537 MOD	Stage 2B
30-Nov-2018	A1-MW-01-SA2MSD	B8K0153-MSD1	MSD	Gen Prep	537 MOD	Stage 2B

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FD = Field Duplicate
TB = Trip Blank
MS = Matrix Spike
MSD = Matrix Spike Duplicate
EB = Equipment Blank
DUP = Laboratory Duplicate
FRB = Field Rinsate Blank

Attachment 2

Overall Data Qualification Summary

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-116898-1

Method Category: **EM**

Method: **9040C** ***Matrix:*** **AQ**

11/12/2018 11:40:00

Sample ID: **A1-MW-04-SA2** ***Collected:*** **AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

11/12/2018 2:24:00

Sample ID: **A1-MW-05-SA2** ***Collected:*** **PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

11/12/2018 8:32:00

Sample ID: **A1-MW-49-SA2** ***Collected:*** **AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

11/12/2018 9:25:00

Sample ID: **A1-MW-50-SA2** ***Collected:*** **AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
PH	7.8	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

11/12/2018 10:46:00

Sample ID: **A1-MW-51-SA2** ***Collected:*** **AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

11/12/2018 1:39:00

Sample ID: **A1-MW-52-SA2** ***Collected:*** **PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-116898-1

Method Category: EM
Method: 9040C **Matrix:** AQ

Sample ID: A1-PZ-19-SA2 **Collected:** 11/12/2018 12:43:00 PM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Method Category: GENCHEM
Method: 9056A **Matrix:** AQ

Sample ID: A1-PZ-19-SA2 **Collected:** 11/12/2018 12:43:00 PM **Analysis Type:** RES/TOT **Dilution:** 2

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NITRATE	0.896	J B	0.200	LOD	1.00	LOQ	mg/L	J	RI

Method Category: GENCHEM
Method: SM3500 Fe B D **Matrix:** AQ

Sample ID: A1-MW-04-SA2 **Collected:** 11/12/2018 11:40:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-05-SA2 **Collected:** 11/12/2018 2:24:00 PM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.119	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI, StoA

Sample ID: A1-MW-49-SA2 **Collected:** 11/12/2018 8:32:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-116898-1

Method Category: **GENCHEM**

Method: **SM3500 Fe B D** ***Matrix:*** **AQ**

Sample ID: **A1-MW-50-SA2** ***Collected:*** **11/12/2018 9:25:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.380	HF	0.0500	LOD	0.200	LOQ	mg/L	J	StoA

Sample ID: **A1-MW-51-SA2** ***Collected:*** **11/12/2018 10:46:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0278	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI, StoA

Sample ID: **A1-MW-52-SA2** ***Collected:*** **11/12/2018 1:39:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: **A1-PZ-19-SA2** ***Collected:*** **11/12/2018 12:43:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0591	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI, StoA

Method Category: **VOA**

Method: **8260B** ***Matrix:*** **AQ**

Sample ID: **A1-MW-50-SA2** ***Collected:*** **11/12/2018 9:25:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.564	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.780	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: **A1-MW-50-SA2D** ***Collected:*** **11/12/2018 9:35:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.630	J	0.800	LOD	1.00	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-116898-1

Method Category: VOA

Method: 8260B ***Matrix:*** AQ

Sample ID: A1-MW-50-SA2D ***Collected:*** 11/12/2018 9:35:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.949	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-MW-52-SA2 ***Collected:*** 11/12/2018 1:39:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.458	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.811	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-PZ-19-SA2 ***Collected:*** 11/12/2018 12:43:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.430	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

SDG: 280-116942-1

Method Category: EM

Method: 9040C ***Matrix:*** AQ

Sample ID: 16-HS-03-SA2 ***Collected:*** 11/13/2018 12:00:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.4	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: 16-MW-06-SA2 ***Collected:*** 11/13/2018 9:38:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.2	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-116942-1

Method Category: EM

Method: 9040C **Matrix: AQ**

Sample ID:16-MW-08-SA2 **Collected: 11/13/2018 1:00:00 PM** **Analysis Type: RES/TOT** **Dilution: 1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID:16-MW-09-SA2 **Collected: 11/13/2018 1:44:00 PM** **Analysis Type: RES/TOT** **Dilution: 1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID:A1-MW-18-SA2 **Collected: 11/13/2018 10:31:00 AM** **Analysis Type: RES/TOT** **Dilution: 1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.8	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID:A1-MW-19-SA2 **Collected: 11/13/2018 11:15:00 AM** **Analysis Type: RES/TOT** **Dilution: 1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID:A1-MW-53-SA2 **Collected: 11/13/2018 2:54:00 PM** **Analysis Type: RES/TOT** **Dilution: 1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Method Category: GENCHEM

Method: 9056A **Matrix: AQ**

Sample ID:16-MW-06-SA2 **Collected: 11/13/2018 9:38:00 AM** **Analysis Type: RE/TOT** **Dilution: 10**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Sulfate	695	F1	5.00	LOD	50.0	LOQ	mg/L	J	Ms

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-116942-1

Method Category: GENCHEM

Method: 9056A ***Matrix:*** AQ

Sample ID: A1-MW-18-SA2 ***Collected:*** 11/13/2018 10:31:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 5

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NITRATE	11.0	H	0.500	LOD	2.50	LOQ	mg/L	J	StoA

Method Category: GENCHEM

Method: SM3500 Fe B D ***Matrix:*** AQ

Sample ID: 16-HS-03-SA2 ***Collected:*** 11/13/2018 12:00:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: 16-MW-06-SA2 ***Collected:*** 11/13/2018 9:38:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: 16-MW-08-SA2 ***Collected:*** 11/13/2018 1:00:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: 16-MW-09-SA2 ***Collected:*** 11/13/2018 1:44:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF F1	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-18-SA2 ***Collected:*** 11/13/2018 10:31:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-116942-1

Method Category: GENCHEM

Method: SM3500 Fe B D ***Matrix:*** AQ

Sample ID: A1-MW-19-SA2 ***Collected:*** 11/13/2018 11:15:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-53-SA2 ***Collected:*** 11/13/2018 2:54:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Method Category: VOA

Method: 8260B ***Matrix:*** AQ

Sample ID: 16-MW-06-SA2 ***Collected:*** 11/13/2018 9:38:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.195	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: 16-MW-08-SA2 ***Collected:*** 11/13/2018 1:00:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TETRACHLOROETHENE	0.538	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: 16-MW-09-SA2 ***Collected:*** 11/13/2018 1:44:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TETRACHLOROETHENE	0.271	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-MW-19-SA2 ***Collected:*** 11/13/2018 11:15:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.545	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-117007-1

Method Category: **EM**

Method: **9040C** ***Matrix:*** **AQ**

Sample ID: **A1-MW-07-SA2** ***Collected:*** **11/14/2018 9:07:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: **A1-MW-23-SA2** ***Collected:*** **11/14/2018 10:03:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.9	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: **A1-MW-25-SA2** ***Collected:*** **11/14/2018 12:15:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: **A1-MW-27-SA2** ***Collected:*** **11/14/2018 1:03:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: **A1-MW-54-SA2** ***Collected:*** **11/14/2018 3:17:00 PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: **A1-MW-55-SA2** ***Collected:*** **11/14/2018 11:02:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-117007-1

Method Category: **GENCHEM**

Method: **SM3500 Fe B D** ***Matrix:*** **AQ**

11/14/2018 9:07:00

Sample ID: **A1-MW-07-SA2** ***Collected:*** **AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

11/14/2018 10:03:00

Sample ID: **A1-MW-23-SA2** ***Collected:*** **AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

11/14/2018 12:15:00

Sample ID: **A1-MW-25-SA2** ***Collected:*** **PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

11/14/2018 1:03:00

Sample ID: **A1-MW-27-SA2** ***Collected:*** **PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

11/14/2018 3:17:00

Sample ID: **A1-MW-54-SA2** ***Collected:*** **PM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF F1	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

11/14/2018 11:02:00

Sample ID: **A1-MW-55-SA2** ***Collected:*** **AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-117007-1

Method Category: VOA

Method: 8260B ***Matrix:*** AQ

Sample ID: A1-MW-07-SA2 ***Collected:*** 11/14/2018 9:07:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.357	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.826	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-MW-25-SA2 ***Collected:*** 11/14/2018 12:15:00 PM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.273	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.539	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

SDG: 280-117103-1

Method Category: EM

Method: 9040C ***Matrix:*** AQ

Sample ID: A1-MW-11-SA2 ***Collected:*** 11/15/2018 9:06:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.1	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-13-SA2 ***Collected:*** 11/15/2018 8:20:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-14-SA2 ***Collected:*** 11/15/2018 10:53:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-117103-1

Method Category: EM

Method: 9040C **Matrix:** AQ

Sample ID: A1-MW-15-SA2 **Collected:** 11/15/2018 10:07:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.1	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-31-SA2 **Collected:** 11/15/2018 2:16:00 PM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: A1-MW-37-SA2 **Collected:** 11/15/2018 11:54:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	7.8	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Method Category: GENCHEM

Method: SM3500 Fe B D **Matrix:** AQ

Sample ID: A1-MW-11-SA2 **Collected:** 11/15/2018 9:06:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-13-SA2 **Collected:** 11/15/2018 8:20:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-14-SA2 **Collected:** 11/15/2018 10:53:00 AM **Analysis Type:** RES/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-117103-1

Method Category: GENCHEM

Method: SM3500 Fe B D ***Matrix:*** AQ

Sample ID: A1-MW-15-SA2 ***Collected:*** 11/15/2018 10:07:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-31-SA2 ***Collected:*** 11/15/2018 2:16:00 PM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

Sample ID: A1-MW-37-SA2 ***Collected:*** 11/15/2018 11:54:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.156	J HF	0.0500	LOD	0.200	LOQ	mg/L	J	RI, StoA

Method Category: VOA

Method: 8260B ***Matrix:*** AQ

Sample ID: A1-MW-14-SA2 ***Collected:*** 11/15/2018 10:53:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.635	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.728	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-MW-15-SA2 ***Collected:*** 11/15/2018 10:07:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.426	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: A1-MW-37-SA2 ***Collected:*** 11/15/2018 11:54:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.379	J	0.800	LOD	1.00	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-117103-1

Method Category: **VOA**

Method: **8260B** ***Matrix:*** **AQ**

Sample ID: **A1-MW-37-SA2** ***Collected:*** **11/15/2018 11:54:00 AM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRICHLOROETHENE	0.914	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

Sample ID: **A1-MW-37-SA2D** ***Collected:*** **11/15/2018 12:04:00 PM** ***Analysis Type:*** **RES** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.373	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.909	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

SDG: 280-117110-1

Method Category: **EM**

Method: **9040C** ***Matrix:*** **AQ**

Sample ID: **A1-MW-01-SA2** ***Collected:*** **11/16/2018 8:12:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Sample ID: **A1-MW-42-SA2** ***Collected:*** **11/16/2018 9:17:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PH	8.0	HF	0.1	LOD	0.1	LOQ	SU	J	StoA

Method Category: **GENCHEM**

Method: **SM3500 Fe B D** ***Matrix:*** **AQ**

Sample ID: **A1-MW-01-SA2** ***Collected:*** **11/16/2018 8:12:00 AM** ***Analysis Type:*** **RES/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF	0.0500	LOD	0.200	LOQ	mg/L	R	StoA

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1, **Laboratory: TA DEN**

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

SDG: 280-117110-1

Method Category: GENCHEM

Method: SM3500 Fe B D ***Matrix:*** AQ

Sample ID: A1-MW-42-SA2 ***Collected:*** 11/16/2018 9:17:00 AM ***Analysis Type:*** RES/TOT ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
Ferrous Iron	0.0500	U HF F1	0.0500	LOD	0.200	LOQ	mg/L	R	Ms, StoA

Method Category: VOA

Method: 8260B ***Matrix:*** AQ

Sample ID: A1-MW-42-SA2 ***Collected:*** 11/16/2018 9:17:00 AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.238	J	0.800	LOD	1.00	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.367	J	0.400	LOD	1.00	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

Lab Reporting Batch ID: 280-116898-1, 280-116942-1,

Laboratory: TA DEN

EDD Filename: 280-116898-1, 280-116942-1, 280-117007-1, 280-117103-1, 280-117110-1

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver

Reason Code Legend

Reason Code	*Description*
Mb	Method Blank Contamination
Ms	Matrix Spike Lower Estimation
Ms	Matrix Spike Lower Rejection
Ms	Matrix Spike Precision
RI	Reporting Limit Trace Value
StoA	Sampling to Analysis Estimation
StoA	Sampling to Analysis Rejection
Surr	Surrogate/Tracer Recovery Upper Estimation

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

1803676, 1803678
EDD Filename: Prep1803615, Prep1803626, Prep1803659, Prep1803676, Prep1803678

Laboratory: Vista

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

SDG: 1803615

Method Category: SVOA

Method: 537 MOD **Matrix:** AQ

11/12/2018 11:40:

Sample ID: A1-MW-04-SA2 **Collected:** AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFOA	0.00646	J	0.00442	LOD	0.00881	LOQ	ug/L	J	RI

11/12/2018 2:24:0

Sample ID: A1-MW-05-SA2 **Collected:** PM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFHxS	0.00359	J, Q	0.00431	LOD	0.00864	LOQ	ug/L	J	RI

11/12/2018 9:25:0

Sample ID: A1-MW-50-SA2 **Collected:** AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFHpA	0.00474	J, Q	0.00446	LOD	0.00894	LOQ	ug/L	J	RI

11/12/2018 9:35:0

Sample ID: A1-MW-50-SA2D **Collected:** AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFHpA	0.00494	J	0.00439	LOD	0.00874	LOQ	ug/L	J	RI

11/12/2018 1:39:0

Sample ID: A1-MW-52-SA2 **Collected:** PM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFOS	0.00356	J	0.00435	LOD	0.00872	LOQ	ug/L	J	RI

11/12/2018 12:43:

Sample ID: A1-PZ-19-SA2 **Collected:** PM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFHpA	0.00548	J	0.00442	LOD	0.00884	LOQ	ug/L	J	RI
PFOS	0.00321	J, Q	0.00442	LOD	0.00884	LOQ	ug/L	J	RI

SDG: 1803626

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

1803676, 1803678
EDD Filename: Prep1803615, Prep1803626, Prep1803659, Prep1803676, Prep1803678

Laboratory: Vista
eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

SDG: 1803626

Method Category: SVOA
Method: 537 MOD **Matrix:** AQ

11/13/2018 9:38:0
Sample ID:16-MW-06-SA2 **Collected:**AM **Analysis Type:**RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFOS	0.00582	J	0.00417	LOD	0.00835	LOQ	ug/L	J	RI

11/13/2018 1:44:0
Sample ID:16-MW-09-SA2 **Collected:**PM **Analysis Type:**RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFOA	0.00449	J	0.00427	LOD	0.00852	LOQ	ug/L	J	RI
PFOS	0.00503	J	0.00427	LOD	0.00852	LOQ	ug/L	J	RI

11/13/2018 10:31:
Sample ID:A1-MW-18-SA2 **Collected:**AM **Analysis Type:**RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFOA	0.00309	J	0.00427	LOD	0.00856	LOQ	ug/L	J	RI

11/13/2018 11:15:
Sample ID:A1-MW-19-SA2 **Collected:**AM **Analysis Type:**RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFDA	0.00721	J	0.00431	LOD	0.00861	LOQ	ug/L	J	RI
PFNA	0.00398	J	0.00431	LOD	0.00861	LOQ	ug/L	J	RI

