Navy_CLEAN_PFAS_FOIA_request_covers.indd

NAVFAC
Naval Facilities Engineering Command

Groundwater Sample Results, Level 2 Laboratory Data Summary, Level 4 Laboratory Report, Electronic Data Deliverable, Data Validation Report, Sample Location Report, SDG 1601395

NAS
Alameda, CA
April 2021

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

November 28, 2016

Vista Work Order No. 1601395

Mr. Kevin Olness
AMEC Foster Wheeler
9210 Sky Park Court Suite 200
San Diego, CA 92123

Dear Mr. Olness,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on November 02, 2016. This sample set was analyzed on a rush turn-around time, under your Project Name 'Alameda Basewide / 5023146096'.

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,

Karen Lopez for

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. 1601395
Case Narrative

Sample Condition on Receipt:

Fourteen aqueous 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. As requested, all "EB" and "FB" samples were extracted and placed on hold except "EB18_161101". As requested, samples "EB-26SW04_161101" and "FB-26SW04_161101" were taken off hold on November 21, 2016.

Analytical Notes:

Samples "26MW06_161101", "26MW08_161101", "26SW04_161101" and "DUP07_161101" contained particulate and were centrifuged prior to extraction.

Modified EPA Method 537

The samples were extracted and analyzed for PFBS, PFOA and PFOS using Modified EPA Method 537.

Holding Times

The field samples were extracted and analyzed within the method hold times. Samples "EB-26SW04_161101" and "FB-26SW04_161101" required re-extractions; the re-extractions were performed outside of the hold time.

Quality Control

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

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with each preparation batch. No analytes were detected in the Method Blanks above the Reporting Limit. The OPR recoveries were within the method acceptance criteria.

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

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Sample Inventory Report

Vista Sample ID	Client Sample ID		Sampled	Received	Components/Containers
1601395-01	26MW06_161101		01-Nov-16 10:10	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-02	26MW08_161101		01-Nov-16 11:20	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-03	26SW01_161101		01-Nov-16 09:13	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-04	26SW04_161101		01-Nov-16 08:25	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-05	DUP07_161101		01-Nov-16 11:25	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-06	EB-26MW06_161101	Extract and hold	01-Nov-16 10:20	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-07	EB-26SW01_161101	Extract and hold	01-Nov-16 09:20	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-08	EB-26SW04_161101	Extract and hold	01-Nov-16 08:35	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-09	FB-26MW06_161101	Extract and hold	01-Nov-16 10:15	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-10	FB-26SW01_161101	Extract and hold	01-Nov-16 09:15	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-11	FB-26SW04_161101	Extract and hold	01-Nov-16 08:30	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-12	EB18_161101		01-Nov-16 13:00	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-13	EB-26MW08_161101	Extract and hold	01-Nov-16 11:35	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-14	FB-26MW08_161101	Extract and hold	01-Nov-16 11:30	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL

ANALYTICAL RESULTS

Sample ID: Method Blank — Modified EPA Method 537

Matrix:	Aqueous	QC Batch:	B6K0076	Lab Sample:	B6K0076-BLK1
Sample Size:	0.125 L	Date Extracted:	11-Nov-2016 8:39	Date Analyzed:	16-Nov-16 14:33 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.79	4.00	8.00	
PFOA	ND	0.651	2.00	8.00	
PFOS	ND	0.807	0.900	8.00	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	123	60 - 150	
IS	13C2-PFOA	102	60 - 150	
IS	13C8-PFOS	98.9	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: Method Blank — Modified EPA Method 537

Matrix:	Aqueous	QC Batch:	B6K0146	Lab Sample:	B6K0146-BLK1
Sample Size:	0.125 L	Date Extracted:	22-Nov-2016 10:24	Date Analyzed:	27-Nov-16 15:57 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.79	4.00	8.00	
PFOA	ND	0.651	2.00	8.00	
PFOS	ND	0.807	0.900	8.00	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	126	60 - 150	
IS	13C2-PFOA	103	60 - 150	
IS	13C8-PFOS	110	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: OPR

Modified EPA Method 537

Matrix:	Aqueous	QC Batch:	B6K0076	Lab Sample:	B6K0076-BS1
Sample Size:	0.125 L	Date Extracted:	11-Nov-2016 8:39	Date Analyzed:	16-Nov-16 11:41 Column: BEH C18

Analyte	Amt Found (ng/L)	Spike Amt	%R	Limits
PFBS	77.8	80.0	97.3	60 - 130
PFOA	77.0	80.0	96.3	70 - 130
PFOS	69.3	80.0	86.7	70 - 130

	Labeled Standard	%R	LCL-UCL
IS	13C3-PFBS	104	60 - 150
IS	13C2-PFOA	92.9	60 - 150
IS	13C8-PFOS	122	60 - 150

LCL-UCL - Lower control limit - upper control limit

Sample ID: OPR

Modified EPA Method 537

Matrix:	Aqueous	QC Batch:	B6K0146	Lab Sample:	B6K0146-BS1
Sample Size:	0.125 L	Date Extracted:	22-Nov-2016 10:24	Date Analyzed:	27-Nov-16 14:54 Column: BEH C18

Analyte	Amt Found (ng/L)	Spike Amt	%R	Limits
PFBS	91.7	80.0	115	60 - 130
PFOA	90.3	80.0	113	70 - 130
PFOS	84.5	80.0	106	70 - 130

	Labeled Standard	%R	LCL-UCL
IS	13C3-PFBS	109	60 - 150
IS	13C2-PFOA	90.1	60 - 150
IS	13C8-PFOS	96.4	60 - 150

LCL-UCL - Lower control limit - upper control limit

Sample ID: 26MW06_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 10:10
Location:

Sample Data

Matrix: Groundwater
Sample Size: 0.126 L

Laboratory Data

Lab Sample: 1601395-01 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 16-Nov-16 18:12 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.78	3.97	7.95	
PFOA	1.93	0.647	1.98	7.95	J
PFOS	ND	0.802	0.893	7.95	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	98.7	60 - 150	
IS	13C2-PFOA	86.2	60 - 150	
IS	13C8-PFOS	104	60 - 150	

DL - Detection limit
RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
Results reported to DL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: 26MW08_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 11:20
Location:

Sample Data

Matrix: Groundwater
Sample Size: 0.128 L

Laboratory Data

Lab Sample: 1601395-02 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 16-Nov-16 18:25 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.75	3.91	7.83	
PFOA	16.2	0.637	1.95	7.83	
PFOS	15.9	0.790	0.879	7.83	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	102	60 - 150	
IS	13C2-PFOA	91.2	60 - 150	
IS	13C8-PFOS	100	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: 26SW01_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 9:13
Location:

Sample Data

Matrix: Groundwater
Sample Size: 0.125 L

Laboratory Data

Lab Sample: 1601395-03 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 18-Nov-16 15:24 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.79	4.00	8.00	
PFOA	36.7	0.651	2.00	8.00	
PFOS	28.3	0.807	0.900	8.00	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	115	60 - 150	
IS	13C2-PFOA	95.7	60 - 150	
IS	13C8-PFOS	105	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: 26SW04_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 8:25
Location:

Sample Data

Matrix: Groundwater
Sample Size: 0.125 L

Laboratory Data

Lab Sample: 1601395-04 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 18-Nov-16 15:36 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	41.8	1.79	4.00	8.02	
PFOA	392	0.652	2.00	8.02	
PFOS	503	0.809	0.900	8.02	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	116	60 - 150	
IS	13C2-PFOA	114	60 - 150	
IS	13C8-PFOS	101	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: DUP07_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 11:25
Location:

Sample Data

Matrix: Groundwater
Sample Size: 0.126 L

Laboratory Data

Lab Sample: 1601395-05 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 16-Nov-16 19:03 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.78	3.97	7.95	
PFOA	27.5	0.647	1.98	7.95	
PFOS	ND	0.802	0.893	7.95	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	90.1	60 - 150	
IS	13C2-PFOA	101	60 - 150	
IS	13C8-PFOS	96.2	60 - 150	

DL - Detection limit
RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
Results reported to DL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: EB-26SW04_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 8:35
Location:

Sample Data

Matrix: QC Water
Sample Size: 0.130 L

Laboratory Data

Lab Sample: 1601395-08 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0146 Date Extracted: 22-Nov-2016 10:24
Date Analyzed: 27-Nov-16 16:10 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.72	3.85	7.68	
PFOA	ND	0.625	1.92	7.68	
PFOS	3.19	0.775	0.865	7.68	J

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	121	60 - 150	
IS	13C2-PFOA	106	60 - 150	
IS	13C8-PFOS	98.9	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: FB-26SW04_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 8:30
Location:

Sample Data

Matrix: QC Water
Sample Size: 0.128 L

Laboratory Data

Lab Sample: 1601395-11 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0146 Date Extracted: 22-Nov-2016 10:24
Date Analyzed: 27-Nov-16 16:22 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.75	3.91	7.81	
PFOA	ND	0.636	1.95	7.81	
PFOS	10.5	0.788	0.879	7.81	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	111	60 - 150	
IS	13C2-PFOA	84.0	60 - 150	
IS	13C8-PFOS	99.8	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: EB18_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 13:00
Location:

Sample Data

Matrix: QC Water
Sample Size: 0.123 L

Laboratory Data

Lab Sample: 1601395-12 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 18-Nov-16 15:48 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.82	4.07	8.14	
PFOA	ND	0.662	2.03	8.14	
PFOS	ND	0.821	0.915	8.14	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	126	60 - 150	
IS	13C2-PFOA	110	60 - 150	
IS	13C8-PFOS	122	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS 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.**
D	**Dilution**
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.**
M	**Estimated Maximum Possible Concentration. (CA Region 2 projects only)**
*****	**See Cover Letter**
Conc.	**Concentration**
NA	**Not applicable**
ND	**Not Detected**
TEQ	**Toxic Equivalency**

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

CERTIFICATIONS

Accrediting Authority	Certificate Number
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2014022
Nevada Division of Environmental Protection	CA004132015-1
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-004
Pennsylvania Department of Environmental Protection	012
South Carolina Department of Health	87002001
Texas Commission on Environmental Quality	T104704189-15-6
Virginia Department of General Services	7923
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	EPA 1613B

Dilution GC/HRMS	
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

1601395 0.0°C

CHAIN OF CUSTODY

DATE: 11/1/2016

COC #: COC161101

PAGE: 1 OF 2

MMEC Group
9177 Sky Park Court
San Diego, CA
(858) 278-3600

SHIP TO:
Vista Analytical
1104 Windfield Way
El Dorado Hills, CA 95762
Atten: Karen Lopez
Lab Phone# 916-673-1520

Project Name:	Alameda Basewide	Project Contact:	Marina Mitchell	Bill To:	KMEA	Disposal Instructions:	LAB
Project Number:	5023146096	Phone Number:	(503) 639-3400		2423 Hoover Ave	Shipment Method:	FEDEX
Project Manager:	Kevin Olness	Project Phase:	.03.****		National City, CA 91950	Waybill Number:	N/A

Sample Information						Methods for Analysis	RUSH					
No.	Sample ID	Date & Time Sampled	Matrix	Sample Type	MS/MSD	PFOS, PFOA, and PFBS	24 Hour	48 Hour	72 Hour	5 Days	TOTAL BOTTLES	HOLD All Analyses
1	26MW06_161101	11/01/16 10:10	WG	N	N	X						
2	26MW08_161101	11/01/16 11:20	WG	N	N	X						
3	26SW01_161101	11/01/16 09:13	WG	N	N	X						
4	26SW04_161101	11/01/16 08:25	WG	N	N	X						
5	DUP07_161101	11/01/16 11:25	WG	FD	N	X						
6	EB-26MW06_161101	11/01/16 10:20	WQ	EB	N	X						X
7	EB-26SW01_161101	11/01/16 09:20	WQ	EB	N	X						X
8	EB-26SW04_161101	11/01/16 08:35	WQ	EB	N	X						X
9	FB-26MW06_161101	11/01/16 10:15	WQ	FB	N	X						X
10	FB-26SW01_161101	11/01/16 09:15	WQ	FB	N	X						X
11	FB-26SW04_161101	11/01/16 08:30	WQ	FB	N	X						X
12												

Sampler's Signature:		Date: 11/1/16	Time: 13:10
Relinquished By/Affiliation:	MG Rute	Date: 11/1/16	Time: 15:00
Received By:	FedEx	Date:	Time:
Relinquished By/Affiliation:	FedEx	Date:	Time:
Received By:	VAL	Date: 11/2/16	Time: 0919
Relinquished By/Affiliation:		Date:	Time:
Received By (LAB):		Date:	Time:

For Lab Use

Does COC match samples:	Y or N
Broken Container:	Y or N
COC seal intact:	Y or N
Other problems:	Y or N
WSDOT contacted:	Y or N
Date contacted:	
Cooler Temperature at receipt:	°C

Comments:
X=Analyze H=Hold Analysis Request
EB-..., FB-... Extraction Only

NUMBER OF COOLERS SENT: 1

1601395

MMEC Group
9177 Sky Park Court
San Diego, CA
(858) 278-3600

SHIP TO:
Vista Analytical
1104 Windfield Way
El Dorado Hills, CA 95762
Atten: Karen Lopez
Lab Phone# 916-673-1520

CHAIN OF CUSTODY

DATE: 11/1/2016
COC #: COC161101
PAGE: 2 OF 2

Project Name:	Alameda Basewide	Project Contact:	Marina Mitchell	Bill To:	KMEA	Disposal Instructions:	LAB
Project Number:	5023146096	Phone Number:	(503) 639-3400		2423 Hoover Ave	Shipment Method:	FEDEX
Project Manager:	Kevin Olness	Project Phase:	.03.****		National City, CA 91950	Waybill Number:	N/A

Sample Information						Methods for Analysis	RUSH					
No.	Sample ID	Date & Time Sampled	Matrix	Sample Type	MS/MSD	PFOS, PFOA, and PFBS	24 Hour	48 Hour	72 Hour	5 Days	TOTAL BOTTLES	HOLD All Analyses
1	EB18_161101	11/01/16 13:00	WQ	EB	N	X						
2	EB-26MW08_161101	11/01/16 11:35	WQ	EB	N	X						X
3	FB-26MW08_161101	11/01/16 11:30	WQ	FB	N	X						X
4												
5												
6												
7												
8												
9												
10												
11												
12												

Sampler's Signature:	Date: 11/1/16	Time: 13:10
Relinquished By/Affiliation: Meg Rustic	Date: 11/1/16	Time: 15:00
Received By: FedEx	Date:	Time:
Relinquished By/Affiliation: FedEx	Date:	Time:
Received By: VAL	Date: 11/2/16	Time: 0919
Relinquished By/Affiliation:	Date:	Time:
Received By (LAB):	Date:	Time:

For Lab Use

Does COC match samples:	Y or N
Broken Container:	Y or N
COC seal intact:	Y or N
Other problems:	Y or N
WSDOT contacted:	Y or N
Date contacted:	
Cooler Temperature at receipt:	°C

Comments:
X=Analyze H=Hold Analysis Request
EB-... , FB-... Extraction Only

NUMBER OF COOLERS SENT: 1

SAMPLE LOG-IN CHECKLIST

Vista Analytical Laboratory

Vista Project #: 1601395 **TAT** 14

Samples Arrival:	**Date/Time** 11/2/16 0850	**Initials:**	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 11/2/16 1346	**Initials:**	**Location:** WR-2 **Shelf/Rack:** B 6

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

Temp °C: 0.3	(uncorrected)	**Time:** 0918	**Thermometer ID:** IR-1
Temp °C: 0.0	(corrected)	**Probe used:** Yes☐ No☑	

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill / Trk # 8081 8722 0840	✓		
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			Yes	No NA
Shipping Container	Vista	Client	Retain	Return	Dispose	

Comments:

November 28, 2016

Vista Work Order No. 1601395

Mr. Kevin Olness
AMEC Foster Wheeler
9210 Sky Park Court Suite 200
San Diego, CA 92123

Dear Mr. Olness,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on November 02, 2016. This sample set was analyzed on a rush turn-around time, under your Project Name 'Alameda Basewide / 5023146096'.

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,

Karen Lopez for

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. 1601395
Case Narrative

Sample Condition on Receipt:

Fourteen aqueous 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. As requested, all "EB" and "FB" samples were extracted and placed on hold except "EB18_161101". As requested, samples "EB-26SW04_161101" and "FB-26SW04_161101" were taken off hold on November 21, 2016.

Analytical Notes:

Samples "26MW06_161101", "26MW08_161101", "26SW04_161101" and "DUP07_161101" contained particulate and were centrifuged prior to extraction.

Modified EPA Method 537

The samples were extracted and analyzed for PFBS, PFOA and PFOS using Modified EPA Method 537.

Holding Times

The field samples were extracted and analyzed within the method hold times. Samples "EB-26SW04_161101" and "FB-26SW04_161101" required re-extractions; the re-extractions were performed outside of the hold time.

Quality Control

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

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with each preparation batch. No analytes were detected in the Method Blanks above the Reporting Limit. The OPR recoveries were within the method acceptance criteria.

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

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Sample Inventory Report

Vista Sample ID	Client Sample ID		Sampled	Received	Components/Containers
1601395-01	26MW06_161101		01-Nov-16 10:10	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-02	26MW08_161101		01-Nov-16 11:20	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-03	26SW01_161101		01-Nov-16 09:13	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-04	26SW04_161101		01-Nov-16 08:25	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-05	DUP07_161101		01-Nov-16 11:25	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-06	EB-26MW06_161101	Extract and hold	01-Nov-16 10:20	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-07	EB-26SW01_161101	Extract and hold	01-Nov-16 09:20	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-08	EB-26SW04_161101	Extract and hold	01-Nov-16 08:35	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-09	FB-26MW06_161101	Extract and hold	01-Nov-16 10:15	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-10	FB-26SW01_161101	Extract and hold	01-Nov-16 09:15	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-11	FB-26SW04_161101	Extract and hold	01-Nov-16 08:30	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-12	EB18_161101		01-Nov-16 13:00	02-Nov-16 08:50	HDPE Bottle, 125 mL
					HDPE Bottle, 125 mL
1601395-13	EB-26MW08_161101	Extract and hold	01-Nov-16 11:35	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL
1601395-14	FB-26MW08_161101	Extract and hold	01-Nov-16 11:30	02-Nov-16 08:50	HDPE Bottle, 125 mL
		Extract and hold			HDPE Bottle, 125 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

Modified EPA Method 537

Matrix:	Aqueous	QC Batch:	B6K0076	Lab Sample:	B6K0076-BLK1
Sample Size:	0.125 L	Date Extracted:	11-Nov-2016 8:39	Date Analyzed:	16-Nov-16 14:33 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.79	4.00	8.00	
PFOA	ND	0.651	2.00	8.00	
PFOS	ND	0.807	0.900	8.00	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	123	60 - 150	
IS	13C2-PFOA	102	60 - 150	
IS	13C8-PFOS	98.9	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: Method Blank — Modified EPA Method 537

Matrix:	Aqueous	QC Batch:	B6K0146	Lab Sample:	B6K0146-BLK1
Sample Size:	0.125 L	Date Extracted:	22-Nov-2016 10:24	Date Analyzed:	27-Nov-16 15:57 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.79	4.00	8.00	
PFOA	ND	0.651	2.00	8.00	
PFOS	ND	0.807	0.900	8.00	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	126	60 - 150	
IS	13C2-PFOA	103	60 - 150	
IS	13C8-PFOS	110	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: OPR

Modified EPA Method 537

Matrix:	Aqueous	QC Batch:	B6K0076	Lab Sample:	B6K0076-BS1
Sample Size:	0.125 L	Date Extracted:	11-Nov-2016 8:39	Date Analyzed:	16-Nov-16 11:41 Column: BEH C18

Analyte	Amt Found (ng/L)	Spike Amt	%R	Limits
PFBS	77.8	80.0	97.3	60 - 130
PFOA	77.0	80.0	96.3	70 - 130
PFOS	69.3	80.0	86.7	70 - 130

	Labeled Standard	%R	LCL-UCL
IS	13C3-PFBS	104	60 - 150
IS	13C2-PFOA	92.9	60 - 150
IS	13C8-PFOS	122	60 - 150

LCL-UCL - Lower control limit - upper control limit

Sample ID: OPR

Modified EPA Method 537

Matrix:	Aqueous	QC Batch:	B6K0146	Lab Sample:	B6K0146-BS1
Sample Size:	0.125 L	Date Extracted:	22-Nov-2016 10:24	Date Analyzed:	27-Nov-16 14:54 Column: BEH C18

Analyte	Amt Found (ng/L)	Spike Amt	%R	Limits
PFBS	91.7	80.0	115	60 - 130
PFOA	90.3	80.0	113	70 - 130
PFOS	84.5	80.0	106	70 - 130

	Labeled Standard	%R	LCL-UCL
IS	13C3-PFBS	109	60 - 150
IS	13C2-PFOA	90.1	60 - 150
IS	13C8-PFOS	96.4	60 - 150

LCL-UCL - Lower control limit - upper control limit

Sample ID: 26MW06_161101

Modified EPA Method 537

Client Data

Name:	AMEC Foster Wheeler
Project:	Alameda Basewide / 5023146096
Date Collected:	01-Nov-2016 10:10
Location:	

Sample Data

Matrix:	Groundwater
Sample Size:	0.126 L

Laboratory Data

Lab Sample:	1601395-01	Date Received:	02-Nov-2016 8:50
QC Batch:	B6K0076	Date Extracted:	11-Nov-2016 8:39
Date Analyzed:	16-Nov-16 18:12	Column:	BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.78	3.97	7.95	
PFOA	1.93	0.647	1.98	7.95	J
PFOS	ND	0.802	0.893	7.95	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	98.7	60 - 150	
IS	13C2-PFOA	86.2	60 - 150	
IS	13C8-PFOS	104	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: 26MW08_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 11:20
Location:

Sample Data

Matrix: Groundwater
Sample Size: 0.128 L

Laboratory Data

Lab Sample: 1601395-02 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 16-Nov-16 18:25 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.75	3.91	7.83	
PFOA	16.2	0.637	1.95	7.83	
PFOS	15.9	0.790	0.879	7.83	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	102	60 - 150	
IS	13C2-PFOA	91.2	60 - 150	
IS	13C8-PFOS	100	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: 26SW01_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 9:13
Location:

Sample Data

Matrix: Groundwater
Sample Size: 0.125 L

Laboratory Data

Lab Sample: 1601395-03 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 18-Nov-16 15:24 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.79	4.00	8.00	
PFOA	36.7	0.651	2.00	8.00	
PFOS	28.3	0.807	0.900	8.00	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	115	60 - 150	
IS	13C2-PFOA	95.7	60 - 150	
IS	13C8-PFOS	105	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: 26SW04_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 8:25
Location:

Sample Data

Matrix: Groundwater
Sample Size: 0.125 L

Laboratory Data

Lab Sample: 1601395-04 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 18-Nov-16 15:36 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	41.8	1.79	4.00	8.02	
PFOA	392	0.652	2.00	8.02	
PFOS	503	0.809	0.900	8.02	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	116	60 - 150	
IS	13C2-PFOA	114	60 - 150	
IS	13C8-PFOS	101	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: DUP07_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 11:25
Location:

Sample Data

Matrix: Groundwater
Sample Size: 0.126 L

Laboratory Data

Lab Sample: 1601395-05 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 16-Nov-16 19:03 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.78	3.97	7.95	
PFOA	27.5	0.647	1.98	7.95	
PFOS	ND	0.802	0.893	7.95	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	90.1	60 - 150	
IS	13C2-PFOA	101	60 - 150	
IS	13C8-PFOS	96.2	60 - 150	

DL - Detection limit
RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
Results reported to DL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: EB-26SW04_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 8:35
Location:

Sample Data

Matrix: QC Water
Sample Size: 0.130 L

Laboratory Data

Lab Sample: 1601395-08 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0146 Date Extracted: 22-Nov-2016 10:24
Date Analyzed: 27-Nov-16 16:10 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.72	3.85	7.68	
PFOA	ND	0.625	1.92	7.68	
PFOS	3.19	0.775	0.865	7.68	J

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	121	60 - 150	
IS	13C2-PFOA	106	60 - 150	
IS	13C8-PFOS	98.9	60 - 150	

DL - Detection limit
RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
Results reported to DL.
When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: FB-26SW04_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 8:30
Location:

Sample Data

Matrix: QC Water
Sample Size: 0.128 L

Laboratory Data

Lab Sample: 1601395-11 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0146 Date Extracted: 22-Nov-2016 10:24
Date Analyzed: 27-Nov-16 16:22 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.75	3.91	7.81	
PFOA	ND	0.636	1.95	7.81	
PFOS	10.5	0.788	0.879	7.81	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	111	60 - 150	
IS	13C2-PFOA	84.0	60 - 150	
IS	13C8-PFOS	99.8	60 - 150	

DL - Detection limit

RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit

Results reported to DL.

When reported, PFBS, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

Sample ID: EB18_161101

Modified EPA Method 537

Client Data

Name: AMEC Foster Wheeler
Project: Alameda Basewide / 5023146096
Date Collected: 01-Nov-2016 13:00
Location:

Sample Data

Matrix: QC Water
Sample Size: 0.123 L

Laboratory Data

Lab Sample: 1601395-12 Date Received: 02-Nov-2016 8:50
QC Batch: B6K0076 Date Extracted: 11-Nov-2016 8:39
Date Analyzed: 18-Nov-16 15:48 Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers
PFBS	ND	1.82	4.07	8.14	
PFOA	ND	0.662	2.03	8.14	
PFOS	ND	0.821	0.915	8.14	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C3-PFBS	126	60 - 150	
IS	13C2-PFOA	110	60 - 150	
IS	13C8-PFOS	122	60 - 150	

DL - Detection limit
RL - Reporting limit

LCL-UCL - Lower control limit - upper control limit
Results reported to DL.
When reported, PFBS, PFHxS, PFOA and PFOS 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.**
D	**Dilution**
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.**
M	**Estimated Maximum Possible Concentration. (CA Region 2 projects only)**
*****	**See Cover Letter**
Conc.	**Concentration**
NA	**Not applicable**
ND	**Not Detected**
TEQ	**Toxic Equivalency**

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

CERTIFICATIONS

Accrediting Authority	Certificate Number
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2014022
Nevada Division of Environmental Protection	CA004132015-1
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-004
Pennsylvania Department of Environmental Protection	012
South Carolina Department of Health	87002001
Texas Commission on Environmental Quality	T104704189-15-6
Virginia Department of General Services	7923
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	EPA 1613B

Dilution GC/HRMS	
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

1601395 0.0°C

CHAIN OF CUSTODY

MMEC Group
9177 Sky Park Court
San Diego, CA
(858) 278-3600

SHIP TO:
Vista Analytical
1104 Windfield Way
El Dorado Hills, CA 95762
Atten: Karen Lopez
Lab Phone# 916-673-1520

DATE: 11/1/2016
COC #: COC161101
PAGE: 1 OF 2

Project Name:	Alameda Basewide	Project Contact:	Marina Mitchell	Bill To:	KMEA	Disposal Instructions:	LAB
Project Number:	5023146096	Phone Number:	(503) 639-3400		2423 Hoover Ave	Shipment Method:	FEDEX
Project Manager:	Kevin Olness	Project Phase:	.03.****		National City, CA 91950	Waybill Number:	N/A

Sample Information / Methods for Analysis / RUSH

No.	Sample ID	Date & Time Sampled	Matrix	Sample Type	MS/MSD	PFOS, PFOA, and PFBS	24 Hour	48 Hour	72 Hour	5 Days	TOTAL BOTTLES	HOLD All Analyses
1	26MW06_161101	11/01/16 10:10	WG	N	N	X						
2	26MW08_161101	11/01/16 11:20	WG	N	N	X						
3	26SW01_161101	11/01/16 09:13	WG	N	N	X						
4	26SW04_161101	11/01/16 08:25	WG	N	N	X						
5	DUP07_161101	11/01/16 11:25	WG	FD	N	X						
6	EB-26MW06_161101	11/01/16 10:20	WQ	EB	N	X						X
7	EB-26SW01_161101	11/01/16 09:20	WQ	EB	N	X						X
8	EB-26SW04_161101	11/01/16 08:35	WQ	EB	N	X						X
9	FB-26MW06_161101	11/01/16 10:15	WQ	FB	N	X						X
10	FB-26SW01_161101	11/01/16 09:15	WQ	FB	N	X						X
11	FB-26SW04_161101	11/01/16 08:30	WQ	FB	N	X						X
12												

Sampler's Signature: [signature]	Date: 11/1/16	Time: 13:10	
Relinquished By/Affiliation: [signature] Ruite	Date: 11/1/16	Time: 15:00	
Received By: FedEx	Date:	Time:	
Relinquished By/Affiliation: FedEx	Date:	Time:	
Received By: [signature] VAL	Date: 11/2/16	Time: 0919	
Relinquished By/Affiliation:	Date:	Time:	
Received By (LAB):	Date:	Time:	

For Lab Use

Does COC match samples:	Y or N
Broken Container:	Y or N
COC seal intact:	Y or N
Other problems:	Y or N
WSDOT contacted:	Y or N
Date contacted:	
Cooler Temperature at receipt:	°C

Comments:
X=Analyze H=Hold Analysis Request
EB-..., FB-... Extraction Only

NUMBER OF COOLERS SENT: 1

1601395

MMEC Group
9177 Sky Park Court
San Diego, CA
(858) 278-3600

SHIP TO:
Vista Analytical
1104 Windfield Way
El Dorado Hills, CA 95762
Atten: Karen Lopez
Lab Phone# 916-673-1520

CHAIN OF CUSTODY

DATE: 11/1/2016
COC #: COC161101
PAGE: 2 OF 2

Project Name:	Alameda Basewide	Project Contact:	Marina Mitchell	Bill To:	KMEA	Disposal Instructions:	LAB
Project Number:	5023146096	Phone Number:	(503) 639-3400		2423 Hoover Ave	Shipment Method:	FEDEX
Project Manager:	Kevin Olness	Project Phase:	.03.****		National City, CA 91950	Waybill Number:	N/A

Sample Information						Methods for Analysis	RUSH					
No.	Sample ID	Date & Time Sampled	Matrix	Sample Type	MS/MSD	PFOS, PFOA, and PFBS	24 Hour	48 Hour	72 Hour	5 Days	TOTAL BOTTLES	HOLD All Analyses
1	EB18_161101	11/01/16 13:00	WQ	EB	N	X						
2	EB-26MW08_161101	11/01/16 11:35	WQ	EB	N	X						X
3	FB-26MW08_161101	11/01/16 11:30	WQ	FB	N	X						X
4												
5												
6												
7												
8												
9												
10												
11												
12												

Sampler's Signature:	Date: 11/1/16	Time: 13:10
Relinquished By/Affiliation: Meg Rustic	Date: 11/1/16	Time: 15:00
Received By: FedEx	Date:	Time:
Relinquished By/Affiliation: FedEx	Date:	Time:
Received By: VAL	Date: 11/2/16	Time: 0919
Relinquished By/Affiliation:	Date:	Time:
Received By (LAB):	Date:	Time:

For Lab Use

Does COC match samples:	Y or N
Broken Container:	Y or N
COC seal intact:	Y or N
Other problems:	Y or N
WSDOT contacted:	Y or N
Date contacted:	
Cooler Temperature at receipt:	°C

Comments:
X=Analyze H=Hold Analysis Request
EB-... , FB-... Extraction Only

NUMBER OF COOLERS SENT: 1

SAMPLE LOG-IN CHECKLIST

Vista Analytical Laboratory

Vista Project #: 1601395 **TAT** 14

Samples Arrival:	**Date/Time** 11/2/16 0850		**Initials:** VBLB			**Location:** WR-2 **Shelf/Rack:** NA	
Logged In:	**Date/Time** 11/2/16 1346		**Initials:** VBLB			**Location:** WR-2 **Shelf/Rack:** B 6	
Delivered By:	FedEx	UPS	On Trac	DHL	Hand Delivered	Other	
Preservation:	Ice	Blue Ice		Dry Ice	None		
Temp °C: 0.3 (uncorrected) **Temp °C:** 0.0 (corrected)		**Time:** 0918 **Probe used:** Yes☐ No☑			**Thermometer ID:** IR-1		

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill / Trk # 8081 8722 0840	✓		
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			Yes	No NA
Shipping Container	Vista	Client	Retain	Return	Dispose	

Comments:

BLA 09/06/2016

EXTRACTION INFORMATION

Process Sheet

Workorder: 1601395

Prep Expiration: 11/15/2016

Client: AMEC Foster Wheeler

Workorder Due: 16-Nov-16 00:00

TAT: 14

Method: **537 PFAS**

Matrix: **Aqueous**

Prep Batch: B6K0076

Prep Data Entered: INJ 11/12/16

Date and Initials

Version: Version1-PFOA, PFOS, PFBS only

Initial Sequence: _____

LabSampleID	Recon	ClientSampleID	Date Received	Location	Comments
1601395-01	☑	26MW06_161101	02-Nov-16 08:50	WR-2 B-6	
1601395-02	☑	26MW08_161101	02-Nov-16 08:50	WR-2 B-6	
1601395-03	☑	26SW01_161101	02-Nov-16 08:50	WR-2 B-6	
1601395-04	☑	26SW04_161101	02-Nov-16 08:50	WR-2 B-6	
1601395-05	☑	DUP07_161101	02-Nov-16 08:50	WR-2 B-6	
1601395-06	☑	EB-26MW06_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
1601395-07	☑	EB-26SW01_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
1601395-08	☑	EB-26SW04_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
1601395-09	☑	FB-26MW06_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
1601395-10	☑	FB-26SW01_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
1601395-11	☑	FB-26SW04_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
1601395-12	☑	EB18_161101	02-Nov-16 08:50	WR-2 B-6	
1601395-13	☑	EB-26MW08_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
1601395-14	☑	FB-26MW08_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**

* Taken off hold 11/21/16 *

WO Comments: **DoD**

Extract all of the Equipment Blanks, but only analyze the extract if the associated sample exceeds EPA PHAs (70 ng/L) for PFOA, PFOS, PFOA + PFOS and 380 ug/L for PFBS.

Vista PM: Martha Maier

Vial Box ID: The Internet

Sample Reconciled By: _____ 11/14/16

Page 1 of 1

Percent Solids

Vista Analytical Laboratory

Project: BLK0076 **Balance ID:** HRMS8

Sample ID	Chemist: NA Date: — Time: ↓ Boat Wt.	Chemist: NA Date: — Time: ↓ Sample + Boat Wt.	Residue + Boat Wt.	Chemist/Date JS 11/11/16 pH before	pH* after	Cl
1601395 -01 (D)				8	2	0
-02				8	2	0
-03 (B)				8	2	0
-04 (A)				8	2	0
-05 (D)				8	2	0
-06 (C)				5	2	0
-07				5	2	0
-08				5	2	0
-09				5	2	0
-10				5	2	0
-11				5	2	0
-12				5	2	0
-13				5	2	0
-14				5	2	0
1601434 -01				6	2	0
-02				6	2	0

JS 11/11/16

Procedure:

- Tare the balance.
- Record Boat Weight.
- Add 2 - 10 g of sample.
- Record Wet Wt. + Boat Wt.
- Dry in oven overnight at 107°C.
- Tare the balance.
- Record Residue + Boat Wt.

Notes:

(A) 8 drops HCl used to adjust pH

(B) 3 drops HCl used to adjust pH JS 11/11/16

(C) 2 drops HCl used to adjust pH

(D) 14 drops HCl used to adjust pH

- *Methods 8280, 613, 1613, 8290, 1614 – pH <9*
- *Methods 1668/PCN – pH 2-3*
- *NCASI 551 – pH 1*

%Solids rmh 5/2011

PREPARATION BENCH SHEET

Matrix: Aqueous

Method: 537 PFAS

Method: 537 PFAS DOD (LOQ as mRL)

B6K0076

Chemist: ESchneider

Prep Date/Time: 11-Nov-16 08:39

Prepared using: LCMS - SPE Extraction-LCMS

C	VISTA Sample ID	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	SPE B6K0068	RS CHEM/WIT DATE
☐	B6K0076-BLK1	NA	NA	(0.125)	ES JS 11/11/16	JS 11/11/16	ES JS 11/11/16
☐	B6K0076-BS1	↓	↓	↓	↓	↓	↓
☐	1601395-01 (A)	153.14	27.37	0.12577			
☐	1601395-02 ~~(A)~~ (B) JS 11/11/16	153.93	26.25	0.12768			
☐	1601395-03	152.28	27.31	0.12497			
☐	1601395-04 (A)	152.05	27.32	0.12473			
☐	1601395-05 ~~(A)~~ (B) JS 11/11/16	152.02	26.18	0.12584			
☐	1601395-06	150.00	27.31	0.12269			
☐	1601395-07	151.98	27.30	0.12468			
☐	1601395-08	149.92	27.22	0.12270			
☐	1601395-09	152.60	27.38	0.12522			
☐	1601395-10	153.30	27.33	0.12597			
☐	1601395-11	150.60	27.22	0.12338			
☐	1601395-12	150.15	27.24	0.12291			
☐	1601395-13	151.99	27.32	0.12467			
☐	1601395-14	151.35	27.32	0.12403	✓	↓	✓

IS Name	NS Name	RS Name		
(V4)	(V2)	(J1)	SPE Chem: Strata XAW 33um 200mg/6mL	Check Out: Chemist/Date: JS 11/11/16
16I2604, 10uL	16I1601, 10uL	16I7603, 10uL	Ele SOLV: 0.5% NH4OH in MeOH + MeOH	Check In: Chemist/Date: NA
			Final Volume(s) 1mL	Balance ID: HRMS8

Comments: · Assume 1 g = 1 mL (A) Sample contained particulate - Transferred to secondary container and centrifuged then decanted into original container. JS 11/11/16

(B) Sample contained particulate. Transferred to secondary container and centrifuged then decanted

PREPARATION BENCH SHEET

Matrix: Aqueous

Method: 537 PFAS

Method: 537 PFAS DOD (LOO as mRL)

B6K0076

Chemist: E. Schneider

Prep Date/Time: 11-Nov-16 08:39

Prepared using: LCMS - SPE Extraction-LCMS

C	VISTA Sample ID	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	SPE	RS CHEM/WIT DATE
☐	1601434-01 (A)	154.33	26.97	0.12736	88 JS 11/11/16	JS 11/11/16	88 JS 11/14/16
☐	1601434-02 (A) (B) JS 11/11/16	151.98	26.29	0.12569	↓	↓	↓

(A) Sample contained particulate. Transferred to secondary container and centrifuged then decanted into original container. JS 11/11/16

(B) Sample contained particulate. Transferred to secondary container and centrifuged then decanted into new bottle due to excess particulate adhering to original. JS 11/11/16

IS Name	NS Name	RS Name		
(U4) 16J1604, 10uL	(U2) 16J1601, 10uL	(U1) 16J1603, 10uL	SPE Chem: Strata X AW 33um 200mg/6mL Ele SOLV: 0.5% NH4OH in MeOH then MeOH Final Volume(s) 1mL	Check Out: Chemist/Date: JS 11/11/16 Check In: Chemist/Date: NA Balance ID: HRMS8

Comments: Assume 1 g = 1 mL

Process Sheet

Workorder: 1601395

Prep Expiration: 11/15/2016

Client: AMEC Foster Wheeler

Workorder Due: 16-Nov-16 00:00

TAT: 14

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

Matrix: **Aqueous**

Prep Batch: B16K0146

Prep Data Entered: 11/23/16 JS
Date and Initials

Version: PFOA PFOS PFBS

Initial Sequence: S16K0071

LabSampleID	Recon	ClientSampleID	Date Received	Location	Comments
~~1601395-01~~	☐	26MW06_161101	02-Nov-16 08:50	WR-2 B-6	
~~1601395-02~~	☐	26MW08_161101	02-Nov-16 08:50	WR-2 B-6	
~~1601395-03~~	☐	26SW01_161101	02-Nov-16 08:50	WR-2 B-6	
~~1601395-04~~	☐	26SW04_161101	02-Nov-16 08:50	WR-2 B-6	
~~1601395-05~~	☐	DUP07_161101	02-Nov-16 08:50	WR-2 B-6	
~~1601395-06~~	☐	EB-26MW06_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
~~1601395-07~~	☐	EB-26SW01_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
1601395-08	☑	EB-26SW04_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
~~1601395-09~~	☐	FB-26MW06_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
~~1601395-10~~	☐	FB-26SW01_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
1601395-11	☑	FB-26SW04_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
~~1601395-12~~	☐	EB18_161101	02-Nov-16 08:50	WR-2 B-6	
~~1601395-13~~	☐	EB-26MW08_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**
~~1601395-14~~	☐	FB-26MW08_161101	02-Nov-16 08:50	WR-2 B-6	**Extract and hold**

WO Comments: **DoD**

Extract all of the Equipment Blanks, but only analyze the extract if the associated sample exceeds EPA PHAs (70 ng/L) for PFOA, PFOS, PFOA + PFOS and 380 ug/L for PFBS.