11/13/2018 2:54:0
Sample ID:A1-MW-53-SA2 **Collected:**PM **Analysis Type:**RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFOS	0.00400	J, Q	0.00420	LOD	0.00841	LOQ	ug/L	J	RI

SDG: 1803659

Method Category: SVOA
Method: 537 MOD **Matrix:** AQ

11/14/2018 10:03:
Sample ID:A1-MW-23-SA2 **Collected:**AM **Analysis Type:**RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFHxS	0.00594	J	0.00424	LOD	0.00849	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

1803676, 1803678
EDD Filename: Prep1803615, Prep1803626, Prep1803659, Prep1803676, Prep1803678

Laboratory: Vista
eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

SDG: 1803676

Method Category: SVOA
Method: 537 MOD ***Matrix:*** AQ

11/15/2018 9:06:0

Sample ID: A1-MW-11-SA2 ***Collected:*** AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NEtFOSAA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
NMeFOSAA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFBS	0.184		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFDA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFDoA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFHpA	0.0352		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFHxA	0.460		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFHxS	0.109		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFNA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFOS	0.00916		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFTeDA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE, Ccv
PFTrDA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFUnA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFOA	0.0349		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE

11/15/2018 8:20:0

Sample ID: A1-MW-13-SA2 ***Collected:*** AM ***Analysis Type:*** RES ***Dilution:*** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NEtFOSAA	0.00455	U	0.00455	LOD	0.00906	LOQ	ug/L	UJ	StoE
NMeFOSAA	0.00455	U	0.00455	LOD	0.00906	LOQ	ug/L	UJ	StoE
PFBS	0.259		0.00455	LOD	0.00906	LOQ	ug/L	J	StoE
PFDA	0.00455	U	0.00455	LOD	0.00906	LOQ	ug/L	UJ	StoE
PFDoA	0.00455	U	0.00455	LOD	0.00906	LOQ	ug/L	UJ	StoE
PFHpA	0.105		0.00455	LOD	0.00906	LOQ	ug/L	J	StoE
PFHxA	0.655		0.00455	LOD	0.00906	LOQ	ug/L	J	StoE
PFHxS	0.368		0.00455	LOD	0.00906	LOQ	ug/L	J	StoE
PFNA	0.00455	U	0.00455	LOD	0.00906	LOQ	ug/L	UJ	StoE
PFOA	0.0695		0.00455	LOD	0.00906	LOQ	ug/L	J	StoE
PFOS	0.107		0.00455	LOD	0.00906	LOQ	ug/L	J	StoE
PFTeDA	0.00455	U	0.00455	LOD	0.00906	LOQ	ug/L	UJ	StoE, Ccv
PFTrDA	0.00455	U	0.00455	LOD	0.00906	LOQ	ug/L	UJ	StoE
PFUnA	0.00455	U	0.00455	LOD	0.00906	LOQ	ug/L	UJ	StoE

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

1803676, 1803678
EDD Filename: Prep1803615, Prep1803626, Prep1803659, Prep1803676, Prep1803678

Laboratory: Vista

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

SDG: 1803676

Method Category: SVOA

Method: 537 MOD **Matrix:** AQ

11/15/2018 10:53

Sample ID: A1-MW-14-SA2 **Collected:** AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NEtFOSAA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
NMeFOSAA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFBS	0.101		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFDA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFDoA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFHpA	0.0658		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFHxA	0.327		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFHxS	0.253		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFNA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFOA	0.0527		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFOS	0.0604		0.00431	LOD	0.00860	LOQ	ug/L	J	StoE
PFTeDA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE, Ccv
PFTrDA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE
PFUnA	0.00431	U	0.00431	LOD	0.00860	LOQ	ug/L	UJ	StoE

11/15/2018 10:07

Sample ID: A1-MW-15-SA2 **Collected:** AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NEtFOSAA	0.00450	U	0.00450	LOD	0.00902	LOQ	ug/L	UJ	StoE
NMeFOSAA	0.00450	U	0.00450	LOD	0.00902	LOQ	ug/L	UJ	StoE
PFBS	0.363		0.00450	LOD	0.00902	LOQ	ug/L	J	StoE
PFDA	0.00450	U	0.00450	LOD	0.00902	LOQ	ug/L	UJ	StoE
PFDoA	0.00450	U	0.00450	LOD	0.00902	LOQ	ug/L	UJ	StoE
PFHpA	0.0773		0.00450	LOD	0.00902	LOQ	ug/L	J	StoE
PFHxA	0.596		0.00450	LOD	0.00902	LOQ	ug/L	J	StoE
PFHxS	0.322		0.00450	LOD	0.00902	LOQ	ug/L	J	StoE
PFNA	0.00450	U	0.00450	LOD	0.00902	LOQ	ug/L	UJ	StoE
PFOA	0.190		0.00450	LOD	0.00902	LOQ	ug/L	J	StoE
PFOS	0.0185		0.00450	LOD	0.00902	LOQ	ug/L	J	StoE
PFTeDA	0.00450	U	0.00450	LOD	0.00902	LOQ	ug/L	UJ	StoE, Ccv
PFTrDA	0.00450	U	0.00450	LOD	0.00902	LOQ	ug/L	UJ	StoE
PFUnA	0.00450	U	0.00450	LOD	0.00902	LOQ	ug/L	UJ	StoE

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

1803676, 1803678
EDD Filename: Prep1803615, Prep1803626, Prep1803659, Prep1803676, Prep1803678

Laboratory: Vista
eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

SDG: 1803676

Method Category: SVOA
Method: 537 MOD Matrix: AQ

11/15/2018 2:16:0
Sample ID:A1-MW-31-SA2 Collected:PM Analysis Type:RES Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NEtFOSAA	0.00427	U	0.00427	LOD	0.00855	LOQ	ug/L	UJ	StoE
NMeFOSAA	0.00427	U	0.00427	LOD	0.00855	LOQ	ug/L	UJ	StoE
PFBS	0.0235		0.00427	LOD	0.00855	LOQ	ug/L	J	StoE
PFDA	0.00427	U	0.00427	LOD	0.00855	LOQ	ug/L	UJ	StoE
PFDoA	0.00427	U	0.00427	LOD	0.00855	LOQ	ug/L	UJ	StoE
PFHpA	0.00427	U	0.00427	LOD	0.00855	LOQ	ug/L	UJ	StoE
PFHxA	0.0732		0.00427	LOD	0.00855	LOQ	ug/L	J	StoE
PFHxS	0.00855		0.00427	LOD	0.00855	LOQ	ug/L	J	StoE
PFNA	0.00427	U	0.00427	LOD	0.00855	LOQ	ug/L	UJ	StoE
PFOA	0.00388	J	0.00427	LOD	0.00855	LOQ	ug/L	J	RI, StoE
PFOS	0.00427	U	0.00427	LOD	0.00855	LOQ	ug/L	UJ	StoE
PFTeDA	0.00427	U	0.00427	LOD	0.00855	LOQ	ug/L	UJ	StoE, Ccv
PFTrDA	0.00427	U	0.00427	LOD	0.00855	LOQ	ug/L	UJ	StoE
PFUnA	0.00427	U	0.00427	LOD	0.00855	LOQ	ug/L	UJ	StoE

11/15/2018 11:54:
Sample ID:A1-MW-37-SA2 Collected:AM Analysis Type:RES Dilution: 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NEtFOSAA	0.00424	U	0.00424	LOD	0.00851	LOQ	ug/L	UJ	StoE
NMeFOSAA	0.00424	U	0.00424	LOD	0.00851	LOQ	ug/L	UJ	StoE
PFBS	0.151		0.00424	LOD	0.00851	LOQ	ug/L	J	StoE
PFDA	0.00424	U	0.00424	LOD	0.00851	LOQ	ug/L	UJ	StoE
PFDoA	0.00424	U	0.00424	LOD	0.00851	LOQ	ug/L	UJ	StoE
PFHpA	0.0856		0.00424	LOD	0.00851	LOQ	ug/L	J	StoE
PFHxA	0.520		0.00424	LOD	0.00851	LOQ	ug/L	J	StoE
PFHxS	0.438		0.00424	LOD	0.00851	LOQ	ug/L	J	StoE
PFNA	0.00424	U	0.00424	LOD	0.00851	LOQ	ug/L	UJ	StoE
PFOA	0.0599		0.00424	LOD	0.00851	LOQ	ug/L	J	StoE
PFOS	0.0288		0.00424	LOD	0.00851	LOQ	ug/L	J	StoE
PFTeDA	0.00424	U	0.00424	LOD	0.00851	LOQ	ug/L	UJ	StoE, Ccv
PFTrDA	0.00424	U	0.00424	LOD	0.00851	LOQ	ug/L	UJ	StoE
PFUnA	0.00424	U	0.00424	LOD	0.00851	LOQ	ug/L	UJ	StoE

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

1803676, 1803678
EDD Filename: Prep1803615, Prep1803626, Prep1803659, Prep1803676, Prep1803678

Laboratory: Vista

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

SDG: 1803676

Method Category: SVOA

Method: 537 MOD **Matrix:** AQ

11/15/2018 12:04:

Sample ID: A1-MW-37-SA2D **Collected:** PM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NEtFOSAA	0.00435	U	0.00435	LOD	0.00870	LOQ	ug/L	UJ	StoE
NMeFOSAA	0.00435	U	0.00435	LOD	0.00870	LOQ	ug/L	UJ	StoE
PFBS	0.150		0.00435	LOD	0.00870	LOQ	ug/L	J	StoE
PFDA	0.00435	U	0.00435	LOD	0.00870	LOQ	ug/L	UJ	StoE
PFDoA	0.00435	U	0.00435	LOD	0.00870	LOQ	ug/L	UJ	StoE
PFHpA	0.0830		0.00435	LOD	0.00870	LOQ	ug/L	J	StoE
PFHxA	0.529		0.00435	LOD	0.00870	LOQ	ug/L	J	StoE
PFHxS	0.429		0.00435	LOD	0.00870	LOQ	ug/L	J	StoE
PFNA	0.00435	U	0.00435	LOD	0.00870	LOQ	ug/L	UJ	StoE
PFOA	0.0555		0.00435	LOD	0.00870	LOQ	ug/L	J	StoE
PFOS	0.0275		0.00435	LOD	0.00870	LOQ	ug/L	J	StoE
PFTeDA	0.00435	U	0.00435	LOD	0.00870	LOQ	ug/L	UJ	StoE, Ccv
PFTrDA	0.00435	U	0.00435	LOD	0.00870	LOQ	ug/L	UJ	StoE
PFUnA	0.00435	U	0.00435	LOD	0.00870	LOQ	ug/L	UJ	StoE

11/15/2018 2:30:0

Sample ID: FRB-20181115 **Collected:** PM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NEtFOSAA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
NMeFOSAA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFBS	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFDA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFDoA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFHpA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFHxA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFHxS	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFNA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFOA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFOS	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFTeDA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE, Ccv
PFTrDA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE
PFUnA	0.00450	U	0.00450	LOD	0.00904	LOQ	ug/L	UJ	StoE

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

1803676, 1803678
EDD Filename: Prep1803615, Prep1803626, Prep1803659, Prep1803676, Prep1803678

Laboratory: Vista

eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

SDG: 1803678

Method Category: SVOA
Method: 537 MOD **Matrix:** AQ

11/16/2018 8:12:0

Sample ID: A1-MW-01-SA2 **Collected:** AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFTeDA	0.00446	U	0.00446	LOD	0.00894	LOQ	ug/L	UJ	Ccv

11/16/2018 9:17:0

Sample ID: A1-MW-42-SA2 **Collected:** AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFTeDA	0.00424	U	0.00424	LOD	0.00849	LOQ	ug/L	UJ	Ccv

11/16/2018 9:50:0

Sample ID: EB-20181116 **Collected:** AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFTeDA	0.00424	U	0.00424	LOD	0.00849	LOQ	ug/L	UJ	Ccv

11/16/2018 9:40:0

Sample ID: FRB-20181116 **Collected:** AM **Analysis Type:** RES **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PFTeDA	0.00481	U	0.00481	LOD	0.00965	LOQ	ug/L	UJ	Ccv

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Data Qualifier Summary

1803676, 1803678
EDD Filename: Prep1803615, Prep1803626, Prep1803659, Prep1803676, Prep1803678

Laboratory: Vista
eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista

Reason Code Legend

Reason Code	*Description*
Ccv	Continuing Calibration Verification Percent Difference Lower Estimation
Lcs	Laboratory Control Spike Upper Estimation
Ms	Matrix Spike Precision
Ms	Matrix Spike Upper Estimation
RI	Reporting Limit Trace Value
StoE	Sampling to Extraction Estimation

* denotes a non-reportable result

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Enclosure I

Stage 2B ADR Outliers

(Including Manual Review Outliers)

Quality Control
Outlier Reports

280-116898-1

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 280-116898-1 **Laboratory: TA DEN**

EDD Filename: 280-116898-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9040C **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-04-SA2 (RES/TOT)	Sampling To Analysis	267.00	24.00	HOURS	J (all detects)
A1-MW-05-SA2 (RES/TOT)		335.00	24.00	HOURS	
A1-MW-49-SA2 (RES/TOT)		341.00	24.00	HOURS	
A1-MW-50-SA2 (RES/TOT)		270.00	24.00	HOURS	
A1-MW-51-SA2 (RES/TOT)		268.75	24.00	HOURS	
A1-MW-52-SA2 (RES/TOT)		265.75	24.00	HOURS	
A1-PZ-19-SA2 (RES/TOT)		336.75	24.00	HOURS	

Method: SM3500 Fe B D **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-04-SA2 (RES/TOT)	Sampling To Analysis	222.75	24.00	HOURS	J(all detects)
A1-MW-05-SA2 (RES/TOT)		220.00	24.00	HOURS	R(all non-detects)
A1-MW-49-SA2 (RES/TOT)		226.00	24.00	HOURS	
A1-MW-50-SA2 (RES/TOT)		225.00	24.00	HOURS	
A1-MW-51-SA2 (RES/TOT)		223.75	24.00	HOURS	
A1-MW-52-SA2 (RES/TOT)		220.75	24.00	HOURS	
A1-PZ-19-SA2 (RES/TOT)		221.75	24.00	HOURS	

Method Blank Outlier Report

Lab Reporting Batch ID: 280-116898-1 **Laboratory: TA DEN**

EDD Filename: 280-116898-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **9056A**
Matrix: **AQ**

Method Blank Sample ID	Analysis Date	Analyte	Result	Associated Samples
MB 280-437370/6	11/13/2018 12:25:00 PM	Sulfate	0.3332 mg/L	A1-MW-04-SA2 A1-MW-05-SA2 A1-MW-49-SA2 A1-MW-50-SA2 A1-MW-51-SA2 A1-MW-52-SA2 A1-PZ-19-SA2
MB 280-437371/6	11/13/2018 12:25:00 PM	NITRATE	0.04530 mg/L	A1-MW-04-SA2 A1-MW-05-SA2 A1-MW-49-SA2 A1-MW-50-SA2 A1-MW-51-SA2 A1-MW-52-SA2 A1-PZ-19-SA2

Reporting Limit Outliers

Lab Reporting Batch ID: 280-116898-1 **Laboratory: TA DEN**

EDD Filename: 280-116898-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **8260B**
Matrix: **AQ**

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-50-SA2	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.564 0.780	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-50-SA2D	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.630 0.949	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-52-SA2	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.458 0.811	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-PZ-19-SA2	TRICHLOROETHENE	J	0.430	1.00	LOQ	ug/L	J (all detects)

Method: **9056A**
Matrix: **AQ**

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-PZ-19-SA2	NITRATE	J B	0.896	1.00	LOQ	mg/L	J (all detects)

Method: **SM3500 Fe B D**
Matrix: **AQ**

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-05-SA2	Ferrous Iron	J HF	0.119	0.200	LOQ	mg/L	J (all detects)
A1-MW-51-SA2	Ferrous Iron	J HF	0.0278	0.200	LOQ	mg/L	J (all detects)
A1-PZ-19-SA2	Ferrous Iron	J HF	0.0591	0.200	LOQ	mg/L	J (all detects)

Field Duplicate RPD Report

Lab Reporting Batch ID: 280-116898-1 **Laboratory: TA DEN**

EDD Filename: Prep280-116898-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 8260B
Matrix: AQ

Analyte	Concentration (ug/L)		Sample RPD	eQAPP RPD	Flag
	A1-MW-50-SA2	A1-MW-50-SA2D			
1,1-DICHLOROETHENE	0.564	0.630	NC	30.00	No Qualifiers Applied
TRICHLOROETHENE	0.780	0.949	NC	30.00	

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

LDC #: 43888A1a **VALIDATION COMPLETENESS WORKSHEET** Date: 12/18/18
SDG #: 280-116898-1 ADR/Stage ~~2B~~ 4 Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: DM
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	ICAL ≤ 15% ICV ≤ 20 %
IV.	Continuing calibration	A	CCV ≤ 20/50 %
V.	Laboratory Blanks	N	Not reviewed for ADR validation.
VI.	Field blanks		
VII.	Surrogate spikes		Not reviewed for ADR validation.
VIII.	Matrix spike/Matrix spike duplicates		Not reviewed for ADR validation.
IX.	Laboratory control samples		Not reviewed for ADR validation.
X.	Field duplicates		
XI.	Internal standards	A	Not reviewed for ADR validation.
XII.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for ADR validation.
XIII.	Target compound identification		Not reviewed for ADR validation.
XIV.	System performance		Not reviewed for ADR validation.
XV.	Overall assessment of data		Not reviewed for ADR validation.

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	A1-MW-04-SA2**	280-116898-1**	Water	11/12/18
2	A1-MW-05-SA2**	280-116898-2**	Water	11/12/18
3	A1-MW-49-SA2**	280-116898-3**	Water	11/12/18
4	A1-MW-50-SA2**	280-116898-4**	Water	11/12/18
5	A1-MW-50-SA2D**	280-116898-5**	Water	11/12/18
6	A1-MW-51-SA2**	280-116898-6**	Water	11/12/18
7	TB-20181112	280-116898-7	Water	11/12/18
8	A1-PZ-19-SA2**	280-116898-8**	Water	11/12/18
9	A1-MW-52-SA2**	280-116898-9**	Water	11/12/18
10	A1-MW-50-SA2MS	280-116898-4MS	Water	11/12/18
11	A1-MW-50-SA2MSD	280-116898-4MSD	Water	11/12/18
12				
13	MB 280-498700/6 - 498747/4			

LDC #: 43888A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12-20-18
SDG #: 280-116898-1 ADR/~~Stage 4~~ Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer:

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B), pH (EPA SW846 Method 9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	Not reviewed for ADR validation. MS/MSD
VII.	Duplicate sample analysis	A	Not reviewed for ADR validation. DUP
VIII.	Laboratory control samples	A	Not reviewed for ADR validation. LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	A	Not reviewed for ADR validation.
XI	Overall assessment of data	A	Not reviewed for ADR validation.

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	A1-MW-04-SA2**	280-116898-1**	Water	11/12/18
2	A1-MW-05-SA2**	280-116898-2**	Water	11/12/18
3	A1-MW-49-SA2**	280-116898-3**	Water	11/12/18
4	A1-MW-50-SA2**	280-116898-4**	Water	11/12/18
5	A1-MW-51-SA2	280-116898-6	Water	11/12/18
6	A1-PZ-19-SA2**	280-116898-8**	Water	11/12/18
7	A1-MW-52-SA2**	280-116898-9**	Water	11/12/18
8	A1-MW-50-SA2MS	280-116898-4MS	Water	11/12/18
9	A1-MW-50-SA2MSD	280-116898-4MSD	Water	11/12/18
10	A1-MW-50-SA2DUP	280-116898-4DUP	Water	11/12/18
11				
12				
13				
14				
15	PBW			

Notes:

LDC #: 43888A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1 → 7	W	(pH) TDS (Cl) F (NO3) NO2 (SO4) PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 (Fe+3)
QC 8 → 10	↓	pH TDS (Cl) F (NO3) NO2 (SO4) PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4

Comments:

LDC #: 43888A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method?
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:		9040C		SM 3500 Fe B			
Parameters:		pH		Ferrous Iron			
Technical holding time:		24 hr		24 hr			
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
1	11:40 11-12-18	14:43 11-23-18	(11 days)				J/UJ/P (det)
2	14:24 11-12-18	13:37 11-26-18	(14)				( )
3	08:32 11-12-18	13:36 11-26-18	(14)				( )
4	09:35 11-12-18	15:19 11-23-18	(11)				( )
5	10:46 11-12-18	15:33 11-23-18	(11)				( )
6	12:43 11-12-18	13:32 11-26-18	(14)				( )
7	13:39 11-12-18	15:23 11-23-18	(11)				( )
1	11:40 11-12-18			18:30 11-21-18	(9 days)		J/R/P (N.D.)
2	14:24 11-12-18				( )		(det)
3	08:32 11-12-18				( )		(ND)
4	09:35 11-12-18				( )		(det)
5	10:46 11-12-18				( )		( )
6	12:43 11-12-18				( )		( )
7	13:39 11-12-18				( )		(ND)

LDC #: 43888A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** all **(NO3-N: 2x dil, SO4: 20x dil, >5x or ND)**

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual's.								
NO3-N	0.04530	0.04526	0.4526									
SO4	0.3332	0.3841	38.41									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Quality Control
Outlier Reports

280-116942-1

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 280-116942-1 **Laboratory: TA DEN**

EDD Filename: 280-116942-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9040C **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
16-HS-03-SA2 (RES/TOT)	Sampling To Analysis	316.00	24.00	HOURS	J (all detects)
16-MW-06-SA2 (RES/TOT)		318.50	24.00	HOURS	
16-MW-08-SA2 (RES/TOT)		314.75	24.00	HOURS	
16-MW-09-SA2 (RES/TOT)		314.50	24.00	HOURS	
A1-MW-18-SA2 (RES/TOT)		317.50	24.00	HOURS	
A1-MW-19-SA2 (RES/TOT)		316.25	24.00	HOURS	
A1-MW-53-SA2 (RES/TOT)		312.75	24.00	HOURS	

Method: 9056A **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-18-SA2 (RES/TOT)	Sampling To Analysis	62.25	48.00	HOURS	J(all detects)
		62.50	48.00	HOURS	UJ(all non-detects)

Method: SM3500 Fe B D **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
16-HS-03-SA2 (RES/TOT)	Sampling To Analysis	198.50	24.00	HOURS	J(all detects)
16-MW-06-SA2 (RES/TOT)		200.75	24.00	HOURS	R(all non-detects)
16-MW-08-SA2 (RES/TOT)		197.50	24.00	HOURS	
16-MW-09-SA2 (RES/TOT)		196.75	24.00	HOURS	
16-MW-09-SA2DUP (RES/TOT)		196.75	24.00	HOURS	
16-MW-09-SA2MS (RES/TOT)		196.75	24.00	HOURS	
16-MW-09-SA2MSD (RES/TOT)		196.75	24.00	HOURS	
A1-MW-18-SA2 (RES/TOT)		200.00	24.00	HOURS	
A1-MW-19-SA2 (RES/TOT)		199.25	24.00	HOURS	
A1-MW-53-SA2 (RES/TOT)		195.50	24.00	HOURS	

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 280-116942-1 **Laboratory: TA DEN**

EDD Filename: 280-116942-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **9056A**
Matrix: **AQ**

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
16-MW-06-SA2MS 16-MW-06-SA2MSD (16-MW-06-SA2)	Sulfate	80	74	87.00-112.00	-	Sulfate	J (all detects) UJ (all non-detects)

Method: **SM3500 Fe B D**
Matrix: **AQ**

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
16-MW-09-SA2MS 16-MW-09-SA2MSD (16-MW-09-SA2)	Ferrous Iron	53	51	85.00-113.00	-	Ferrous Iron	J(all detects) UJ(all non-detects)

Reporting Limit Outliers

Lab Reporting Batch ID: 280-116942-1 **Laboratory: TA DEN**

EDD Filename: 280-116942-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **8260B**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
16-MW-06-SA2	TRICHLOROETHENE	J	0.195	1.00	LOQ	ug/L	J (all detects)
16-MW-08-SA2	TETRACHLOROETHENE	J	0.538	1.00	LOQ	ug/L	J (all detects)
16-MW-09-SA2	TETRACHLOROETHENE	J	0.271	1.00	LOQ	ug/L	J (all detects)
A1-MW-19-SA2	TRICHLOROETHENE	J	0.545	1.00	LOQ	ug/L	J (all detects)

LDC #: 43888B1a **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: 280-116942-1 ADR Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: DVG
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	ICAL ≤ 15%. ICV ≤ 20%.
IV.	Continuing calibration	A	CCV ≤ 20/50%.
V.	Laboratory Blanks	N	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	~~N~~ A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	16-HS-03-SA2	280-116942-1	Water	11/13/18
2	16-MW-06-SA2	280-116942-2	Water	11/13/18
3	16-MW-08-SA2	280-116942-3	Water	11/13/18
4	16-MW-09-SA2	280-116942-4	Water	11/13/18
5	A1-MW-18-SA2	280-116942-5	Water	11/13/18
6	A1-MW-19-SA2	280-116942-6	Water	11/13/18
7	TB-20181113	280-116942-7	Water	11/13/18
8	A1-MW-53-SA2	280-116942-8	Water	11/13/18
9	16-HS-063-SA2D	280-116942-9	Water	11/13/18
10				
11				
12	MB 280-438817/4			
13				

(H, AA, S only)

LDC #: 43888B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12-20-18
SDG #: 280-116942-1 ADR Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer:

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B), pH (EPA SW846 Method 9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW	HT out for all pH, Fe^{+2}; NO3 out for #5
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	ICB/CCB only
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	MS/MSD (#8/9: SO4 fails, #11/12: Fe^{+2} fails)
VII.	Duplicate sample analysis	N	DUP
VIII.	Laboratory control samples	N	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	16-HS-03-SA2	280-116942-1	Water	11/13/18
2	16-MW-06-SA2	280-116942-2	Water	11/13/18
3	16-MW-08-SA2	280-116942-3	Water	11/13/18
4	16-MW-09-SA2	280-116942-4	Water	11/13/18
5	A1-MW-18-SA2	280-116942-5	Water	11/13/18
6	A1-MW-19-SA2	280-116942-6	Water	11/13/18
7	A1-MW-53-SA2	280-116942-8	Water	11/13/18
8	16-MW-06-SA2MS	280-116942-2MS	Water	11/13/18
9	16-MW-06-SA2MSD	280-116942-2MSD	Water	11/13/18
10	16-MW-06-SA2DUP	280-116942-2DUP	Water	11/13/18
11	16-MW-09-SA2MS	280-116942-4MS	Water	11/13/18
12	16-MW-09-SA2MSD	280-116942-4MSD	Water	11/13/18
13	16-MW-09-SA2DUP	280-116942-4DUP	Water	11/13/18
14	PBW1			
15	PBW2			

Notes:

LDC #: 43888B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1→7	W	(pH) TDS (Cl) F (NO3) NO2 (SO4) PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 (Fe+2)
QC 8→10	↓	pH TDS (Cl) F (NO3) NO2 (SO4) PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
↓ 11→13	↓	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 (Fe+2)
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4

Comments:

LDC #: 43888B6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 1-4,6 (various dilutions, >5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual's.								
SO4		0.6931	3.466									

Conc. units: mg/L **Associated Samples:** 2,3,4,7 (various dilutions, >5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual's.								
Cl		0.3086	1.543									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Quality Control
Outlier Reports

280-117007-1

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 280-117007-1 **Laboratory: TA DEN**

EDD Filename: 280-117007-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9040C **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-07-SA2 (RES/TOT)	Sampling To Analysis	363.25	24.00	HOURS	J (all detects)
A1-MW-23-SA2 (RES/TOT)		362.25	24.00	HOURS	
A1-MW-25-SA2 (RES/TOT)		359.75	24.00	HOURS	
A1-MW-27-SA2 (RES/TOT)		359.25	24.00	HOURS	
A1-MW-54-SA2 (RES/TOT)		356.75	24.00	HOURS	
A1-MW-55-SA2 (RES/TOT)		361.00	24.00	HOURS	

Method: SM3500 Fe B D **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-07-SA2 (RES/TOT)	Sampling To Analysis	177.50	24.00	HOURS	J(all detects)
A1-MW-23-SA2 (RES/TOT)		176.50	24.00	HOURS	R(all non-detects)
A1-MW-25-SA2 (RES/TOT)		174.25	24.00	HOURS	
A1-MW-27-SA2 (RES/TOT)		173.50	24.00	HOURS	
A1-MW-54-SA2 (RES/TOT)		171.25	24.00	HOURS	
A1-MW-54-SA2DUP (RES/TOT)		171.25	24.00	HOURS	
A1-MW-54-SA2MS (RES/TOT)		171.25	24.00	HOURS	
A1-MW-54-SA2MSD (RES/TOT)		171.25	24.00	HOURS	
A1-MW-55-SA2 (RES/TOT)		175.50	24.00	HOURS	

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 280-117007-1 **Laboratory: TA DEN**

EDD Filename: 280-117007-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **SM3500 Fe B D**
Matrix: **AQ**

QC Sample ID (Associated Samples)	*Compound*	*MS %R*	*MSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
A1-MW-54-SA2MS A1-MW-54-SA2MSD (A1-MW-54-SA2)	Ferrous Iron	34	35	85.00-113.00	-	Ferrous Iron	J (all detects) UJ (all non-detects)

Reporting Limit Outliers

Lab Reporting Batch ID: 280-117007-1 **Laboratory: TA DEN**

EDD Filename: 280-117007-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **8260B**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
A1-MW-07-SA2	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.357 0.826	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-25-SA2	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.273 0.539	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)

LDC #: 43888C1a **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: 280-117007-1 ADR Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: JV
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	ICAL ≤ 15% ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	N	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	~~N~~ A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-07-SA2	280-117007-1	Water	11/14/18
2	A1-MW-23-SA2	280-117007-2	Water	11/14/18
3	A1-MW-25-SA2	280-117007-3	Water	11/14/18
4	A1-MW-27-SA2	280-117007-4	Water	11/14/18
5	A1-MW-55-SA2	280-117007-5	Water	11/14/18
6	TB-20181114	280-117007-6	Water	11/14/18
7	A1-MW-54-SA2	280-117007-7	Water	11/14/18
8	A1-MW-07-SA2MS	280-117007-1MS	Water	11/14/18
9	A1-MW-07-SA2MSD	280-117007-1MSD	Water	11/14/18
10				
11	MB 280-438841/6			
12				
13				