Vista PM:Martha Maier

Vial Box ID: Tardis

Sample Reconciled By: 11/22/16

Page 1 of 1

Percent Solids

Vista Analytical Laboratory

Project: BLK 0146 *Balance ID:* HPMS8

Sample ID	Chemist: NA Date: T Time: V — Boat Wt.	Sample + Boat Wt.	Chemist: NA Date: T Time: V — Residue + Boat Wt.	Chemist/Date JS 11/22/14 — pH before	pH* after	Cl
1601395-08 (A)				≤	2	○
JV - 11			JS 11/22/14	≤	2	○

Procedure:

- Tare the balance.
- Record Boat Weight.
- Add 2 - 10 g of sample.
- Record Wet Wt. + Boat Wt.
- Dry in oven overnight at 107°C.
- Tare the balance.
- Record Residue + Boat Wt.

Notes:

(A) 7 drops HCl used to adjust pH JS 11/24/14

- *Methods 8280, 613, 1613, 8290, 1614 – pH <9*
- *Methods 1668/PCN – pH 2-3*
- *NCASI 551 – pH 1*

%Solids rmh 5/21

PREPARATION BENCH SHEET

- **Matrix: Aqueous**
- **Method: 537 PFAS DOD (LOO as mRL)**

B6K0146

Chemist: E. Schneider

Prep Date/Time: 22-Nov-16 10:24

Prepared using: LCMS - SPE Extraction-LCMS

C	VISTA Sample ID	Bottle + Sample (g)	Bottle Only (g)	Sample Amt. (L)	IS/NS CHEM/WIT DATE	SPE C6K0121	RS CHEM/WIT DATE
☐	B6K0146-BLK1	NA	NA	(0.125)	ES JS 11/22/16	dm 11/22/16	dm JS 11/22/16
☐	B6K0146-BS1	↓	↓	↓	↓	↓	↓
☐	1601395-08RE2	157.43	27.28	0.13015 ✓			
☐	1601395-11RE2	155.23	27.27	0.12796			

IS Name	NS Name	RS Name		
(IS2) 16I2604, 10mL	(NS) 16I1601, 10mL	16K1105, 10mL (VCO)	SPE Chem: Strata XAW 33um 200mg/6mL Ele SOLV: 0.5% NH4OH in MeOH + MeOH Final Volume(s): 1mL	Check Out: Chemist/Date: JS 11/22/16 Check In: Chemist/Date: NA Balance ID: HRMS8

Comments: Assume 1 g = 1 mL

SAMPLE DATA – MODIFIED EPA METHOD 537

Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161116J3\161116J3_07.qld

Last Altered: Thursday, November 17, 2016 14:51:55 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:54:03 Pacific Standard Time

Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 15 Nov 2016 11:51:30
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

ID: B6K0076-BLK1, Description: Method Blank, Name: 161116J3_07.wiff, Date: 16-Nov-2016, Time: 14:33:22

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3	PFBS	79.90		7.135e3		0.125			
2	5	PFHpA	318.90		8.459e3		0.125			
3	6	PFHxS	79.91	1.316e1	1.352e3		0.125	4.40	0.198	
4	8	PFOA	368.90	6.553e1	7.467e3		0.125	4.69	0.381	
5	9	PFNA	419.00		6.042e3		0.125			
6	10	PFOS	79.92	2.557e0	3.658e3		0.125	5.09		
7	15	13C3-PFBS	79.95	7.135e3	1.095e4	0.531	0.125	3.41	123	123
8	16	13C2-PFHxA	269.90	4.360e3	1.095e4	0.905	0.125	3.81	44.0	110
9	17	13C4-PFHpA	321.90	8.459e3	1.095e4	0.770	0.125	4.29	100	100
10	18	18O2-PFHxS	102.90	1.352e3	4.656e3	0.276	0.125	4.40	105	105
11	19	13C2-6:2 FTS	408.90	2.462e3	1.108e4	0.219	0.125	4.64	102	102
12	20	13C2-PFOA	369.90	7.467e3	1.108e4	0.663	0.125	4.69	102	102
13	21	13C5-PFNA	422.90	6.042e3	6.195e3	1.019	0.125	5.03	95.7	95.7
14	22	13C8-PFOS	79.93	3.658e3	4.013e3	0.921	0.125	5.09	98.9	98.9
15	25	13C4-PFBA	171.90	1.074e4	1.074e4	1.000	0.125	1.93	100	100
16	26	13C5-PFHxA	273.00	1.095e4	1.095e4	1.000	0.125	3.81	100	100
17	27	13C3-PFHxS	80.01	4.656e3	4.656e3	1.000	0.125	4.40	100	100
18	28	13C8-PFOA	375.90	1.108e4	1.108e4	1.000	0.125	4.68	100	100
19	29	13C4-PFOS	79.94	4.013e3	4.013e3	1.000	0.125	5.09	100	100
20	30	13C9-PFNA	427.00	6.195e3	6.195e3	1.000	0.125	5.02	100	100
21	31	13C6-PFDA	474.00	5.084e3	5.084e3	1.000	0.125	5.32	100	100
22	32	Total PFBS	79.90		7.135e3		0.125			
23	33	Total PFHxS	79.91		1.352e3		0.125		0.198	
24	34	Total PFOA	368.90		7.467e3		0.125		0.381	
25	35	Total PFOS	79.92		3.658e3		0.125			

Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161116J3\161116J3_07.qld

Last Altered: Thursday, November 17, 2016 14:51:55 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:54:03 Pacific Standard Time

Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 15 Nov 2016 11:51:30
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

ID: B6K0076-BLK1, Description: Method Blank, Name: 161116J3_07.wiff, Date: 16-Nov-2016, Time: 14:33:22

Total PFBS

	#	Name	Trace	RT	Area	IS Area	Conc.
1							

Total PFHxS

	#	Name	Trace	RT	Area	IS Area	Conc.
1	6	PFHxS	79.91	4.40	13.158	1352.000	0.2

Total PFOA

	#	Name	Trace	RT	Area	IS Area	Conc.
1	8	PFOA	368.90	4.69	65.525	7467.182	0.4

Total PFOS

	#	Name	Trace	RT	Area	IS Area	Conc.
1	35	Total PFOS	79.92	5.01	9.962	3658.097	
2	10	PFOS	79.92	5.09	2.557	3658.097	

Vista Analytical Laboratory Q1

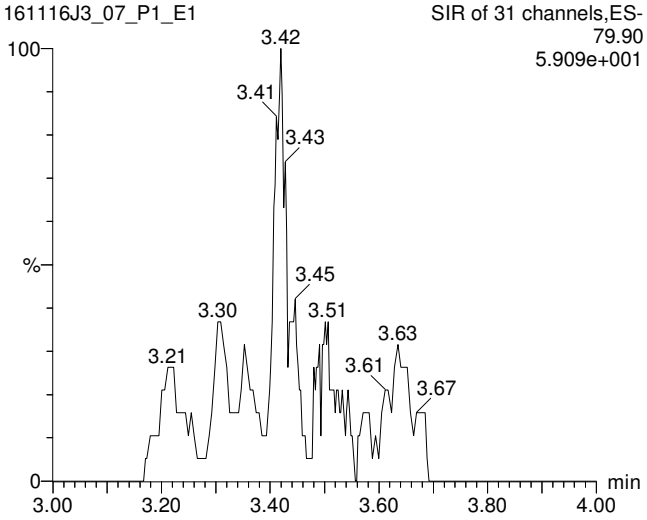
Dataset: U:\Q2.PRO\Results\161116J3\161116J3_07.qld

Last Altered: Thursday, November 17, 2016 14:51:55 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:54:03 Pacific Standard Time

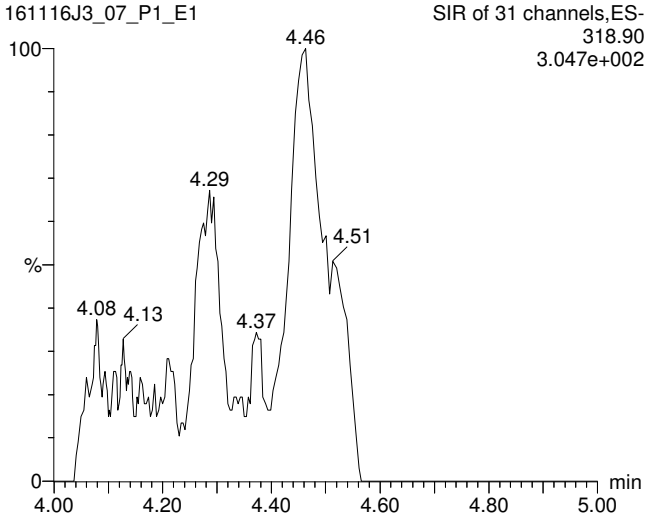
Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 15 Nov 2016 11:51:30
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

ID: B6K0076-BLK1, Description: Method Blank, Name: 161116J3_07.wiff, Date: 16-Nov-2016, Time: 14:33:22, Instrument: , Lab: ©PE-SCIEX, User: sciex

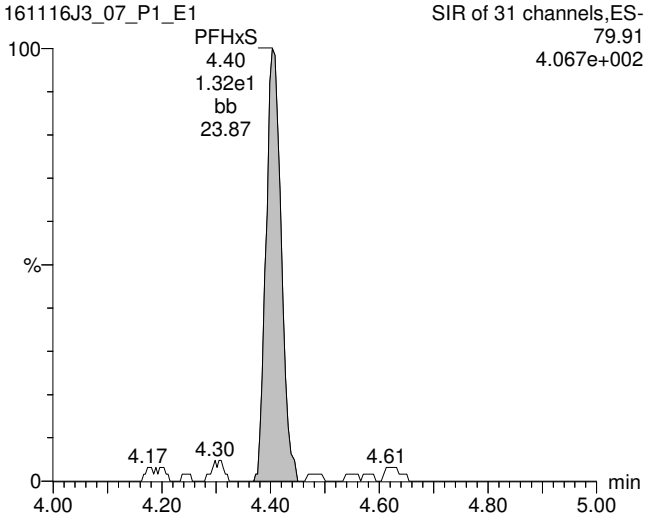
Total PFBS



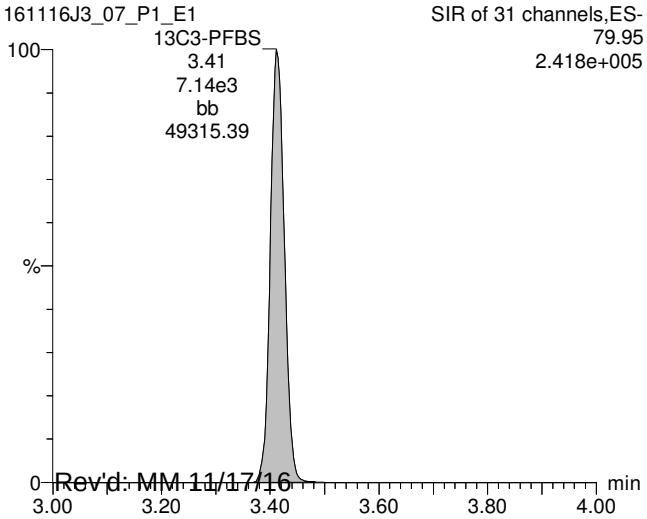
PFHpA



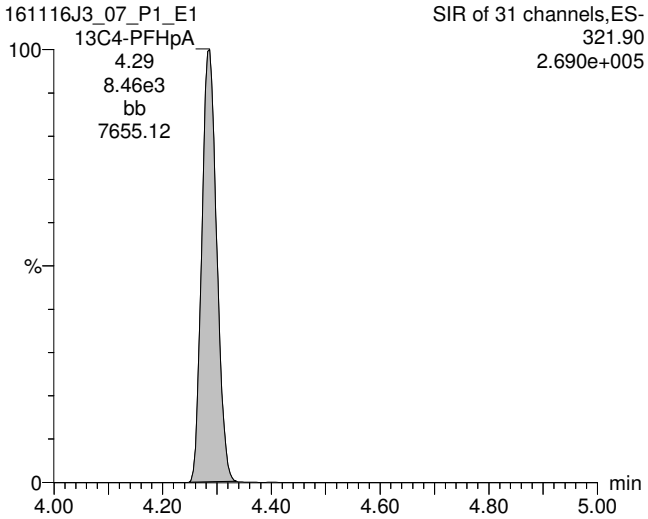
Total PFHxS



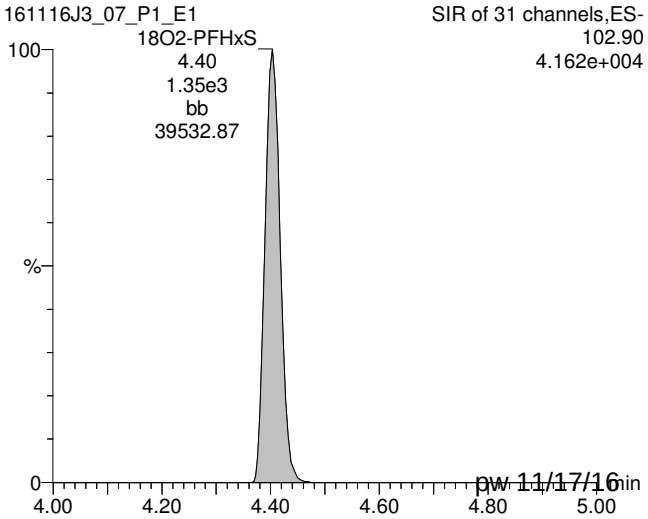
13C3-PFBS



13C4-PFHpA



18O2-PFHxS



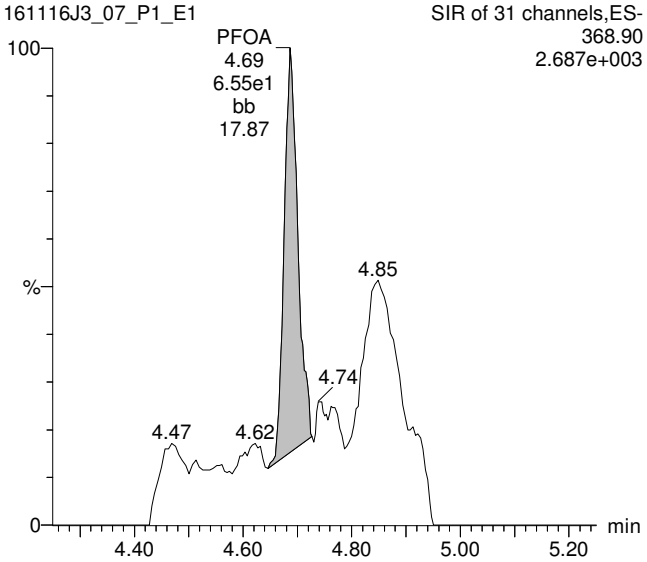
Rev'd: MM 11/17/16 pw 11/17/16

Dataset: U:\Q2.PRO\Results\161116J3\161116J3_07.qld

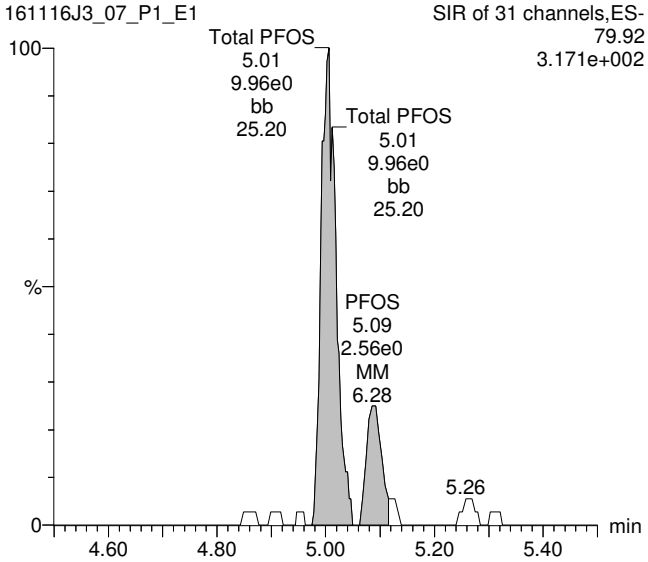
Last Altered: Thursday, November 17, 2016 14:51:55 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:54:03 Pacific Standard Time

ID: B6K0076-BLK1, Description: Method Blank, Name: 161116J3_07.wiff, Date: 16-Nov-2016, Time: 14:33:22, Instrument: , Lab: ©PE-SCIEX, User: sciex

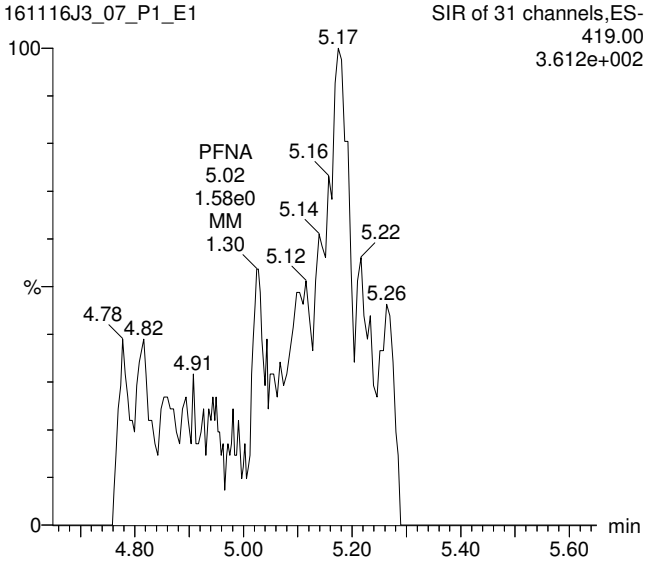
Total PFOA



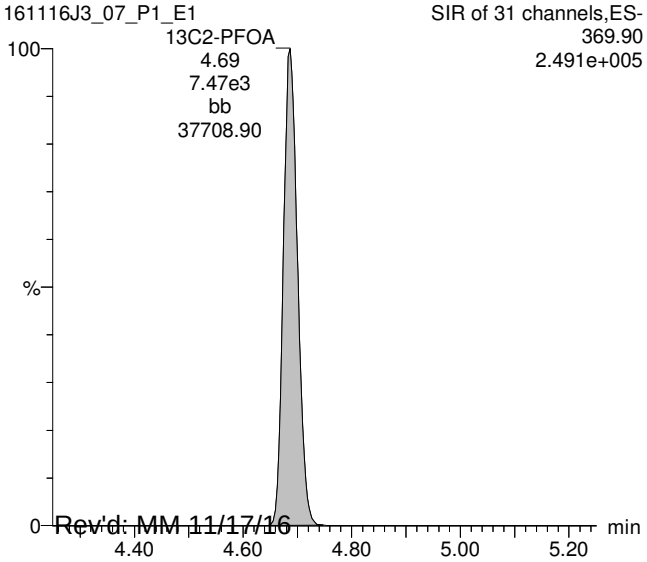
Total PFOS



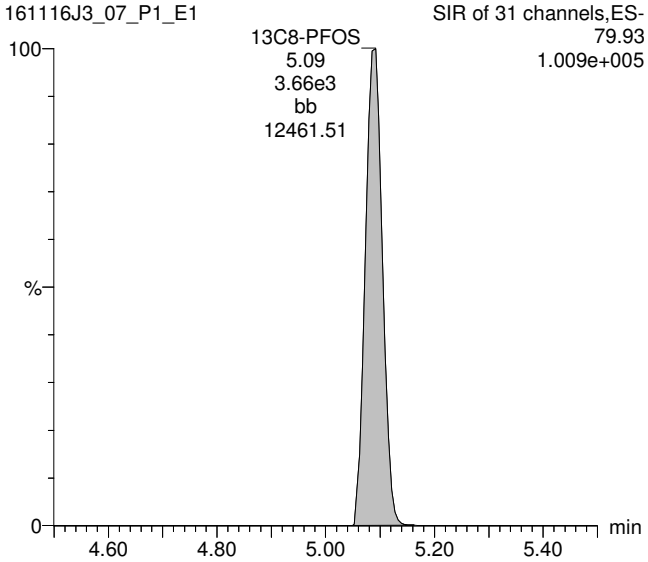
PFNA



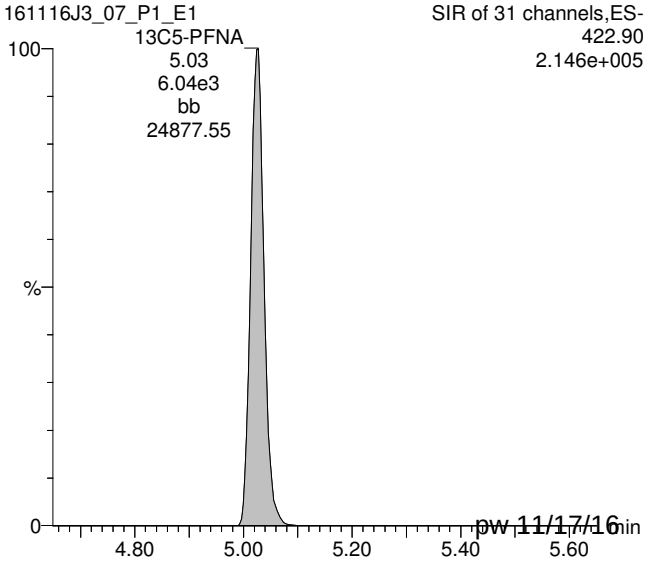
13C2-PFOA



13C8-PFOS



13C5-PFNA



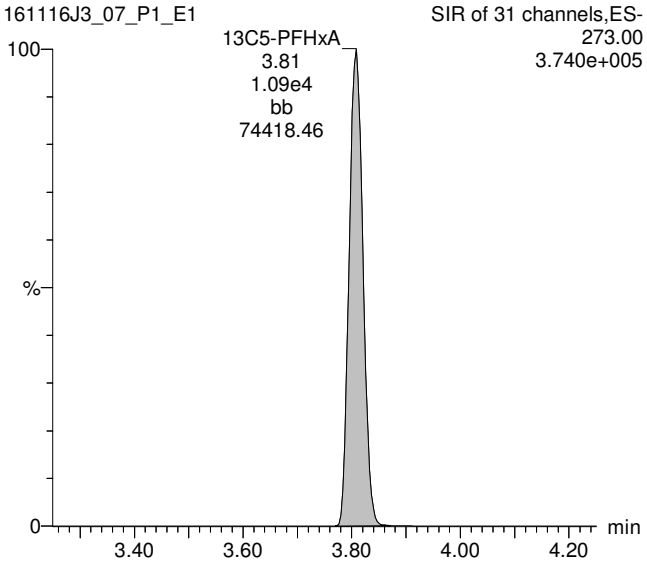
Rev'd: MM 11/17/16 pw 11/17/16

Dataset: U:\Q2.PRO\Results\161116J3\161116J3_07.qld

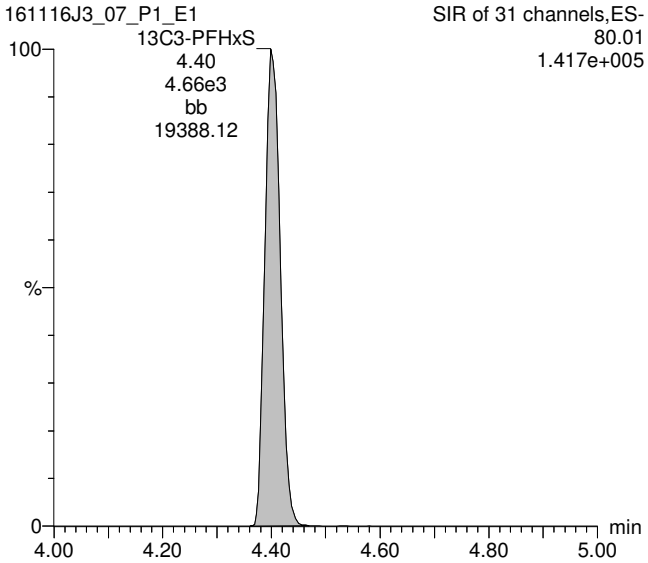
Last Altered: Thursday, November 17, 2016 14:51:55 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:54:03 Pacific Standard Time

ID: B6K0076-BLK1, Description: Method Blank, Name: 161116J3_07.wiff, Date: 16-Nov-2016, Time: 14:33:22, Instrument: , Lab: ©PE-SCIEX, User: sciex

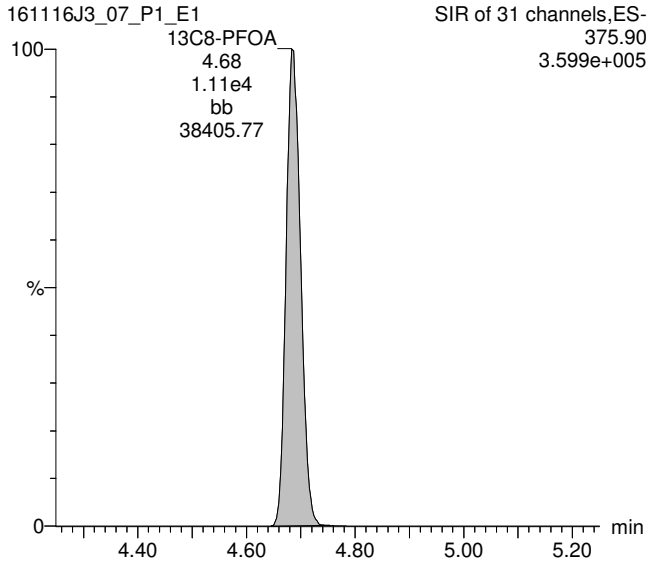
13C5-PFHxA



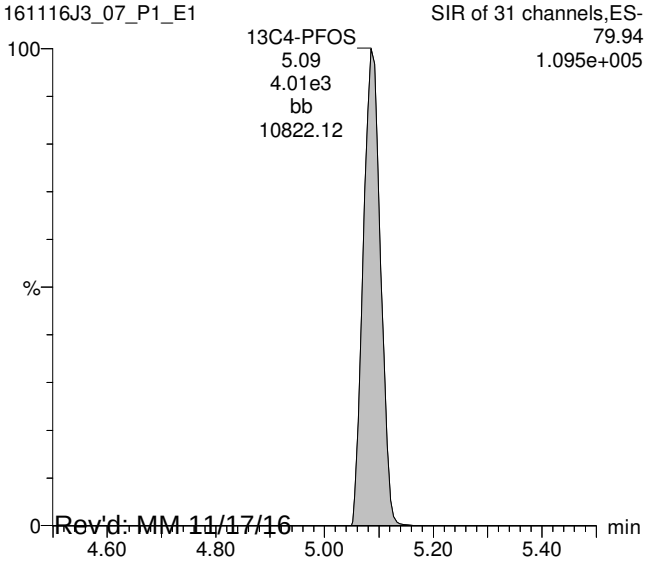
13C3-PFHxS



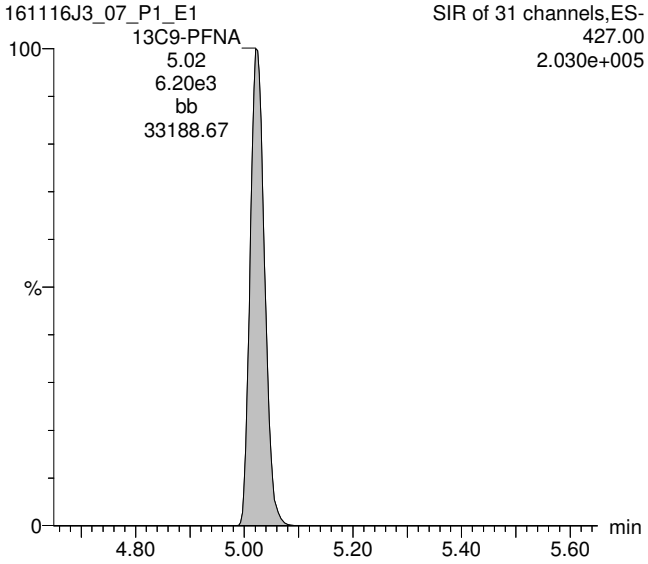
13C8-PFOA



13C4-PFOS



13C9-PFNA



Rev'd: MM 11/17/16

pw 11/17/16

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-5.qld

Last Altered: Thursday, November 17, 2016 14:13:33 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:14:05 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

ID: B6K0076-BS1 OPR 0.125, Description: OPR, Name: 161116G1_5, Date: 16-Nov-2016, Time: 11:41:16

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	1	PFBS	299 > 79.7	7.181e3	6.695e3		0.125	3.09	77.8	97.3
2	3	PFHpA	363 > 318.9	1.719e4	1.958e4		0.125	3.97	72.4	90.4
3	4	PFHxS	398.9 > 79.6	6.640e3	6.321e3		0.125	4.09	79.9	99.9
4	5	PFOA	413 > 368.7	1.733e4	2.734e4		0.125	4.37	77.0	96.3
5	6	PFOS	499 >79.9	3.368e3	6.766e3		0.125	4.77	69.3	86.7
6	7	PFNA	463 > 418.8	1.367e4	1.060e4		0.125	4.71	80.5	101
7	9	13C3-PFBS	302.0 > 98.8	6.695e3	2.583e4	0.250	0.125	3.09	104	104
8	10	13C2-PFHxA	315 > 269.8	7.714e3	2.583e4	0.741	0.125	3.46	40.3	101
9	11	13C4-PFHpA	367.2 > 321.8	1.958e4	9.476e3	2.077	0.125	3.97	99.5	99.5
10	12	18O2-PFHxS	403 > 102.6	6.321e3	9.476e3	0.603	0.125	4.09	111	111
11	13	13C2-PFOA	414.9 > 369.7	2.734e4	1.206e4	2.438	0.125	4.37	92.9	92.9
12	14	13C8-PFOS	507.0 > 79.9	6.766e3	5.254e3	1.055	0.125	4.77	122	122
13	15	13C5-PFNA	468.2 > 422.9	1.060e4	1.025e4	1.158	0.125	4.71	89.3	89.3
14	16	13C2-PFDA	515.1 > 469.9	9.347e3	1.075e4	1.164	0.125	5.02	74.7	74.7
15	17	13C5-PFHxA	318.0 > 272.9	2.583e4	2.583e4	1.000	0.125	3.46	100	100
16	18	13C3-PFHxS	401.9 > 79.9	9.476e3	9.476e3	1.000	0.125	4.09	100	100
17	19	13C8-PFOA	421.3 > 376	1.206e4	1.206e4	1.000	0.125	4.37	100	100
18	20	13C4-PFOS	503.0 > 79.9	5.254e3	5.254e3	1.000	0.125	4.77	100	100
19	21	13C9-PFNA	472.2 > 426.9	1.025e4	1.025e4	1.000	0.125	4.71	100	100
20	22	13C6-PFDA	519.1 > 473.7	1.075e4	1.075e4	1.000	0.125	5.02	100	100
21	23	Total PFBS	299 > 79.7		6.695e3		0.125		77.8	
22	24	Total PFHxS	398.9 > 79.6		6.321e3		0.125		79.9	
23	25	Total PFOA	413 > 368.7		2.734e4		0.125		77.0	
24	26	Total PFOS	499 > 79.9		6.766e3		0.125		69.3	

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-5.qld

Last Altered: Thursday, November 17, 2016 14:13:33 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:14:05 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

ID: B6K0076-BS1 OPR 0.125, Description: OPR, Name: 161116G1_5, Date: 16-Nov-2016, Time: 11:41:16

Total PFBS

	#	Name	Trace	RT	Area	IS Area	Conc.
1	1	PFBS	299 > 79.7	3.09	7181.011	6694.600	77.8

Total PFHxS

	#	Name	Trace	RT	Area	IS Area	Conc.
1	4	PFHxS	398.9 > 79.6	4.09	6639.874	6321.212	79.9

Total PFOA

	#	Name	Trace	RT	Area	IS Area	Conc.
1	5	PFOA	413 > 368.7	4.37	17333.859	27336.398	77.0

Total PFOS

	#	Name	Trace	RT	Area	IS Area	Conc.
1	6	PFOS	499 >79.9	4.77	3367.681	6766.138	69.3

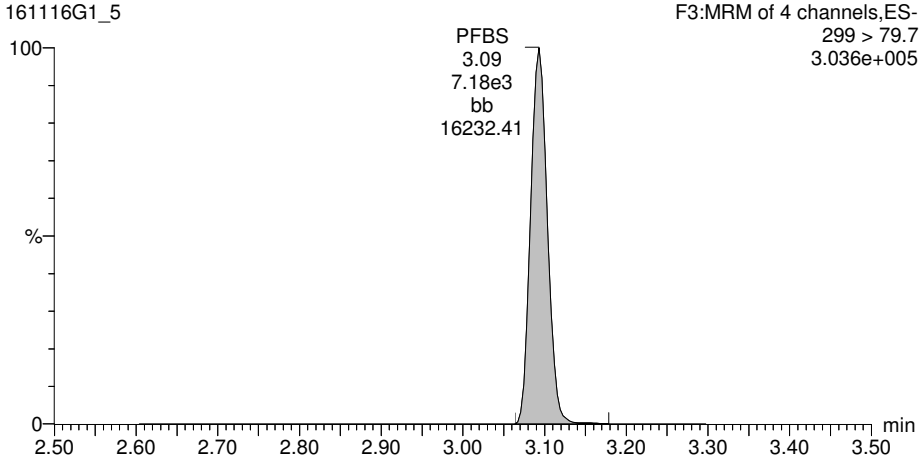
Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-5.qld

Last Altered: Thursday, November 17, 2016 14:13:33 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:14:05 Pacific Standard Time

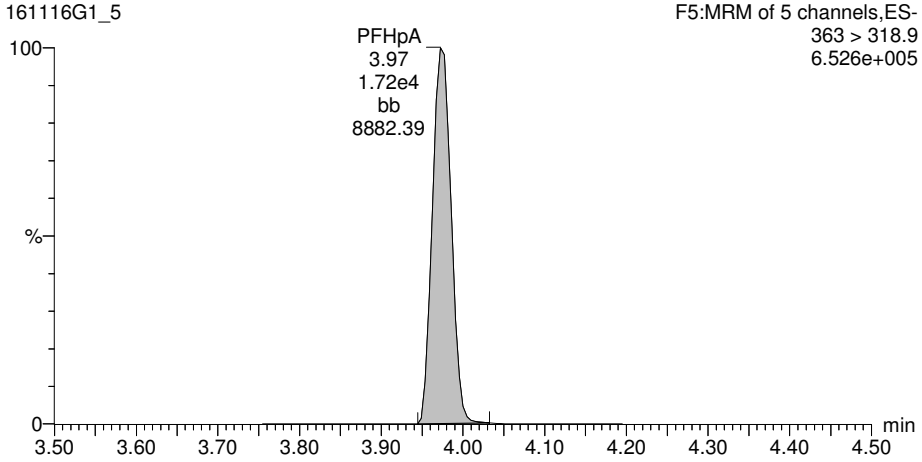
Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

ID: B6K0076-BS1 OPR 0.125, Description: OPR, Name: 161116G1_5, Date: 16-Nov-2016, Time: 11:41:16, Instrument: , Lab: , User:

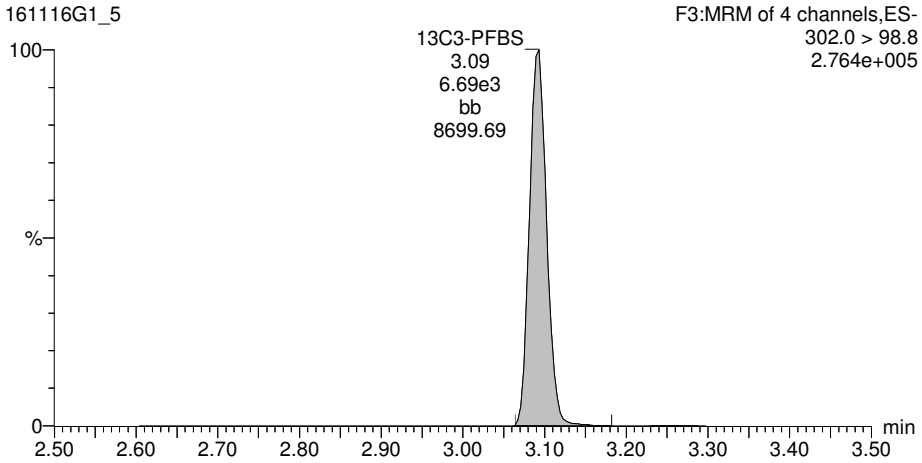
Total PFBS



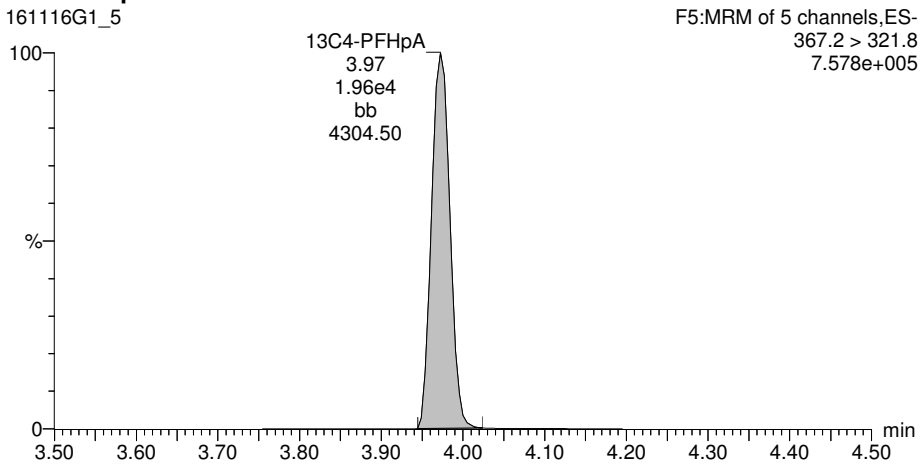
PFHpA



13C3-PFBS



13C4-PFHpA



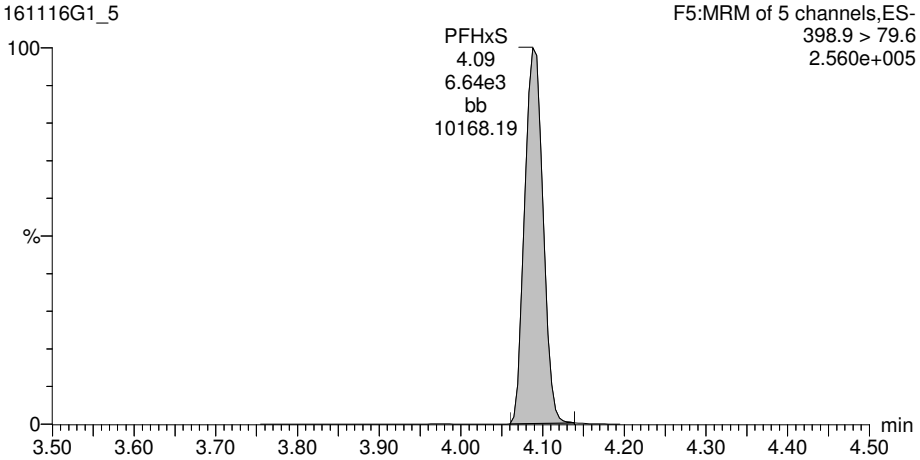
Rev'd: MM 11/17/16 AC 11/17/16

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-5.qld

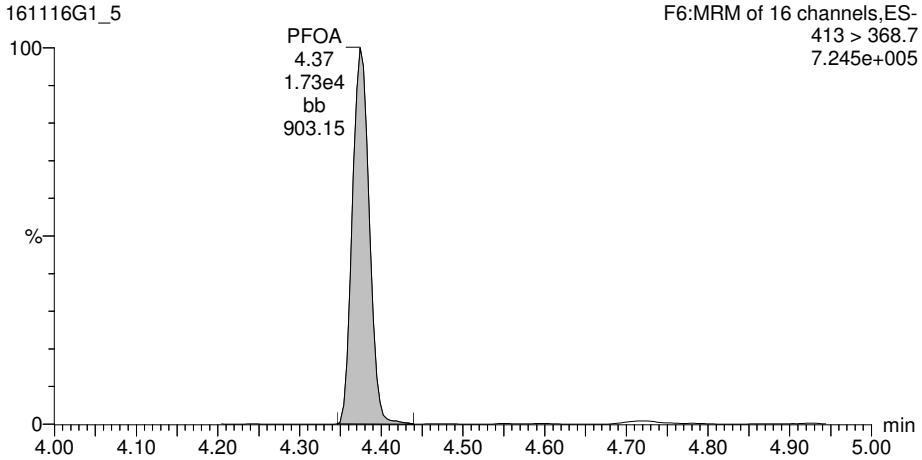
Last Altered: Thursday, November 17, 2016 14:13:33 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:14:05 Pacific Standard Time

ID: B6K0076-BS1 OPR 0.125, Description: OPR, Name: 161116G1_5, Date: 16-Nov-2016, Time: 11:41:16, Instrument: , Lab: , User:

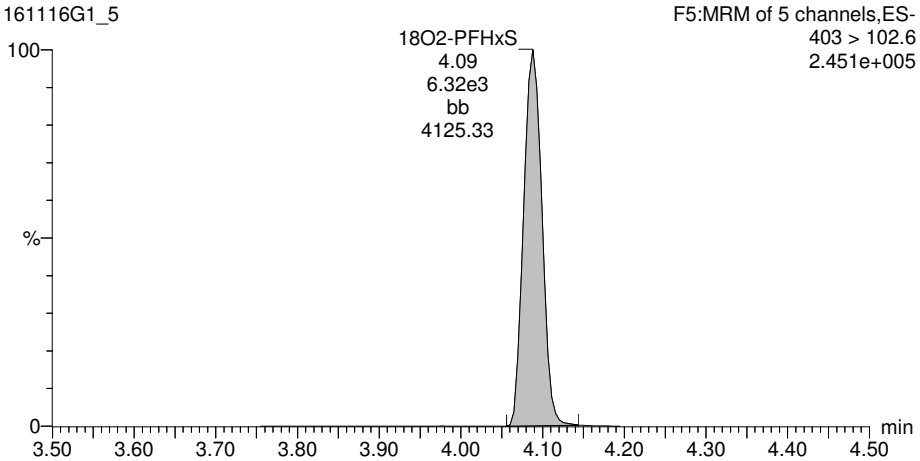
Total PFHxS



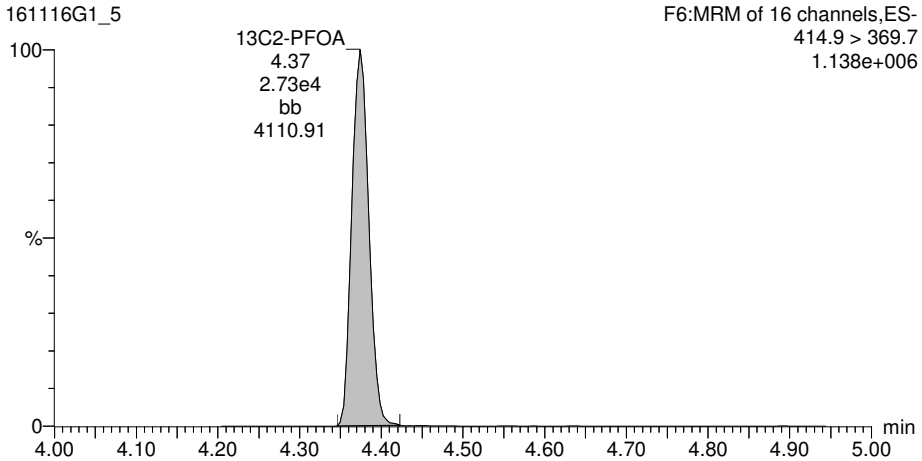
Total PFOA



18O2-PFHxS



13C2-PFOA



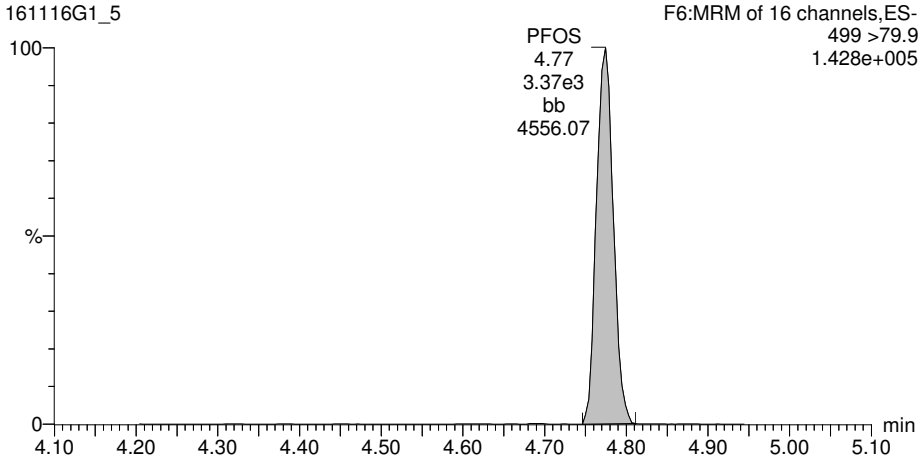
Rev'd: MM 11/17/16 AC 11/17/16

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-5.qld

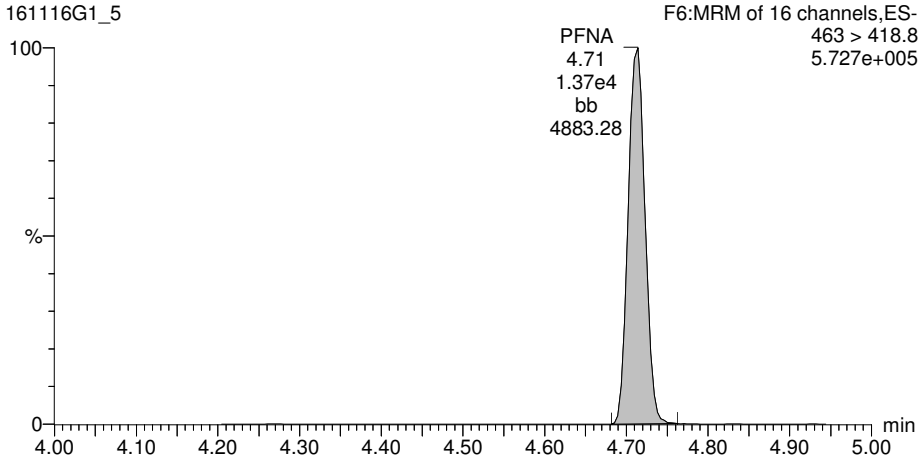
Last Altered: Thursday, November 17, 2016 14:13:33 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:14:05 Pacific Standard Time

ID: B6K0076-BS1 OPR 0.125, Description: OPR, Name: 161116G1_5, Date: 16-Nov-2016, Time: 11:41:16, Instrument: , Lab: , User:

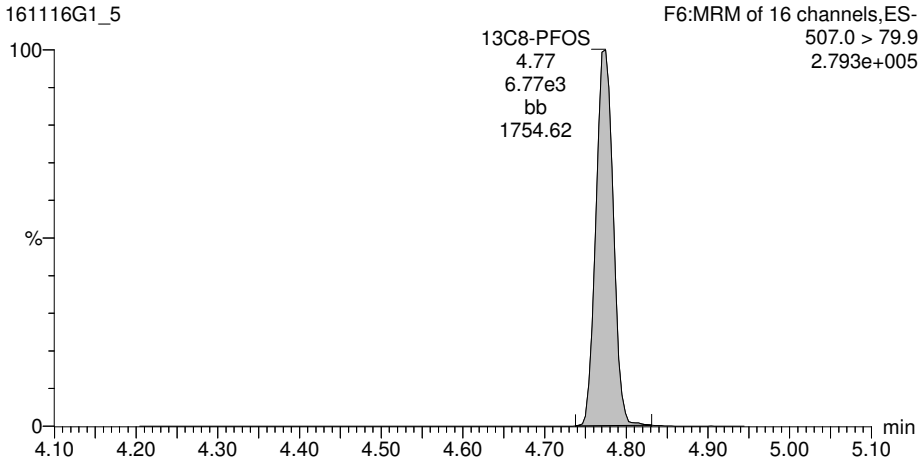
Total PFOS



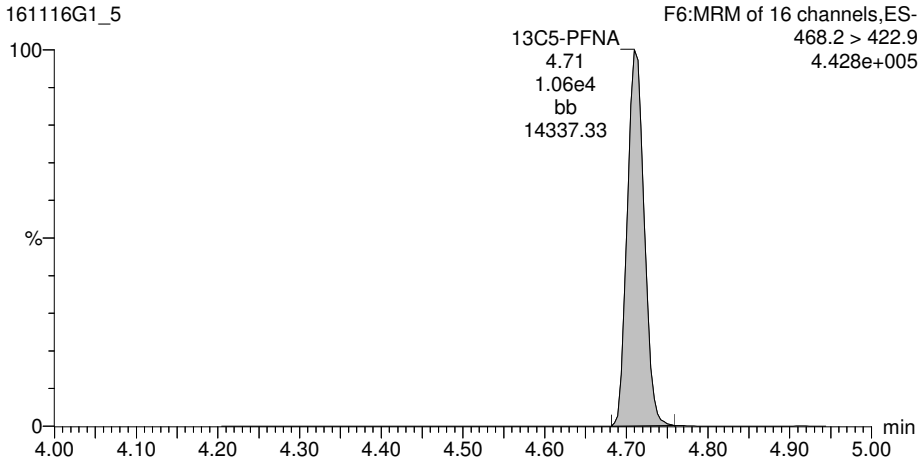
PFNA



13C8-PFOS



13C5-PFNA



Rev'd: MM 11/17/16 AC 11/17/16

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-5.qld

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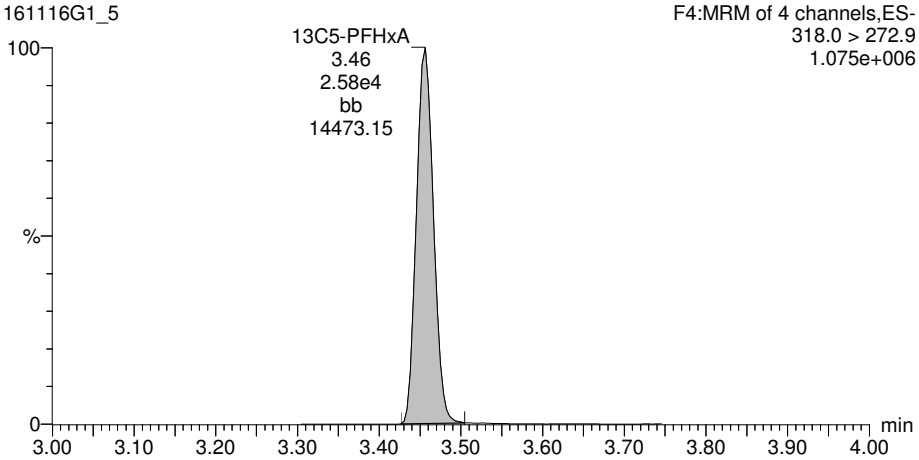
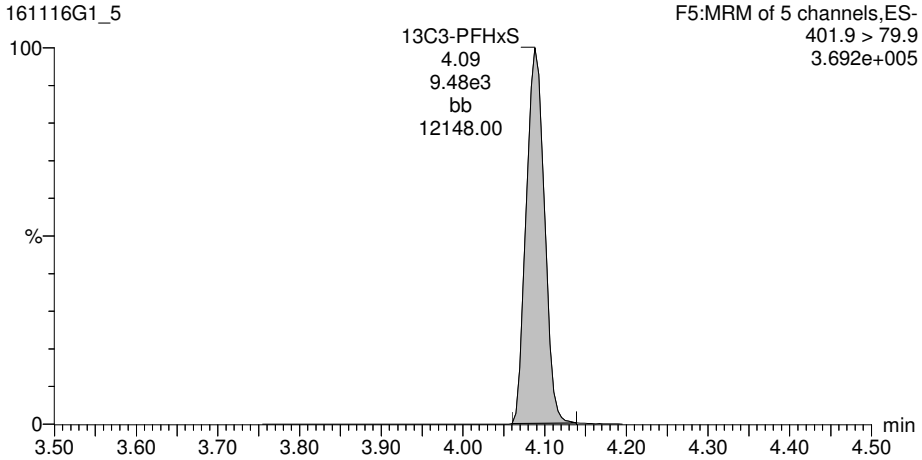
Printed: Thursday, November 17, 2016 14:14:05 Pacific Standard Time

ID: B6K0076-BS1 OPR 0.125, Description: OPR, Name: 161116G1_5, Date: 16-Nov-2016, Time: 11:41:16, Instrument: , Lab: , User:

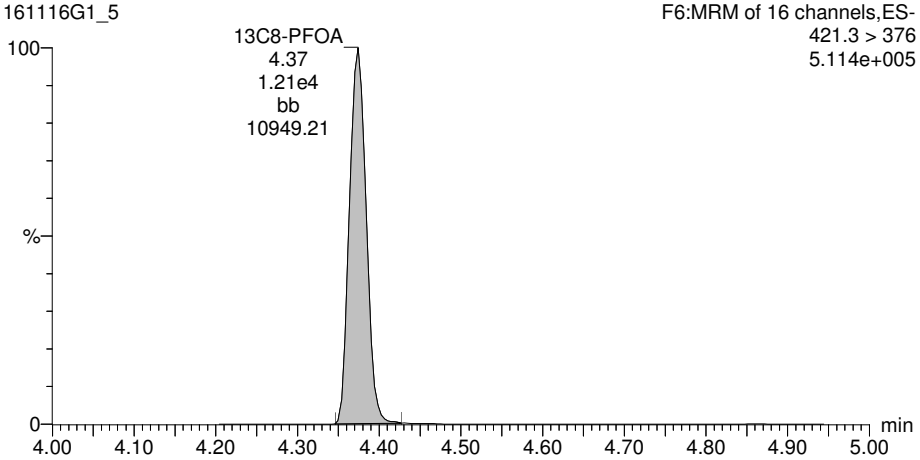
13C5-PFHxA



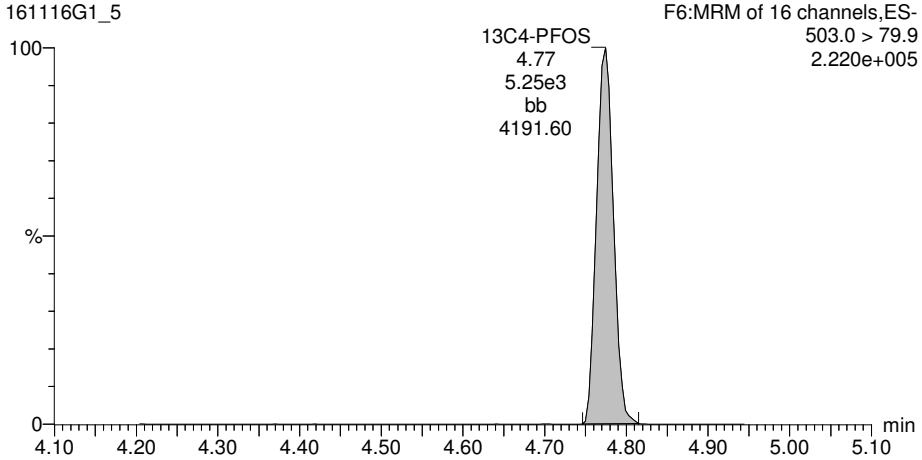
13C3-PFHxS



13C8-PFOA



13C4-PFOS



Rev'd: MM 11/17/16 AC 11/17/16

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Last Altered: Thursday, November 17, 2016 14:13:33 Pacific Standard Time
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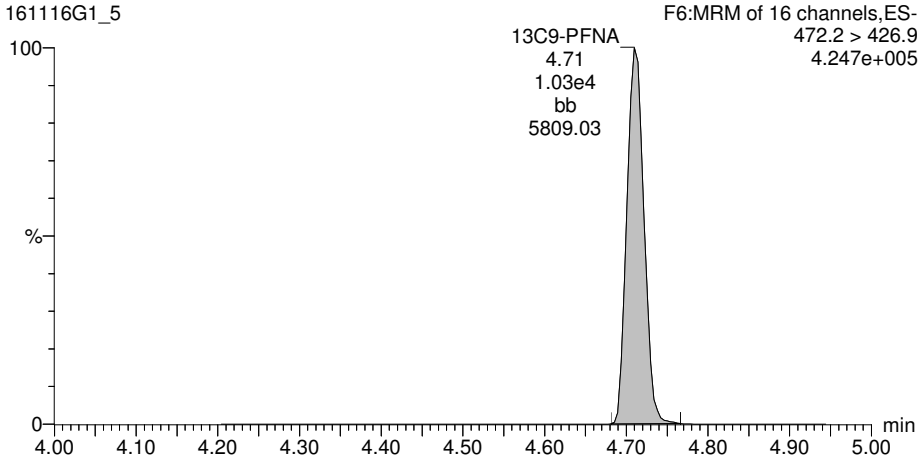
ID: B6K0076-BS1 OPR 0.125, Description: OPR, Name: 161116G1_5, Date: 16-Nov-2016, Time: 11:41:16, Instrument: , Lab: , User:

13C9-PFNA



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-13.qld

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Printed: Monday, November 28, 2016 09:16:58 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

ID: B6K0146-BLK1 Method Blank 0.125, Description: Method Blank, Name: 161127G1_13, Date: 27-Nov-2016, Time: 15:57:25

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3	PFBS	299 > 79.7	3.101e0	6.556e3		0.125	3.09	0.677	
2	8	PFOA	413 > 368.7	1.463e2	1.810e4		0.125	4.36	0.0829	
3	10	PFOS	499 >79.9		7.190e3		0.125			
4	16	13C3-PFBS	302.0 > 98.8	6.556e3	1.728e4	0.302	0.125	3.08	126	126
5	17	13C2-PFHxA	315 > 269.8	4.325e3	1.728e4	0.620	0.125	3.44	40.4	101
6	18	13C4-PFHpA	367.2 > 321.8	1.170e4	1.189e4	1.139	0.125	3.96	86.4	86.4
7	19	18O2-PFHxS	403 > 102.6	5.537e3	1.189e4	0.449	0.125	4.07	104	104
8	20	13C2-6:2 FTS	429.1 > 408.9	3.537e3	4.235e3	1.073	0.125	4.31	77.8	77.8
9	21	13C2-PFOA	414.9 > 369.7	1.810e4	7.740e3	2.262	0.125	4.36	103	103
10	22	13C8-PFOS	507.0 > 79.9	7.190e3	6.934e3	0.944	0.125	4.76	110	110
11	23	13C5-PFNA	468.2 > 422.9	9.288e3	9.416e3	1.082	0.125	4.70	91.2	91.2
12	24	13C2-PFDA	515.1 > 469.9	6.968e3	7.617e3	1.019	0.125	5.00	89.8	89.8
13	25	13C2-8:2 FTS	529.1 > 508.7	3.676e3	4.235e3	0.569	0.125	4.97	153	153
14	26	13C4-PFBA	217 > 171.8	1.549e4	1.549e4	1.000	0.125	1.85	100	100
15	27	13C2-4:2 FTS	329.2 > 308.9	4.235e3	4.235e3	1.000	0.125	3.35	100	100
16	28	13C5-PFHxA	318.0 > 272.9	1.728e4	1.728e4	1.000	0.125	3.44	100	100
17	29	13C3-PFHxS	401.9 > 79.9	1.189e4	1.189e4	1.000	0.125	4.07	100	100
18	30	13C8-PFOA	421.3 > 376	7.740e3	7.740e3	1.000	0.125	4.36	100	100
19	31	13C4-PFOS	503.0 > 79.9	6.934e3	6.934e3	1.000	0.125	4.76	100	100
20	34	Total PFBS	299 > 79.7		5.537e3		0.125		0.677	
21	36	Total PFOA	413 > 368.7		1.810e4		0.125		0.0829	
22	37	Total PFOS	499 > 79.9		7.190e3		0.125			

Rev'd: MM 11/28/16 AC 11/28/16

Vista Analytical Laboratory Q1

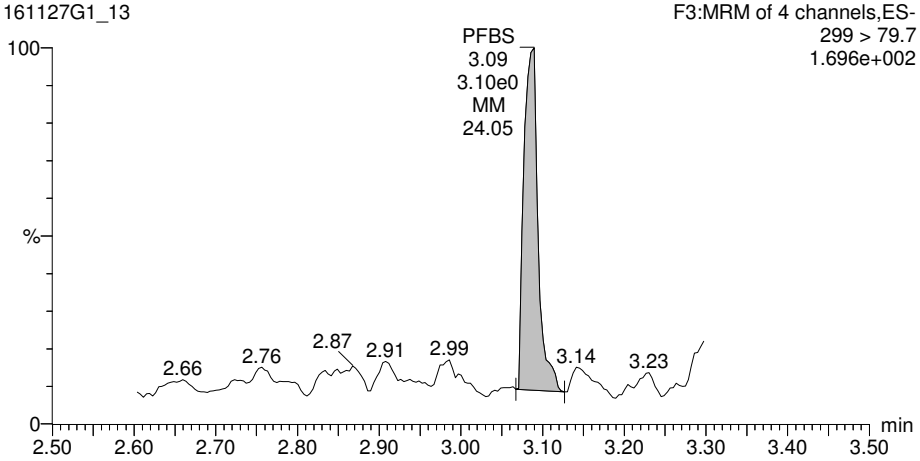
Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-13.qld

Last Altered: Monday, November 28, 2016 09:16:24 Pacific Standard Time
Printed: Monday, November 28, 2016 09:16:58 Pacific Standard Time

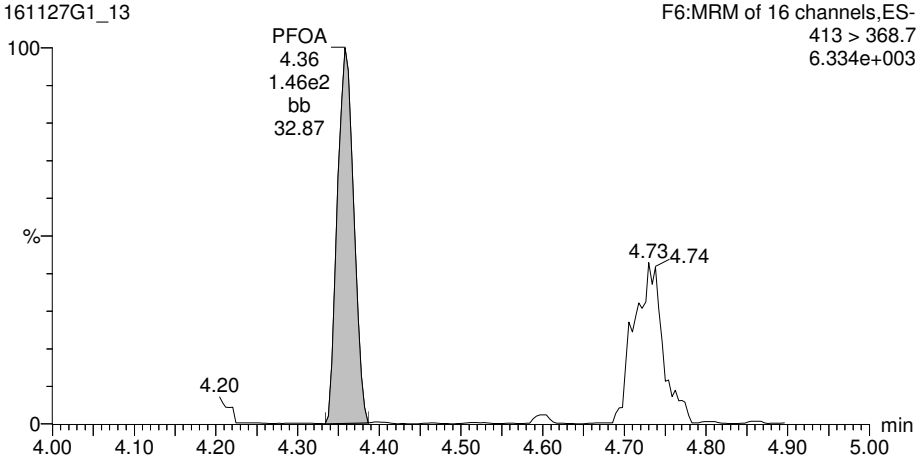
Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

ID: B6K0146-BLK1 Method Blank 0.125, Description: Method Blank, Name: 161127G1_13, Date: 27-Nov-2016, Time: 15:57:25, Instrument: , Lab: , User:

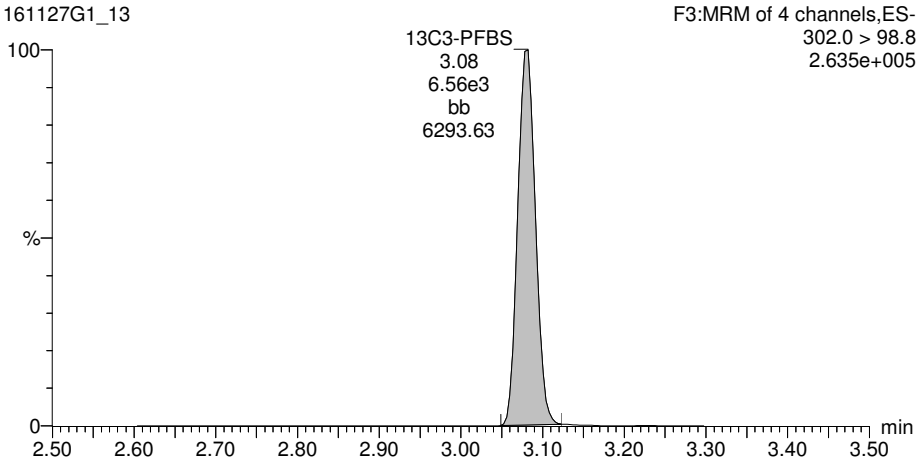
Total PFBS



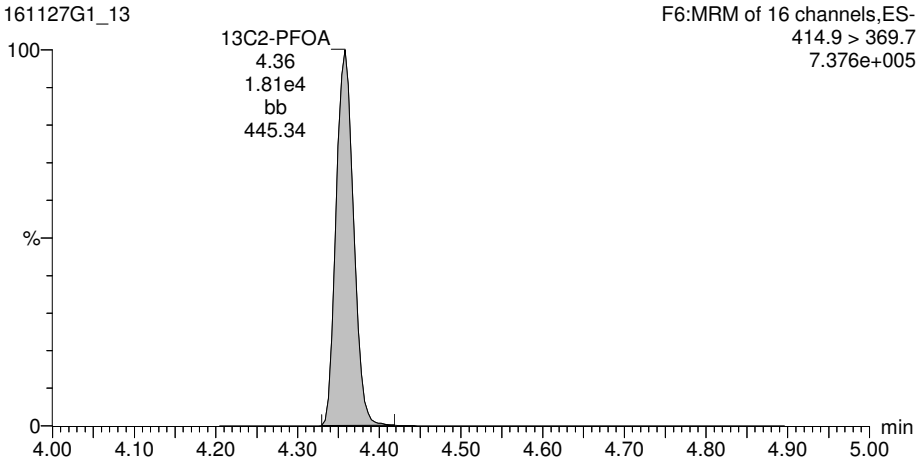
Total PFOA



13C3-PFBS



13C2-PFOA



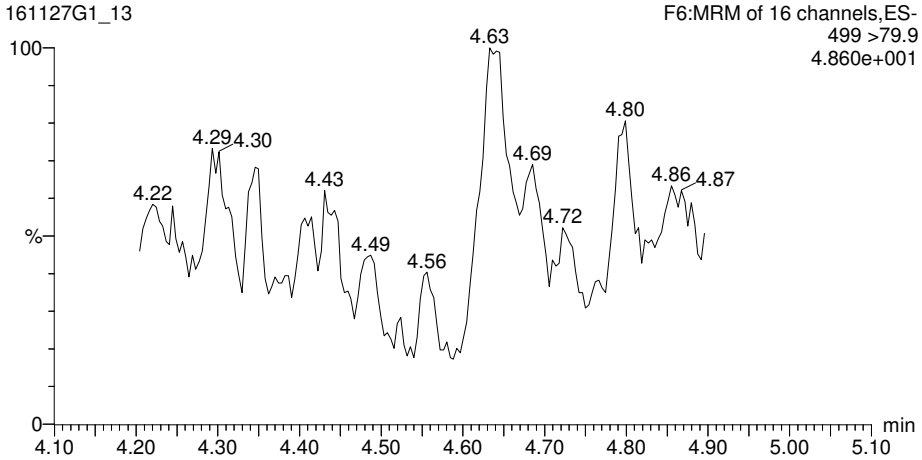
Rev'd: MM 11/28/16 AC 11/28/16

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-13.qld

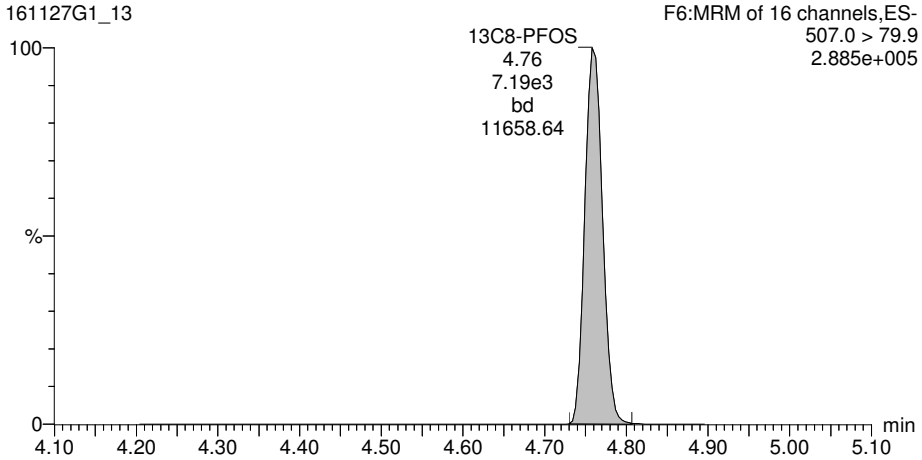
Last Altered: Monday, November 28, 2016 09:16:24 Pacific Standard Time
Printed: Monday, November 28, 2016 09:16:58 Pacific Standard Time

ID: B6K0146-BLK1 Method Blank 0.125, Description: Method Blank, Name: 161127G1_13, Date: 27-Nov-2016, Time: 15:57:25, Instrument: , Lab: , User:

Total PFOS



13C8-PFOS



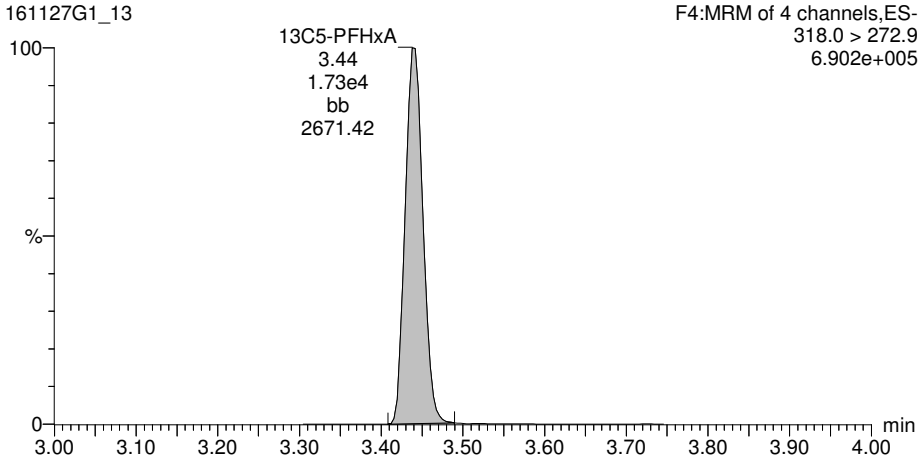
Rev'd: MM 11/28/16 AC 11/28/16

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-13.qld

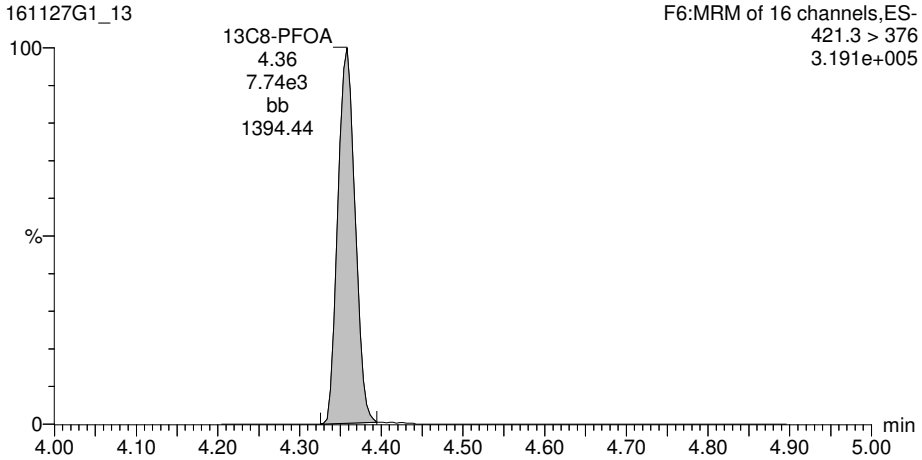
Last Altered: Monday, November 28, 2016 09:16:24 Pacific Standard Time
Printed: Monday, November 28, 2016 09:16:58 Pacific Standard Time

ID: B6K0146-BLK1 Method Blank 0.125, Description: Method Blank, Name: 161127G1_13, Date: 27-Nov-2016, Time: 15:57:25, Instrument: , Lab: , User:

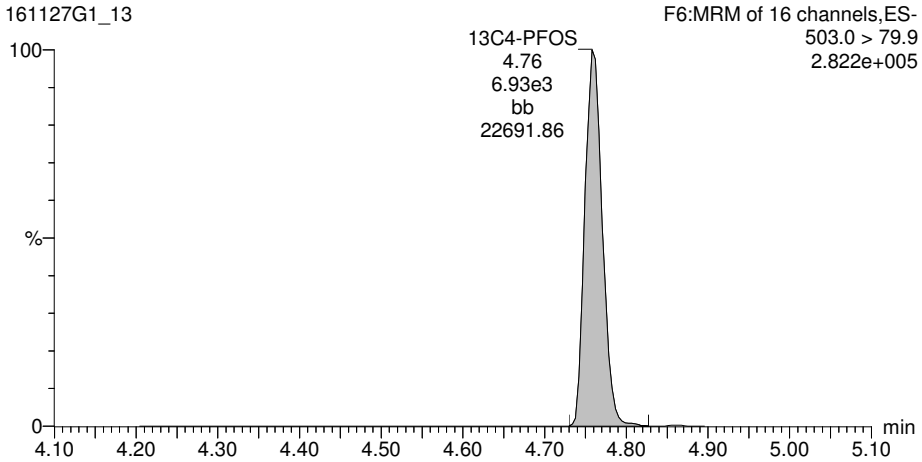
13C5-PFHxA



13C8-PFOA



13C4-PFOS



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-8.qld

Last Altered: Monday, November 28, 2016 09:13:18 Pacific Standard Time
Printed: Monday, November 28, 2016 09:14:08 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

ID: B6K0146-BS1 OPR 0.125, Description: OPR, Name: 161127G1_8, Date: 27-Nov-2016, Time: 14:54:16

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3	PFBS	299 > 79.7	8.794e3	5.388e3		0.125	3.08	91.7	115
2	8	PFOA	413 > 368.7	1.175e4	1.432e4		0.125	4.35	90.3	113
3	10	PFOS	499 >79.9	3.187e3	4.605e3		0.125	4.76	84.5	106
4	16	13C3-PFBS	302.0 > 98.8	5.388e3	1.642e4	0.302	0.125	3.07	109	109
5	17	13C2-PFHxA	315 > 269.8	4.002e3	1.642e4	0.620	0.125	3.44	39.3	98.4
6	18	13C4-PFHpA	367.2 > 321.8	1.015e4	9.748e3	1.139	0.125	3.95	91.4	91.4
7	19	18O2-PFHxS	403 > 102.6	3.840e3	9.748e3	0.449	0.125	4.07	87.7	87.7
8	20	13C2-6:2 FTS	429.1 > 408.9	2.967e3	4.243e3	1.073	0.125	4.31	65.2	65.2
9	21	13C2-PFOA	414.9 > 369.7	1.432e4	7.028e3	2.262	0.125	4.35	90.1	90.1
10	22	13C8-PFOS	507.0 > 79.9	4.605e3	5.066e3	0.944	0.125	4.76	96.4	96.4
11	23	13C5-PFNA	468.2 > 422.9	6.473e3	7.136e3	1.082	0.125	4.69	83.8	83.8
12	24	13C2-PFDA	515.1 > 469.9	4.164e3	5.863e3	1.019	0.125	5.00	69.7	69.7
13	25	13C2-8:2 FTS	529.1 > 508.7	2.236e3	4.243e3	0.569	0.125	4.97	92.7	92.7
14	26	13C4-PFBA	217 > 171.8	1.540e4	1.540e4	1.000	0.125	1.84	100	100
15	27	13C2-4:2 FTS	329.2 > 308.9	4.243e3	4.243e3	1.000	0.125	3.34	100	100
16	28	13C5-PFHxA	318.0 > 272.9	1.642e4	1.642e4	1.000	0.125	3.44	100	100
17	29	13C3-PFHxS	401.9 > 79.9	9.748e3	9.748e3	1.000	0.125	4.07	100	100
18	30	13C8-PFOA	421.3 > 376	7.028e3	7.028e3	1.000	0.125	4.35	100	100
19	31	13C4-PFOS	503.0 > 79.9	5.066e3	5.066e3	1.000	0.125	4.76	100	100
20	34	Total PFBS	299 > 79.7		3.840e3		0.125		91.7	
21	36	Total PFOA	413 > 368.7		1.432e4		0.125		90.3	
22	37	Total PFOS	499 > 79.9		4.605e3		0.125		84.5	