(H, AA, S only)

LDC #: 43888C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12-20-18
SDG #: 280-117007-1 ADR Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer:

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B), pH (EPA SW846 Method 9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW	HT out for all pH, Fe^{+2}
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	ICB/CCB only
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	MS/MSD (#7/8: Fe^{+2} fails)
VII.	Duplicate sample analysis	N	DUP
VIII.	Laboratory control samples	N	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-07-SA2	280-117007-1	Water	11/14/18
2	A1-MW-23-SA2	280-117007-2	Water	11/14/18
3	A1-MW-25-SA2	280-117007-3	Water	11/14/18
4	A1-MW-27-SA2	280-117007-4	Water	11/14/18
5	A1-MW-55-SA2	280-117007-5	Water	11/14/18
6	A1-MW-54-SA2	280-117007-7	Water	11/14/18
7	A1-MW-54-SA2MS	280-117007-7MS	Water	11/14/18
8	A1-MW-54-SA2MSD	280-117007-7MSD	Water	11/14/18
9	A1-MW-54-SA2DUP	280-117007-7DUP	Water	11/14/18
10				
11				
12				
13				
14				
15	PBW			

Notes:

LDC #: 43888C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1→6	W	(pH) TDS (Cl) F (NO3) NO2 (SO4) PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 (Fe+2)
QC 7→9	↓	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 (Fe+2)
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4

Comments:

LDC #: 43888C6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 1-5 (10x dil, >5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual's.								
Cl		0.2558	12.79									

Conc. units: mg/L **Associated Samples:** 6 (10x dil, >5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual.								
Cl		0.2618	13.09									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Quality Control
Outlier Reports

280-117103-1

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 280-117103-1 **Laboratory: TA DEN**

EDD Filename: 280-117103-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9040C **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-11-SA2 (RES/TOT)	Sampling To Analysis	340.75	24.00	HOURS	J (all detects)
A1-MW-13-SA2 (RES/TOT)		341.00	24.00	HOURS	
A1-MW-14-SA2 (RES/TOT)		338.75	24.00	HOURS	
A1-MW-14-SA2DUP (RES/TOT)		338.75	24.00	HOURS	
A1-MW-15-SA2 (RES/TOT)		339.75	24.00	HOURS	
A1-MW-31-SA2 (RES/TOT)		335.50	24.00	HOURS	
A1-MW-37-SA2 (RES/TOT)		337.75	24.00	HOURS	

Method: SM3500 Fe B D **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-11-SA2 (RES/TOT)	Sampling To Analysis	153.50	24.00	HOURS	J(all detects)
A1-MW-13-SA2 (RES/TOT)		154.25	24.00	HOURS	R(all non-detects)
A1-MW-14-SA2 (RES/TOT)		151.75	24.00	HOURS	
A1-MW-15-SA2 (RES/TOT)		152.50	24.00	HOURS	
A1-MW-31-SA2 (RES/TOT)		148.25	24.00	HOURS	
A1-MW-37-SA2 (RES/TOT)		150.75	24.00	HOURS	

Method Blank Outlier Report

Lab Reporting Batch ID: 280-117103-1 **Laboratory: TA DEN**

EDD Filename: 280-117103-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **9056A**
Matrix: **AQ**

Method Blank Sample ID	Analysis Date	Analyte	Result	Associated Samples
MB 280-437914/6	11/16/2018 5:36:00 PM	CHLORIDE Sulfate	0.2635 mg/L 0.3386 mg/L	A1-MW-11-SA2 A1-MW-13-SA2 A1-MW-14-SA2 A1-MW-15-SA2 A1-MW-31-SA2 A1-MW-37-SA2
MB 280-437915/6	11/16/2018 5:36:00 PM	NITRATE	0.04638 mg/L	A1-MW-11-SA2 A1-MW-13-SA2 A1-MW-14-SA2 A1-MW-15-SA2 A1-MW-31-SA2 A1-MW-37-SA2

Reporting Limit Outliers

Lab Reporting Batch ID: 280-117103-1 **Laboratory: TA DEN**

EDD Filename: 280-117103-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 8260B

Matrix: AQ

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-14-SA2	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.635 0.728	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-15-SA2	TRICHLOROETHENE	J	0.426	1.00	LOQ	ug/L	J (all detects)
A1-MW-37-SA2	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.379 0.914	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-37-SA2D	1,1-DICHLOROETHENE TRICHLOROETHENE	J J	0.373 0.909	1.00 1.00	LOQ LOQ	ug/L ug/L	J (all detects)

Method: SM3500 Fe B D

Matrix: AQ

SampleID	Analyte	Lab Qual	Result	Reporting Limit	RL Type	Units	Flag
A1-MW-37-SA2	Ferrous Iron	J HF	0.156	0.200	LOQ	mg/L	J (all detects)

Field Duplicate RPD Report

Lab Reporting Batch ID: 280-117103-1 **Laboratory: TA DEN**

EDD Filename: Prep280-117103-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 8260B
Matrix: AQ

Analyte	*Concentration (ug/L)*		*Sample RPD*	*eQAPP RPD*	*Flag*
	A1-MW-37-SA2	**A1-MW-37-SA2D**			
1,1-DICHLOROETHENE	0.379	0.373	NC	30.00	No Qualifiers Applied
TRICHLOROETHENE	0.914	0.909	NC	30.00	

LDC #: 43888D1a **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: 280-117103-1 ADR Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: SW
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	ICAL ≤ 15? ICV ≤ 20?
IV.	Continuing calibration	A	CCV ≤ 20/50?
V.	Laboratory Blanks	N	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	~~N~~ A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-11-SA2	280-117103-1	Water	11/15/18
2	A1-MW-13-SA2	280-117103-2	Water	11/15/18
3	A1-MW-14-SA2	280-117103-3	Water	11/15/18
4	A1-MW-15-SA2	280-117103-4	Water	11/15/18
5	A1-MW-37-SA2	280-117103-5	Water	11/15/18
6	A1-MW-37-SA2D	280-117103-6	Water	11/15/18
7	TB-20181115	280-117103-7	Water	11/15/18
8	A1-MW-31-SA2	280-117103-8	Water	11/15/18
9				
10				
11				
12	MB 280-438823/9			
13				

(H, AA, S only)

LDC #: 43888D6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12-20-18
SDG #: 280-117103-1 ADR Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer:

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B), pH (EPA SW846 Method 9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW	HT out for all pH, Fe^{+2}
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	ICB/CCB only
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	client specified
VII.	Duplicate sample analysis	N	DUP
VIII.	Laboratory control samples	N	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-11-SA2	280-117103-1	Water	11/15/18
2	A1-MW-13-SA2	280-117103-2	Water	11/15/18
3	A1-MW-14-SA2	280-117103-3	Water	11/15/18
4	A1-MW-15-SA2	280-117103-4	Water	11/15/18
5	A1-MW-37-SA2	280-117103-5	Water	11/15/18
6	A1-MW-31-SA2	280-117103-8	Water	11/15/18
7	A1-MW-14-SA2DUP	280-117103-3DUP	Water	11/15/18
8				
9				
10				
11				
12				
13				
14				
15	PBW			

Notes:

LDC #: 43888D6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1→6	W	(pH) TDS (Cl) F (NO3) NO2 (SO4) PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 (Fe+2)
QC 7	↓	(pH) TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4

Comments:

LDC #: 43888D6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** all (20x dil, >5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual's.								
Cl		0.2982	29.82									
SO4		0.4094	40.94									

Conc. units: mg/L **Associated Samples:** 1-5 (>5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual's.								
NO3-N		0.04805	0.2402									

Conc. units: mg/L **Associated Samples:** 6 (>5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual.								
NO3-N		0.04749	0.2374									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Quality Control
Outlier Reports

280-117110-1

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 280-117110-1 **Laboratory: TA DEN**

EDD Filename: 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: 9040C **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-01-SA2 (RES/TOT)	Sampling To Analysis	318.00	24.00	HOURS	J (all detects)
A1-MW-42-SA2 (RES/TOT)		316.75	24.00	HOURS	

Method: SM3500 Fe B D **Preparation Method: METHOD**

Matrix: AQ

Sample ID	Type	Actual	Criteria	Units	Flag
A1-MW-01-SA2 (RES/TOT)	Sampling To Analysis	130.25	24.00	HOURS	J(all detects)
A1-MW-42-SA2 (RES/TOT)		129.25	24.00	HOURS	R(all non-detects)
A1-MW-42-SA2DUP (RES/TOT)		129.25	24.00	HOURS	
A1-MW-42-SA2MS (RES/TOT)		129.25	24.00	HOURS	
A1-MW-42-SA2MSD (RES/TOT)		129.25	24.00	HOURS	

Surrogate Outlier Report

Lab Reporting Batch ID: 280-117110-1 **Laboratory: TA DEN**

EDD Filename: 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **8260B**
Matrix: **AQ**

Sample ID (Analysis Type)	*Surrogate*	*Sample % Recovery*	*% Recovery Limits*	*Affected Compounds*	*Flag*
EB-20181116	1,2-DICHLOROETHANE-D4	122	81.00-118.00	All Target Analytes	J (all detects)

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 280-117110-1 **Laboratory: TA DEN**

EDD Filename: 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: SM3500 Fe B D
Matrix: AQ

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
A1-MW-42-SA2MS A1-MW-42-SA2MSD (A1-MW-42-SA2)	Ferrous Iron	27	27	85.00-113.00	-	Ferrous Iron	J (all detects) R (all non-detects)

Method: 8260B
Matrix: AQ

QC Sample ID (Associated Samples)	Compound	MS %R	MSD %R	%R Limits	RPD (Limits)	Affected Compounds	Flag
A1-MW-01-SA2MSD (A1-MW-01-SA2)	1,1-DICHLOROETHENE	-	-	71.00-131.00	22 (20.00)	1,1-DICHLOROETHENE	J(all detects)

Reporting Limit Outliers

Lab Reporting Batch ID: 280-117110-1 **Laboratory: TA DEN**

EDD Filename: 280-117110-1 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Denver**

Method: **8260B**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
A1-MW-42-SA2	1,1-DICHLOROETHENE	J	0.238	1.00	LOQ	ug/L	J (all detects)
	TRICHLOROETHENE	J	0.367	1.00	LOQ	ug/L	

LDC #: 43888E1a **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: 280-117110-1 ADR Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: JV
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	ICAL ≤ 15% ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	N	
VI.	Field blanks	N	TB
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N	
X.	Field duplicates	N	
XI.	Internal standards	NA	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank

	Client ID	Lab ID	Matrix	Date
1	A1-MW-01-SA2	280-117110-1	Water	11/16/18
2	A1-MW-42-SA2	280-117110-2	Water	11/16/18
3	TB-20181116	280-117110-3	Water	11/16/18
4	EB-20181116	280-117110-4	Water	11/16/18
5	A1-MW-01-SA2MS	280-117110-1MS	Water	11/16/18
6	A1-MW-01-SA2MSD	280-117110-1MSD	Water	11/16/18
7				
8				
9				

Notes:

(H, AA, S only)

LDC #: 43888E6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12-20-18
SDG #: 280-117110-1 ADR Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer:

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B), pH (EPA SW846 Method 9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW	HT out for all pH, Fe^{+2}
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	ICB/CCB only
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	MS/MSD (#3/4: Fe^{+2} fails)
VII.	Duplicate sample analysis	N	DUP
VIII.	Laboratory control samples	N	LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	N	
XI	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-01-SA2	280-117110-1	Water	11/16/18
2	A1-MW-42-SA2	280-117110-2	Water	11/16/18
3	A1-MW-42-SA2MS	280-117110-2MS	Water	11/16/18
4	A1-MW-42-SA2MSD	280-117110-2MSD	Water	11/16/18
5	A1-MW-42-SA2DUP	280-117110-2DUP	Water	11/16/18
6				
7				
8				
9				
10				
11				
12				
13				
14				
15	PBW			

Notes:

LDC #: 43888E6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1, 2	W	(pH) TDS (Cl) F (NO3) NO2 (SO4) PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 (Fe+2)
QC 3→5	↓	pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4 (Fe+2)
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4
		pH TDS Cl F NO3 NO2 SO4 PO4 ALK CN- NH3 TKN TOC CR6+ ClO4

Comments:

LDC #: 43888E6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** 2 (20x dil, >5x)

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual's.								
Cl		0.6147	61.47									
SO4		0.3987	39.87									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Quality Control Outlier Reports

1803615

Reporting Limit Outliers

Lab Reporting Batch ID: 1803615 **Laboratory: Vista**

EDD Filename: 1803615 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
A1-MW-04-SA2	PFOA	J	0.00646	0.00881	LOQ	ug/L	J (all detects)
A1-MW-05-SA2	PFHxS	J, Q	0.00359	0.00864	LOQ	ug/L	J (all detects)
A1-MW-50-SA2	PFHpA	J, Q	0.00474	0.00894	LOQ	ug/L	J (all detects)
A1-MW-50-SA2D	PFHpA	J	0.00494	0.00874	LOQ	ug/L	J (all detects)
A1-MW-52-SA2	PFOS	J	0.00356	0.00872	LOQ	ug/L	J (all detects)
A1-PZ-19-SA2	PFHpA PFOS	J J, Q	0.00548 0.00321	0.00884 0.00884	LOQ LOQ	ug/L ug/L	J (all detects)

Field Duplicate RPD Report

Lab Reporting Batch ID: 1803615 **Laboratory: Vista**

EDD Filename: Prep1803615 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: 537 MOD
Matrix: AQ

Analyte	*Concentration (ug/L)*		*Sample RPD*	*eQAPP RPD*	*Flag*
	A1-MW-50-SA2	**A1-MW-50-SA2D**			
PFBS	0.0250	0.0264	5	30.00	
PFHpA	0.00474	0.00494	NC	30.00	
PFHxA	0.0806	0.0829	3	30.00	No Qualifiers Applied
PFHxS	0.0367	0.0355	3	30.00	
PFOA	0.00947	0.00878	8	30.00	

LDC #: 43888K96 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: 1803615 ADR/Stage 4 Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: JM
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	ICAL ≤ 20% Individual ≤ 30% ICV ≤ 30%
IV.	Continuing calibration/ISC	A	CCV ≤ 30% true conc.
V.	Laboratory Blanks	N	Not reviewed for ADR validation.
VI.	Field blanks		
VII.	Matrix spike/Matrix spike duplicates		Not reviewed for ADR validation.
VIII.	Laboratory control samples		Not reviewed for ADR validation.
IX.	Field duplicates		
X.	Labeled Compounds	A	Not reviewed for ADR validation.
XI.	Compound quantitation RL/LOQ/LODs	N	Not reviewed for ADR validation.
XII.	Target compound identification		Not reviewed for ADR validation.
XIII.	System performance		Not reviewed for ADR validation.
XIV.	Overall assessment of data		Not reviewed for ADR validation.

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	A1-MW-04-SA2**	1803615-01**	Water	11/12/18
2	A1-MW-05-SA2**	1803615-02**	Water	11/12/18
3	A1-MW-49-SA2**	1803615-03**	Water	11/12/18
4	A1-MW-50-SA2**	1803615-04**	Water	11/12/18
5	A1-MW-50-SA2D**	1803615-05**	Water	11/12/18
6	A1-MW-51-SA2**	1803615-06**	Water	11/12/18
7	A1-MW-52-SA2**	1803615-07**	Water	11/12/18
8	FRB-20181112	1803615-08	Water	11/12/18
9	A1-~~MW~~ PZ-19-SA2**	1803615-09**	Water	11/12/18
10	A1-MW-50-SA2MS	1803615-04MS	Water	11/12/18
11	A1-MW-50-SA2MSD	1803615-04MSD	Water	11/12/18
12				
13				
14	BSK0091-BLK1			
15				

Quality Control
Outlier Reports

1803626

Reporting Limit Outliers

Lab Reporting Batch ID: 1803626 **Laboratory: Vista**

EDD Filename: 1803626 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
16-MW-06-SA2	PFOS	J	0.00582	0.00835	LOQ	ug/L	J (all detects)
16-MW-09-SA2	PFOA PFOS	J J	0.00449 0.00503	0.00852 0.00852	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-18-SA2	PFOA	J	0.00309	0.00856	LOQ	ug/L	J (all detects)
A1-MW-19-SA2	PFDA PFNA	J J	0.00721 0.00398	0.00861 0.00861	LOQ LOQ	ug/L ug/L	J (all detects)
A1-MW-53-SA2	PFOS	J, Q	0.00400	0.00841	LOQ	ug/L	J (all detects)

Field Duplicate RPD Report

Lab Reporting Batch ID: 1803626 **Laboratory: Vista**

EDD Filename: 1803626 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: 537 MOD
Matrix: AQ

Analyte	*Concentration (ug/L)*		*Sample RPD*	*eQAPP RPD*	*Flag*
	16-HS-03-SA2	**16-HS-03-SA2D**			
PFBS	1.34	1.39	4	30.00	
PFHpA	0.405	0.412	2	30.00	
PFHxA	10.3	11.7	13	30.00	No Qualifiers Applied
PFHxS	0.324	0.312	4	30.00	
PFOA	0.0206	0.0200	3	30.00	

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

LDC #: 43888L96 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: 1803626 ADR Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: JVC
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	r² Individual ≤30% Mean value ICV ≤30%
IV.	Continuing calibration/ISC	A	CCV ≤30%
V.	Laboratory Blanks	N	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	N	
X.	Labeled Compounds	N/A	
XI.	Compound quantitation RL/LOQ/LODs	N	
XII.	Target compound identification	N	
XIII.	System performance	N	
XIV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	16-HS-03-SA2	1803626-01	Water	11/13/18
2	16-MW-06-SA2	1803626-02	Water	11/13/18
3	16-MW-08-SA2	1803626-03	Water	11/13/18
4	16-MW-09-SA2	1803626-04	Water	11/13/18
5	A1-MW-18-SA2	1803626-05	Water	11/13/18
6	A1-MW-19-SA2	1803626-06	Water	11/13/18
7	FRB-20181113	1803626-07	Water	11/13/18
8	A1-MW-53-SA2	1803626-08	Water	11/13/18
9	16-HS-03-SA2D	1803626-09	Water	11/13/18
10				
11				

Notes:

Quality Control
Outlier Reports

1803659

Reporting Limit Outliers

Lab Reporting Batch ID: 1803659 **Laboratory: Vista**

EDD Filename: 1803659 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
A1-MW-23-SA2	PFHxS	J	0.00594	0.00849	LOQ	ug/L	J (all detects)

LDC #: 43888M96 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: 1803659 ADR Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: SM
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	~~%R~~ RT Individual ≤30% ICV ≤ 30% True value
IV.	Continuing calibration/ISC	A	CCV ≤ 30%
V.	Laboratory Blanks	N	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	N	
X.	Labeled Compounds	~~N~~ A	
XI.	Compound quantitation RL/LOQ/LODs	N	
XII.	Target compound identification	N	
XIII.	System performance	N	
XIV.	Overall assessment of data	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-07-SA2	1803659-01	Water	11/14/18
2	A1-MW-23-SA2	1803659-02	Water	11/14/18
3	A1-MW-25-SA2	1803659-03	Water	11/14/18
4	A1-MW-27-SA2	1803659-04	Water	11/14/18
5	A1-MW-55-SA2	1803659-05	Water	11/14/18
6	A1-MW-54-SA2	1803659-06	Water	11/14/18
7	FRB-20181114	1803659-07	Water	11/14/18
8				
9				
10				

Notes:

	B8K0149-BLK1						

Quality Control
Outlier Reports

1803676

QC Outlier Report: HoldingTimes

Lab Reporting Batch ID: 1803676 **Laboratory: Vista**

EDD Filename: 1803676 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: 537 MOD **Preparation Method: Gen Prep**

Matrix: AQ

Sample ID	*Type*	*Actual*	*Criteria*	*Units*	*Flag*
A1-MW-11-SA2 (RES)	Sampling To Extraction	15.00	14.00	DAYS	J (all detects)
A1-MW-13-SA2 (RES)		15.00	14.00	DAYS	UJ (all non-detects)
A1-MW-14-SA2 (RES)		15.00	14.00	DAYS	
A1-MW-15-SA2 (RES)		15.00	14.00	DAYS	
A1-MW-31-SA2 (RES)		15.00	14.00	DAYS	
A1-MW-37-SA2 (RES)		15.00	14.00	DAYS	
A1-MW-37-SA2D (RES)		15.00	14.00	DAYS	
FRB-20181115 (RES)		15.00	14.00	DAYS	

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 1803676 **Laboratory: Vista**

EDD Filename: 1803676 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**
Matrix: **AQ**

QC Sample ID (Associated Samples)	*Compound*	*LCS %R*	*LCSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
B8K0153-BS1 (A1-MW-11-SA2 A1-MW-13-SA2 A1-MW-14-SA2 A1-MW-15-SA2 A1-MW-31-SA2 A1-MW-37-SA2 A1-MW-37-SA2D FRB-20181115)	PFTeDA	140	-	70.00-130.00	-	PFTeDA	J (all detects)

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Reporting Limit Outliers

Lab Reporting Batch ID: 1803676 **Laboratory: Vista**

EDD Filename: 1803676 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**

Matrix: **AQ**

SampleID	*Analyte*	*Lab Qual*	*Result*	*Reporting Limit*	*RL Type*	*Units*	*Flag*
A1-MW-31-SA2	PFOA	J	0.00388	0.00855	LOQ	ug/L	J (all detects)

Field Duplicate RPD Report

Lab Reporting Batch ID: 1803676 **Laboratory: Vista**

EDD Filename: 1803676 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: 537 MOD
Matrix: AQ

Analyte	*Concentration (ug/L)*		*Sample RPD*	*eQAPP RPD*	*Flag*
	A1-MW-37-SA2	**A1-MW-37-SA2D**			
PFBS	0.151	0.150	1	30.00	No Qualifiers Applied
PFHpA	0.0856	0.0830	3	30.00	
PFHxA	0.520	0.529	2	30.00	
PFHxS	0.438	0.429	2	30.00	
PFOA	0.0599	0.0555	8	30.00	
PFOS	0.0288	0.0275	5	30.00	

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

LDC #: 43888N96 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: 1803676 ADR Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: JG
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, ~~A~~SW	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A, A	r r Individual ≤30% ICV≤30% true value
IV.	Continuing calibration/ISC	SW	CCV≤30%
V.	Laboratory Blanks	N	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	N	
X.	Labeled Compounds	~~N~~ A	
XI.	Compound quantitation RL/LOQ/LODs	N	
XII.	Target compound identification	N	
XIII.	System performance	N	
XIV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-11-SA2	1803676-01	Water	11/15/18
2	A1-MW-13-SA2	1803676-02	Water	11/15/18
3	A1-MW-14-SA2	1803676-03	Water	11/15/18
4	A1-MW-15-SA2	1803676-04	Water	11/15/18
5	A1-MW-37-SA2	1803676-05	Water	11/15/18
6	A1-MW-37-SA2D	1803676-06	Water	11/15/18
7	FRB-20181115	1803676-07	Water	11/15/18
8	A1-MW-31-SA2	1803676-08	Water	11/15/18
9				
10				
11				

Notes:

	B8K0153-BLK1						

TARGET COMPOUND WORKSHEET

METHOD: PFAS

A. PFHxA			
B. PFHpA			
C. PFOA			
D. PFNA			
E. PFDA			
F. PFUnA			
G. PFDoA			
H. PFTriA			
I. PFTeDA			
J. PFBS			
K. PFHxS			
L. PFHpS			
M. PFOS			
N. PFDS			
O. FOSA			
P. PFBA			
Q. PFPeA			
R. 6:2FTS			
S. 8:2FTS			
T. MeFOSAA			
U. EtFOSAA			
V. Combined PFOAS/PFOS			

LDC #: 43588 N96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: MG
2nd Reviewer:

METHOD: LC/MS PFOS/PFOAs (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Was a continuing calibration standard analyzed after every 10 injections for each instrument?

Y (N) N/A Were all continuing calibration percent differences (%D) ≤30 %?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	12/03/18	181203M1_3	I	42.4	All (ND)	J/UJ/A

Quality Control
Outlier Reports

1803678

Matrix Spike/Matrix Spike Duplicate Outlier Report

Lab Reporting Batch ID: 1803678 **Laboratory: Vista**

EDD Filename: 1803678 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: **537 MOD**
Matrix: **AQ**

QC Sample ID (Associated Samples)	*Compound*	*MS %R*	*MSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
A1-MW-01-SA2MS A1-MW-01-SA2MSD (A1-MW-01-SA2)	PFTeDA	139	-	70.00-130.00	31.7 (30.00)	PFTeDA	J (all detects)

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

Lab Control Spike/Lab Control Spike Duplicate Outlier Report

Lab Reporting Batch ID: 1803678 **Laboratory: Vista**

EDD Filename: 1803678 **eQAPP Name: SW RAC 6_CTO 3803 YUMA - Vista**

Method: 537 MOD
Matrix: AQ

QC Sample ID (Associated Samples)	*Compound*	*LCS %R*	*LCSD %R*	*%R Limits*	*RPD (Limits)*	*Affected Compounds*	*Flag*
B8K0153-BS1 (A1-MW-01-SA2 A1-MW-42-SA2 EB-20181116 FRB-20181116)	PFTeDA	140	-	70.00-130.00	-	PFTeDA	J (all detects)

Project Name and Number: 4663.3803 - CTO 17F3803 Yuma

LDC #: 43888O96 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: 1803678 ADR Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: JW
2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%R Individual ≤ 30% ICV ≤ 30%
IV.	Continuing calibration/ISC	SW	CCV ≤ 30% True value
V.	Laboratory Blanks	N	
VI.	Field blanks	N	FRB = 3 EB = 4
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	N	
IX.	Field duplicates	N	
X.	Labeled Compounds	N/A	
XI.	Compound quantitation RL/LOQ/LODs	N	
XII.	Target compound identification	N	
XIII.	System performance	N	
XIV.	Overall assessment of data	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	A1-MW-01-SA2	1803678-01	Water	11/16/18
2	A1-MW-42-SA2	1803678-02	Water	11/16/18
3	FRB-20181116	1803678-03	Water	11/16/18
4	EB-20181116	1803678-04	Water	11/16/18
5	A1-MW-01-SA2MS	1803678-01MS	Water	11/16/18
6	A1-MW-01-SA2MSD	1803678-01MSD	Water	11/16/18
7				
8				
9				
10				

Notes:

	B8K0153-BLK1						

TARGET COMPOUND WORKSHEET

METHOD: PFAS

A. PFHxA			
B. PFHpA			
C. PFOA			
D. PFNA			
E. PFDA			
F. PFUnA			
G. PFDoA			
H. PFTriA			
I. PFTeDA			
J. PFBS			
K. PFHxS			
L. PFHpS			
M. PFOS			
N. PFDS			
O. FOSA			
P. PFBA			
Q. PFPeA			
R. 6:2FTS			
S. 8:2FTS			
T. MeFOSAA			
U. EtFOSAA			
V. Combined PFOAS/PFOS			

LDC #: 43888096

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: JVG
2nd Reviewer: G

METHOD: LC/MS PFAS (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed after every 10 injections for each instrument?

(Y) N N/A Were all continuing calibration percent differences (%D) ≤30 %?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Finding RRF (Limit:)	Associated Samples	Qualifications
	12/03/18	181203M1_2	I	42.4		All (ND)	J/UJ/A

Enclosure II

Manual Stage 2B and Stage 4 Data Validation Reports

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: December 20, 2018

Parameters: Volatiles

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-116898-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-04-SA2	280-116898-1	Water	11/12/18
A1-MW-05-SA2	280-116898-2	Water	11/12/18
A1-MW-49-SA2	280-116898-3	Water	11/12/18
A1-MW-50-SA2	280-116898-4	Water	11/12/18
A1-MW-50-SA2D	280-116898-5	Water	11/12/18
A1-MW-51-SA2	280-116898-6	Water	11/12/18
A1-PZ-19-SA2	280-116898-8	Water	11/12/18
A1-MW-52-SA2	280-116898-9	Water	11/12/18
A1-MW-50-SA2MS	280-116898-4MS	Water	11/12/18
A1-MW-50-SA2MSD	280-116898-4MSD	Water	11/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Volatile Organic Compounds (VOCs) by Environmental Protection Agency (EPA) SW 846 Method 8260B

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0% for all compounds.

Average relative response factors (RRF) for all compounds were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0% for all compounds.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample TB-20181112 was identified as a trip blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

Samples A1-MW-50-SA2 and A1-MW-50-SA2D were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentration (ug/L)				
Compound	A1-MW-50-SA2	A1-MW-50-SA2D	RPD (Limits)	Flag	A or P
1,1-Dichloroethene	0.564	0.630	Not calculable	-	-
Trichloroethene	0.780	0.949	Not calculable	-	-

RPDs were not calculated when sample results in one or both samples were less than 5x the limit of quantitation (LOQ).

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria.

All compounds reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
A1-MW-04-SA2 A1-MW-05-SA2 A1-MW-49-SA2 A1-MW-50-SA2 A1-MW-50-SA2D A1-MW-51-SA2 A1-PZ-19-SA2 A1-MW-52-SA2	All compounds reported below the LOQ.	J (all detects)	A

XIII. Target Compound Identifications

All target compound identifications met validation criteria.

XIV. System Performance

The system performance was acceptable.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results below the LOQ, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
Volatiles - Data Qualification Summary - SDG 280-116898-1

Sample	Compound	Flag	A or P	Reason
A1-MW-04-SA2 A1-MW-05-SA2 A1-MW-49-SA2 A1-MW-50-SA2 A1-MW-50-SA2D A1-MW-51-SA2 A1-PZ-19-SA2 A1-MW-52-SA2	All compounds reported below the LOQ.	J (all detects)	A	Compound quantitation

MCAS Yuma, CTO 17F3803
Volatiles - Laboratory Blank Data Qualification Summary - SDG 280-116898-1

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Volatiles - Field Blank Data Qualification Summary - SDG 280-116898-1

No Sample Data Qualified in this SDG

LDC #: 43888A1a

SDG #: 280-116898-1

Laboratory: Test America, Inc.