Vista Analytical Laboratory Q1

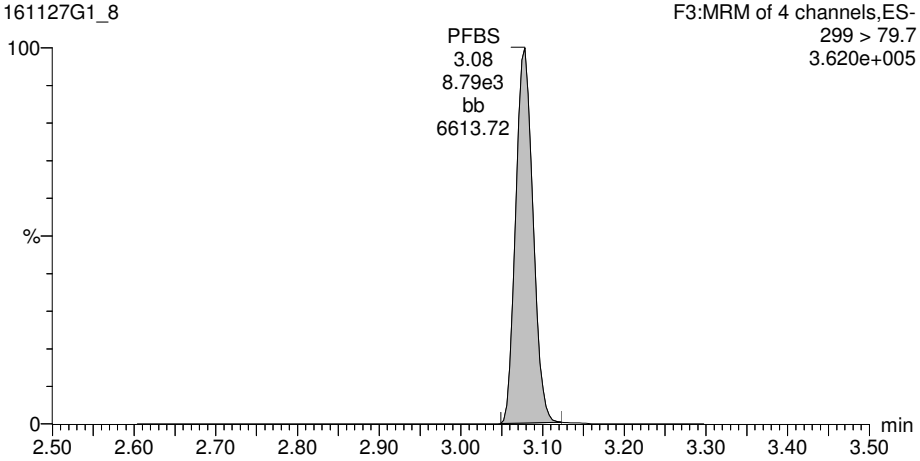
Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-8.qld

Last Altered: Monday, November 28, 2016 09:13:18 Pacific Standard Time
Printed: Monday, November 28, 2016 09:14:08 Pacific Standard Time

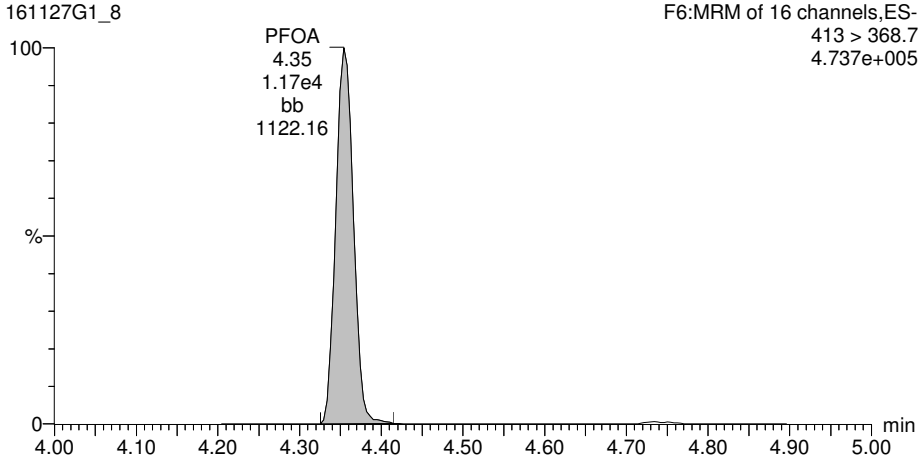
Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

ID: B6K0146-BS1 OPR 0.125, Description: OPR, Name: 161127G1_8, Date: 27-Nov-2016, Time: 14:54:16, Instrument: , Lab: , User:

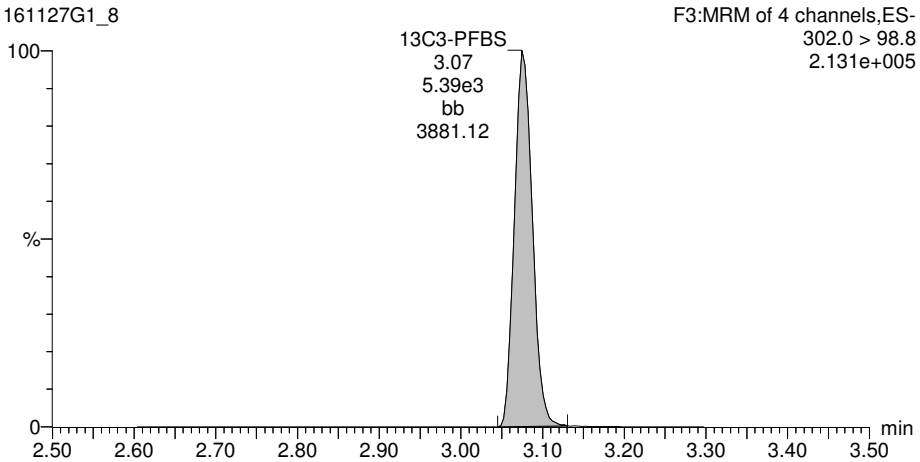
Total PFBS



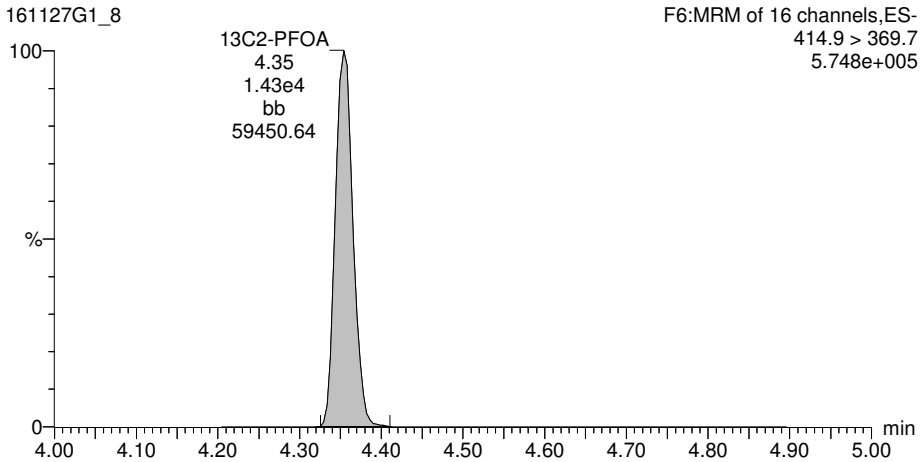
Total PFOA



13C3-PFBS



13C2-PFOA



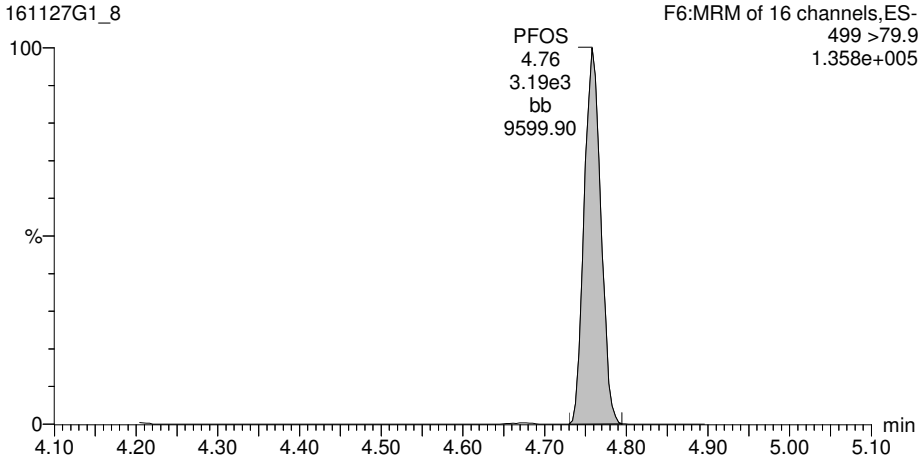
Rev'd: MM 11/28/16 AC 11/28/16

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-8.qld

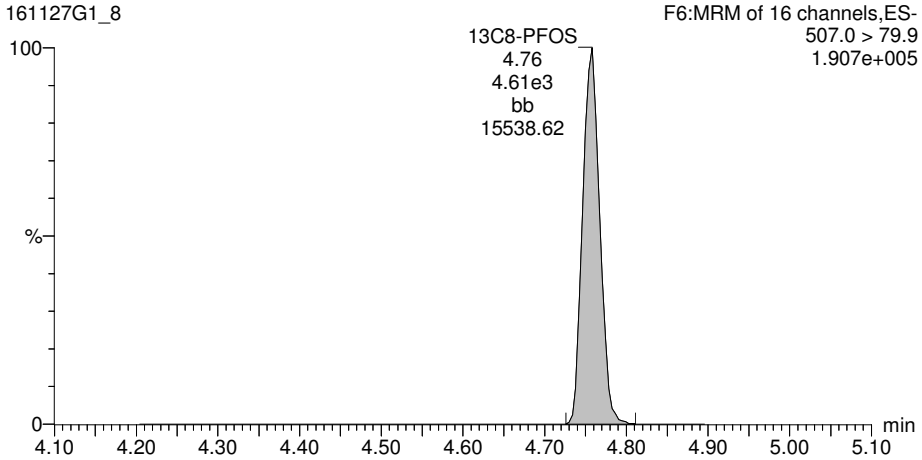
Last Altered: Monday, November 28, 2016 09:13:18 Pacific Standard Time
Printed: Monday, November 28, 2016 09:14:08 Pacific Standard Time

ID: B6K0146-BS1 OPR 0.125, Description: OPR, Name: 161127G1_8, Date: 27-Nov-2016, Time: 14:54:16, Instrument: , Lab: , User:

Total PFOS



13C8-PFOS



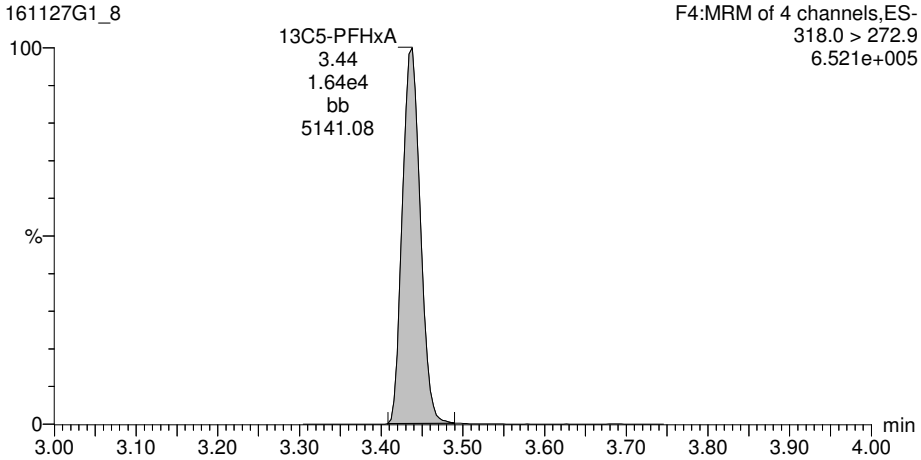
Rev'd: MM 11/28/16 AC 11/28/16

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-8.qld

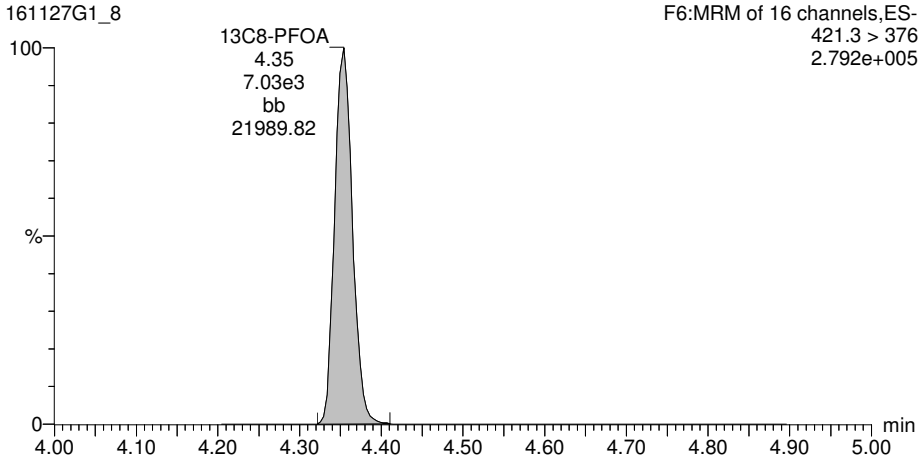
Last Altered: Monday, November 28, 2016 09:13:18 Pacific Standard Time
Printed: Monday, November 28, 2016 09:14:08 Pacific Standard Time

ID: B6K0146-BS1 OPR 0.125, Description: OPR, Name: 161127G1_8, Date: 27-Nov-2016, Time: 14:54:16, Instrument: , Lab: , User:

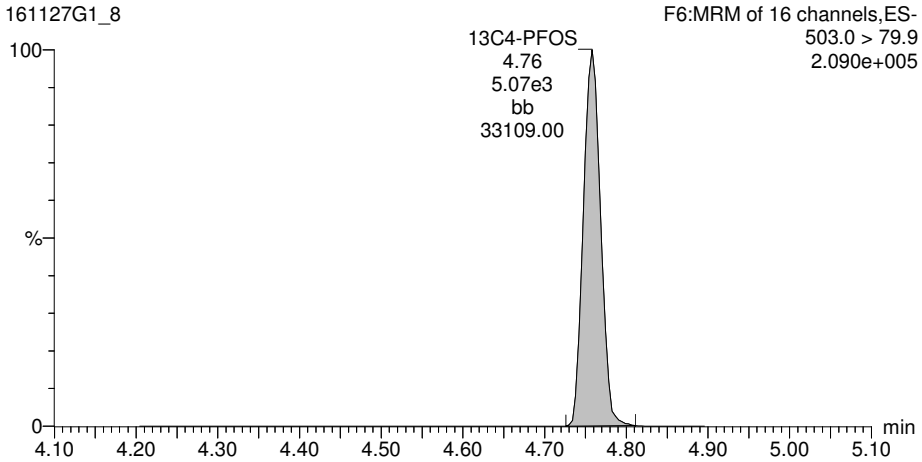
13C5-PFHxA



13C8-PFOA



13C4-PFOS



Rev'd: MM 11/28/16 AC 11/28/16

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-36.qld

Last Altered: Thursday, November 17, 2016 14:01:48 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:05:50 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

ID: 1601395-01 26MW06_161101 0.12577, Description: 26MW06_161101, Name: 161116G1_36, Date: 16-Nov-2016, Time: 18:12:46

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	1	PFBS	299 > 79.7		7.197e2		0.126			
2	5	PFOA	413 > 368.7	1.312e2	3.938e3		0.126	4.37	1.93	
3	6	PFOS	499 >79.9		8.508e2		0.126			
4	9	13C3-PFBS	302.0 > 98.8	7.197e2	2.920e3	0.250	0.126	3.07	97.9	98.7
5	10	13C2-PFHxA	315 > 269.8	7.381e2	2.920e3	0.741	0.126	3.43	33.8	85.3
6	11	13C4-PFHpA	367.2 > 321.8	1.985e3	1.257e3	2.077	0.126	3.96	75.4	76.0
7	12	18O2-PFHxS	403 > 102.6	7.501e2	1.257e3	0.603	0.126	4.08	98.2	99.0
8	13	13C2-PFOA	414.9 > 369.7	3.938e3	1.873e3	2.438	0.126	4.37	85.5	86.2
9	14	13C8-PFOS	507.0 > 79.9	8.508e2	7.786e2	1.055	0.126	4.76	103	104
10	17	13C5-PFHxA	318.0 > 272.9	2.920e3	2.920e3	1.000	0.126	3.43	99.2	100
11	18	13C3-PFHxS	401.9 > 79.9	1.257e3	1.257e3	1.000	0.126	4.08	99.2	100
12	19	13C8-PFOA	421.3 > 376	1.873e3	1.873e3	1.000	0.126	4.36	99.2	100
13	20	13C4-PFOS	503.0 > 79.9	7.786e2	7.786e2	1.000	0.126	4.76	99.2	100
14	21	13C9-PFNA	472.2 > 426.9	1.367e3	1.367e3	1.000	0.126	4.70	99.2	100
15	22	13C6-PFDA	519.1 > 473.7	1.366e3	1.366e3	1.000	0.126	5.00	99.2	100
16	23	Total PFBS	299 > 79.7		7.197e2		0.126			
17	25	Total PFOA	413 > 368.7		3.938e3		0.126		1.93	
18	26	Total PFOS	499 > 79.9		8.508e2		0.126			

Vista Analytical Laboratory Q1

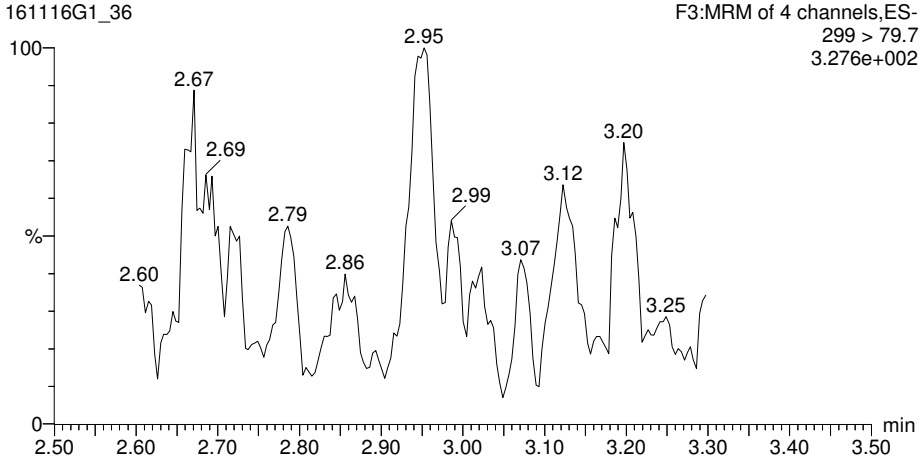
Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-36.qld

Last Altered: Thursday, November 17, 2016 14:01:48 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:05:50 Pacific Standard Time

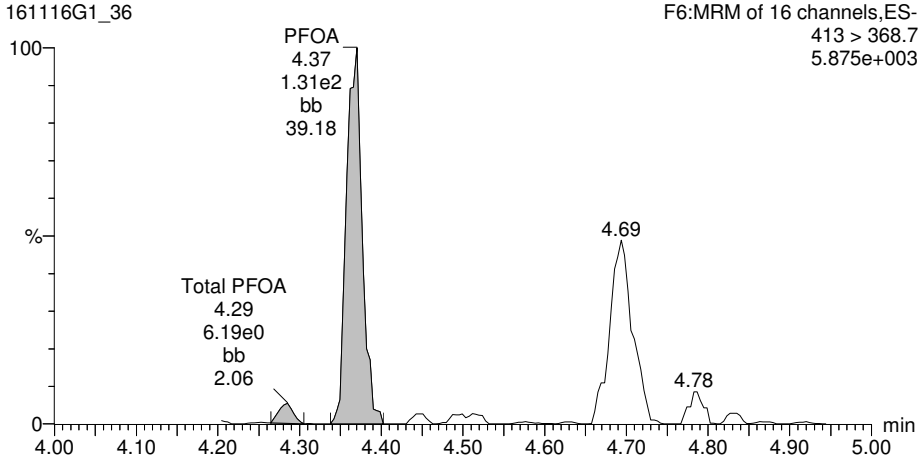
Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

ID: 1601395-01 26MW06_161101 0.12577, Description: 26MW06_161101, Name: 161116G1_36, Date: 16-Nov-2016, Time: 18:12:46, Instrument: , Lab: , User:

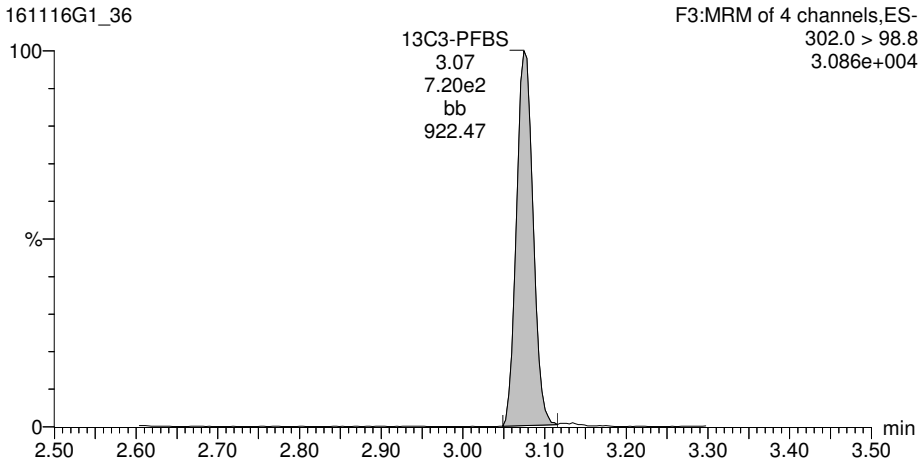
Total PFBS



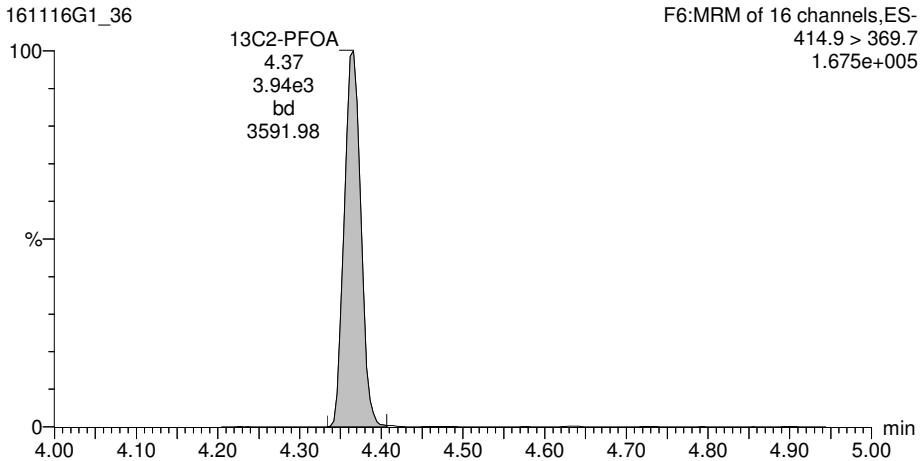
Total PFOA



13C3-PFBS



13C2-PFOA



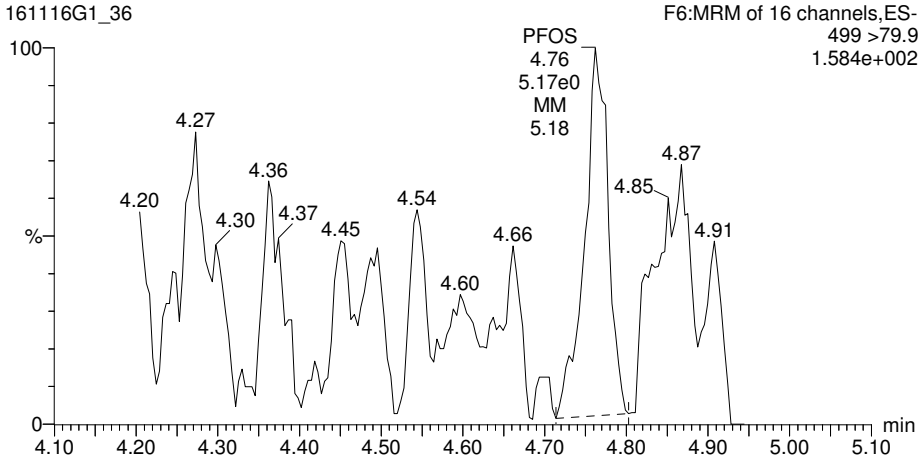
Rev'd: MM 11/20/16 AC 11/17/16

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-36.qld

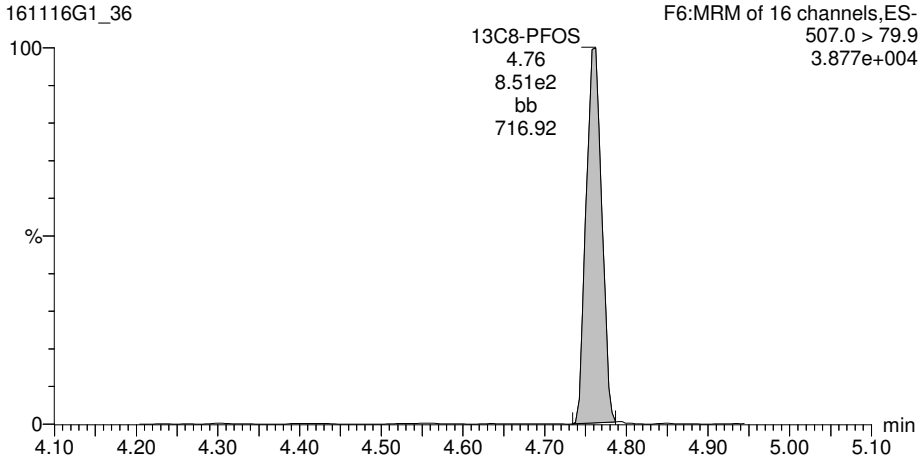
Last Altered: Thursday, November 17, 2016 14:01:48 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:05:50 Pacific Standard Time

ID: 1601395-01 26MW06_161101 0.12577, Description: 26MW06_161101, Name: 161116G1_36, Date: 16-Nov-2016, Time: 18:12:46, Instrument: , Lab: , User:

Total PFOS



13C8-PFOS



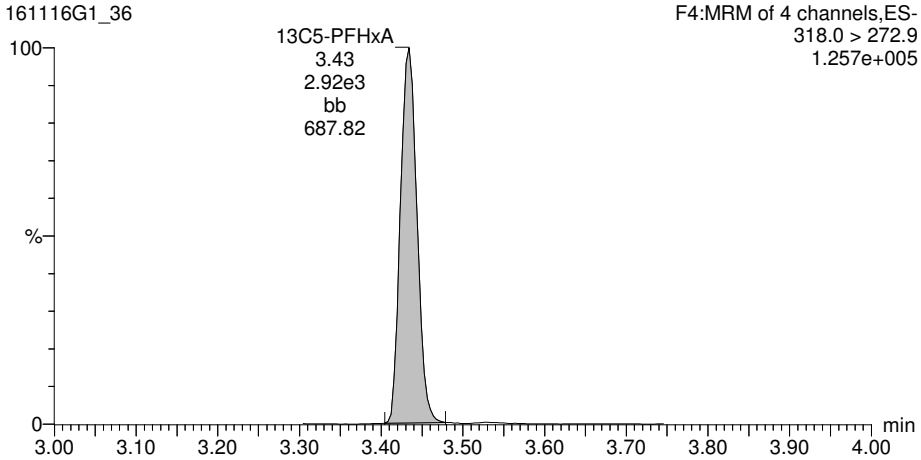
Rev'd: MM 11/20/16 AC 11/17/16

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-36.qld

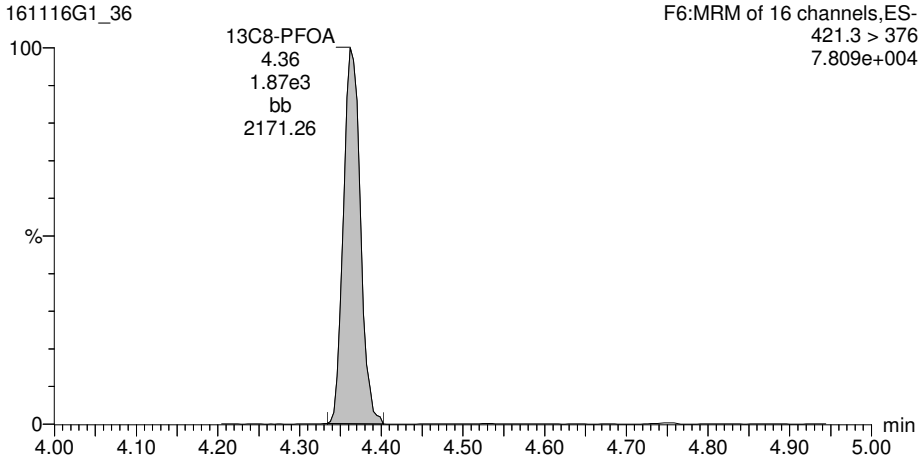
Last Altered: Thursday, November 17, 2016 14:01:48 Pacific Standard Time
Printed: Thursday, November 17, 2016 14:05:50 Pacific Standard Time

ID: 1601395-01 26MW06_161101 0.12577, Description: 26MW06_161101, Name: 161116G1_36, Date: 16-Nov-2016, Time: 18:12:46, Instrument: , Lab: , User:

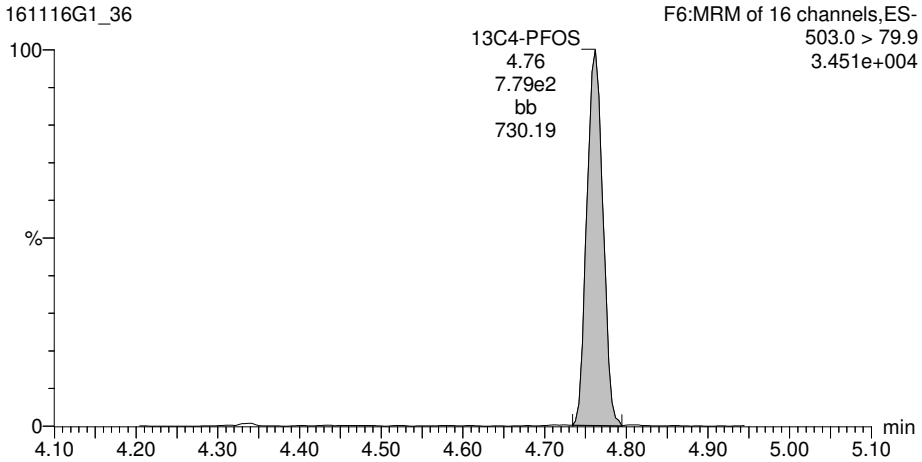
13C5-PFHxA



13C8-PFOA



13C4-PFOS



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-37.qld

Last Altered: Thursday, November 17, 2016 15:05:07 Pacific Standard Time
Printed: Thursday, November 17, 2016 15:07:26 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

ID: 1601395-02 26MW08_161101 0.12768, Description: 26MW08_161101, Name: 161116G1_37, Date: 16-Nov-2016, Time: 18:25:22

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	1	PFBS	299 > 79.7		6.482e2		0.128			
2	5	PFOA	413 > 368.7	5.736e2	3.819e3		0.128	4.36	16.2	
3	6	PFOS	499 >79.9	5.229e1	9.270e2		0.128	4.77	8.49	
4	9	13C3-PFBS	302.0 > 98.8	6.482e2	2.546e3	0.250	0.128	3.07	99.8	102
5	10	13C2-PFHxA	315 > 269.8	8.391e2	2.546e3	0.741	0.128	3.43	43.5	111
6	11	13C4-PFHpA	367.2 > 321.8	2.068e3	1.353e3	2.077	0.128	3.96	72.1	73.6
7	12	18O2-PFHxS	403 > 102.6	8.407e2	1.353e3	0.603	0.128	4.07	101	103
8	13	13C2-PFOA	414.9 > 369.7	3.819e3	1.717e3	2.438	0.128	4.36	89.3	91.2
9	14	13C8-PFOS	507.0 > 79.9	9.270e2	8.752e2	1.055	0.128	4.76	98.3	100
10	17	13C5-PFHxA	318.0 > 272.9	2.546e3	2.546e3	1.000	0.128	3.43	97.9	100
11	18	13C3-PFHxS	401.9 > 79.9	1.353e3	1.353e3	1.000	0.128	4.08	97.9	100
12	19	13C8-PFOA	421.3 > 376	1.717e3	1.717e3	1.000	0.128	4.36	97.9	100
13	20	13C4-PFOS	503.0 > 79.9	8.752e2	8.752e2	1.000	0.128	4.76	97.9	100
14	21	13C9-PFNA	472.2 > 426.9	1.630e3	1.630e3	1.000	0.128	4.70	97.9	100
15	22	13C6-PFDA	519.1 > 473.7	1.564e3	1.564e3	1.000	0.128	5.00	97.9	100
16	23	Total PFBS	299 > 79.7		6.482e2		0.128			
17	25	Total PFOA	413 > 368.7		3.819e3		0.128		16.2	
18	26	Total PFOS	499 > 79.9		9.270e2		0.128		15.9	

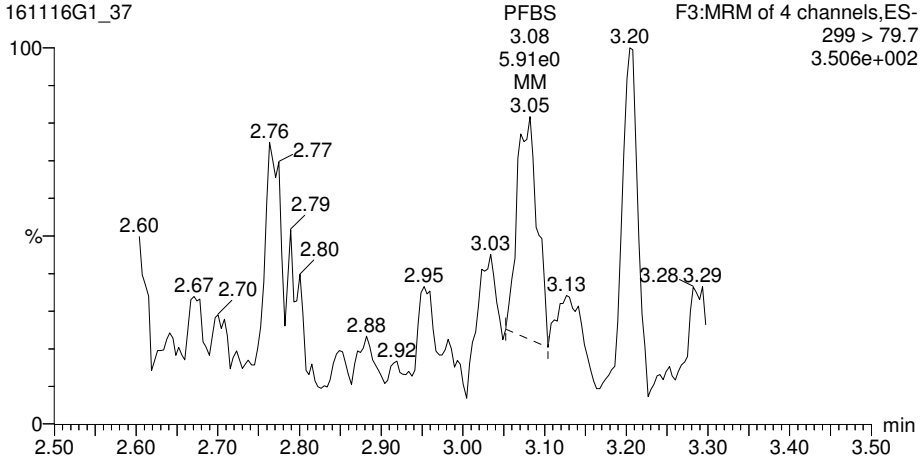
Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-37.qld

Last Altered: Thursday, November 17, 2016 15:05:07 Pacific Standard Time
Printed: Thursday, November 17, 2016 15:07:26 Pacific Standard Time

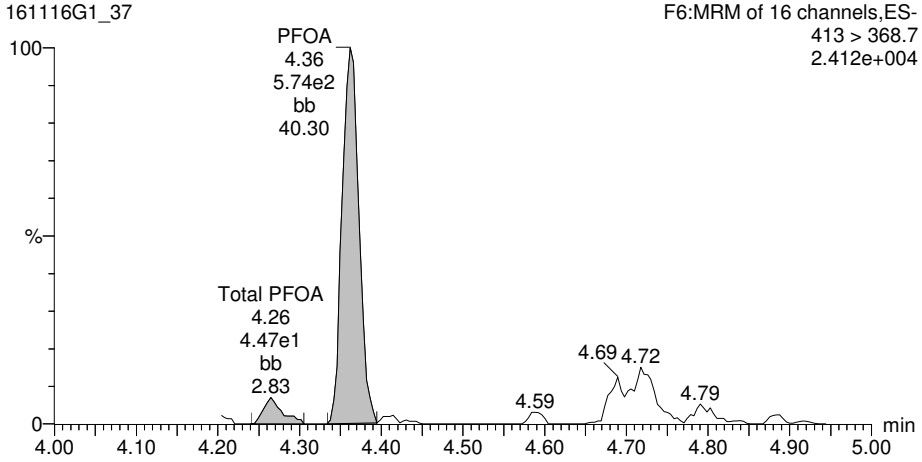
Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

ID: 1601395-02 26MW08_161101 0.12768, Description: 26MW08_161101, Name: 161116G1_37, Date: 16-Nov-2016, Time: 18:25:22, Instrument: , Lab: , User:

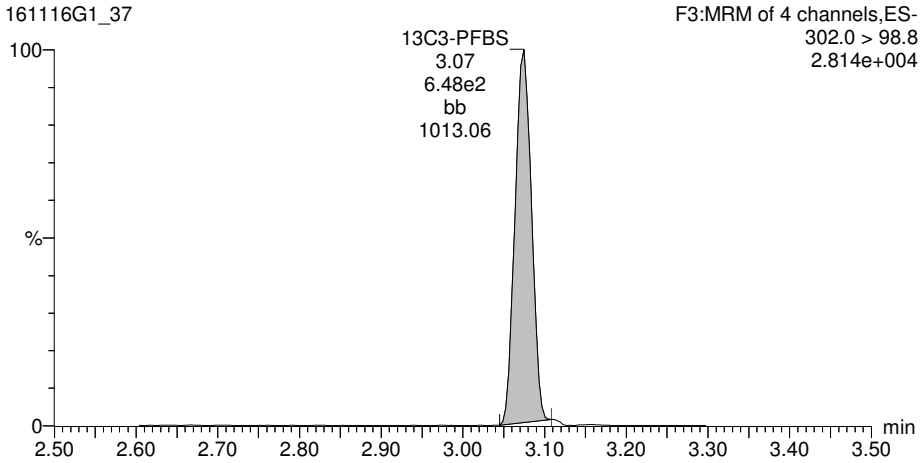
Total PFBS



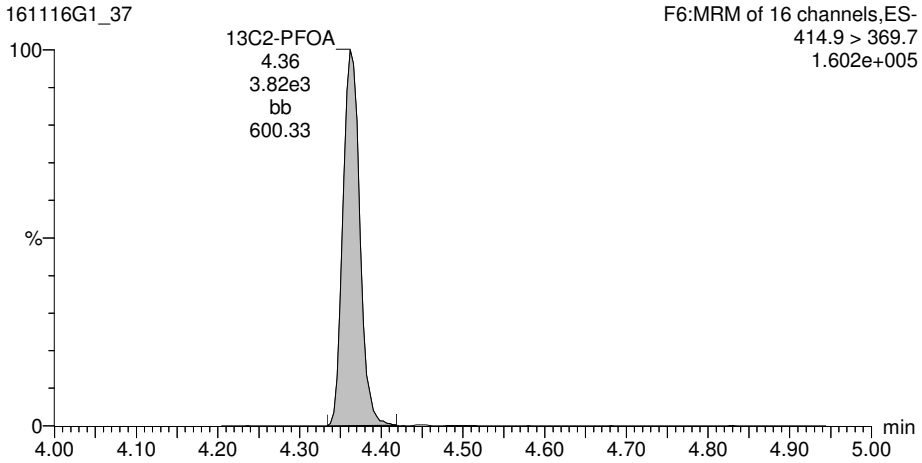
Total PFOA



13C3-PFBS



13C2-PFOA



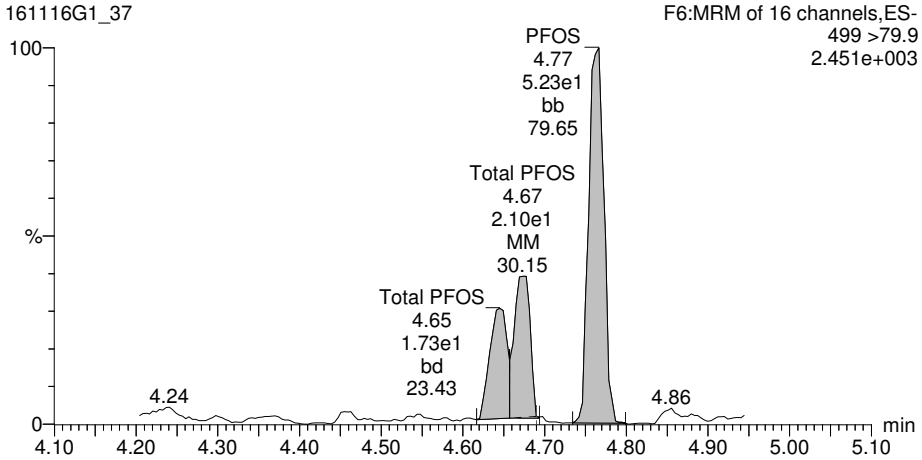
Rev'd: MM 11/20/16 AC 11/17/16

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-37.qld

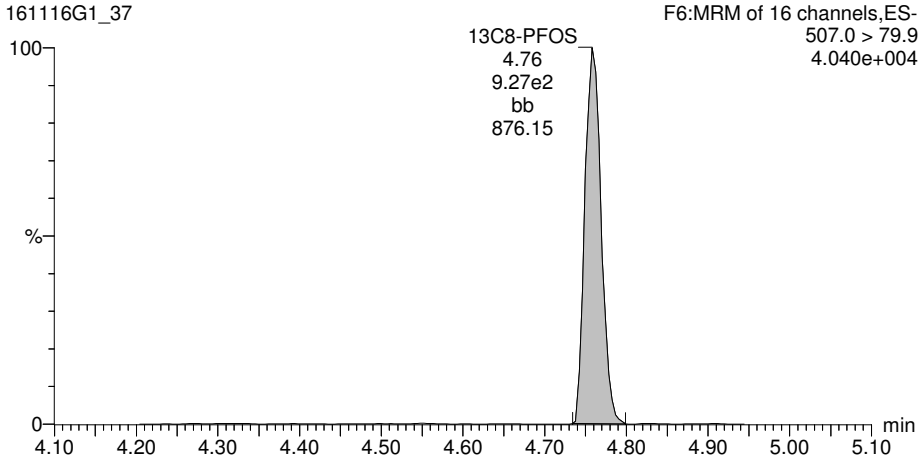
Last Altered: Thursday, November 17, 2016 15:05:07 Pacific Standard Time
Printed: Thursday, November 17, 2016 15:07:26 Pacific Standard Time

ID: 1601395-02 26MW08_161101 0.12768, Description: 26MW08_161101, Name: 161116G1_37, Date: 16-Nov-2016, Time: 18:25:22, Instrument: , Lab: , User:

Total PFOS



13C8-PFOS

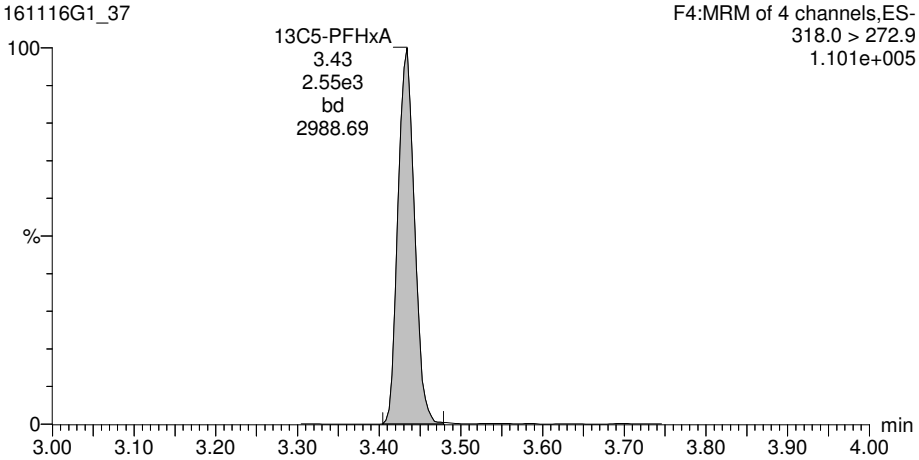


Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-37.qld

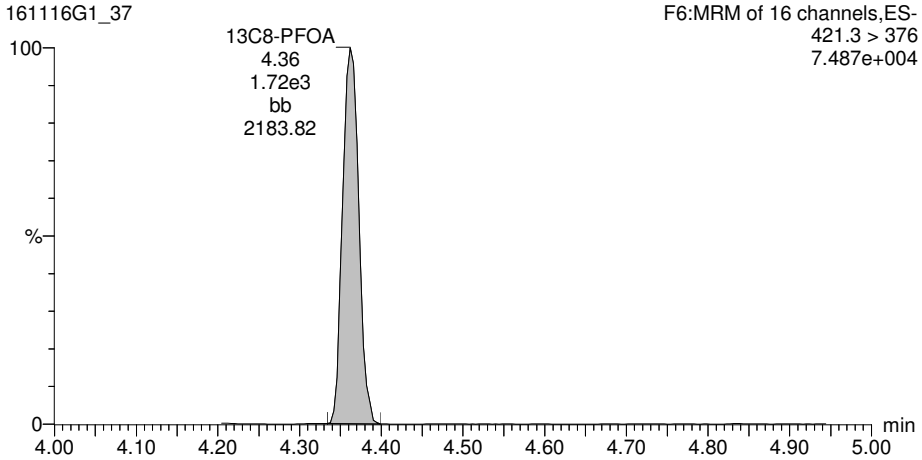
Last Altered: Thursday, November 17, 2016 15:05:07 Pacific Standard Time
Printed: Thursday, November 17, 2016 15:07:26 Pacific Standard Time

ID: 1601395-02 26MW08_161101 0.12768, Description: 26MW08_161101, Name: 161116G1_37, Date: 16-Nov-2016, Time: 18:25:22, Instrument: , Lab: , User:

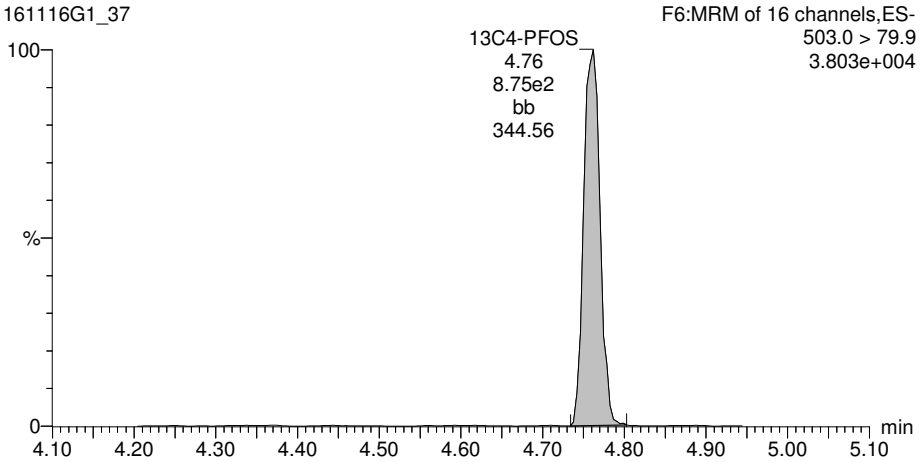
13C5-PFHxA



13C8-PFOA



13C4-PFOS



Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161118J1\161118J1_04.qld

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Printed: Saturday, November 19, 2016 12:53:05 Pacific Standard Time

Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 15 Nov 2016 11:51:30
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

ID: 1601395-03, Description: 26SW01_161101, Name: 161118J1_04.wiff, Date: 18-Nov-2016, Time: 15:24:05

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3	PFBS	79.90	1.207e2	7.264e3		0.125	3.39	0.669	
2	8	PFOA	368.90	3.101e3	7.009e3		0.125	4.67	33.7	
3	10	PFOS	79.92	1.039e3	4.216e3		0.125	5.07	18.9	
4	15	13C3-PFBS	79.95	7.264e3	1.187e4	0.531	0.125	3.39	115	115
5	16	13C2-PFHxA	269.90	4.280e3	1.187e4	0.905	0.125	3.79	39.9	99.6
6	17	13C4-PFHpA	321.90	8.344e3	1.187e4	0.770	0.125	4.27	91.3	91.3
7	18	18O2-PFHxS	102.90	1.413e3	5.300e3	0.276	0.125	4.38	96.6	96.6
8	19	13C2-6:2 FTS	408.90	2.622e3	1.104e4	0.219	0.125	4.62	109	109
9	20	13C2-PFOA	369.90	7.009e3	1.104e4	0.663	0.125	4.67	95.7	95.7
10	21	13C5-PFNA	422.90	6.022e3	6.682e3	1.019	0.125	5.01	88.4	88.4
11	22	13C8-PFOS	79.93	4.216e3	4.379e3	0.921	0.125	5.07	105	104
12	26	13C5-PFHxA	273.00	1.187e4	1.187e4	1.000	0.125	3.78	100	100
13	27	13C3-PFHxS	80.01	5.300e3	5.300e3	1.000	0.125	4.38	100	100
14	28	13C8-PFOA	375.90	1.104e4	1.104e4	1.000	0.125	4.67	100	100
15	29	13C4-PFOS	79.94	4.379e3	4.379e3	1.000	0.125	5.07	100	100
16	32	Total PFBS	79.90		7.264e3		0.125		0.669	
17	33	Total PFHxS	79.91		1.413e3		0.125		34.4	
18	34	Total PFOA	368.90		7.009e3		0.125		36.7	
19	35	Total PFOS	79.92		4.216e3		0.125		28.3	

Rev'd: MM 11/20/16 CG 11/19/16

Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161118J1\161118J1_04.qld

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Printed: Saturday, November 19, 2016 12:53:05 Pacific Standard Time

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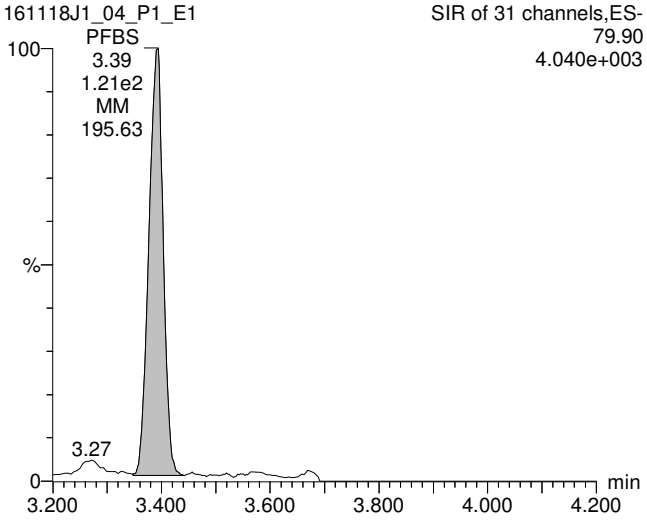
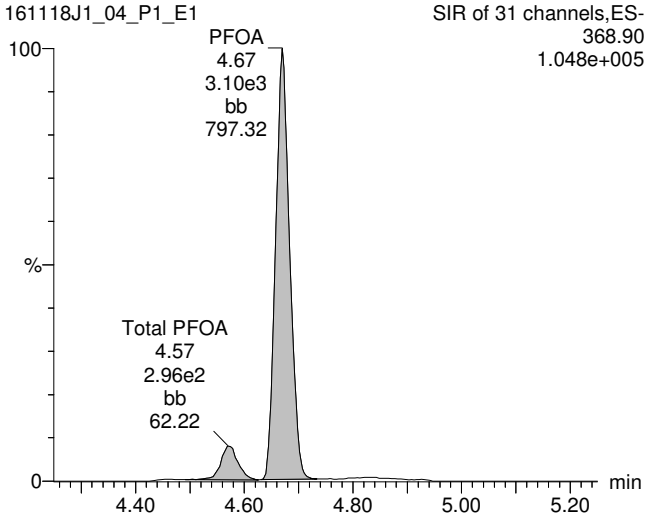
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

ID: 1601395-03, Description: 26SW01_161101, Name: 161118J1_04.wiff, Date: 18-Nov-2016, Time: 15:24:05, Instrument: , Lab: ©PE-SCIEX, User: sciex

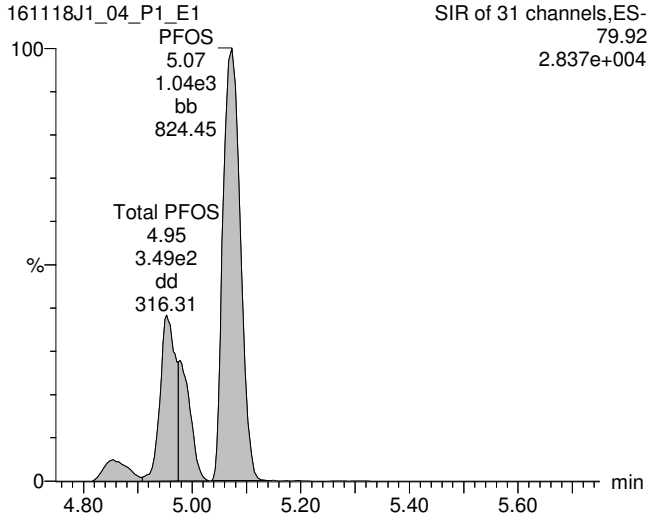
Total PFBS



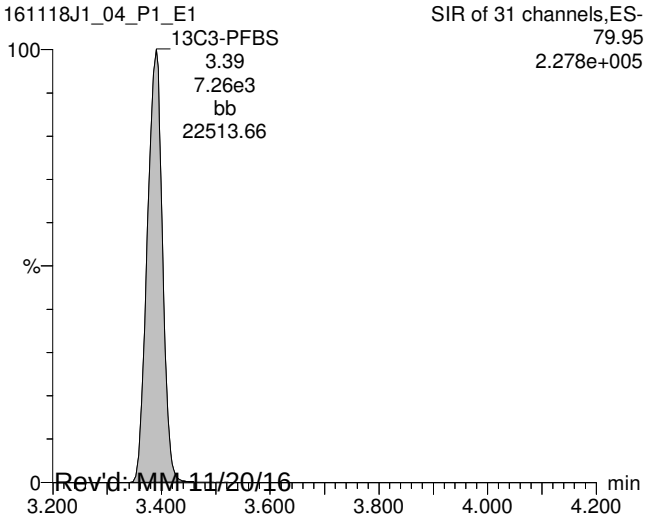
Total PFOA



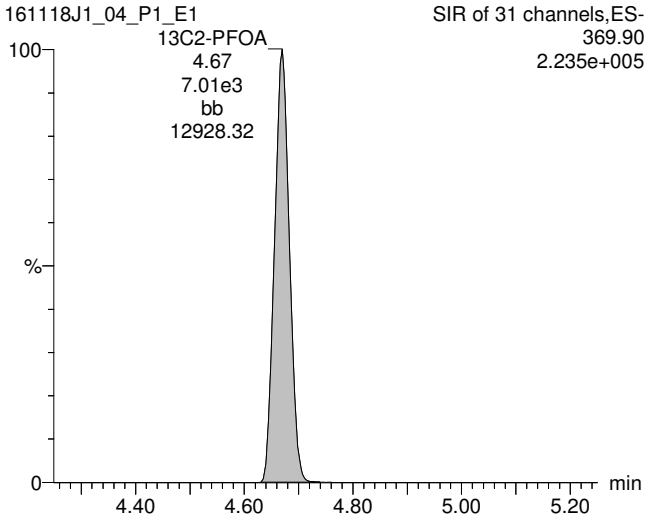
Total PFOS



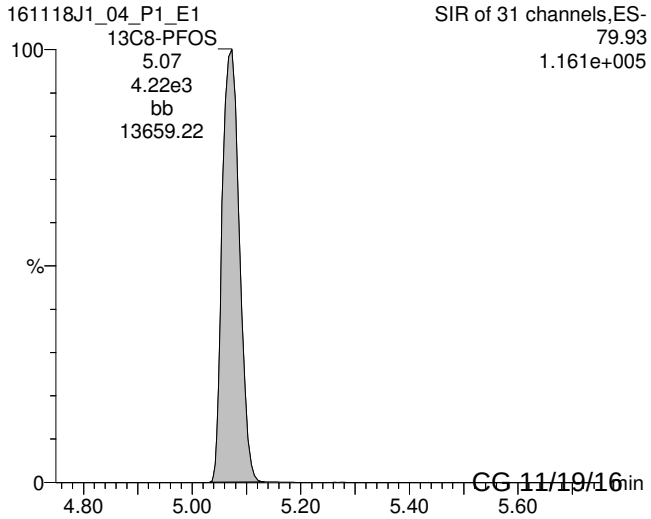
13C3-PFBS



13C2-PFOA



13C8-PFOS



Rev'd: MM 11/20/16 CG 11/19/16

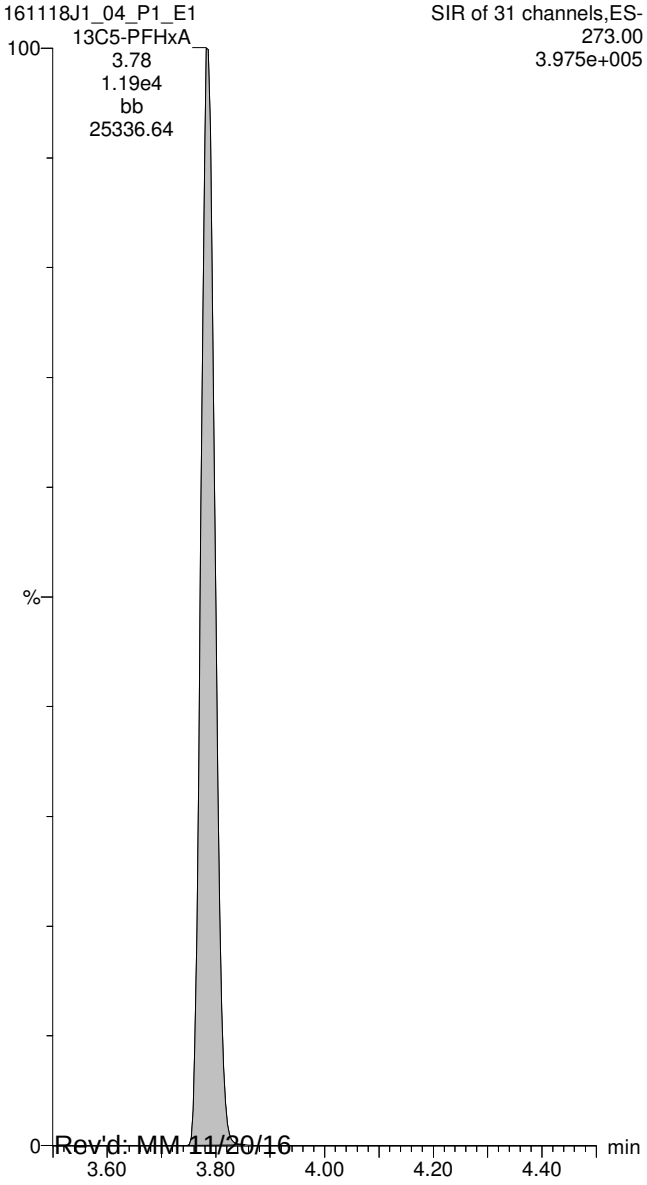
Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161118J1\161118J1_04.qld

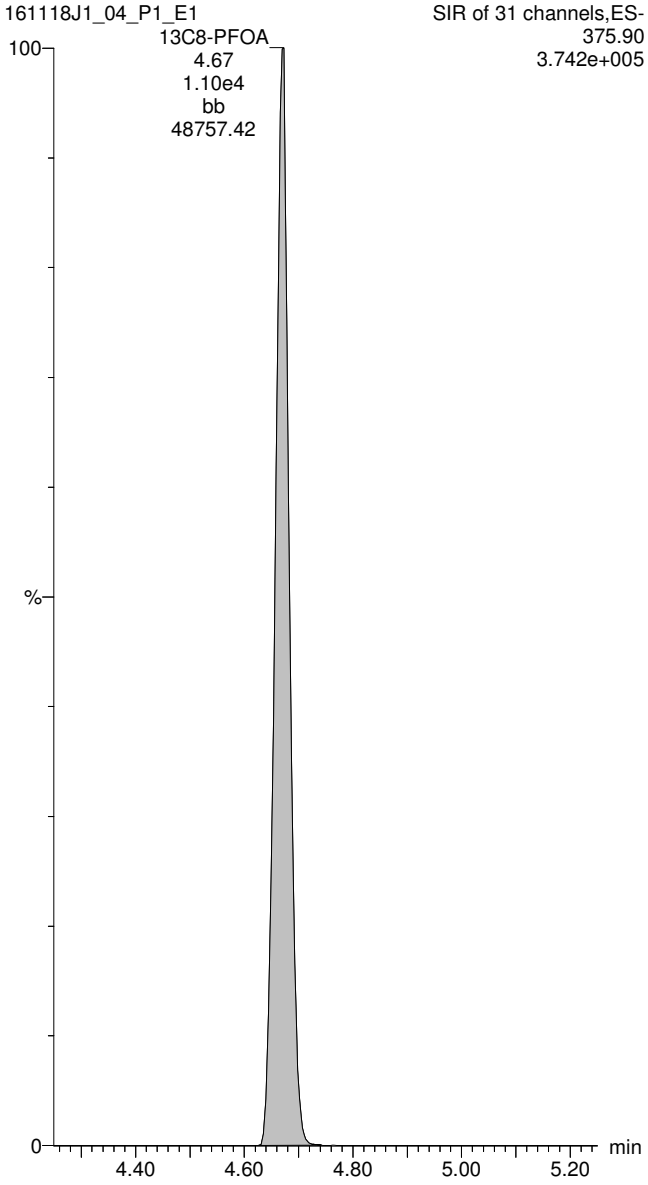
Last Altered: Saturday, November 19, 2016 12:49:34 Pacific Standard Time
Printed: Saturday, November 19, 2016 12:53:05 Pacific Standard Time

ID: 1601395-03, Description: 26SW01_161101, Name: 161118J1_04.wiff, Date: 18-Nov-2016, Time: 15:24:05, Instrument: , Lab: ©PE-SCIEX, User: sciex

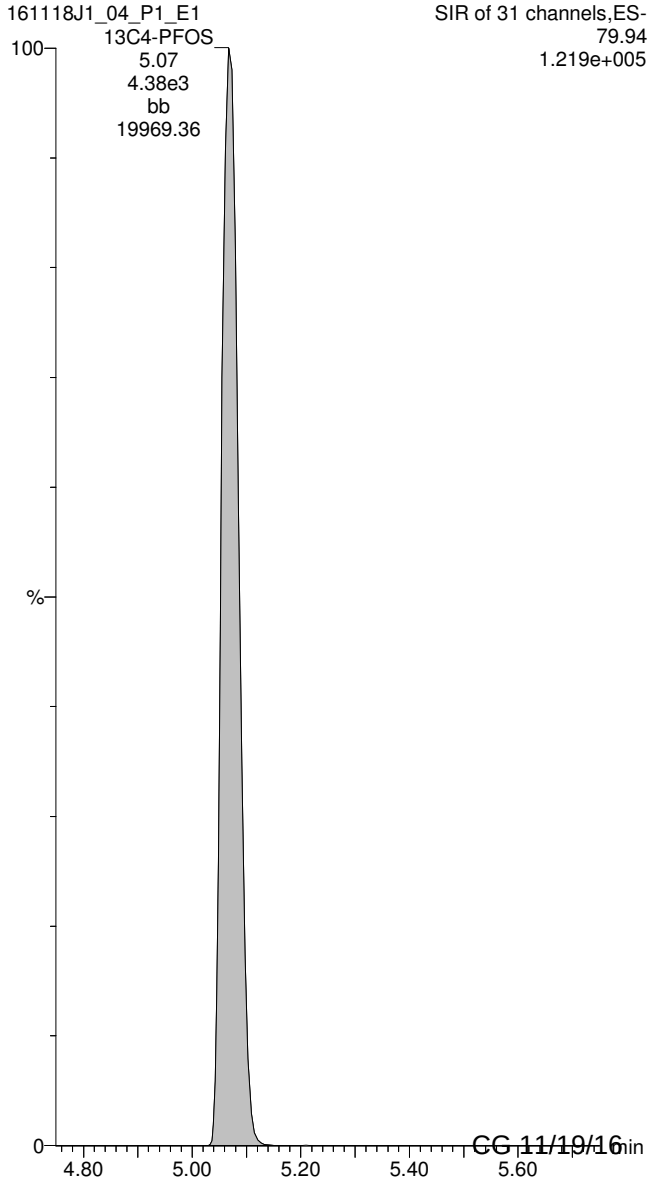
13C5-PFHxA



13C8-PFOA



13C4-PFOS



Rev'd: MM 11/20/16 CG 11/19/16

Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161118J1\161118J1_05.qld

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Printed: Saturday, November 19, 2016 13:01:21 Pacific Standard Time

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Calibration: U:\Q2.pro\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

ID: 1601395-04, Description: 26SW04_161101, Name: 161118J1_05.wiff, Date: 18-Nov-2016, Time: 15:36:19

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3	PFBS	79.90	2.414e3	7.446e3		0.125	3.40	41.8	
2	8	PFOA	368.90	3.120e4	7.860e3		0.125	4.67	329	
3	10	PFOS	79.92	1.255e4	3.827e3		0.125	5.05	262	
4	15	13C3-PFBS	79.95	7.446e3	1.206e4	0.531	0.125	3.40	117	116
5	16	13C2-PFHxA	269.90	4.538e3	1.206e4	0.905	0.125	3.79	41.7	104
6	17	13C4-PFHpA	321.90	9.119e3	1.206e4	0.770	0.125	4.27	98.5	98.3
7	18	18O2-PFHxS	102.90	1.420e3	4.842e3	0.276	0.125	4.39	107	106
8	19	13C2-6:2 FTS	408.90	3.295e3	1.042e4	0.219	0.125	4.62	145	145
9	20	13C2-PFOA	369.90	7.860e3	1.042e4	0.663	0.125	4.67	114	114
10	21	13C5-PFNA	422.90	6.827e3	7.128e3	1.019	0.125	4.99	94.2	93.9
11	22	13C8-PFOS	79.93	3.827e3	4.120e3	0.921	0.125	5.05	101	101
12	26	13C5-PFHxA	273.00	1.206e4	1.206e4	1.000	0.125	3.79	100	100
13	27	13C3-PFHxS	80.01	4.842e3	4.842e3	1.000	0.125	4.39	100	100
14	28	13C8-PFOA	375.90	1.042e4	1.042e4	1.000	0.125	4.67	100	100
15	29	13C4-PFOS	79.94	4.120e3	4.120e3	1.000	0.125	5.05	100	100
16	32	Total PFBS	79.90		7.446e3		0.125		41.8	
17	33	Total PFHxS	79.91		1.420e3		0.125		286	
18	34	Total PFOA	368.90		7.860e3		0.125		392	
19	35	Total PFOS	79.92		3.827e3		0.125		503	

Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161118J1\161118J1_05.qld

Last Altered: Saturday, November 19, 2016 13:00:29 Pacific Standard Time
Printed: Saturday, November 19, 2016 13:01:21 Pacific Standard Time

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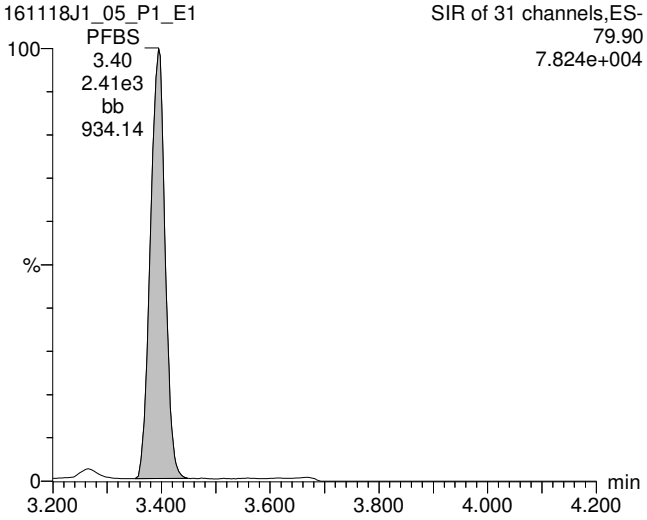
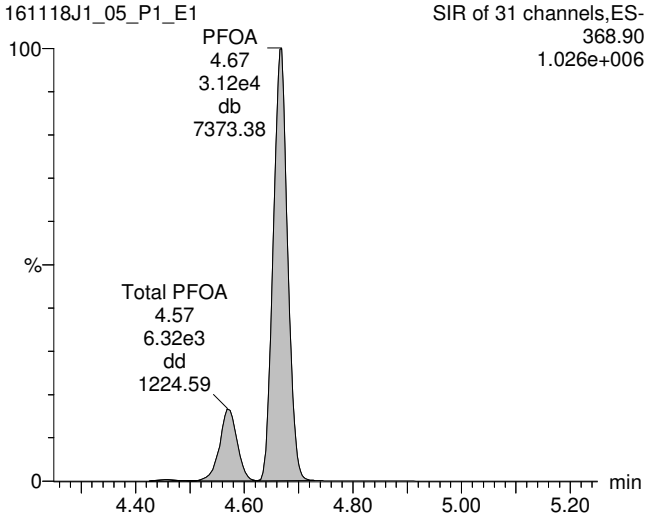
ID: 1601395-04, Description: 26SW04_161101, Name: 161118J1_05.wiff, Date: 18-Nov-2016, Time: 15:36:19, Instrument: , Lab: ©PE-SCIEX, User: sciex

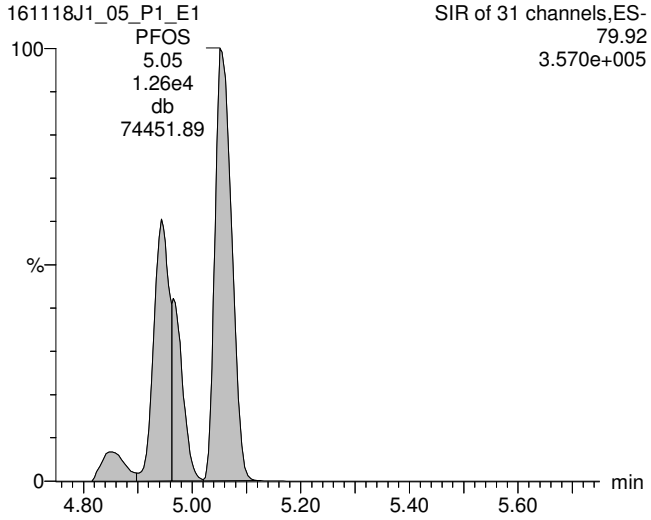
Total PFBS



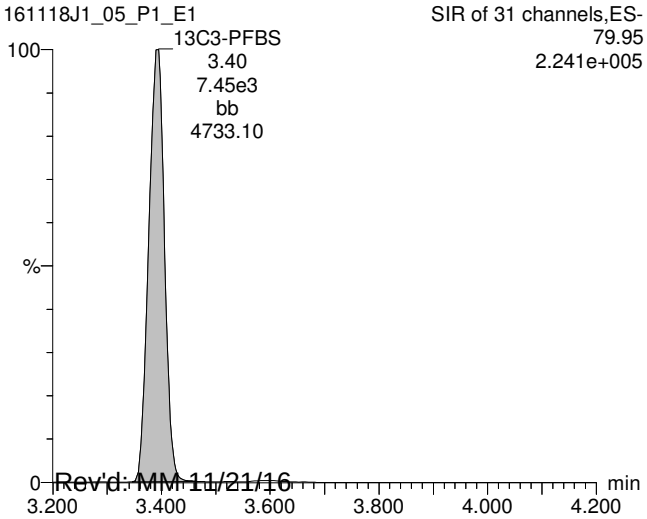
Total PFOA



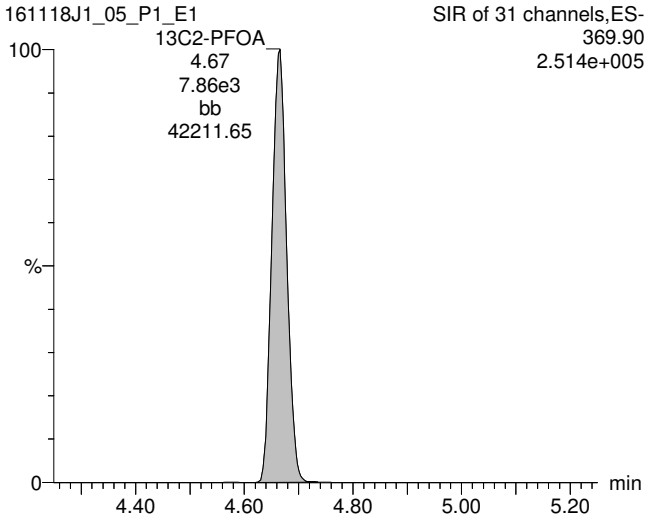
Total PFOS



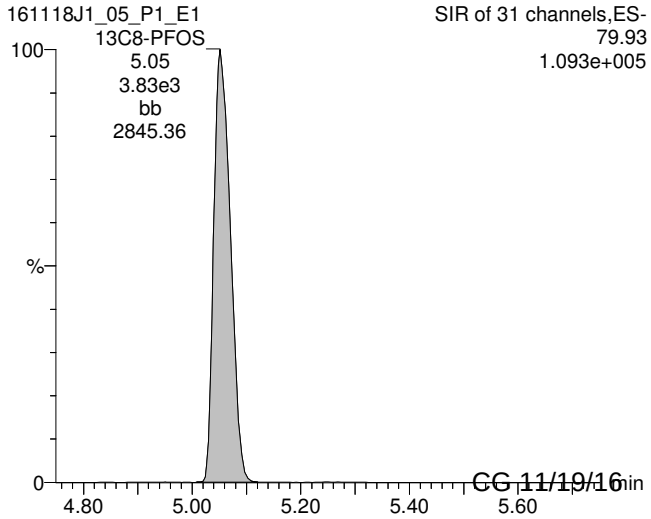
13C3-PFBS



13C2-PFOA



13C8-PFOS



Rev'd: MM 11/21/16 CG 11/19/16

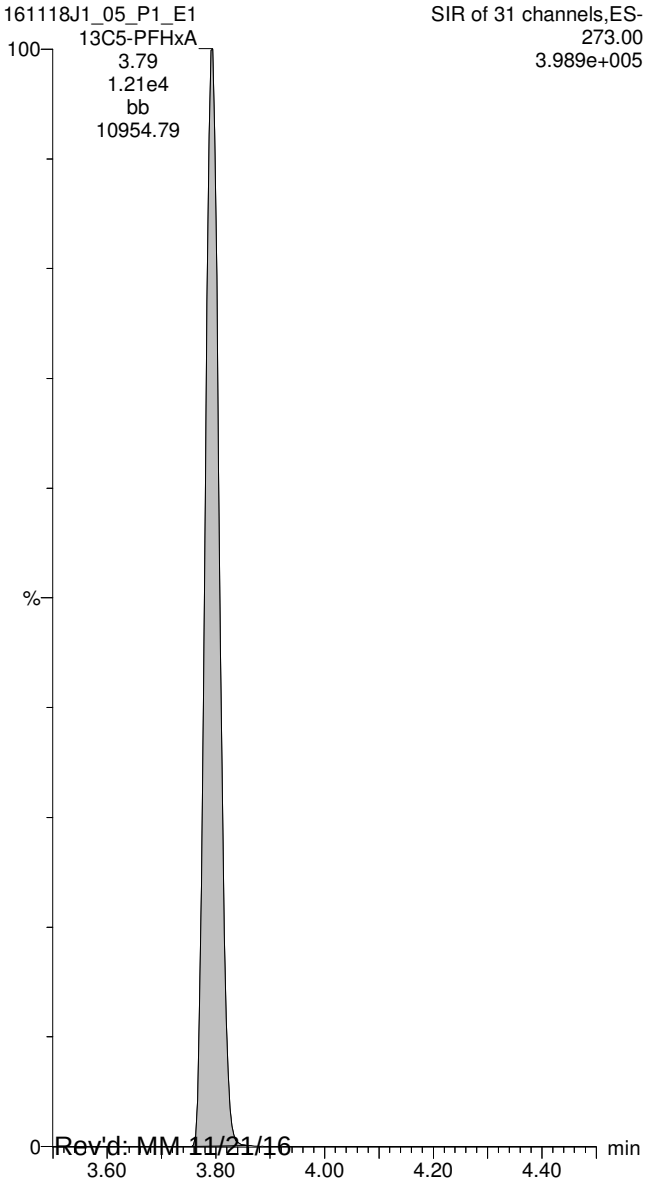
Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161118J1\161118J1_05.qld