VALIDATION COMPLETENESS WORKSHEET

ADR/Stage ~~2B~~ 4

Date: 12/19/18

Page: 1 of 1

Reviewer: SM

2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	ICAL ≤ 15% ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50 %
V.	Laboratory Blanks	A	~~Not reviewed for ADR validation.~~
VI.	Field blanks	ND	TB = 7
VII.	Surrogate spikes	A	~~Not reviewed for ADR validation.~~
VIII.	Matrix spike/Matrix spike duplicates	A	Not reviewed for ADR validation.
IX.	Laboratory control samples	A	~~Not reviewed for ADR validation.~~ LCS
X.	Field duplicates	SW	D = 4/5
XI.	Internal standards	A	~~Not reviewed for ADR validation.~~
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for ADR validation.
XIII.	Target compound identification	A	Not reviewed for ADR validation.
XIV.	System performance	A	Not reviewed for ADR validation.
XV.	Overall assessment of data	A	~~Not reviewed for ADR validation.~~

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	A1-MW-04-SA2**	280-116898-1**	Water	11/12/18
2	A1-MW-05-SA2**	280-116898-2**	Water	11/12/18
3	A1-MW-49-SA2**	280-116898-3**	Water	11/12/18
4	A1-MW-50-SA2** D	280-116898-4**	Water	11/12/18
5	A1-MW-50-SA2D** D	280-116898-5**	Water	11/12/18
6	A1-MW-51-SA2**	280-116898-6**	Water	11/12/18
7	~~TB-20181112~~	280-116898-7	Water	11/12/18
8	A1-PZ-19-SA2**	280-116898-8**	Water	11/12/18
9	A1-MW-52-SA2**	280-116898-9**	Water	11/12/18
10	A1-MW-50-SA2MS	280-116898-4MS	Water	11/12/18
11	A1-MW-50-SA2MSD	280-116898-4MSD	Water	11/12/18
12	MB 280-438700/6			
13	L - 438747/4			

(H, AA, S only)

LDC #: 43888A1N

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Method: Volatiles (EPA SW 846 Method 8260B)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of $\geq$ 0.990?			✓	
Were all percent relative standard deviations (%RSD) $\leq$ 30%/15% and relative response factors (RRF) $\geq$ 0.05?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) $\leq$ 20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) and relative response factors (RRF) within method criteria for all CCCs and SPCCs?	✓			
Were all percent differences (%D) $\leq$ 20% and relative response factors (RRF) $\geq$ 0.05?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?	✓	*		
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	

LDC #: 93888A1a

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene	A2.
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane	B2.
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane	C2.
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene	D2.
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11	E2.
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12	F2.
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113	G2.
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114	H2.
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane	I2.
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide	J2.
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane	K2.
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane	L2.
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane	M2.
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane	N2.
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane	O2.
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane	P2.
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane	Q2.
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane	R2.
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane	S2.
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane	T2.
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal	U2.
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene	V2.
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol	W2.
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene	X2.
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.	Y2.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.	Z2.

LDC#: 43888A1a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVG
2nd Reviewer:

METHOD: GCMS VOA (EPA SW 846 Method 8260B)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD (≤30%)	Qualifications (Parent only)
	4	5		
H	0.564	0.630	NC	
S	0.780	0.949	NC	

V:\Josephine\FIELD DUPLICATES\43888A1a ttech yuma.wpd

LDC #: 43888A1a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (RRF 10 std)	Recalculated RRF (RRF 10 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL GC MSV G	10/29/2018	Trichloroethene (IS1)	0.4141	0.4141	0.3989	0.3989	3.0	3.0
			Tetrachloroethene (IS2)	1.5494	1.5494	1.4974	1.4974	2.5	2.5
2	ICAL GC MSV Z	11/3/2018	Trichloroethene (IS1)	0.4665	0.4665	0.4837	0.4837	6.8	6.8
			Tetrachloroethene (IS2)	1.6975	1.6975	1.7599	1.7599	5.9	5.9

LDC # 43888A1a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CCV)	Recalculated RRF (CCV)	Reported % D	Recalculated %D
1	G2197 GC MSV G	11/26/2018	Trichloroethene (IS1)	0.3989	0.4216	0.4216	5.7	5.7
			Tetrachloroethene (IS2)	1.4974	1.5171	1.5171	1.3	1.3
2	Z3472 GC MSV Z	11/26/2018	Trichloroethene (IS1)	0.4837	0.5081	0.5081	5.0	5.0
			Tetrachloroethene (IS2)	1.7599	1.7106	1.7106	2.8	2.8

LDC #: 43888 A1a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane	10.0	10.1	101	101	0
1,2-Dichloroethane-d4		9.22	92	92	
Toluene-d8		10.3	103	103	
Bromofluorobenzene	↓	10.1	101	101	↓

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 42888A1a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC)

MSC = Matrix spike concentration; MSDC = Matrix spike duplicate concentration

MS/MSD sample: 10/11

Compound	Spike Added (ug/L)		Sample Concentration (ug/L)	Spiked Sample Concentration (ug/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	5.00	5.00	0.564	5.549	5.972	100	100	108	108	7	7
Trichloroethene	↓	↓	0.780	5.580	5.935	96	96	103	107	6	6
Benzene											
Toluene											
Chlorobenzene											

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 93888 A1a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: LCS 280-438700/4

Compound	Spike Added (ug/L)		Spiked Sample Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	5.00	NA	4.874	NA	97	97				
Trichloroethene	5.00	↓	5.029	↓	101	101				
Benzene										
Toluene										
Chlorobenzene										

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43888A1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. 4, TCE:

Conc. = $\frac{(13951)(12.5)(\quad)}{(560722)(0.3989)(\quad)(\quad)}$

= 0.780 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Qualification
			0.780		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: January 2, 2019

Parameters: Wet Chemistry

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 280-116898-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-04-SA2	280-116898-1	Water	11/12/18
A1-MW-05-SA2	280-116898-2	Water	11/12/18
A1-MW-49-SA2	280-116898-3	Water	11/12/18
A1-MW-50-SA2	280-116898-4	Water	11/12/18
A1-PZ-19-SA2	280-116898-8	Water	11/12/18
A1-MW-52-SA2	280-116898-9	Water	11/12/18
A1-MW-50-SA2MS	280-116898-4MS	Water	11/12/18
A1-MW-50-SA2MSD	280-116898-4MSD	Water	11/12/18
A1-MW-50-SA2DUP	280-116898-4DUP	Water	11/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Chloride, Nitrate as Nitrogen, and Sulfate by Environmental Protection Agency (EPA) SW 846 Method 9056A
Ferrous Iron by Standard Method 3500-Fe B
pH by EPA SW 846 Method 9040C

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
A1-MW-04-SA2 A1-MW-50-SA2 A1-MW-52-SA2	pH	11 days	24 hours	J (all detects)	P
A1-MW-05-SA2 A1-MW-49-SA2 A1-PZ-19-SA2	pH	14 days	24 hours	J (all detects)	P
A1-MW-04-SA2 A1-MW-49-SA2 A1-MW-52-SA2	Ferrous Iron	9 days	24 hours	R (all non-detects)	P
A1-MW-05-SA2 A1-MW-50-SA2 A1-PZ-19-SA2	Ferrous Iron	9 days	24 hours	J (all detects)	P

II. Initial Calibration

All criteria for the initial calibration of each method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for each method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Nitrate as N Sulfate	0.04530 mg/L 0.3332 mg/L	All samples in SDG 280-116898-1
ICB/CCB	Nitrate as N Sulfate	0.04526 mg/L 0.3841 mg/L	All samples in SDG 280-116898-1

Data qualification by the laboratory blanks was based on the maximum contaminant concentration in the laboratory blanks in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

All sample result verifications were acceptable.

All analytes reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
A1-MW-04-SA2 A1-MW-05-SA2 A1-MW-49-SA2 A1-MW-50-SA2 A1-PZ-19-SA2 A1-MW-52-SA2	All analytes reported below the LOQ.	J (all detects)	A

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods.

Due to technical holding time, data were rejected in three samples.

Due to technical holding time and results below the LOQ, data were qualified as estimated in six samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
Wet Chemistry - Data Qualification Summary - SDG 280-116898-1

Sample	Analyte	Flag	A or P	Reason
A1-MW-04-SA2 A1-MW-05-SA2 A1-MW-49-SA2 A1-MW-50-SA2 A1-PZ-19-SA2 A1-MW-52-SA2	pH	J (all detects)	P	Technical holding times
A1-MW-04-SA2 A1-MW-49-SA2 A1-MW-52-SA2	Ferrous Iron	R (all non-detects)	P	Technical holding times
A1-MW-05-SA2 A1-MW-50-SA2 A1-PZ-19-SA2	Ferrous Iron	J (all detects)	P	Technical holding times
A1-MW-04-SA2 A1-MW-05-SA2 A1-MW-49-SA2 A1-MW-50-SA2 A1-PZ-19-SA2 A1-MW-52-SA2	All analytes reported below the LOQ.	J (all detects)	A	Sample result verification

MCAS Yuma, CTO 17F3803
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 280-116898-1

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Wet Chemistry - Field Blank Data Qualification Summary - SDG 280-116898-1

No Sample Data Qualified in this SDG

LDC #: 43888A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 12-20-18
SDG #: 280-116898-1 ~~ADR~~/Stage 4 Page: 1 of 1
Laboratory: Test America, Inc. Reviewer: MG
2nd Reviewer:

METHOD: (Analyte) Chloride, Nitrate-N, Sulfate (EPA SW846 Method 9056A), Ferrous Iron (SM3500-Fe B), pH (EPA SW846 Method 9040C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	SW	
II	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	Not reviewed for ADR validation. MS/MSD
VII.	Duplicate sample analysis	A	Not reviewed for ADR validation. DUP
VIII.	Laboratory control samples	A	Not reviewed for ADR validation. LCS/LCSD
IX.	Field duplicates	N	
X.	Sample result verification	A	Not reviewed for ADR validation.
XI	Overall assessment of data	A	Not reviewed for ADR validation.

Note: A = Acceptable ND = No compounds detected D = Duplicate SB=Source blank
N = Not provided/applicable R = Rinsate TB = Trip blank OTHER:
SW = See worksheet FB = Field blank EB = Equipment blank
** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	A1-MW-04-SA2**	280-116898-1**	Water	11/12/18
2	A1-MW-05-SA2**	280-116898-2**	Water	11/12/18
3	A1-MW-49-SA2**	280-116898-3**	Water	11/12/18
4	A1-MW-50-SA2**	280-116898-4**	Water	11/12/18
5	~~A1-MW-51-SA2~~	280-116898-6	Water	11/12/18
6	A1-PZ-19-SA2**	280-116898-8**	Water	11/12/18
7	A1-MW-52-SA2**	280-116898-9**	Water	11/12/18
8	~~A1-MW-50-SA2MS~~	280-116898-4MS	Water	11/12/18
9	A1-MW-50-SA2MSD	280-116898-4MSD	Water	11/12/18
10	~~A1-MW-50-SA2DUP~~	280-116898-4DUP	Water	11/12/18
11				
12				
13				
14				
15	PBW			

Notes:

LDC #: 43888A6

VALIDATION FINDINGS CHECKLIST

Reviewer: MG
2nd Reviewer:

Method: Inorganics (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.		✓		
Cooler temperature criteria was met.	✓			
II. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial calibration correlation coefficients ≥ 0.995?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% QC limits?	✓			
Were titrant checks performed as required? (Level IV only)			✓	
Were balance checks performed as required? (Level IV only)			✓	
III. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
IV. Matrix spike/Matrix spike duplicates and Duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of ≤ CRDL(≤ 2X CRDL for soil) was used for samples that were ≤ 5X the CRDL, including when only one of the duplicate sample values were ≤ 5X the CRDL.	✓			
V. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% (85-115% for Method 300.0) QC limits?	✓			
VI. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were detection limits < RL?	✓			
VIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
X. Field blanks				
Field blanks were identified in this SDG.		✓		
Target analytes were detected in the field blanks.			✓	

LDC #: 43888A6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: MG
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Matrix	Parameter
1 → 7	W	(pH) TDS (Cl) F (NO_3) NO_2 (SO_4) PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4 (Fe+2)
QC 8 → 10	↓	pH TDS (Cl) F (NO_3) NO_2 (SO_4) PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4
		pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ClO_4

Comments:

LDC #: 43888A6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: MG
2nd reviewer:

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method?
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:	9040C	SM 3500 Fe B				
Parameters:	pH	Ferrous Iron				
Technical holding time:	24 hr	24 hr				

Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier	
1	11:40 11-12-18	14:43 11-23-18	(11 days)				J/UJ/P	(det)
2	14:24 11-12-18	13:27 11-26-18	(14)					( )
3	08:32 11-12-18	13:36 11-26-18	(14)					( )
4	09:25 11-12-18	15:19 11-23-18	(11)					( )
~~5~~	~~10:46 11-12-18~~	~~15:33 11-23-18~~	~~(11)~~					( )
6	12:43 11-12-18	13:32 11-26-18	(14)					( )
7	13:39 11-12-18	15:23 11-23-18	(11)					( )
1	11:40 11-12-18			18:30 11-21-18	(9 days)		J/R/P	(N.D.)
2	14:24 11-12-18				( )			(det)
3	08:32 11-12-18				( )			(ND)
4	09:25 11-12-18				( )			(det)
~~5~~	~~10:46 11-12-18~~				( )			( )
6	12:43 11-12-18				( )			( )
7	13:39 11-12-18				( )			(ND)

LDC #: 43888A6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: MG
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Conc. units: mg/L **Associated Samples:** all **(NO3-N: 2x dil, SO4: 20x dil, >5x or ND)**

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No Qual's.								
NO3-N	0.04530	0.04526	0.4526									
SO4	0.3332	0.3841	38.41									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 43888A6

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd Reviewer:

METHOD: Inorganics, Method See cover

The correlation coefficient (r) for the calibration of Cl was recalculated. Calibration date: 9-1-18

An initial or continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found x 100 / True

Where, Found = concentration of each analyte measured in the analysis of the ICV or CCV solution
True = concentration of each analyte in the ICV or CCV source

Type of Analysis	Analyte	Standard ID	Conc. Found (units)	Area True (units)	Recalculated r or %R	Reported r or %R	Acceptable (Y/N)
Initial calibration	Cl	Blank	-	-	r=1.000	r= 1.000	Y
		Standard 1	1.0 (mg/L)	17320827			
		Standard 2	2.5 ( )	46063990			
		Standard 3	5.0 ( )	94576246			
		Standard 4	60.0 ( )	1169987193			
		Standard 5	120.0 ( )	2305131911			
		Standard 6	200.0 ( )	3845262113			
		Standard 7	-	-			
Calibration verification	Ferrous Iron	1830 ICV	1.045 (mg/L)	1.00 (mg/L)	104	105	
Calibration verification	NO_3-N	1052 CCV	4.85 (mg/L)	5.00 (mg/L)	97	97	
Calibration verification	SO_4	1646 CCV	102.2 (mg/L)	100 (mg/L)	102	102	

Comments: Refer to Calibration Verification findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43888A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: MG
2nd Reviewer:

METHOD: Inorganics, Method See Cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

%R = Found / True x 100 Where, Found = concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| / (S+D)/2 x 100 Where, S = Original sample concentration
D = Duplicate sample concentration

Sample ID	Type of Analysis	Element	Found / S (units)	True / D (units)	Recalculated %R / RPD	Reported %R / RPD	Acceptable (Y/N)
1830 LCS	Laboratory control sample	Ferrous Iron	2.13 (mg/L)	2.00 (mg/L)	106	106	Y
1801 8	Matrix spike sample	Cl	(SSR-SR) 512 (mg/L)	500 (mg/L)	102	102	
1734/1743 10	Duplicate sample	SO_4	894 (mg/L)	866 (mg/L)	3	3	

Comments: Refer to appropriate worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43888A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: MG
2nd reviewer:

METHOD: Inorganics, Method see cover

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments?
(Y) N N/A Are all detection limits below the CRQL?

Compound (analyte) results for #1, SO_4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $Y = mx + b$
where
$m = 14253830$
$b = -272056$
dil = 20 x

Recalculation:

$$601084316 = 14253830\left(\frac{x}{20}\right) - 272056$$

$$843.78 \text{ mg/L} = x$$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
1	1	SO_4	847	844	Y
2	2	Ferrous Iron	0.119	0.119	
3	3	pH	7.9 (SU)	7.9 (SU)	
4	4	NO_3-N	3.26	3.18	
5	6	Ferrous Iron	0.0591	0.0591	
6	7	pH	8.0 (SU)	8.0 (SU)	

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: December 20, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 2B & 4

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1846366

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-04-SA2**	L1846366-01**	Water	11/12/18
A1-MW-05-SA2**	L1846366-02**	Water	11/12/18
A1-MW-49-SA2**	L1846366-03**	Water	11/12/18
A1-MW-50-SA2**	L1846366-04**	Water	11/12/18
A1-MW-50-SA2D	L1846366-05	Water	11/12/18
A1-MW-51-SA2**	L1846366-06**	Water	11/12/18
A1-PZ-19-SA2**	L1846366-07**	Water	11/12/18
A1-MW-52-SA2**	L1846366-08**	Water	11/12/18
A1-MW-50-SA2MS	L1846366-04MS	Water	11/12/18
A1-MW-50-SA2MSD	L1846366-04MSD	Water	11/12/18

**Indicates sample underwent Stage 4 validation

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results. Samples appended with a double asterisk on the cover page were subjected to Stage 4 data validation, which is comprised of the QC summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples A1-MW-50-SA2** and A1-MW-50-SA2D were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

	Concentration (ng/L)				
Compound	A1-MW-50-SA2**	A1-MW-50-SA2D	RPD (Limits)	Flag	A or P
1,4-Dioxane	592	591	0 (≤30)	-	-

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

All target compound identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

The system performance was acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1846366

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1846366

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1846366

No Sample Data Qualified in this SDG

LDC #: 43888F2b

SDG #: L1846366

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

~~ADR/~~Stage 4 2B

Date: 12/19/18

Page: 1 of 1

Reviewer: JG

2nd Reviewer:

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	ICAL ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	~~Not reviewed for ADR validation~~.
VI.	Field blanks	N	
VII.	Surrogate spikes	A	~~Not reviewed for ADR validation~~.
VIII.	Matrix spike/Matrix spike duplicates	A	Not reviewed for ~~ADR~~ validation.
IX.	Laboratory control samples	A	~~Not reviewed for ADR validation~~. LCS/D
X.	Field duplicates	SW	D = 4/5
XI.	Internal standards	A	~~Not reviewed for ADR validation~~.
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for ADR validation.
XIII.	Target compound identification	A	Not reviewed for ADR validation.
XIV.	System performance	A	Not reviewed for ADR validation.
XV.	Overall assessment of data	A	~~Not reviewed for ADR validation~~.

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	A1-MW-04-SA2**	L1846366-01**	Water	11/12/18
2	A1-MW-05-SA2**	L1846366-02**	Water	11/12/18
3	A1-MW-49-SA2**	L1846366-03**	Water	11/12/18
4	A1-MW-50-SA2** D	L1846366-04**	Water	11/12/18
5	A1-MW-50-SA2D D	L1846366-05	Water	11/12/18
6	A1-MW-51-SA2**	L1846366-06**	Water	11/12/18
7	A1-PZ-19-SA2**	L1846366-07**	Water	11/12/18
8	A1-MW-52-SA2**	L1846366-08**	Water	11/12/18
9	A1-MW-50-SA2MS	L1846366-04MS	Water	11/12/18
10	A1-MW-50-SA2MSD	L1846366-04MSD	Water	11/12/18
11				
12				
13	NG118091I-1 BLANK			

LDC #: 43888F2b

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Method: ~~PAH~~ SVOA (EPA SW 846 Method 8270D-SIM)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check (Not required)				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤30% or percent recoveries (%R) 70-130%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) ≥ 0.05?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes				
Were all surrogate percent differences (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	

LDC #: 43858F26

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓	-		
Were target compounds detected in the field duplicates?		✓		
XI. Internal standards				
Were internal standard area counts within -50% or +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 43888F2b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$RRF = (A_x)(C_{is})/(A_{is})(C_x)$ — A_x = Area of Compound — A_{is} = Area of associated internal standard

average RRF = sum of the RRFs/number of standards — C_x = Concentration of compound, — C_{is} = Concentration of internal standard

%RSD = 100 * (S/X) — S= Standard deviation of the RRFs, — X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (500 std)	Recalculated RRF (500 std)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL MS16	11/15/2018	1,4-Dioxane (DXN-d8)	1.428	1.428	1.407	1.407	3.61	3.60

LDC #: 43888 F2b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

METHOD: GC/MS ~~PAH~~ SVOA (EPA SW 846 Method 8270D-SIM)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
~~Nitrobenzene-d5~~ 1,4-Dioxane-d8	500	126.288	25	25	0
2-Fluorobiphenyl					
Terphenyl-d14					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					

LDC #: 43888 F26

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS ~~PAH~~ SVOA (EPA SW 846 Method 8270D-SIM)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 9/10

Compound	Spike Added (ng/L)		Sample Concentration (ng/L)	Spiked Sample Concentration (ng/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Acenaphthene											
Pyrene											
1,4-Dioxane-d8	5000	5000	592	6560	6760	119	119	123	123	3	3

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43888F2b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: GC/MS ~~PAH~~ SVOA (EPA SW 846 Method 8270D-SIM)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: WG11 80911-2/3

Compound	Spike Added (ng/L)		Spike Concentration (ng/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Acenaphthene										
Pyrene										
1,4-Dioxane	5000	5000	5780	5890	116	116	118	118	2	2

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43888 F26

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd reviewer:

METHOD: GC/MS ~~PAH~~ SVOA (EPA SW 846 Method 8270D-SIM)

(Y) N N/A Were all reported results recalculated and verified for all level IV samples?
Y (N) N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1, 1,4-Dioxane

Conc. = $\frac{(9071)(500)(5\ ml)(\ )(\ )(\ )}{(7476)(1.407)(0.5\ L)(\ )(\ )(\ )}$

= 4311 ng/L

#	Sample ID	Compound	Reported Concentration (ng/L)	Calculated Concentration ( )	Qualification
			4310		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: December 20, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1846592

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
16-HS-03-SA2	L1846592-01	Water	11/13/18
16-MW-06-SA2	L1846592-02	Water	11/13/18
16-MW-08-SA2	L1846592-03	Water	11/13/18
16-MW-09-SA2	L1846592-04	Water	11/13/18
A1-MW-18-SA2	L1846592-05	Water	11/13/18
A1-MW-19-SA2	L1846592-06	Water	11/13/18
A1-MW-53-SA2	L1846592-07	Water	11/13/18
16-HS-03-SA2D	L1846592-08	Water	11/13/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples 16-HS-03-SA2 and 16-HS-03-SA2D were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/L)		RPD (Limits)	Flag	A or P
	16-HS-03-SA2	16-HS-03-SA2D			
1,4-Dioxane	5330	6120	14 (≤30)	-	-

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1846592

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1846592

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1846592

No Sample Data Qualified in this SDG

LDC #: 43888G2b **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: L1846592 ADR Stage2B Page: 1 of 1
Laboratory: Alpha Analytical, Inc. Reviewer: SW
2nd Reviewer:

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	ICAL ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	N A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	N A	LCS/D
X.	Field duplicates	SW	D = 1/8
XI.	Internal standards	N A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	N A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1	16-HS-03-SA2	D	L1846592-01	Water	11/13/18
2	16-MW-06-SA2		L1846592-02	Water	11/13/18
3	16-MW-08-SA2		L1846592-03	Water	11/13/18
4	16-MW-09-SA2		L1846592-04	Water	11/13/18
5	A1-MW-18-SA2		L1846592-05	Water	11/13/18
6	A1-MW-19-SA2		L1846592-06	Water	11/13/18
7	A1-MW-53-SA2		L1846592-07	Water	11/13/18
8	16-HS-03-SA2D	D	L1846592-08	Water	11/13/18
9					
10					

Notes:

	WG 1180911-1 BLANK						

LDC#: 43888G2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVG
2nd Reviewer:

METHOD: GCMS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ng/L)		RPD (≤30%)	Qualifications (Parent only)
	1	8		
1,4-Dioxane	5330	6120	14	

V:\Josephine\FIELD DUPLICATES\43888G2b ttech yuma.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: December 20, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1846856

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-07-SA2	L1846856-01	Water	11/14/18
A1-MW-23-SA2	L1846856-02	Water	11/14/18
A1-MW-25-SA2	L1846856-03	Water	11/14/18
A1-MW-27-SA2	L1846856-04	Water	11/14/18
A1-MW-55-SA2	L1846856-05	Water	11/14/18
A1-MW-54-SA2	L1846856-06	Water	11/14/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1846856

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1846856

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1846856

No Sample Data Qualified in this SDG

LDC #: 43888H2b **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18
SDG #: L1846856 ~~ADR~~ Stage2B Page: 1 of 1
Laboratory: Alpha Analytical, Inc. Reviewer: SW
2nd Reviewer:

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	ICAL ≤ 15% ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	~~N~~ A	
VI.	Field blanks	N	
VII.	Surrogate spikes	~~N~~ A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	~~N~~ A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	~~N~~ A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	~~N~~ A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
+ 1	A1-MW-07-SA2	L1846856-01	Water	11/14/18
— 2	A1-MW-23-SA2	L1846856-02	Water	11/14/18
+ 3	A1-MW-25-SA2	L1846856-03	Water	11/14/18
+ 4	A1-MW-27-SA2	L1846856-04	Water	11/14/18
— 5	A1-MW-55-SA2	L1846856-05	Water	11/14/18
— 6	A1-MW-54-SA2	L1846856-06	Water	11/14/18
7				
8				
9				

Notes:

—	WG1181575-1 ~~BLA~~ MK						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: December 20, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1847243

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-11-SA2	L1847243-01	Water	11/15/18
A1-MW-13-SA2	L1847243-02	Water	11/15/18
A1-MW-14-SA2	L1847243-03	Water	11/15/18
A1-MW-15-SA2	L1847243-04	Water	11/15/18
A1-MW-37-SA2	L1847243-05	Water	11/15/18
A1-MW-37-SA2D	L1847243-06	Water	11/15/18
A1-MW-31-SA2	L1847243-07	Water	11/15/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

IX. Laboratory Control Samples

Laboratory control samples (LCS) and laboratory control samples duplicates (LCSD) were analyzed as required by the method. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples A1-MW-37-SA2 and A1-MW-37-SA2D were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ng/L)		RPD (Limits)	Flag	A or P
	A1-MW-37-SA2	A1-MW-37-SA2D			
1,4-Dioxane	13100	13200	1 (≤30)	-	-

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1847243

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1847243

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1847243

No Sample Data Qualified in this SDG

LDC #: 43888I2b

SDG #: L1847243

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

ADR Stage 2B

Date: 12/19/18

Page: 1 of 1

Reviewer: JM

2nd Reviewer:

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	ICAL ≤ 15% ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	~~N~~ A	
VI.	Field blanks	N	
VII.	Surrogate spikes	~~N~~ A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	~~N~~ A	LCS/D
X.	Field duplicates	SW	D = 5/6
XI.	Internal standards	~~N~~ A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	~~N~~ A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID		Lab ID	Matrix	Date
1	A1-MW-11-SA2		L1847243-01	Water	11/15/18
2	A1-MW-13-SA2		L1847243-02	Water	11/15/18
3	A1-MW-14-SA2		L1847243-03	Water	11/15/18
4	A1-MW-15-SA2		L1847243-04	Water	11/15/18
5	A1-MW-37-SA2	D	L1847243-05	Water	11/15/18
6	A1-MW-37-SA2D	D	L1847243-06	Water	11/15/18
7	A1-MW-31-SA2		L1847243-07	Water	11/15/18
8					
9					

Notes:

	WG1181805-1 BLANK						

(EB - on hold)

LDC#: 43888I2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: GCMS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ng/L)		RPD (≤30%)	Qualifications (Parent only)
	5	6		
1,4-Dioxane	13100	13200	1	

V:\Josephine\FIELD DUPLICATES\43888I2b ttech yuma.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: December 20, 2018

Parameters: 1,4-Dioxane

Validation Level: Stage 2B

Laboratory: Alpha Analytical, Inc.

Sample Delivery Group (SDG): L1847316

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-01-SA2	L1847316-01	Water	11/16/18
A1-MW-42-SA2	L1847316-02	Water	11/16/18
EB-20181116	L1847316-03	Water	11/16/18
A1-MW-01-SA2MS	L1847316-01MS	Water	11/16/18
A1-MW-01-SA2MSD	L1847316-01MSD	Water	11/16/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

1,4-Dioxane by Environmental Protection Agency (EPA) SW 846 Method 8270D in Selected Ion Monitoring (SIM) mode

All sample results were subjected to Stage 2B data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A decafluorotriphenylphosphine (DFTPP) tune was performed at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 15.0%.

Average relative response factors (RRF) were within validation criteria.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0%.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

The percent differences (%D) were less than or equal to 20.0%.

The percent differences (%D) of the ending continuing calibration verifications (CCVs) were less than or equal to 50.0%.

All of the continuing calibration relative response factors (RRF) were within validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB-20181116 was identified as an equipment blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XIII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIV. System Performance

Raw data were not reviewed for Stage 2B validation.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Data Qualification Summary - SDG L1847316

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Laboratory Blank Data Qualification Summary - SDG L1847316

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
1,4-Dioxane - Field Blank Data Qualification Summary - SDG L1847316

No Sample Data Qualified in this SDG

LDC #: 43888J2b

SDG #: L1847316

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

~~ADR~~ Stage2B

Date: 2/19/19

Page: 1 of 1

Reviewer: JVG

2nd Reviewer:

METHOD: GC/MS 1,4-Dioxane (EPA SW 846 Method 8270D-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	ICAL ≤ 15%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20%/50%.
V.	Laboratory Blanks	~~X~~ A	
VI.	Field blanks	ND	EB = 3
VII.	Surrogate spikes	~~X~~ A	
VIII.	Matrix spike/Matrix spike duplicates	~~X~~ A	
IX.	Laboratory control samples	~~X~~ A	LCS
X.	Field duplicates	N	
XI.	Internal standards	~~X~~ A	
XII.	Compound quantitation RL/LOQ/LODs	N	
XIII.	Target compound identification	N	
XIV.	System performance	N	
XV.	Overall assessment of data	~~X~~ A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
+ 1	A1-MW-01-SA2	L1847316-01	Water	11/16/18
+ 2	A1-MW-42-SA2	L1847316-02	Water	11/16/18
− 3	EB-20181116	L1847316-03	Water	11/16/18
4	A1-MW-01-SA2MS	L1847316-01MS	Water	11/16/18
5	A1-MW-01-SA2MSD	L1847316-01MSD	Water	11/16/18
6				
7				
8				

Notes:

−	WG1181887-1 BLANK						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: MCAS Yuma, CTO 17F3803

LDC Report Date: January 2, 2019

Parameters: Perfluoroalkyl & Polyfluoroalkyl Substances

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1803615

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
A1-MW-04-SA2	1803615-01	Water	11/12/18
A1-MW-05-SA2	1803615-02	Water	11/12/18
A1-MW-49-SA2	1803615-03	Water	11/12/18
A1-MW-50-SA2	1803615-04	Water	11/12/18
A1-MW-50-SA2D	1803615-05	Water	11/12/18
A1-MW-51-SA2	1803615-06	Water	11/12/18
A1-MW-52-SA2	1803615-07	Water	11/12/18
FRB-20181112	1803615-08	Water	11/12/18
A1-PZ-19-SA2	1803615-09	Water	11/12/18
A1-MW-50-SA2MS	1803615-04MS	Water	11/12/18
A1-MW-50-SA2MSD	1803615-04MSD	Water	11/12/18

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Sampling and Analysis Plan for Groundwater Long-Term Monitoring Program at Operable Unit-1 Area 1, Marine Corps Air Station Yuma, Arizona (April 2018), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.1 (2017), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following method:

Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) by Environmental Protection Agency (EPA) Method 537

All sample results were subjected to Stage 4 data validation, which is comprised of the quality control (QC) summary forms as well as the raw data, to confirm sample quantitation and identification.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition and cooler temperatures upon receipt met validation criteria.