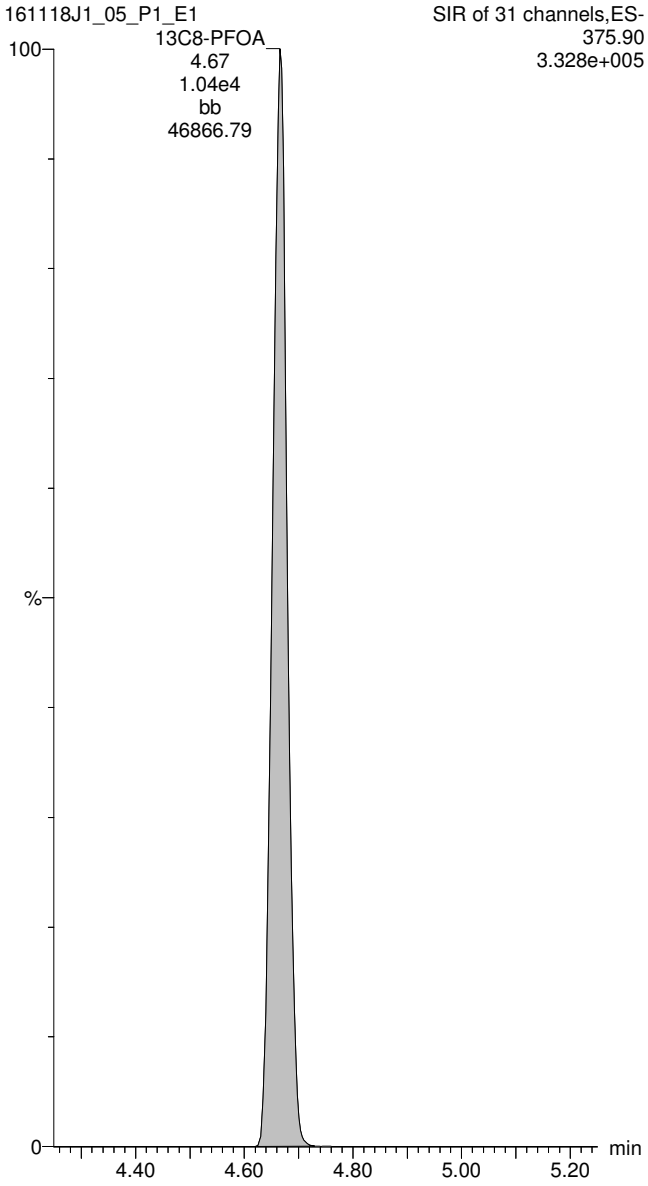
Last Altered: Saturday, November 19, 2016 13:00:29 Pacific Standard Time
Printed: Saturday, November 19, 2016 13:01:21 Pacific Standard Time

ID: 1601395-04, Description: 26SW04_161101, Name: 161118J1_05.wiff, Date: 18-Nov-2016, Time: 15:36:19, Instrument: , Lab: ©PE-SCIEX, User: sciex

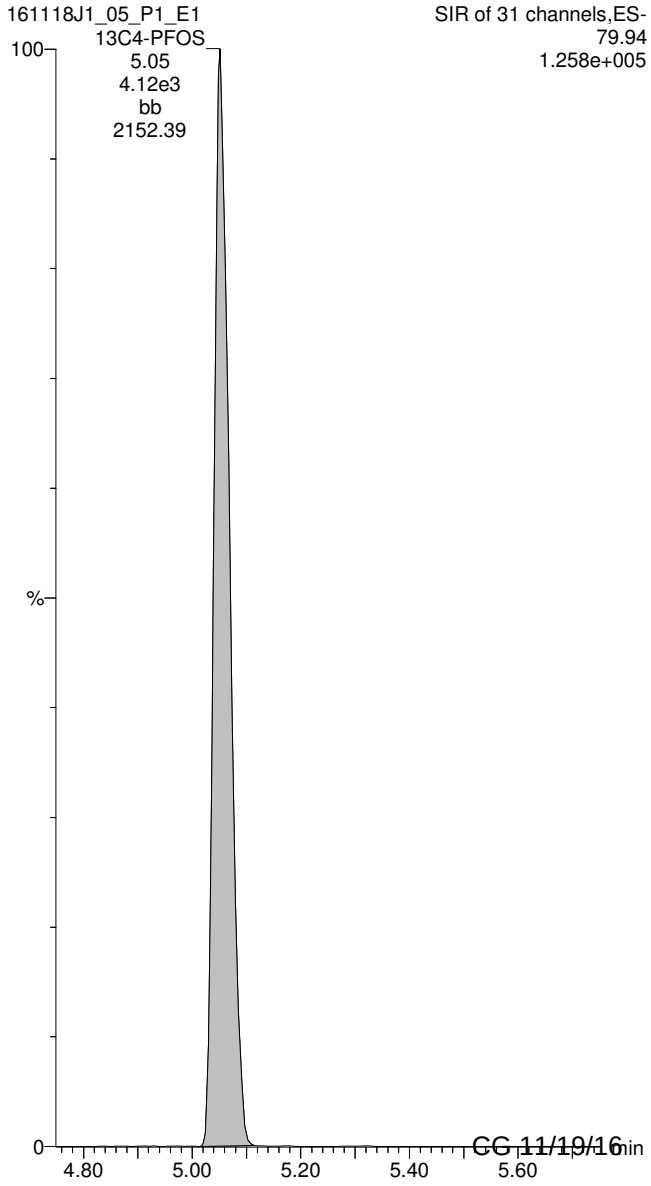
13C5-PFHxA



13C8-PFOA



13C4-PFOS



Rev'd: MM 11/21/16 CG 11/19/16

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-40.qld

Last Altered: Monday, November 21, 2016 11:54:07 Pacific Standard Time
Printed: Monday, November 21, 2016 11:55:24 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

ID: 1601395-05 DUP07_161101 0.12584, Description: DUP07_161101, Name: 161116G1_40, Date: 16-Nov-2016, Time: 19:03:18

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	1	PFBS	299 > 79.7		3.430e2		0.126			
2	5	PFOA	413 > 368.7	3.988e2	1.669e3		0.126	4.37	27.5	
3	6	PFOS	499 >79.9		3.730e2		0.126			
4	9	13C3-PFBS	302.0 > 98.8	3.430e2	1.523e3	0.250	0.126	3.08	89.5	90.1
5	10	13C2-PFHxA	315 > 269.8	3.698e2	1.523e3	0.741	0.126	3.44	32.5	81.9
6	11	13C4-PFHpA	367.2 > 321.8	1.004e3	7.224e2	2.077	0.126	3.96	66.5	66.9
7	12	18O2-PFHxS	403 > 102.6	3.855e2	7.224e2	0.603	0.126	4.08	87.9	88.5
8	13	13C2-PFOA	414.9 > 369.7	1.669e3	6.760e2	2.438	0.126	4.37	101	101
9	14	13C8-PFOS	507.0 > 79.9	3.730e2	3.673e2	1.055	0.126	4.76	95.6	96.2
10	15	13C5-PFNA	468.2 > 422.9	6.319e2	6.850e2	1.158	0.126	4.70	79.1	79.7
11	16	13C2-PFDA	515.1 > 469.9	4.827e2	5.813e2	1.164	0.126	5.00	70.9	71.3
12	17	13C5-PFHxA	318.0 > 272.9	1.523e3	1.523e3	1.000	0.126	3.43	99.3	100
13	18	13C3-PFHxS	401.9 > 79.9	7.224e2	7.224e2	1.000	0.126	4.08	99.3	100
14	19	13C8-PFOA	421.3 > 376	6.760e2	6.760e2	1.000	0.126	4.36	99.3	100
15	20	13C4-PFOS	503.0 > 79.9	3.673e2	3.673e2	1.000	0.126	4.76	99.3	100
16	23	Total PFBS	299 > 79.7		3.430e2		0.126			
17	25	Total PFOA	413 > 368.7		1.669e3		0.126		27.5	
18	26	Total PFOS	499 > 79.9		3.730e2		0.126			

Rev'd: MM 11/21/16 AC 11/21/16

Vista Analytical Laboratory Q1

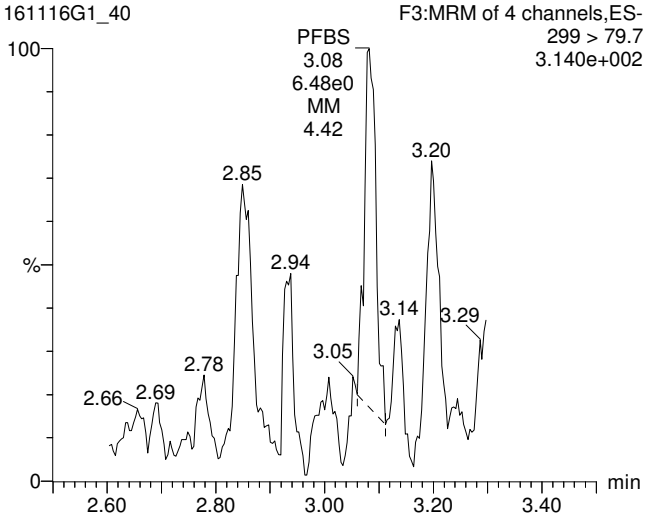
Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-40.qld

Last Altered: Monday, November 21, 2016 11:54:07 Pacific Standard Time
Printed: Monday, November 21, 2016 11:55:24 Pacific Standard Time

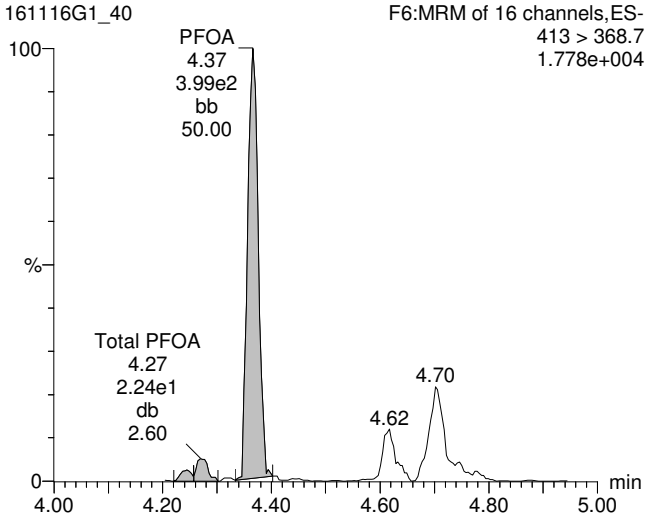
Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

ID: 1601395-05 DUP07_161101 0.12584, Description: DUP07_161101, Name: 161116G1_40, Date: 16-Nov-2016, Time: 19:03:18, Instrument: , Lab: , User:

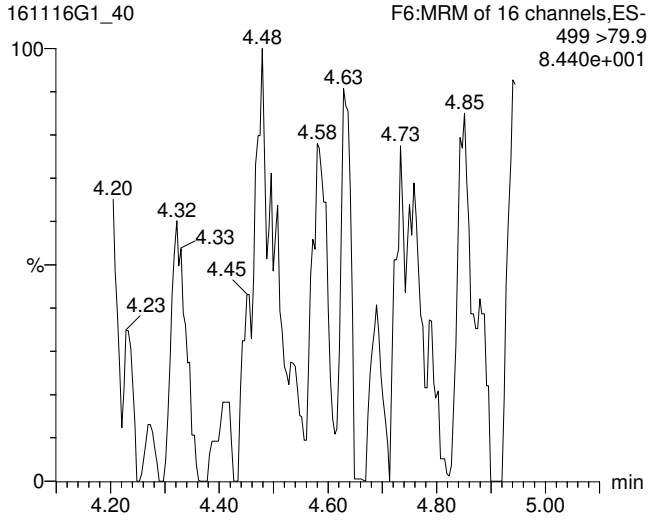
Total PFBS



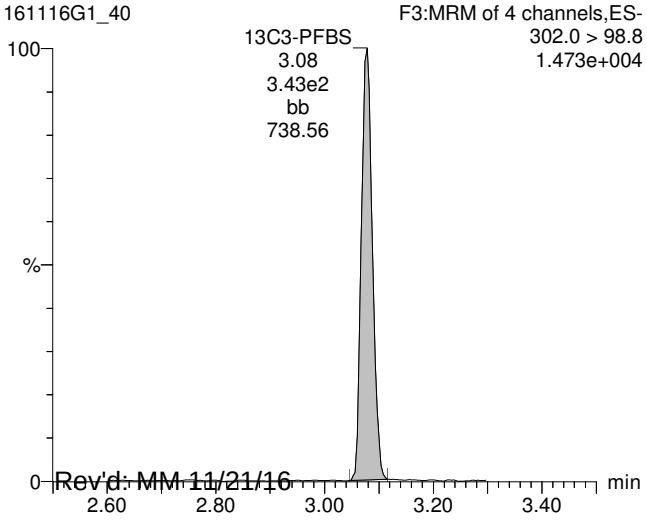
Total PFOA



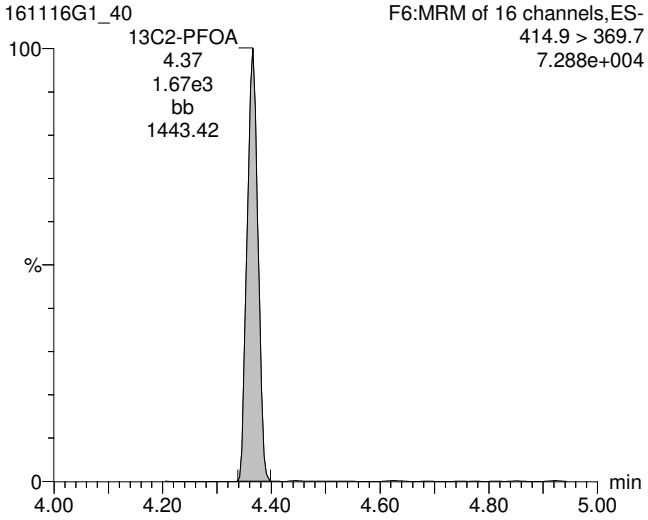
Total PFOS



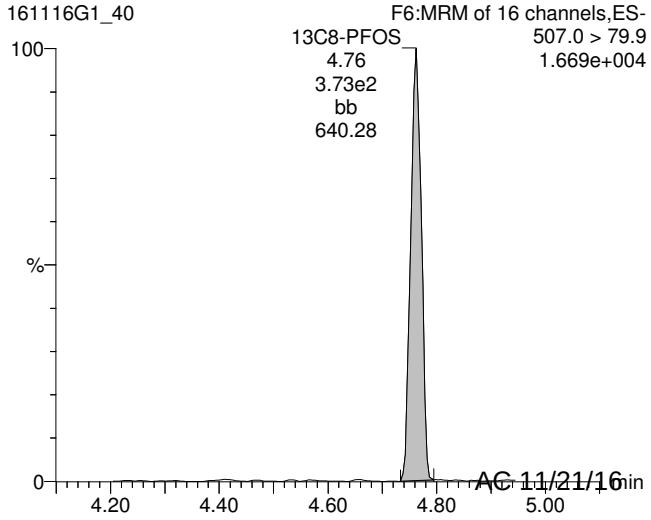
13C3-PFBS



13C2-PFOA



13C8-PFOS



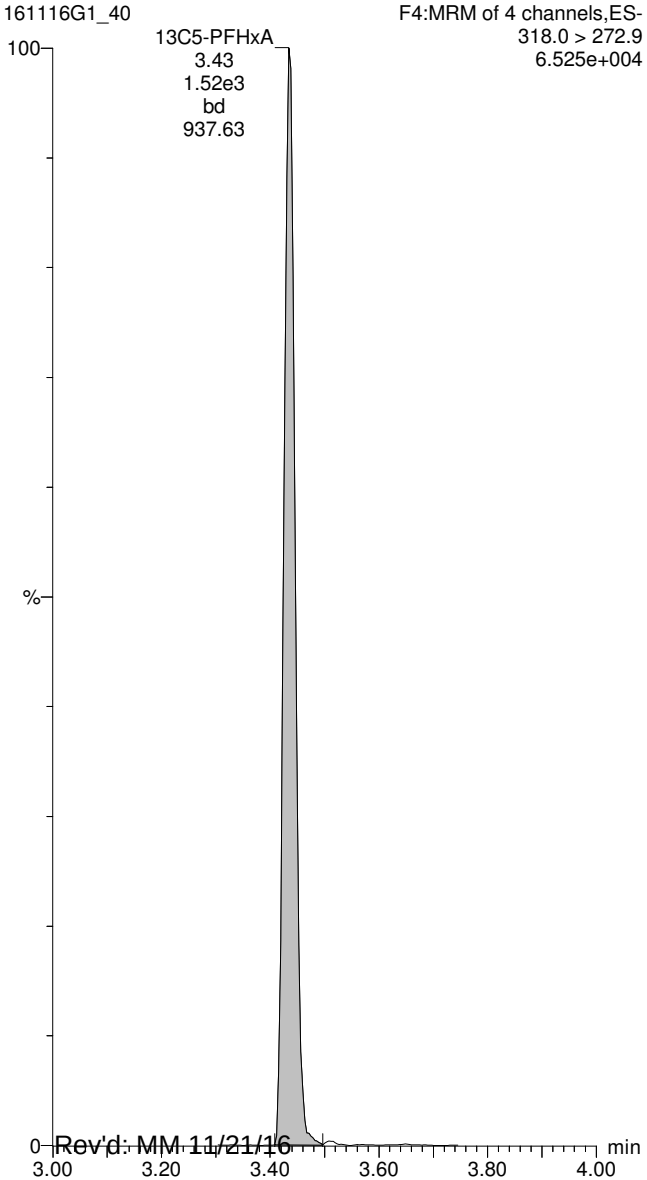
Rev'd: MM 11/21/16 AC 11/21/16

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-40.qld

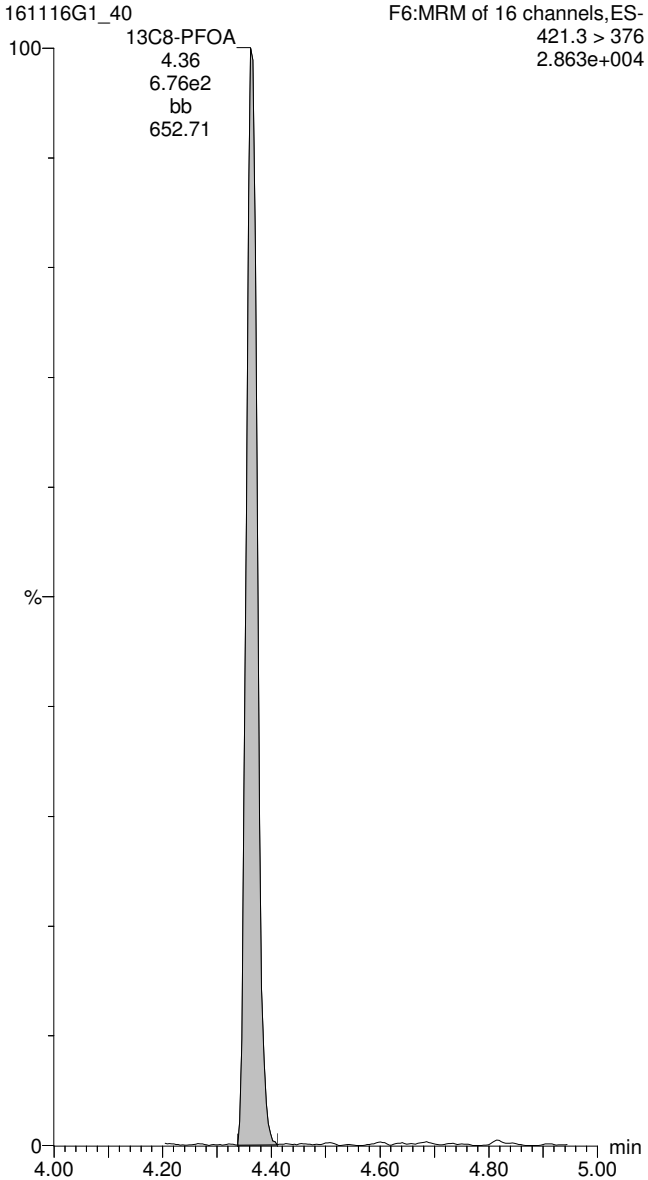
Last Altered: Monday, November 21, 2016 11:54:07 Pacific Standard Time
Printed: Monday, November 21, 2016 11:55:24 Pacific Standard Time

ID: 1601395-05 DUP07_161101 0.12584, Description: DUP07_161101, Name: 161116G1_40, Date: 16-Nov-2016, Time: 19:03:18, Instrument: , Lab: , User:

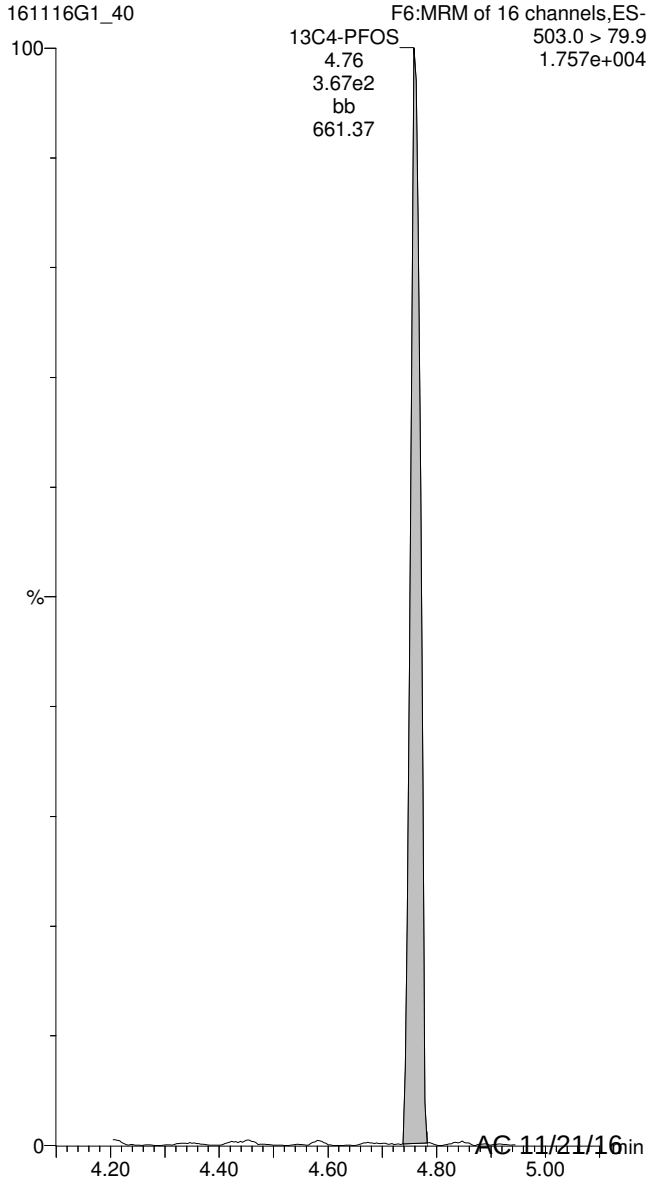
13C5-PFHxA



13C8-PFOA



13C4-PFOS



Rev'd: MM 11/21/16 AC 11/21/16

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-14.qld

Last Altered: Monday, November 28, 2016 09:18:31 Pacific Standard Time
Printed: Monday, November 28, 2016 09:18:51 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

ID: 1601395-08RE2 EB-26SW04_161101 0.13015, Description: EB-26SW04_161101, Name: 161127G1_14, Date: 27-Nov-2016, Time: 16:10:00

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3	PFBS	299 > 79.7	4.902e0	5.837e3		0.130	3.08	0.670	
2	8	PFOA	413 > 368.7	2.168e2	1.837e4		0.130	4.36	0.476	
3	10	PFOS	499 >79.9	4.861e0	6.814e3		0.130	4.76	1.61	
4	16	13C3-PFBS	302.0 > 98.8	5.837e3	1.604e4	0.302	0.130	3.08	116	120
5	17	13C2-PFHxA	315 > 269.8	3.980e3	1.604e4	0.620	0.130	3.44	38.5	100
6	18	13C4-PFHpA	367.2 > 321.8	1.058e4	1.129e4	1.139	0.130	3.95	79.1	82.3
7	19	18O2-PFHxS	403 > 102.6	5.003e3	1.129e4	0.449	0.130	4.07	94.7	98.6
8	20	13C2-6:2 FTS	429.1 > 408.9	2.691e3	4.478e3	1.073	0.130	4.31	53.8	56.0
9	21	13C2-PFOA	414.9 > 369.7	1.837e4	7.638e3	2.262	0.130	4.35	102	106
10	22	13C8-PFOS	507.0 > 79.9	6.814e3	7.301e3	0.944	0.130	4.76	95.0	98.9
11	23	13C5-PFNA	468.2 > 422.9	8.374e3	9.161e3	1.082	0.130	4.69	81.1	84.5
12	24	13C2-PFDA	515.1 > 469.9	6.629e3	7.901e3	1.019	0.130	5.00	79.1	82.3
13	25	13C2-8:2 FTS	529.1 > 508.7	2.582e3	4.478e3	0.569	0.130	4.97	97.4	101
14	26	13C4-PFBA	217 > 171.8	1.424e4	1.424e4	1.000	0.130	1.85	96.0	100
15	27	13C2-4:2 FTS	329.2 > 308.9	4.478e3	4.478e3	1.000	0.130	3.34	96.0	100
16	28	13C5-PFHxA	318.0 > 272.9	1.604e4	1.604e4	1.000	0.130	3.44	96.0	100
17	29	13C3-PFHxS	401.9 > 79.9	1.129e4	1.129e4	1.000	0.130	4.07	96.0	100
18	30	13C8-PFOA	421.3 > 376	7.638e3	7.638e3	1.000	0.130	4.35	96.0	100
19	31	13C4-PFOS	503.0 > 79.9	7.301e3	7.301e3	1.000	0.130	4.76	96.0	100
20	34	Total PFBS	299 > 79.7		5.003e3		0.130		1.31	
21	36	Total PFOA	413 > 368.7		1.837e4		0.130		0.476	
22	37	Total PFOS	499 > 79.9		6.814e3		0.130		3.19	

Rev'd: MM 11/28/16 AC 11/28/16

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-14.qld

Last Altered: Monday, November 28, 2016 09:18:31 Pacific Standard Time
Printed: Monday, November 28, 2016 09:18:51 Pacific Standard Time

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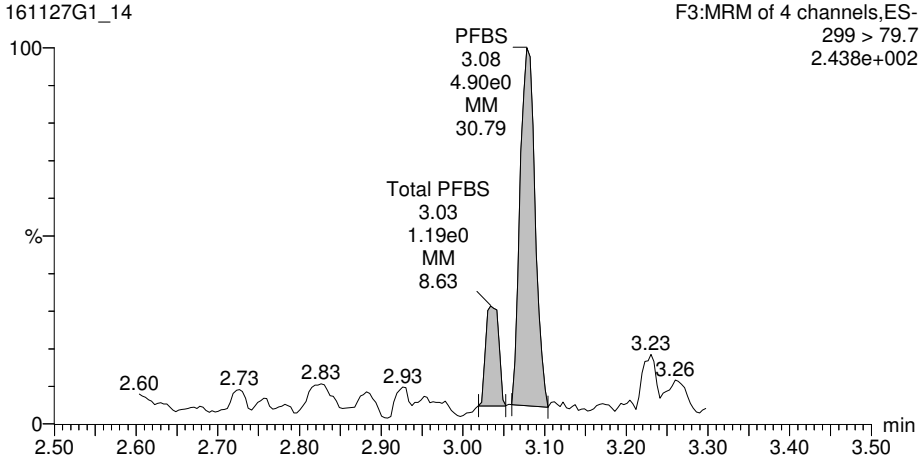
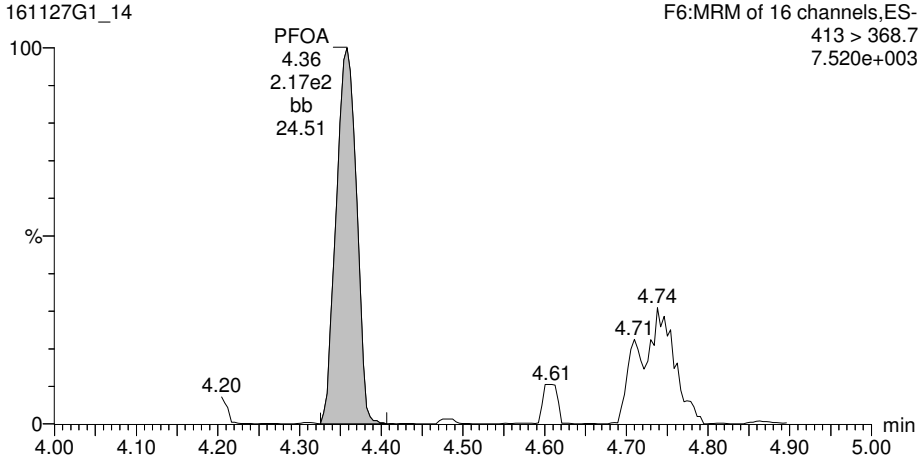
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

ID: 1601395-08RE2 EB-26SW04_161101 0.13015, Description: EB-26SW04_161101, Name: 161127G1_14, Date: 27-Nov-2016, Time: 16:10:00, Instrument: , Lab: , User:

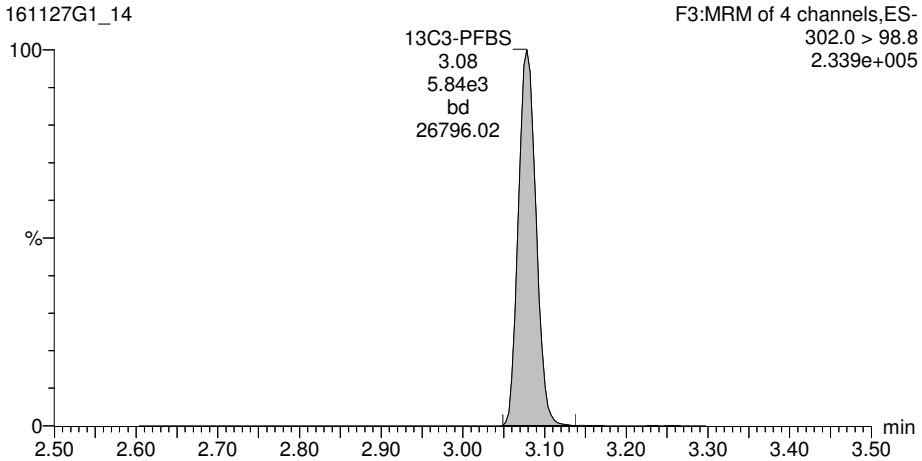
Total PFBS



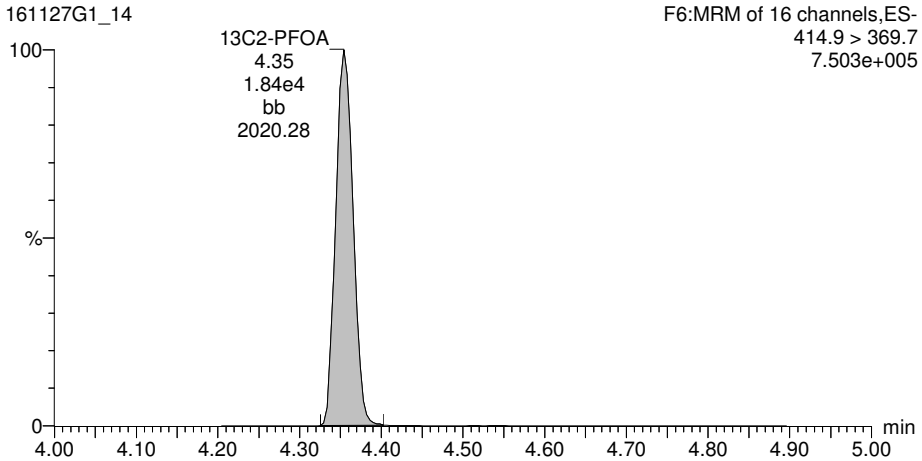
Total PFOA



13C3-PFBS



13C2-PFOA



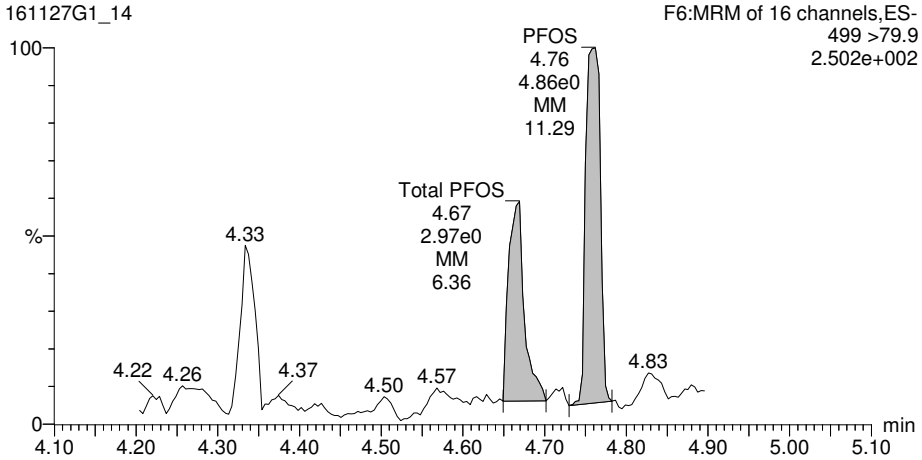
Rev'd: MM 11/28/16 AC 11/28/16

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-14.qld

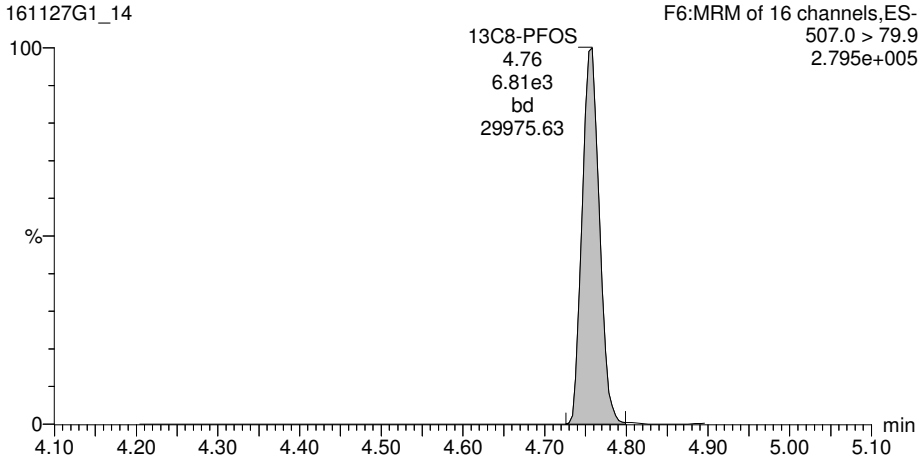
Last Altered: Monday, November 28, 2016 09:18:31 Pacific Standard Time
Printed: Monday, November 28, 2016 09:18:51 Pacific Standard Time

ID: 1601395-08RE2 EB-26SW04_161101 0.13015, Description: EB-26SW04_161101, Name: 161127G1_14, Date: 27-Nov-2016, Time: 16:10:00, Instrument: , Lab: , User:

Total PFOS



13C8-PFOS



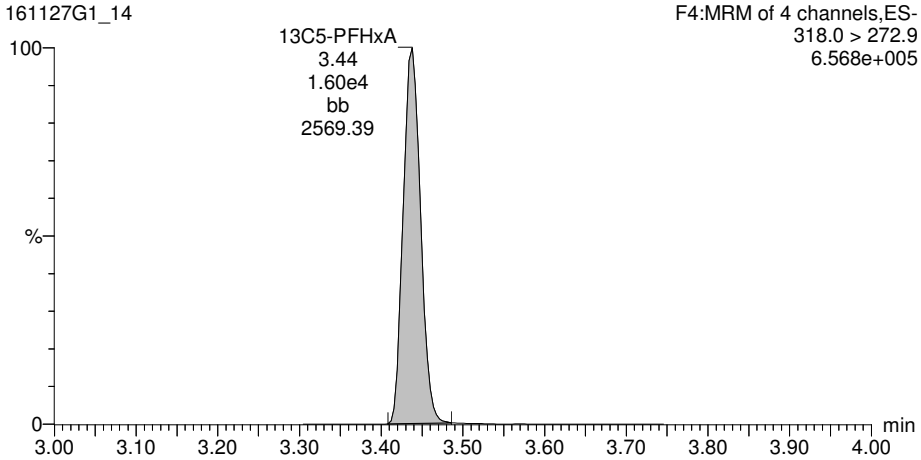
Rev'd: MM 11/28/16 AC 11/28/16

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-14.qld

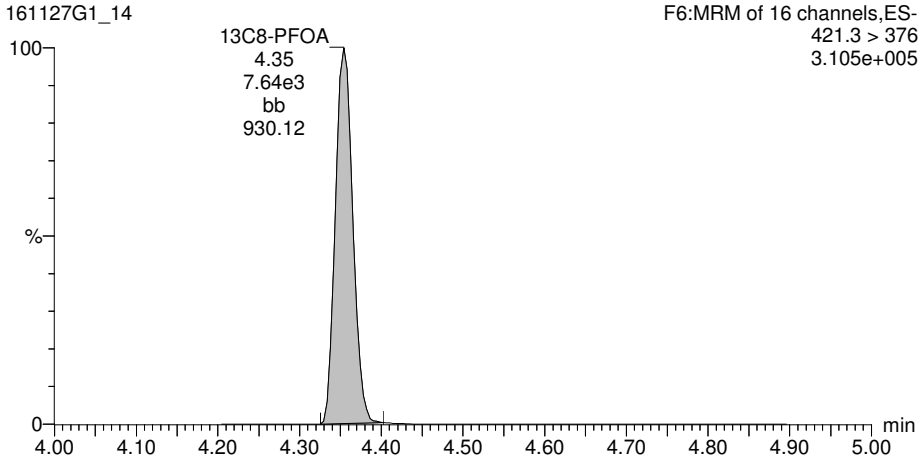
Last Altered: Monday, November 28, 2016 09:18:31 Pacific Standard Time
Printed: Monday, November 28, 2016 09:18:51 Pacific Standard Time

ID: 1601395-08RE2 EB-26SW04_161101 0.13015, Description: EB-26SW04_161101, Name: 161127G1_14, Date: 27-Nov-2016, Time: 16:10:00, Instrument: , Lab: , User:

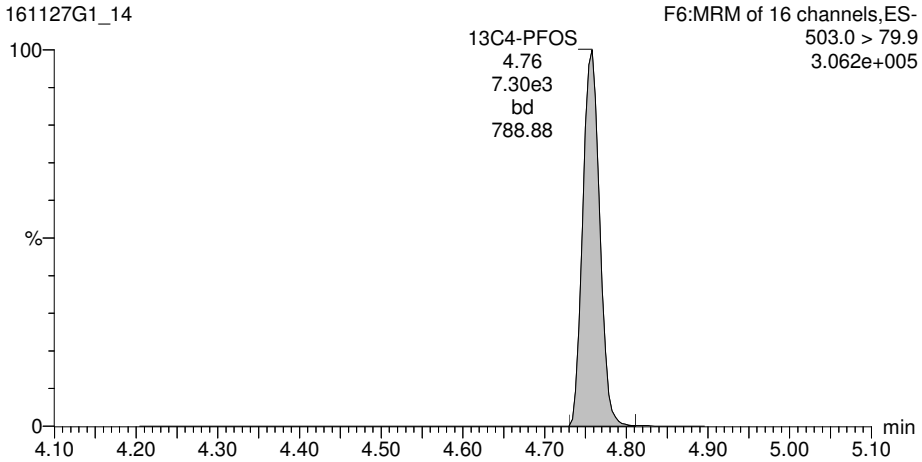
13C5-PFHxA



13C8-PFOA



13C4-PFOS



Rev'd: MM 11/28/16 AC 11/28/16

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-15.qld

Last Altered: Monday, November 28, 2016 09:20:36 Pacific Standard Time
Printed: Monday, November 28, 2016 09:21:06 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