All technical holding time requirements were met.

II. LC/MS Instrument Performance Check

Instrument performance was checked and the requirements were met.

III. Initial Calibration and Initial Calibration Verification

Initial calibration was performed as required by the method.

A curve fit, based on the initial calibration, was established for quantitation. The coefficient of determination (r^2) was greater than or equal to 0.990.

For each calibration standard, all compounds were less than or equal to 30% of their true value.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 30.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 30.0% for all compounds.

The signal to noise (S/N) ratio was within validation criteria for all compounds.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample FRB-20181112 was identified as a field rinsate blank. No contaminants were found.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits. Relative percent differences (RPD) were within QC limits.

VIII. Ongoing Precision Recovery

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples A1-MW-50-SA2 and A1-MW-50-SA2D were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Flag	A or P
	A1-MW-50-SA2	A1-MW-50-SA2D			
PFTeDA	0.0250	0.0264	5 (≤30)	-	-
PFHxA	0.0806	0.0829	3 (≤30)	-	-
PFHpA	0.00474	0.00494	Not calculable	-	-
PFHxS	0.0367	0.0355	3 (≤30)	-	-
PFOA	0.00947	0.00878	Not calculable	-	-

RPDs were not calculated when sample results in one or both samples were less than 5x the limit of quantitation (LOQ).

X. Labeled Compounds

All percent recoveries (%R) for labeled compounds used to quantitate target compounds were within QC limits.

XI. Compound Quantitation

All compound quantitations met validation criteria.

The laboratory indicated that the parent/product transition ion ratios met laboratory requirements with the following exceptions:

Sample	Compound	Finding
A1-MW-05-SA2 A1-MW-50-SA2 A1-PZ-19-SA2	All compounds qualified 'Q' by the laboratory	The parent/product transition ion ratio was outside of the 70-130% laboratory limits.

Since there are no established transition ion ratio requirements in the validation documents for this project, using professional judgment, no data were qualified.

All compounds reported below the limit of quantitation (LOQ) were qualified as follows:

Sample	Finding	Flag	A or P
A1-MW-04-SA2 A1-MW-05-SA2 A1-MW-49-SA2 A1-MW-50-SA2 A1-MW-50-SA2D A1-MW-51-SA2 A1-MW-52-SA2 A1-PZ-19-SA2	All compounds reported below the LOQ.	J (all detects)	A

XII. Target Compound Identifications

All target compound identifications met validation criteria.

XIII. System Performance

The system performance was acceptable.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to results below the LOQ, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable.

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Data Qualification Summary - SDG 1803615

Sample	Compound	Flag	A or P	Reason
A1-MW-04-SA2 A1-MW-05-SA2 A1-MW-49-SA2 A1-MW-50-SA2 A1-MW-50-SA2D A1-MW-51-SA2 A1-MW-52-SA2 A1-PZ-19-SA2	All compounds reported below the LOQ.	J (all detects)	A	Compound quantitation

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Laboratory Blank Data Qualification Summary - SDG 1803615

No Sample Data Qualified in this SDG

MCAS Yuma, CTO 17F3803
Perfluoroalkyl & Polyfluoroalkyl Substances - Field Blank Data Qualification Summary - SDG 1803615

No Sample Data Qualified in this SDG

LDC #: 43888K96 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/19/18

SDG #: 1803615 ADR/Stage 4 Page: 1 of 1

Laboratory: Vista Analytical Laboratory Reviewer: SVG

2nd Reviewer:

METHOD: LC/MS Perfluoroalkyl & Polyfluoroalkyl Substances (EPA Method 537)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A, A	
II.	LC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A, A	ICAL ~~≤~~ r² Individual ≤30% ICV ≤ 30%
IV.	Continuing calibration/ISC	A	CCV ≤ 30% True value
V.	Laboratory Blanks	A	Not reviewed for ADR validation.
VI.	Field blanks	ND	FRB = 8
VII.	Matrix spike/Matrix spike duplicates	A	Not reviewed for ADR validation.
VIII.	Laboratory control samples	A	Not reviewed for ADR validation. OPR
IX.	Field duplicates	SW	D = 4/5
X.	Labeled Compounds	A	Not reviewed for ADR validation.
XI.	Compound quantitation RL/LOQ/LODs	SW	Not reviewed for ADR validation.
XII.	Target compound identification	A	Not reviewed for ADR validation.
XIII.	System performance	A	Not reviewed for ADR validation.
XIV.	Overall assessment of data	A	Not reviewed for ADR validation.

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER: FRB = Field Rinsate Blk

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	A1-MW-04-SA2**	1803615-01**	Water	11/12/18
2	A1-MW-05-SA2**	1803615-02**	Water	11/12/18
3	A1-MW-49-SA2**	1803615-03**	Water	11/12/18
4	A1-MW-50-SA2** D	1803615-04**	Water	11/12/18
5	A1-MW-50-SA2D** D	1803615-05**	Water	11/12/18
6	A1-MW-51-SA2**	1803615-06**	Water	11/12/18
7	A1-MW-52-SA2**	1803615-07**	Water	11/12/18
8	FRB-20181112	1803615-08	Water	11/12/18
9	A1-~~MW~~PZ-19-SA2**	1803615-09**	Water	11/12/18
10	A1-MW-50-SA2MS	1803615-04MS	Water	11/12/18
11	A1-MW-50-SA2MSD	1803615-04MSD	Water	11/12/18
12				
13				
14	B8K0091-BLK1			
15				

LDC #: 43888 K96

VALIDATION FINDINGS CHECKLIST

Reviewer: SK
2nd Reviewer: [illegible]

Method: LCMS (EPA Method 537 Modified)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. LC/MS Instrument performance check				
Were the instrument performance reviewed and found to be within the validation criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit criteria of ≥ 0.990?	✓			
Were all analytes within 70-130% or percent differences (%D) ≤30% of their true value for each calibration standard?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) < 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) of the continuing calibration < 30%?	✓			
Was the signal to noise (S/N) ratio for all compounds within the validation criteria?	✓			
Were all percent differences (%D) of the Instrument Sensitivity Check < 30%?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks?		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VIII. Matrix spike/Matrix spike duplicates				
Were matrix spike (MS) and matrix spike duplicate (MSD) analyzed in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed per extraction batch for this SDG?	✓			

LDC #: 43888K96

VALIDATION FINDINGS CHECKLIST

Reviewer: JVG
2nd Reviewer: [signature]

Validation Area	Yes	No	NA	Findings/Comments
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
XI. Labeled compounds				
Were labeled compound percent recoveries (%R) within the QC limits?	✓			
XII. Compound quantitation				
Did the laboratory reporting limits (RL) meet the QAPP RLs?	✓			
Did reported results include both branched and linear isomers?	✓			
Were the correct ion transition, labeled compound and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were two transitions and the ion transition ratio per analyte monitored and documented with the exception of PFBA and PFPeA?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: PFAS

A. PFHxA			
B. PFHpA			
C. PFOA			
D. PFNA			
E. PFDA			
F. PFUnA			
G. PFDoA			
H. PFTriA			
I. PFTeDA			
J. PFBS			
K. PFHxS			
L. PFHpS			
M. PFOS			
N. PFDS			
O. FOSA			
P. PFBA			
Q. PFPeA			
R. 6:2FTS			
S. 8:2FTS			
T. MeFOSAA			
U. EtFOSAA			
V. Combined PFOAS/PFOS			

LDC#: 43888K96

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: JVG
2nd Reviewer:

METHOD: LCMS PFAS (EPA Method 537M)

Y N NA Were field duplicate pairs identified in this SDG?
Y N NA Were target analytes detected in the field duplicate pairs?

Compound	Concentration (ug/L)		RPD (≤30%)	Qualifications (Parent only)
	4	5		
J	0.0250	0.0264	5	
A	0.0806	0.0829	3	
B	0.00474	0.00494	NC	
K	0.0367	0.0355	3	
C	0.00947	0.00878	NC	

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LDC #: 43888K96

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported RLs

Reviewer: JVG
2nd Reviewer: A

METHOD: LCMS PFAS (EPA Method 537M)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Samples	Compound	Finding	Qualifications
	2, 4, 9	All compounds qualified "Q" by the lab.	The laboratory indicated that the parent/product transition ion ratio was outside of the 70-130% laboratory limits.	Since there are no established transition ion ratio requirements in the validation documents for this project, using professional judgment, no data were qualified.

Comments: See sample calculation verification worksheet for recalculations

LDC # 43888K96

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	Instrument	Compound	Standard	(Y) Response ratio	(X) Conc. Ratio	(X^2) Conc. Ratio
11/19/2018	SCN960	PFOA	1	0.0327	0.02	0.00040
			2	0.0593	0.04	0.0016
		13C2-PFOA	3	0.1197	0.08	0.0064
			4	0.2358	0.16	0.0256
			5	0.5699	0.40	0.1600
			6	1.0165	0.80	0.6400
			7	5.1296	4.00	16.0000
			8	10.3516	8.00	64.0000
			9	25.6395	20.00	400.0000
			10	51.9892	40.00	1600.0000

Regression Output	**Calculated**		***Reported WQR***	
Constant	*c*	*0.03180*	*c*	*0.1398430*
Std Err of Y Est				
R Squared		*0.9999917*		*0.9999030*
Degrees of Freedom				
	m1	*m2*	*m1*	*m2*
X Coefficient(s)	*1.2736124*	*0.0006421*	*1.2814700*	*0.000032442*
Std Err of Coef.				
Correlation Coefficient		*0.999996*		
Coefficient of Determination (r^2)		*0.999992*		

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

METHOD: LC/MS PFCs (EPA Method 537Mod)

Calibration Date	System	Compound	Standard	(Y) Area ratio	(X) Conc ratio
11/19/2018	SCN960	PFOS	1	0.02405	0.020
			2	0.04028	0.040
			3	0.00828	0.080
		13C8-PFOS	4	0.15076	0.160
			5	0.42475	0.400
			6	0.84488	0.800
			7	4.25487	4.000
			8	8.43628	8.000
			9	21.03584	20.000
			10	43.32010	40.000

Regression Output	Calculated	Reported WLR
Constant	-0.073380	-0.0118865
Std Err of Y Est		
R Squared	0.999854	0.999775
Degrees of Freedom		
X Coefficient(s)	1.07855632	1.069710
Std Err of Coef.		
Correlation Coefficient	0.999927	
Coefficient of Determination (r^2)	0.999854	0.999775

LDC # 43888K96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Calculation Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAs (EPA Method 537Mod)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
RRF = (Ax)(Cis)/(Ais)(Cx)

Where:
ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
Ax = Area of compound
Cx = Concentration of compound,
Ais = Area of associated internal standard
Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound	(IS)	Conc	Reported	Recalculated	Reported % R	Recalculated % R
1	181120M1_58	11/20/2018	PFOA	(13C2-PFOA)	1.00	1.139	1.139	113.9	113.9
			PFOS	(13C8-PFOS)	1.00	1.092	1.092	109.2	109.2

LDC #: 43888K9G

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFAS (EPA Method 537Mod)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 10/11

Compound	Spike Added (ng/L)		Sample Conc (ng/L)	Spiked Sample Concentration (ng/L)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
PFOA	0.0567	0.0863	0.00947	0.112	0.110	118	118	116	116	1.71	1.80
PFOS	↓	↓	0	0.0954	0.0910	110	110	105	105	4.65	4.72

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43888K96

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/ Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer:

METHOD: LC/MS PFCs (EPA Method 537Mod)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: B8K0091-BS1

Compound	Spike Added (ng/L)		Spike Concentration (ng/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc..
PFOS	0.0800	~~0.086~~ NA	0.0864	NA	108	108				
PFOA	"	"	0.0959	"	119	119				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43888 K96

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: JVG
2nd reviewer:

METHOD: LC/MS PFAS (EPA Method 537M)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. 1 , PFOA :

Conc. $= \frac{(437)(12.5)}{(5076)} = 3.24421e-5X^2 + 1.28147X + 0.B9843$

$X = 0.73163$

final conc. $= \frac{(0.73163)(1L)}{(0.113454)(1000)}$

$= 0.00645$ ng/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Qualification
			0.00646		

LOCATION-NAME	SITE_NAME	INSTALLATION_ID	LOCATION_TYPE	LOCATION_TYPE_DESC	SDG	COORD_X	COORD_Y	ANALYTICAL_METHOD_GRP_DESC	SAMPLE_NAME	SAMPLE_MATRIX	SAMPLE_MATRIC_DESC	COLLECT_DATE
A1-MW-07	SITE 00019	YUMA_MCAS	WLM	Monitoring well	1803659	439541.91	606106.3553	Perfluoroalkyl Compounds	A1-MW-07-SA2	WG	GROUNDWATER	11/14/2018
A1-MW-23	SITE 00019	YUMA_MCAS	WLM	Monitoring well	1803659	439180.7795	606307.5976	Perfluoroalkyl Compounds	A1-MW-23-SA2	WG	GROUNDWATER	11/14/2018
A1-MW-25	SITE 00019	YUMA_MCAS	WLM	Monitoring well	1803659	437848.2796	606352.9876	Perfluoroalkyl Compounds	A1-MW-25-SA2	WG	GROUNDWATER	11/14/2018
A1-MW-27	SITE 00019	YUMA_MCAS	WLM	Monitoring well	1803659	437455.9739	606818.6576	Perfluoroalkyl Compounds	A1-MW-27-SA2	WG	GROUNDWATER	11/14/2018
A1-MW-54	OU 0000001 AREA 1	YUMA_MCAS	WLM	Monitoring well	1803659	436340.456	606933.323	Perfluoroalkyl Compounds	A1-MW-54-SA2	WG	GROUNDWATER	11/14/2018
A1-MW-55	OU 0000001 AREA 1	YUMA_MCAS	WLM	Monitoring well	1803659	439126.157	606237.177	Perfluoroalkyl Compounds	A1-MW-55-SA2	WG	GROUNDWATER	11/14/2018