ID: 1601395-11RE2 FB-26SW04_161101 0.12796, Description: FB-26SW04_161101, Name: 161127G1_15, Date: 27-Nov-2016, Time: 16:22:37

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3	PFBS	299 > 79.7	3.745e0	5.773e3		0.128	3.09	0.671	
2	8	PFOA	413 > 368.7	1.298e2	1.751e4		0.128	4.35	0.00788	
3	10	PFOS	499 >79.9	1.908e2	7.522e3		0.128	4.75	4.52	
4	16	13C3-PFBS	302.0 > 98.8	5.773e3	1.715e4	0.302	0.128	3.08	109	111
5	17	13C2-PFHxA	315 > 269.8	3.861e3	1.715e4	0.620	0.128	3.44	35.5	90.9
6	18	13C4-PFHpA	367.2 > 321.8	1.095e4	1.247e4	1.139	0.128	3.95	75.3	77.1
7	19	18O2-PFHxS	403 > 102.6	5.240e3	1.247e4	0.449	0.128	4.07	91.4	93.5
8	20	13C2-6:2 FTS	429.1 > 408.9	3.430e3	4.005e3	1.073	0.128	4.31	77.9	79.8
9	21	13C2-PFOA	414.9 > 369.7	1.751e4	9.217e3	2.262	0.128	4.35	82.0	84.0
10	22	13C8-PFOS	507.0 > 79.9	7.522e3	7.991e3	0.944	0.128	4.75	97.5	99.8
11	23	13C5-PFNA	468.2 > 422.9	9.424e3	9.250e3	1.082	0.128	4.69	92.0	94.2
12	24	13C2-PFDA	515.1 > 469.9	6.218e3	1.052e4	1.019	0.128	4.99	56.7	58.0
13	25	13C2-8:2 FTS	529.1 > 508.7	3.513e3	4.005e3	0.569	0.128	4.97	151	154
14	26	13C4-PFBA	217 > 171.8	1.587e4	1.587e4	1.000	0.128	1.84	97.7	100
15	27	13C2-4:2 FTS	329.2 > 308.9	4.005e3	4.005e3	1.000	0.128	3.35	97.7	100
16	28	13C5-PFHxA	318.0 > 272.9	1.715e4	1.715e4	1.000	0.128	3.44	97.7	100
17	29	13C3-PFHxS	401.9 > 79.9	1.247e4	1.247e4	1.000	0.128	4.07	97.7	100
18	30	13C8-PFOA	421.3 > 376	9.217e3	9.217e3	1.000	0.128	4.35	97.7	100
19	31	13C4-PFOS	503.0 > 79.9	7.991e3	7.991e3	1.000	0.128	4.75	97.7	100
20	34	Total PFBS	299 > 79.7		5.240e3		0.128		0.671	
21	36	Total PFOA	413 > 368.7		1.751e4		0.128		0.00788	
22	37	Total PFOS	499 > 79.9		7.522e3		0.128		10.5	

Rev'd: MM 11/28/16 AC 11/28/16

Vista Analytical Laboratory Q1

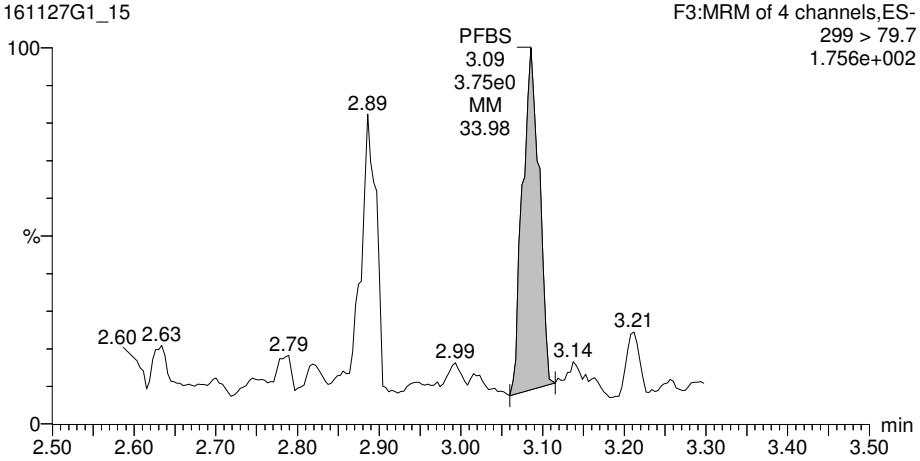
Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-15.qld

Last Altered: Monday, November 28, 2016 09:20:36 Pacific Standard Time
Printed: Monday, November 28, 2016 09:21:06 Pacific Standard Time

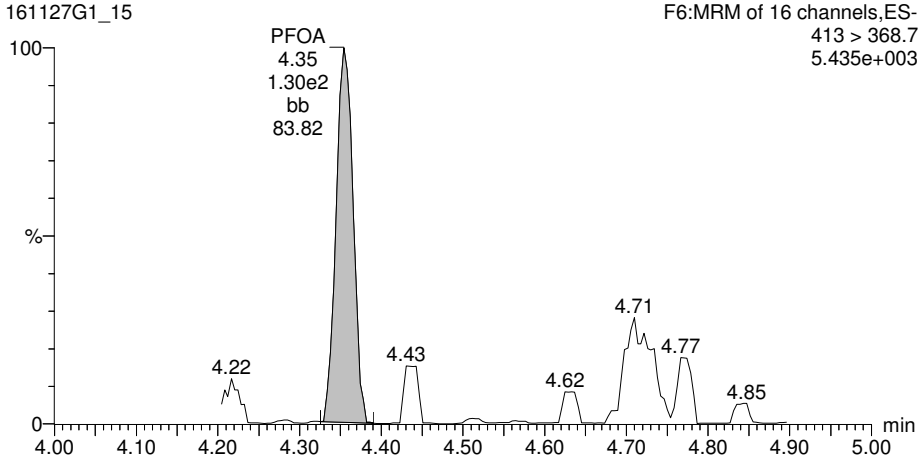
Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

ID: 1601395-11RE2 FB-26SW04_161101 0.12796, Description: FB-26SW04_161101, Name: 161127G1_15, Date: 27-Nov-2016, Time: 16:22:37, Instrument: , Lab: , User:

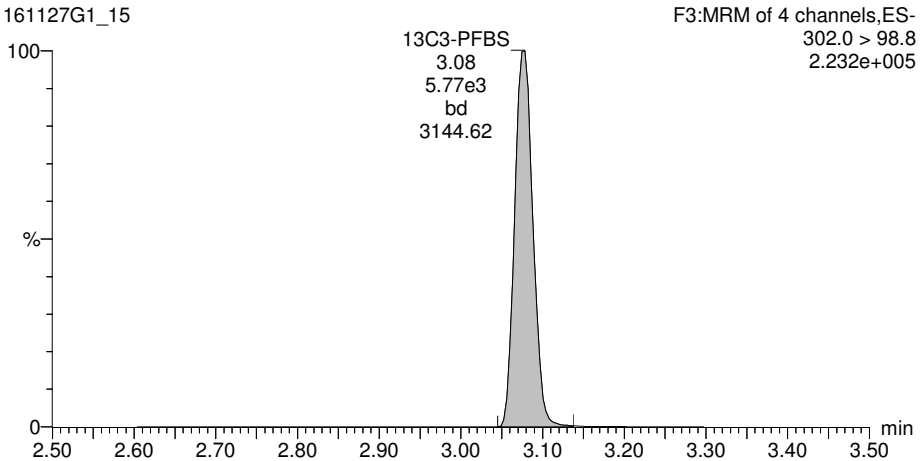
Total PFBS



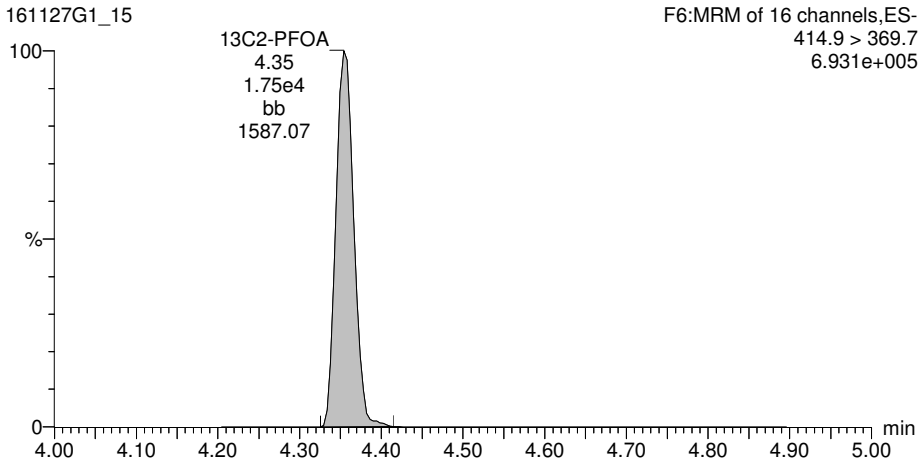
Total PFOA



13C3-PFBS



13C2-PFOA



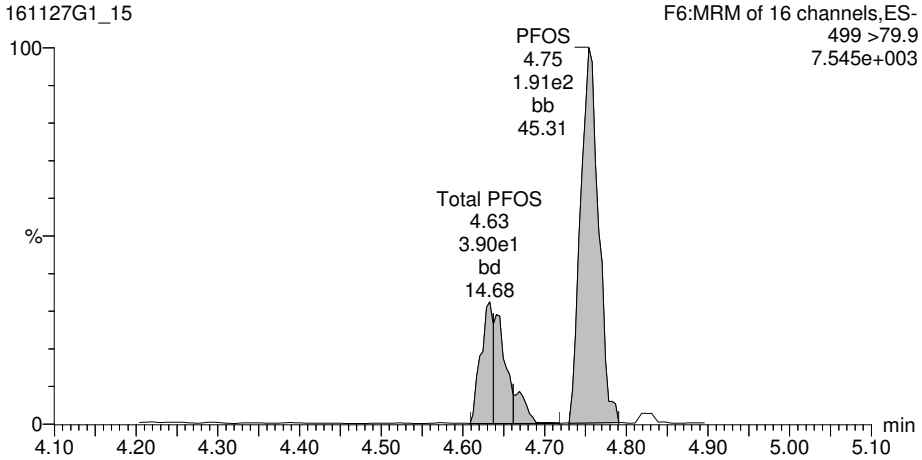
Rev'd: MM 11/28/16 AC 11/28/16

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-15.qld

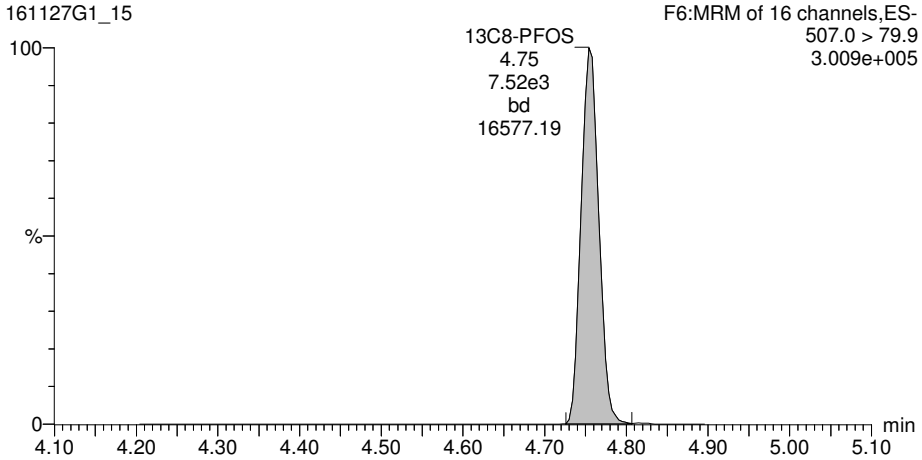
Last Altered: Monday, November 28, 2016 09:20:36 Pacific Standard Time
Printed: Monday, November 28, 2016 09:21:06 Pacific Standard Time

ID: 1601395-11RE2 FB-26SW04_161101 0.12796, Description: FB-26SW04_161101, Name: 161127G1_15, Date: 27-Nov-2016, Time: 16:22:37, Instrument: , Lab: , User:

Total PFOS



13C8-PFOS



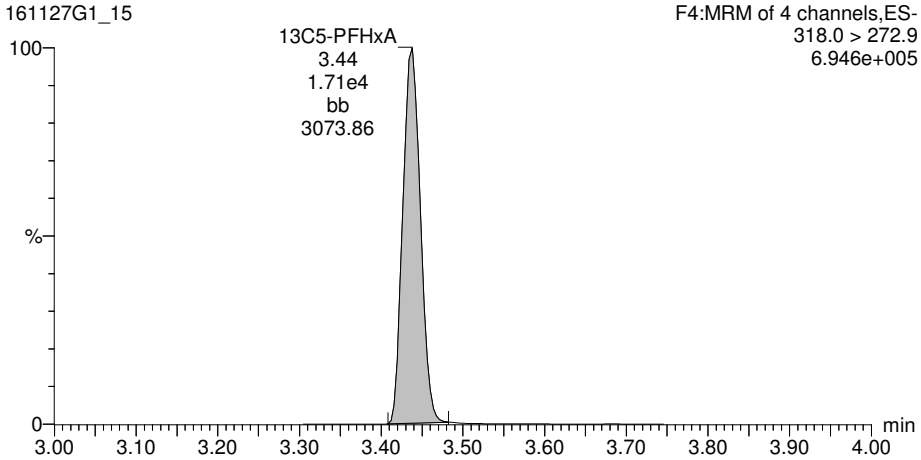
Rev'd: MM 11/28/16 AC 11/28/16

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-15.qld

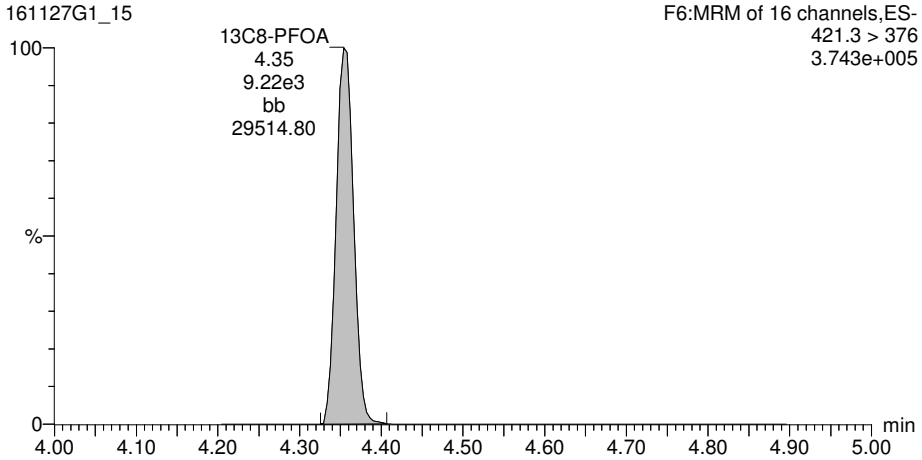
Last Altered: Monday, November 28, 2016 09:20:36 Pacific Standard Time
Printed: Monday, November 28, 2016 09:21:06 Pacific Standard Time

ID: 1601395-11RE2 FB-26SW04_161101 0.12796, Description: FB-26SW04_161101, Name: 161127G1_15, Date: 27-Nov-2016, Time: 16:22:37, Instrument: , Lab: , User:

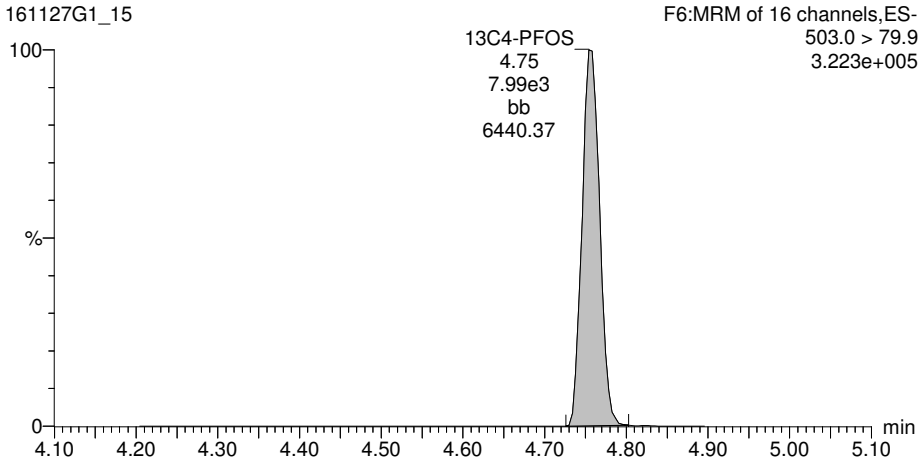
13C5-PFHxA



13C8-PFOA



13C4-PFOS



Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161118J1\161118J1_06.qld

Last Altered: Saturday, November 19, 2016 13:05:29 Pacific Standard Time
Printed: Saturday, November 19, 2016 13:05:54 Pacific Standard Time

Method: U:\Q2.pro\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 15 Nov 2016 11:51:30
Calibration: U:\Q2.pro\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

ID: 1601395-12, Description: EB18_161101, Name: 161118J1_06.wiff, Date: 18-Nov-2016, Time: 15:48:33

	#	Name	Trace	Peak Area	IS Resp	RRF Mean	wt/vol	RT	Conc.	%Rec
1	3	PFBS	79.90	2.001e0	8.595e3		0.123	3.40		
2	8	PFOA	368.90	1.014e2	8.459e3		0.123	4.67	0.637	
3	10	PFOS	79.92	9.257e0	3.491e3		0.123	5.08		
4	15	13C3-PFBS	79.95	8.595e3	1.286e4	0.531	0.123	3.40	128	126
5	16	13C2-PFHxA	269.90	5.227e3	1.286e4	0.905	0.123	3.79	45.7	112
6	17	13C4-PFHpA	321.90	1.004e4	1.286e4	0.770	0.123	4.27	103	101
7	18	18O2-PFHxS	102.90	1.656e3	5.569e3	0.276	0.123	4.38	110	108
8	19	13C2-6:2 FTS	408.90	2.924e3	1.160e4	0.219	0.123	4.62	117	115
9	20	13C2-PFOA	369.90	8.459e3	1.160e4	0.663	0.123	4.67	112	110
10	21	13C5-PFNA	422.90	7.175e3	6.771e3	1.019	0.123	5.01	106	104
11	22	13C8-PFOS	79.93	3.491e3	3.104e3	0.921	0.123	5.07	124	122
12	26	13C5-PFHxA	273.00	1.286e4	1.286e4	1.000	0.123	3.79	102	100
13	27	13C3-PFHxS	80.01	5.569e3	5.569e3	1.000	0.123	4.38	102	100
14	28	13C8-PFOA	375.90	1.160e4	1.160e4	1.000	0.123	4.67	102	100
15	29	13C4-PFOS	79.94	3.104e3	3.104e3	1.000	0.123	5.07	102	100
16	32	Total PFBS	79.90		8.595e3		0.123			
17	33	Total PFHxS	79.91		1.656e3		0.123		0.371	
18	34	Total PFOA	368.90		8.459e3		0.123		0.637	
19	35	Total PFOS	79.92		3.491e3		0.123			

Rev'd: MM 11/21/16 CG 11/19/16

Vista Analytical Laboratory Q1

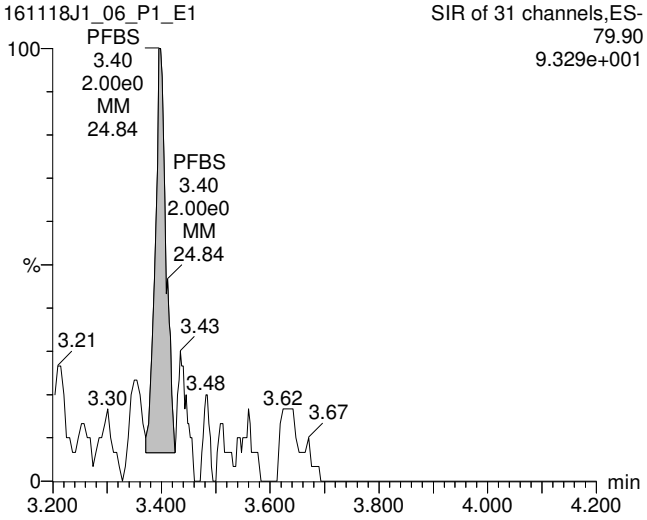
Dataset: U:\Q2.PRO\Results\161118J1\161118J1_06.qld

Last Altered: Saturday, November 19, 2016 13:05:29 Pacific Standard Time
Printed: Saturday, November 19, 2016 13:05:54 Pacific Standard Time

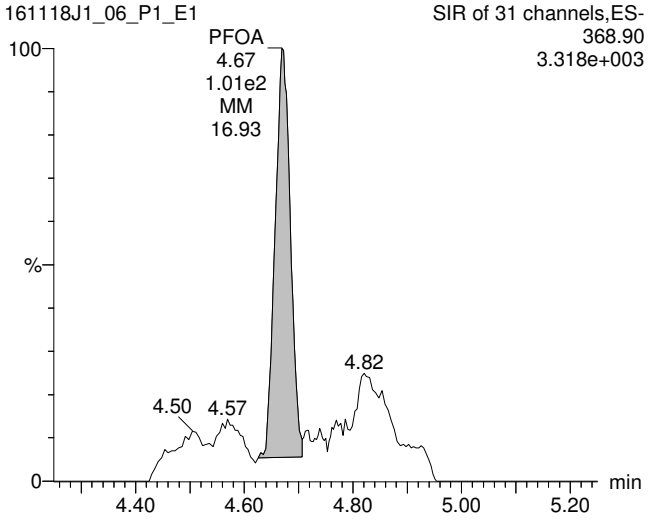
Method: U:\Q2.pro\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 15 Nov 2016 11:51:30
Calibration: U:\Q2.pro\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

ID: 1601395-12, Description: EB18_161101, Name: 161118J1_06.wiff, Date: 18-Nov-2016, Time: 15:48:33, Instrument: , Lab: ©PE-SCIEX, User: sciex

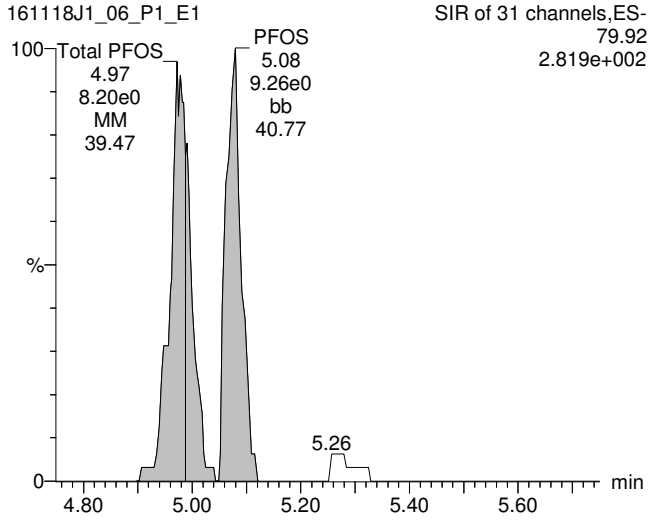
Total PFBS



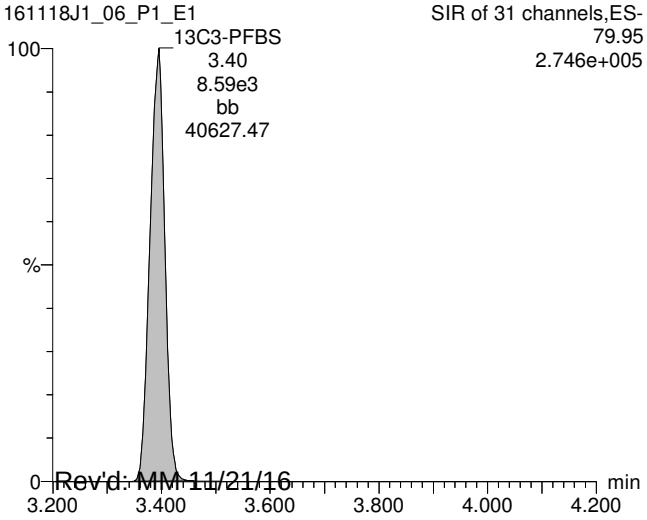
Total PFOA



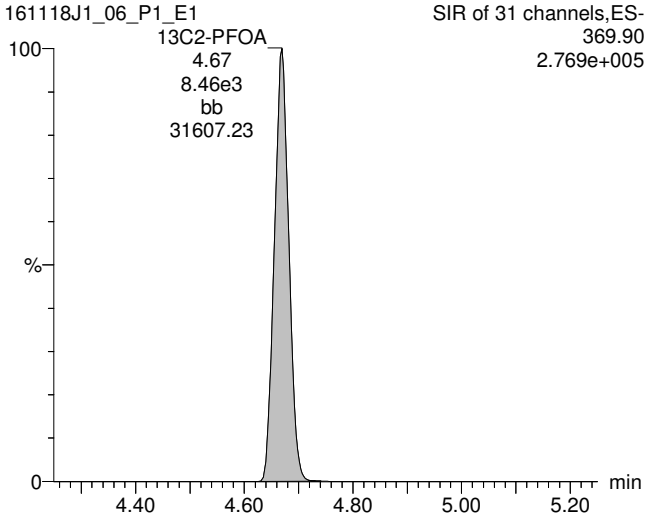
Total PFOS



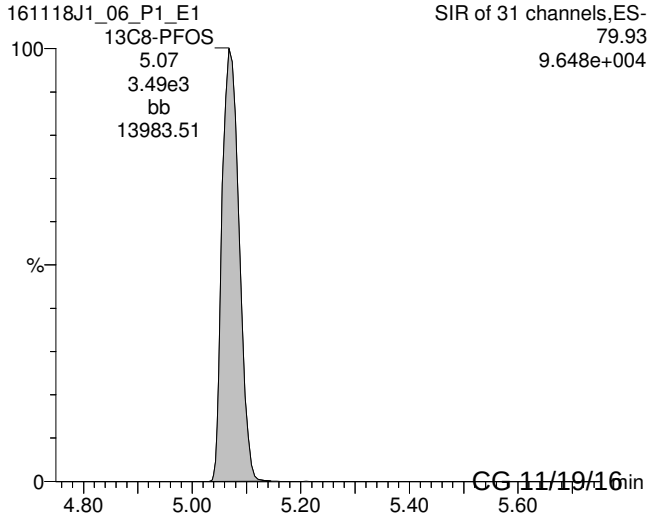
13C3-PFBS



13C2-PFOA



13C8-PFOS



Rev'd: MM 11/21/16 CG 11/19/16

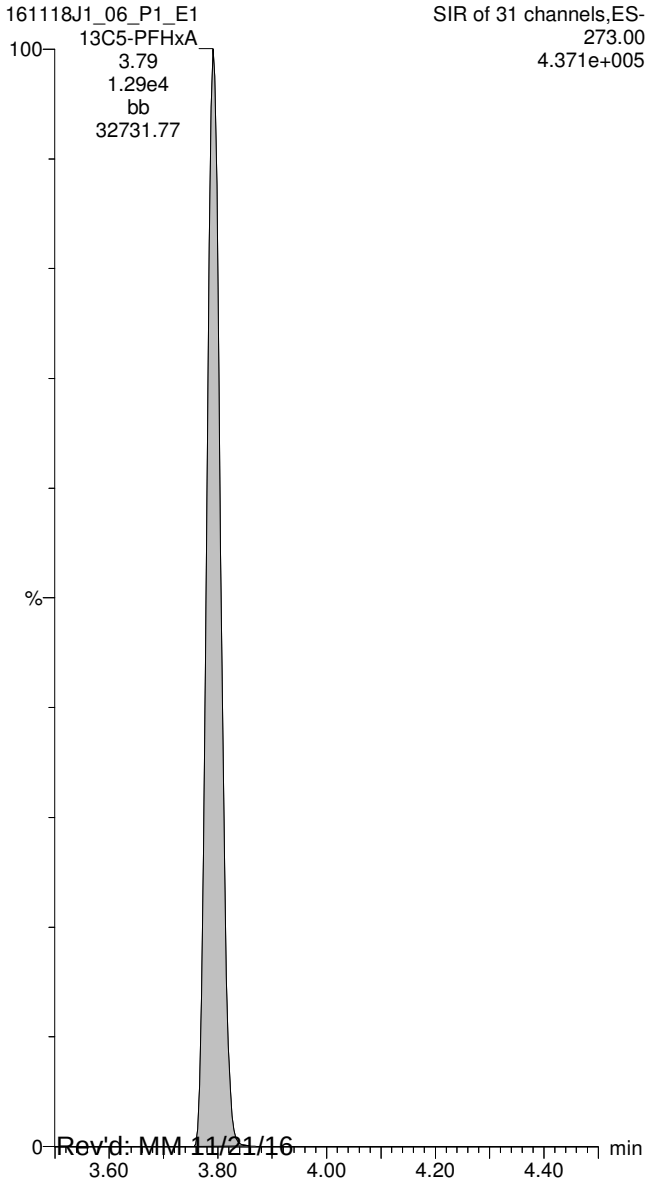
Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161118J1\161118J1_06.qld

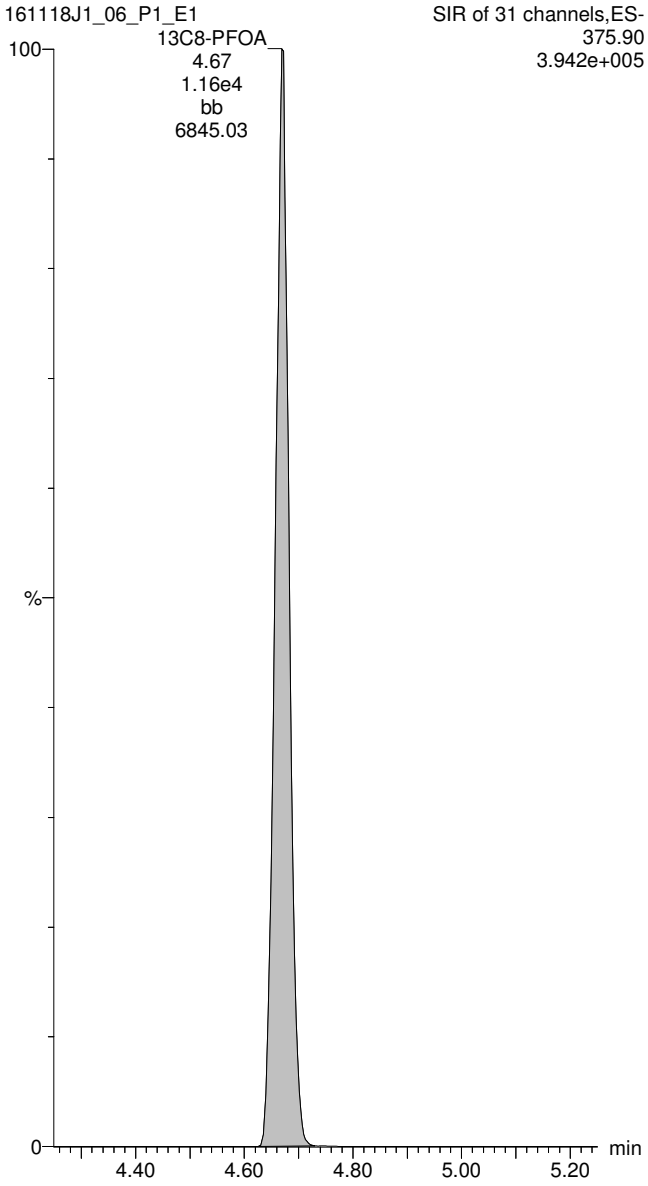
Last Altered: Saturday, November 19, 2016 13:05:29 Pacific Standard Time
Printed: Saturday, November 19, 2016 13:05:54 Pacific Standard Time

ID: 1601395-12, Description: EB18_161101, Name: 161118J1_06.wiff, Date: 18-Nov-2016, Time: 15:48:33, Instrument: , Lab: ©PE-SCIEX, User: sciex

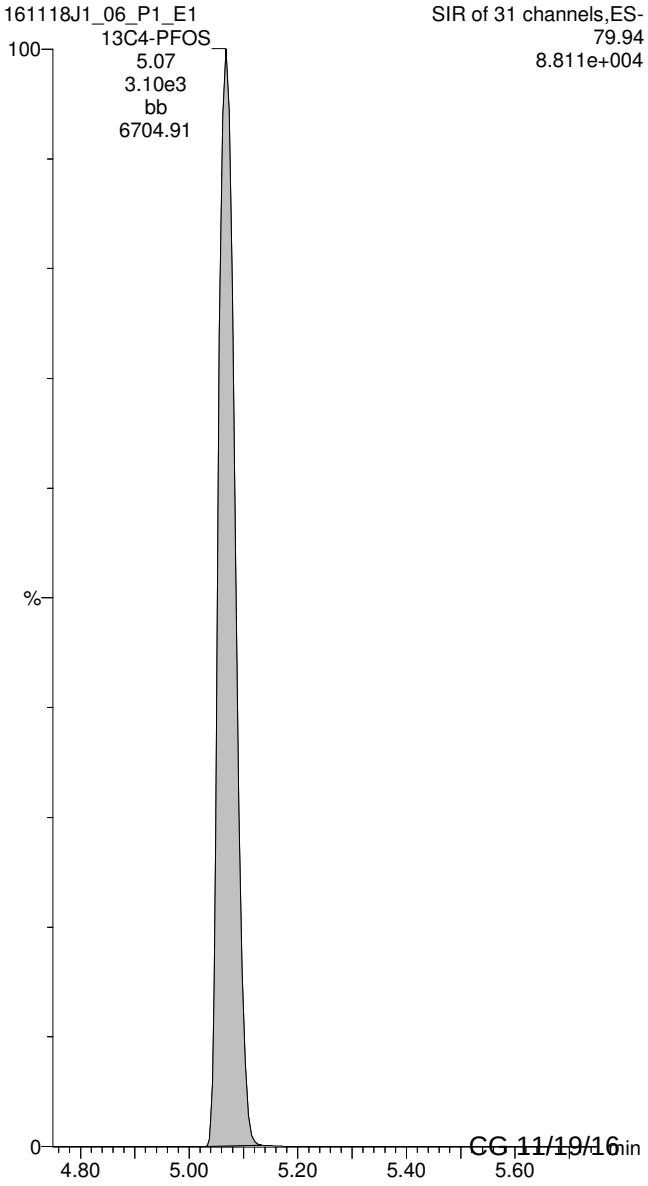
13C5-PFHxA



13C8-PFOA



13C4-PFOS



Rev'd: MM 11/21/16 CG 11/19/16

CONTINUING CALIBRATION

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-2.qld

Last Altered: Wednesday, November 16, 2016 13:42:08 Pacific Standard Time
Printed: Wednesday, November 16, 2016 13:44:30 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161116G1_2, Date: 16-Nov-2016, Time: 11:03:24, ID: ST161116G1-1 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec	
1	1	PFBS	299 > 79.7	7.32e3	6.15e3		1.000	3.10	10.8	108.1	75-125
2	2	PFHxA	313.2 > 268.9	8.58e3	6.93e3		1.000	3.46	11.4	114.3	
3	3	PFHpA	363 > 318.9	1.93e4	1.71e4		1.000	3.98	11.7	116.7	
4	4	PFHxS	398.9 > 79.6	6.04e3	5.50e3		1.000	4.10	10.4	104.4	
5	5	PFOA	413 > 368.7	1.77e4	2.45e4		1.000	4.38	11.0	110.0	
6	6	PFOS	499 >79.9	1.96e3	3.45e3		1.000	4.78	9.88	98.8	
7	7	PFNA	463 > 418.8	1.17e4	8.49e3		1.000	4.72	10.8	107.9	
8	8	PFDA	513 > 468.8	1.93e3	3.98e3		1.000	5.03	11.0	110.0	
9	9	13C3-PFBS	302.0 > 98.8	6.15e3	3.15e4	0.250	1.000	3.10	9.76	78.1	60-150
10	10	13C2-PFHxA	315 > 269.8	6.93e3	3.15e4	0.741	1.000	3.46	3.71	74.2	
11	11	13C4-PFHpA	367.2 > 321.8	1.71e4	1.02e4	2.077	1.000	3.98	10.0	80.3	
12	12	18O2-PFHxS	403 > 102.6	5.50e3	1.02e4	0.603	1.000	4.10	11.1	89.2	
13	13	13C2-PFOA	414.9 > 369.7	2.45e4	1.27e4	2.438	1.000	4.38	9.87	78.9	
14	14	13C8-PFOS	507.0 > 79.9	3.45e3	3.77e3	1.055	1.000	4.78	10.8	86.7	
15	15	13C5-PFNA	468.2 > 422.9	8.49e3	1.03e4	1.158	1.000	4.72	8.89	71.1	50-150
16	16	13C2-PFDA	515.1 > 469.9	3.98e3	5.29e3	1.164	1.000	5.03	8.08	64.6	60-150
17	17	13C5-PFHxA	318.0 > 272.9	3.15e4	3.15e4	1.000	1.000	3.46	12.5	100.0	
18	18	13C3-PFHxS	401.9 > 79.9	1.02e4	1.02e4	1.000	1.000	4.10	12.5	100.0	
19	19	13C8-PFOA	421.3 > 376	1.27e4	1.27e4	1.000	1.000	4.38	12.5	100.0	
20	20	13C4-PFOS	503.0 > 79.9	3.77e3	3.77e3	1.000	1.000	4.78	12.5	100.0	
21	21	13C9-PFNA	472.2 > 426.9	1.03e4	1.03e4	1.000	1.000	4.72	12.5	100.0	
22	22	13C6-PFDA	519.1 > 473.7	5.29e3	5.29e3	1.000	1.000	5.02	12.5	100.0	

AC
11/16/16
PW
11/16/16

Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Wednesday, November 16, 2016 14:55:01 Pacific Standard Time
Printed: Wednesday, November 16, 2016 14:55:16 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Compound name: PFBS

	Name	ID	Acq.Date	Acq.Time
1	161116G1_1	IPA	16-Nov-16	10:50:46
2	161116G1_2	ST161116G1-1 PFC CS3 16K1605	16-Nov-16	11:03:24
3	161116G1_3	B6K0076-BS1 OPR 0.125	16-Nov-16	11:16:03
4	161116G1_4	IPA	16-Nov-16	11:28:39
5	161116G1_5	B6K0076-BS1 OPR 0.125	16-Nov-16	11:41:16
6	161116G1_6	1601388-01 MW-BG07-1016 0.12618	16-Nov-16	11:53:52
7	161116G1_7	1601388-02 MW-BG06-1016 0.12354	16-Nov-16	12:06:28
8	161116G1_8	1601388-03 MW-BG05-1016 0.12746	16-Nov-16	12:19:05
9	161116G1_9	1601388-04 MW-BG05P-1016 0.1237	16-Nov-16	12:31:42
10	161116G1_10	1601388-05 MW-BG04-1016 0.13102	16-Nov-16	12:44:20
11	161116G1_11	1601388-06 OC-FB-102816 0.12776	16-Nov-16	12:56:58
12	161116G1_12	1601388-07 MW-BG01-1016 0.12279	16-Nov-16	13:09:37
13	161116G1_13	1601388-08 MW-BG09-1016 0.12536	16-Nov-16	13:22:13
14	161116G1_14	B6K0053-MS1 Matrix Spike 0.13008	16-Nov-16	13:34:48
15	161116G1_15	B6K0053-MSD1 Matrix Spike Dup 0.12486	16-Nov-16	13:47:24
16	161116G1_16	1601388-09 OC-MW04-1016 0.12595	16-Nov-16	14:00:04
17	161116G1_17	1601388-10 MW-BG11-1016 0.12196	16-Nov-16	14:12:46
18	161116G1_18	IPA	16-Nov-16	14:25:24
19	161116G1_19	ST161116G1-2 PFC CS3 16K1605	16-Nov-16	14:38:02

LC Calibration Standards Review Checklist Q1

			ION Ratio	Concentration	C-Cals Name	Sign Date	Correct I-Cal	Manaul Integrations	N/A
Calibration ID:	ST16111 6G1-1	L (M) H	N/A	☑	☑	☑	☑	☑	☐
Calibration ID:	-2	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: 6/29/16

Reviewed By: PW 11/16/16
Initials/Date

Comments:
L14 A

Vista Analytical Laboratory Q1

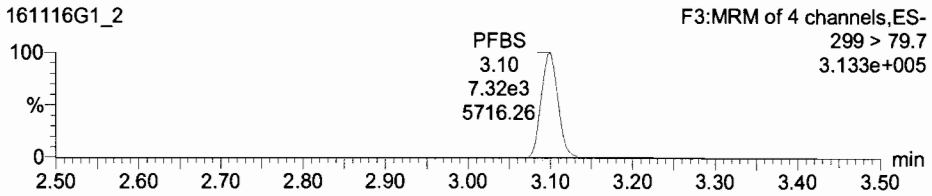
Dataset: Untitled

Last Altered: Wednesday, November 16, 2016 13:42:08 Pacific Standard Time
Printed: Wednesday, November 16, 2016 13:42:51 Pacific Standard Time

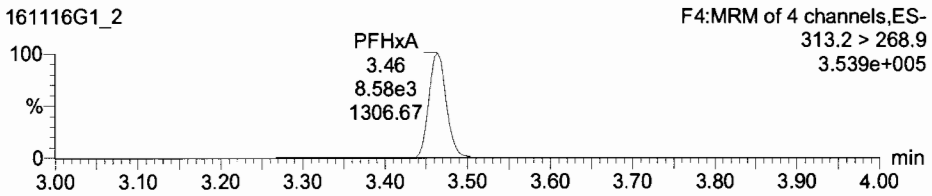
Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161116G1_2, Date: 16-Nov-2016, Time: 11:03:24, ID: ST161116G1-1 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

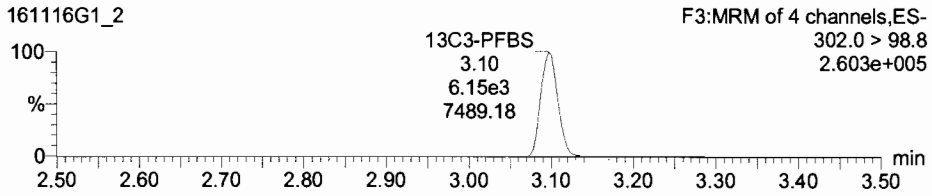
Total PFBS



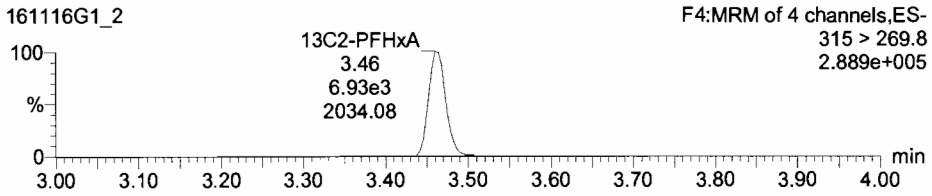
PFHxA



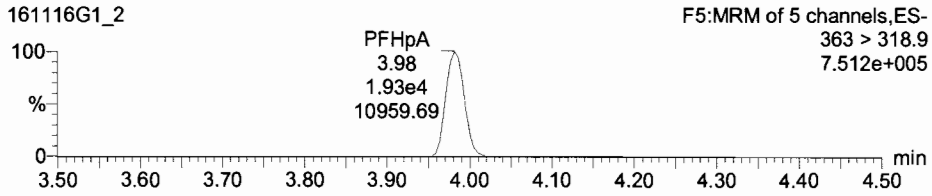
13C3-PFBS



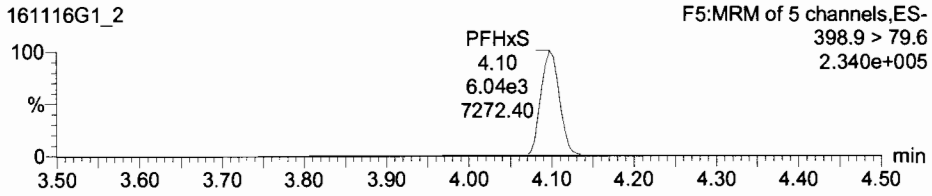
13C2-PFHxA



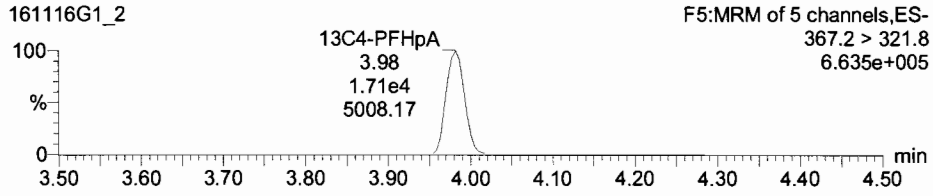
PFHpA



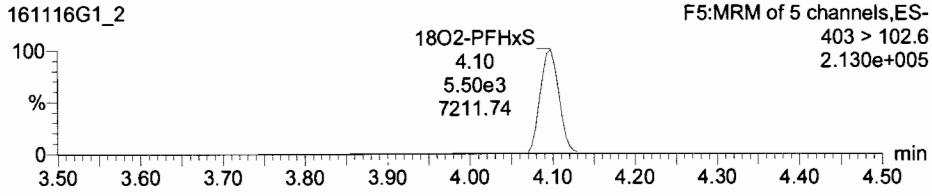
Total PFHxS



13C4-PFHpA



18O2-PFHxS



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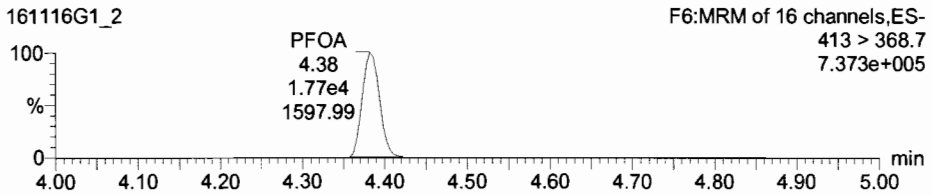
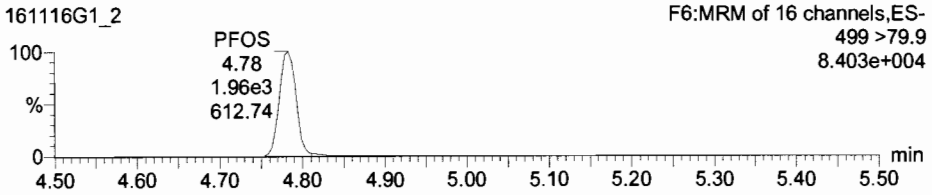
Printed: Wednesday, November 16, 2016 13:42:51 Pacific Standard Time

Name: 161116G1_2, Date: 16-Nov-2016, Time: 11:03:24, ID: ST161116G1-1 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

Total PFOA



Total PFOS



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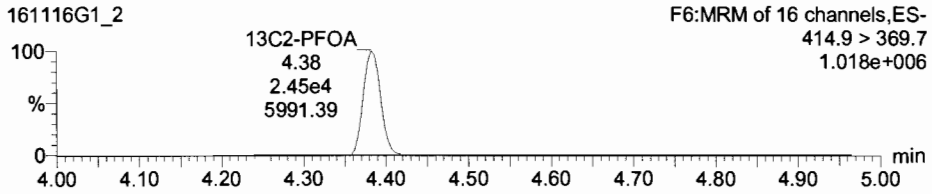
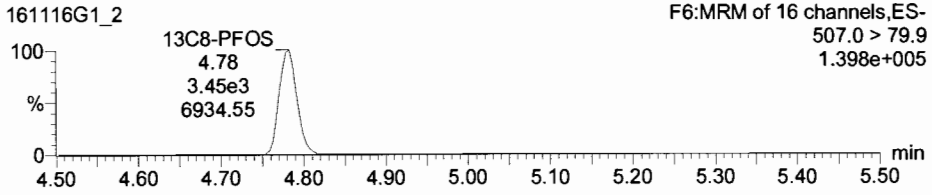


13C8-PFOS



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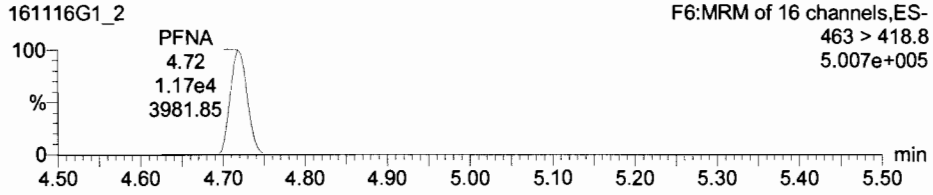
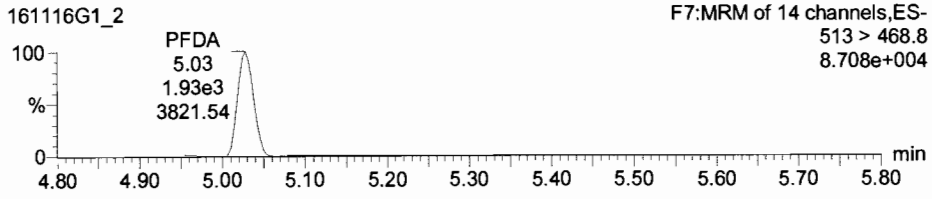
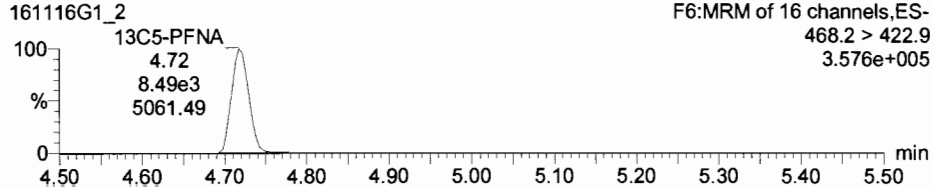


PFDA



13C5-PFNA



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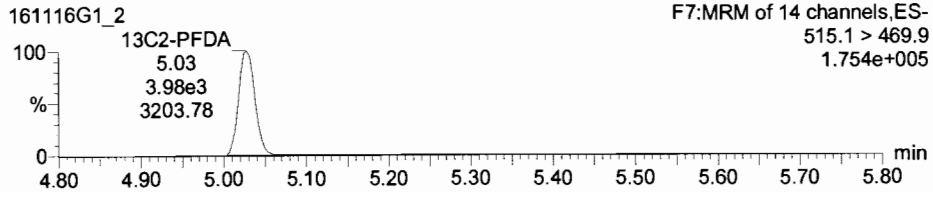

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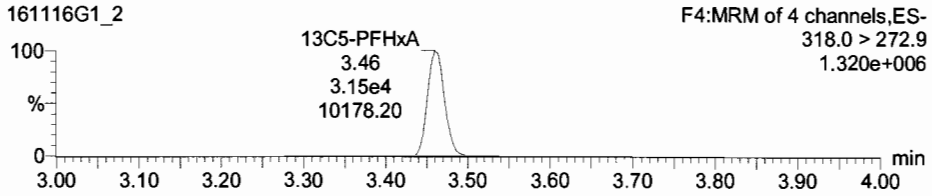
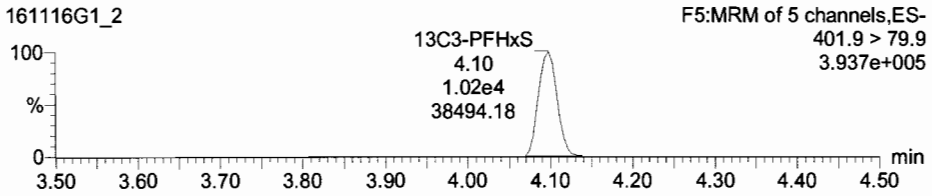
Printed: Wednesday, November 16, 2016 13:42:51 Pacific Standard Time

Name: 161116G1_2, Date: 16-Nov-2016, Time: 11:03:24, ID: ST161116G1-1 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

13C5-PFHxA



13C3-PFHxS



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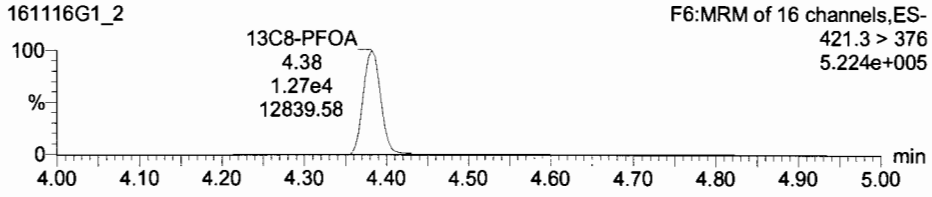

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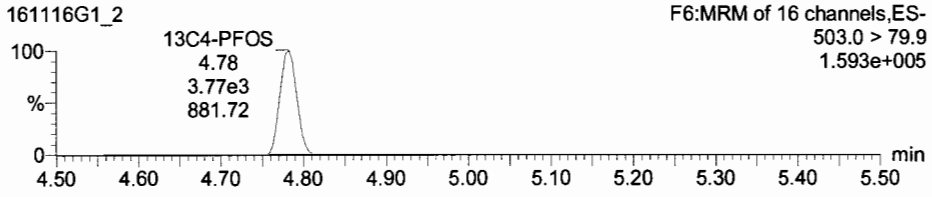
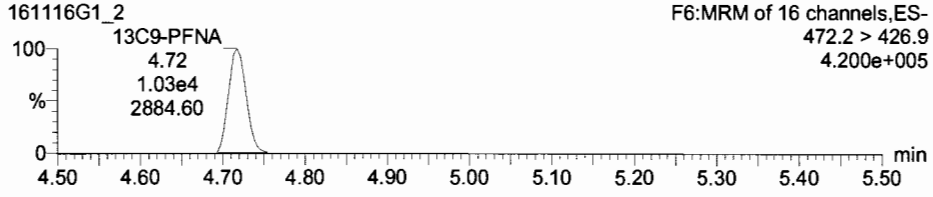
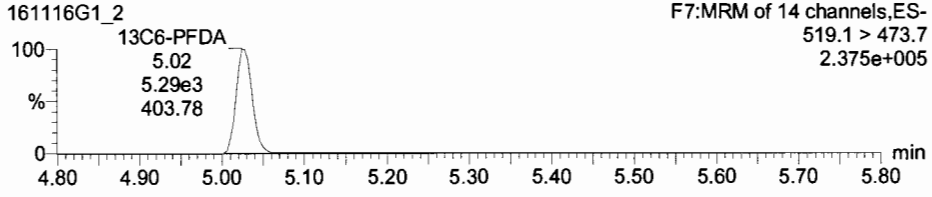


13C9-PFNA



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-19.qld

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Printed: Wednesday, November 16, 2016 14:53:32 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161116G1_19, Date: 16-Nov-2016, Time: 14:38:02, ID: ST161116G1-2 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

	#-Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec	
1	1 PFBS	299 > 79.7	7.60e3	6.22e3		1.000	3.10	11.1	110.9	75-125
2	2 PFHxA	313.2 > 268.9	9.19e3	7.48e3		1.000	3.46	11.4	113.6	
3	3 PFHpA	363 > 318.9	2.14e4	1.87e4		1.000	3.98	11.8	118.3	
4	4 PFHxS	398.9 > 79.6	7.05e3	6.33e3		1.000	4.10	10.6	106.0	
5	5 PFOA	413 > 368.7	2.18e4	2.90e4		1.000	4.38	11.5	114.7	
6	6 PFOS	499 >79.9	2.66e3	4.69e3		1.000	4.78	9.87	98.7	
7	7 PFNA	463 > 418.8	1.46e4	1.06e4		1.000	4.72	10.7	107.3	
8	8 PFDA	513 > 468.8	3.31e3	6.81e3		1.000	5.02	11.0	110.1	
9	9 13C3-PFBS	302.0 > 98.8	6.22e3	3.40e4	0.250	1.000	3.10	9.15	73.2	60-150
10	10 13C2-PFHxA	315 > 269.8	7.48e3	3.40e4	0.741	1.000	3.46	3.70	74.1	
11	11 13C4-PFHpA	367.2 > 321.8	1.87e4	1.27e4	2.077	1.000	3.98	8.87	70.9	
12	12 18O2-PFHxS	403 > 102.6	6.33e3	1.27e4	0.603	1.000	4.10	10.3	82.7	
13	13 13C2-PFOA	414.9 > 369.7	2.90e4	1.64e4	2.438	1.000	4.38	9.05	72.4	
14	14 13C8-PFOS	507.0 > 79.9	4.69e3	5.51e3	1.055	1.000	4.78	10.1	80.6	
15	15 13C5-PFNA	468.2 > 422.9	1.06e4	1.23e4	1.158	1.000	4.72	9.34	74.7	50-150
16	16 13C2-PFDA	515.1 > 469.9	6.81e3	8.46e3	1.164	1.000	5.02	8.65	69.2	60-150
17	17 13C5-PFHxA	318.0 > 272.9	3.40e4	3.40e4	1.000	1.000	3.46	12.5	100.0	
18	18 13C3-PFHxS	401.9 > 79.9	1.27e4	1.27e4	1.000	1.000	4.10	12.5	100.0	
19	19 13C8-PFOA	421.3 > 376	1.64e4	1.64e4	1.000	1.000	4.38	12.5	100.0	
20	20 13C4-PFOS	503.0 > 79.9	5.51e3	5.51e3	1.000	1.000	4.78	12.5	100.0	
21	21 13C9-PFNA	472.2 > 426.9	1.23e4	1.23e4	1.000	1.000	4.72	12.5	100.0	
22	22 13C6-PFDA	519.1 > 473.7	8.46e3	8.46e3	1.000	1.000	5.02	12.5	100.0	

AC 11/16/16

PW 11/16/16

Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Wednesday, November 16, 2016 14:55:01 Pacific Standard Time
Printed: Wednesday, November 16, 2016 14:55:16 Pacific Standard Time

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Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Compound name: PFBS

	Name	ID	Acq.Date	Acq.Time
1	161116G1_1	IPA	16-Nov-16	10:50:46
2	161116G1_2	ST161116G1-1 PFC CS3 16K1605	16-Nov-16	11:03:24
3	161116G1_3	B6K0076-BS1 OPR 0.125	16-Nov-16	11:16:03
4	161116G1_4	IPA	16-Nov-16	11:28:39
5	161116G1_5	B6K0076-BS1 OPR 0.125	16-Nov-16	11:41:16
6	161116G1_6	1601388-01 MW-BG07-1016 0.12618	16-Nov-16	11:53:52
7	161116G1_7	1601388-02 MW-BG06-1016 0.12354	16-Nov-16	12:06:28
8	161116G1_8	1601388-03 MW-BG05-1016 0.12746	16-Nov-16	12:19:05
9	161116G1_9	1601388-04 MW-BG05P-1016 0.1237	16-Nov-16	12:31:42
10	161116G1_10	1601388-05 MW-BG04-1016 0.13102	16-Nov-16	12:44:20
11	161116G1_11	1601388-06 OC-FB-102816 0.12776	16-Nov-16	12:56:58
12	161116G1_12	1601388-07 MW-BG01-1016 0.12279	16-Nov-16	13:09:37
13	161116G1_13	1601388-08 MW-BG09-1016 0.12536	16-Nov-16	13:22:13
14	161116G1_14	B6K0053-MS1 Matrix Spike 0.13008	16-Nov-16	13:34:48
15	161116G1_15	B6K0053-MSD1 Matrix Spike Dup 0.12486	16-Nov-16	13:47:24
16	161116G1_16	1601388-09 OC-MW04-1016 0.12595	16-Nov-16	14:00:04
17	161116G1_17	1601388-10 MW-BG11-1016 0.12196	16-Nov-16	14:12:46
18	161116G1_18	IPA	16-Nov-16	14:25:24
19	161116G1_19	ST161116G1-2 PFC CS3 16K1605	16-Nov-16	14:38:02

Vista Analytical Laboratory Q1

Dataset: Untitled

Last Altered: Wednesday, November 16, 2016 14:52:03 Pacific Standard Time
Printed: Wednesday, November 16, 2016 14:52:33 Pacific Standard Time

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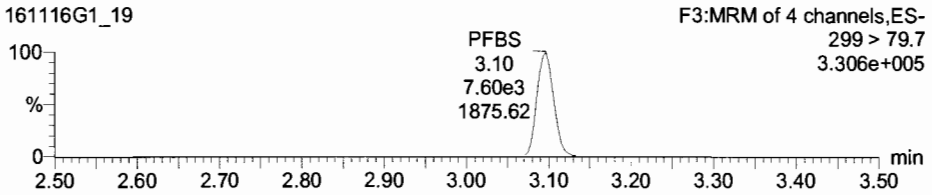
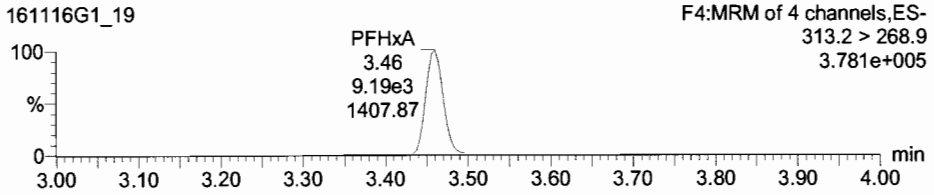
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161116G1_19, Date: 16-Nov-2016, Time: 14:38:02, ID: ST161116G1-2 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

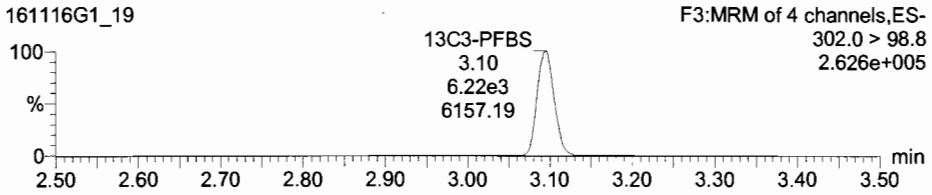
Total PFBS



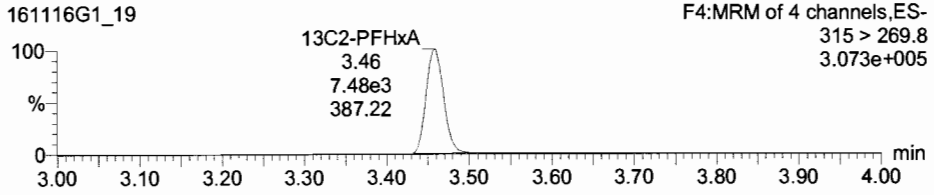
PFHxA



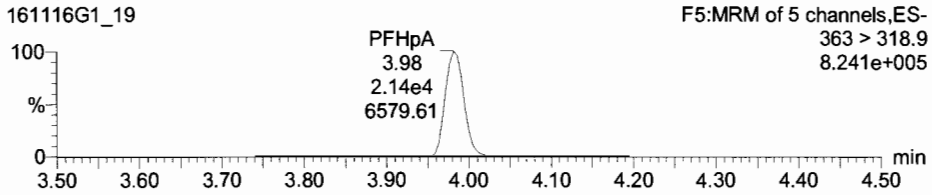
13C3-PFBS



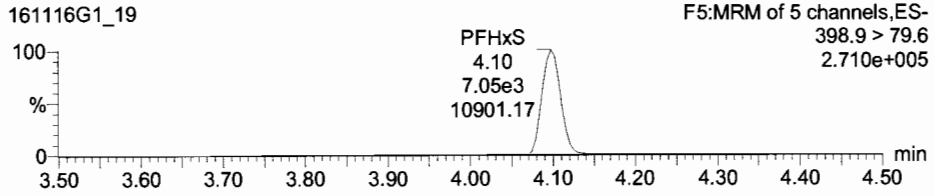
13C2-PFHxA



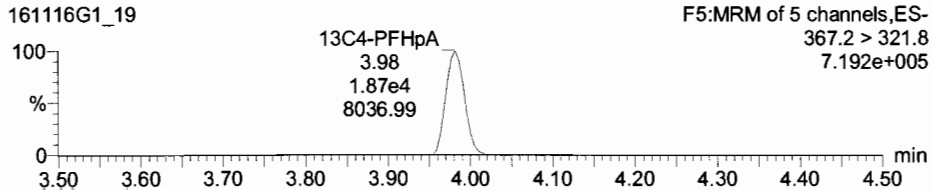
PFHpA



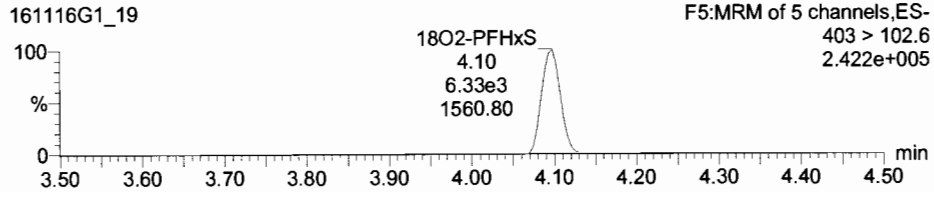
Total PFHxS



13C4-PFHpA



18O2-PFHxS



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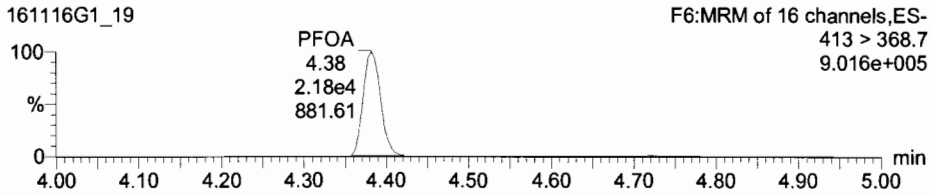
Printed: Wednesday, November 16, 2016 14:52:33 Pacific Standard Time

Name: 161116G1_19, Date: 16-Nov-2016, Time: 14:38:02, ID: ST161116G1-2 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

Total PFOA



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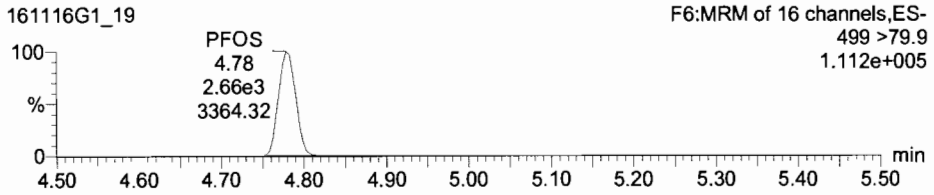

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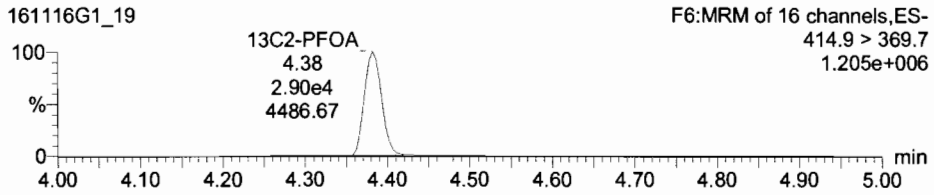

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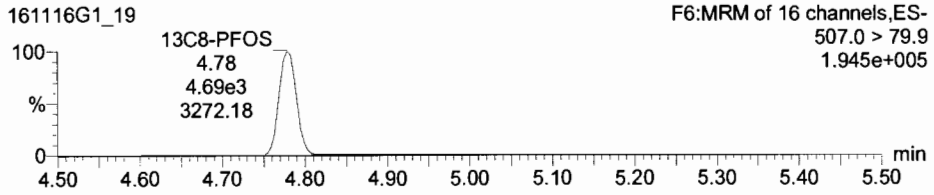

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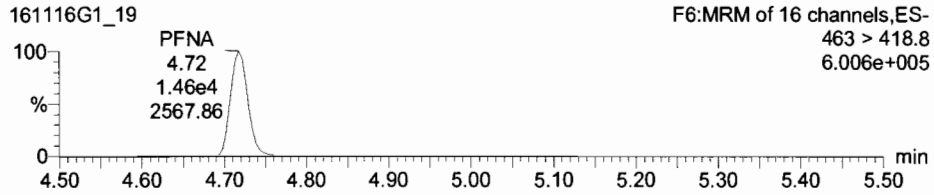

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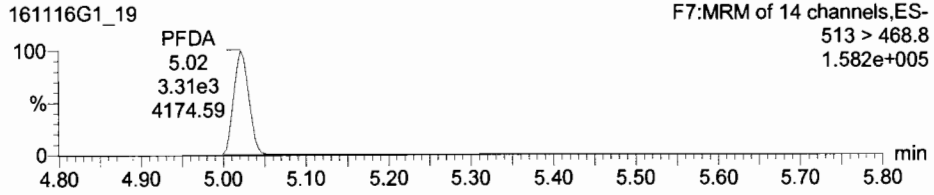

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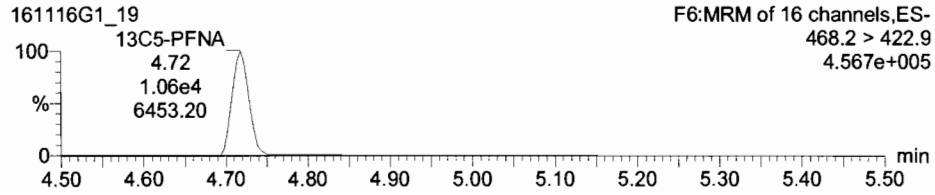
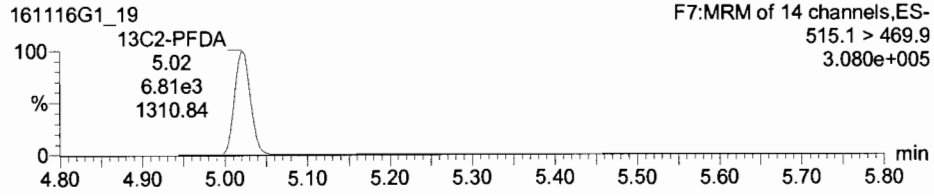


13C2-PFDA



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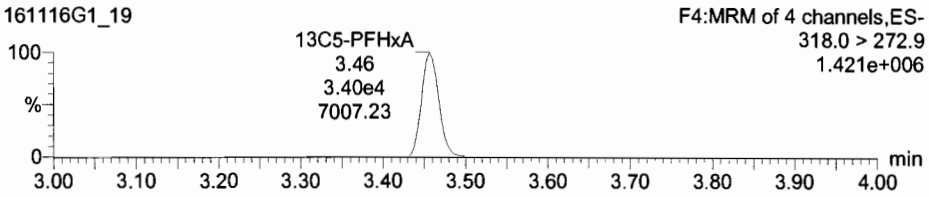
Printed: Wednesday, November 16, 2016 14:52:33 Pacific Standard Time

Name: 161116G1_19, Date: 16-Nov-2016, Time: 14:38:02, ID: ST161116G1-2 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

13C5-PFHxA



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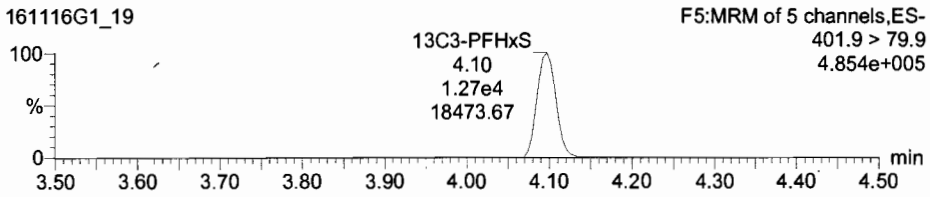
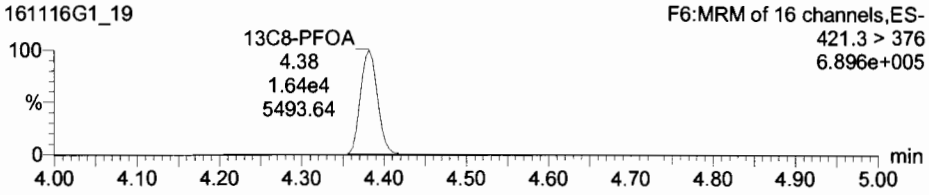
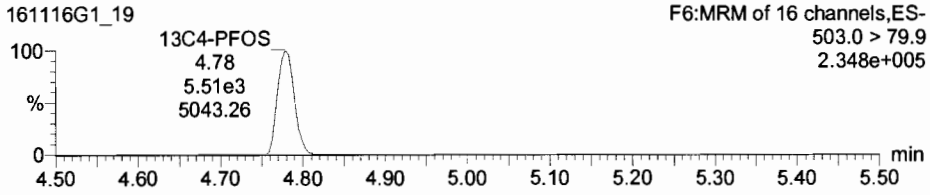


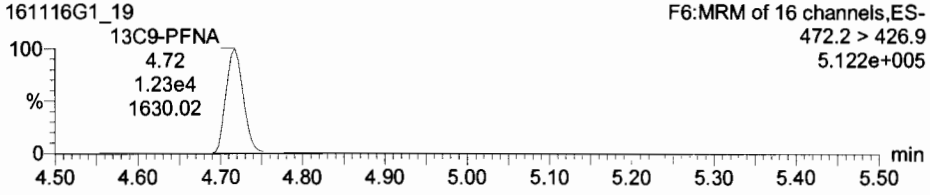
13C8-PFOA



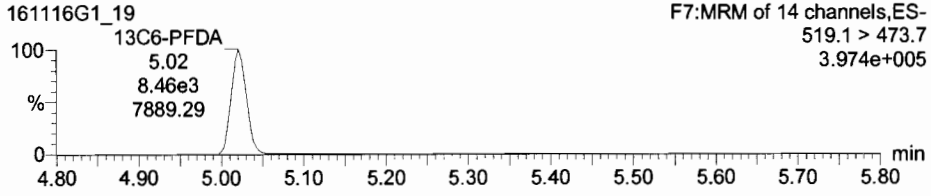
13C4-PFOS



13C9-PFNA



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-32.qld

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Printed: Thursday, November 17, 2016 10:23:12 Pacific Standard Time

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Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161116G1_32, Date: 16-Nov-2016, Time: 17:22:01, ID: ST161116G1-3 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec	
1	1	PFBS	299 > 79.7	8.39e3	6.46e3		1.000	3.07	11.8	118.1	75-125
2	2	PFHxA	313.2 > 268.9	1.10e4	8.55e3		1.000	3.44	11.9	118.5	
3	3	PFHpA	363 > 318.9	2.22e4	2.09e4		1.000	3.96	11.0	109.7	
4	4	PFHxS	398.9 > 79.6	7.22e3	6.65e3		1.000	4.08	10.3	103.4	
5	5	PFOA	413 > 368.7	2.32e4	3.11e4		1.000	4.36	11.4	113.7	
6	6	PFOS	499 >79.9	3.01e3	5.05e3		1.000	4.76	10.3	103.5	
7	7	PFNA	463 > 418.8	1.78e4	1.38e4		1.000	4.70	10.1	100.9	
8	8	PFDA	513 > 468.8	3.98e3	7.73e3		1.000	5.00	11.7	116.7	
9	9	13C3-PFBS	302.0 > 98.8	6.46e3	3.82e4	0.250	1.000	3.07	8.46	67.6	60-150
10	10	13C2-PFHxA	315 > 269.8	8.55e3	3.82e4	0.741	1.000	3.44	3.77	75.5	
11	11	13C4-PFHpA	367.2 > 321.8	2.09e4	1.33e4	2.077	1.000	3.96	9.47	75.8	
12	12	18O2-PFHxS	403 > 102.6	6.65e3	1.33e4	0.603	1.000	4.07	10.4	82.8	
13	13	13C2-PFOA	414.9 > 369.7	3.11e4	1.62e4	2.438	1.000	4.36	9.85	78.8	
14	14	13C8-PFOS	507.0 > 79.9	5.05e3	5.94e3	1.055	1.000	4.76	10.1	80.5	
15	15	13C5-PFNA	468.2 > 422.9	1.38e4	1.42e4	1.158	1.000	4.70	10.5	83.7	50-150
16	16	13C2-PFDA	515.1 > 469.9	7.73e3	9.37e3	1.164	1.000	5.00	8.86	70.9	60-150
17	17	13C5-PFHxA	318.0 > 272.9	3.82e4	3.82e4	1.000	1.000	3.44	12.5	100.0	
18	18	13C3-PFHxS	401.9 > 79.9	1.33e4	1.33e4	1.000	1.000	4.07	12.5	100.0	
19	19	13C8-PFOA	421.3 > 376	1.62e4	1.62e4	1.000	1.000	4.36	12.5	100.0	
20	20	13C4-PFOS	503.0 > 79.9	5.94e3	5.94e3	1.000	1.000	4.76	12.5	100.0	
21	21	13C9-PFNA	472.2 > 426.9	1.42e4	1.42e4	1.000	1.000	4.70	12.5	100.0	
22	22	13C6-PFDA	519.1 > 473.7	9.37e3	9.37e3	1.000	1.000	5.00	12.5	100.0	

AC 11/17/16

PW 11/17/16

Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Thursday, November 17, 2016 10:28:27 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:28:48 Pacific Standard Time

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Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Compound name: PFBS

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1	161116G1_1	IPA	16-Nov-16	10:50:46
2	161116G1_2	ST161116G1-1 PFC CS3 16K1605	16-Nov-16	11:03:24
3	161116G1_3	B6K0076-BS1 OPR 0.125	16-Nov-16	11:16:03
4	161116G1_4	IPA	16-Nov-16	11:28:39
5	161116G1_5	B6K0076-BS1 OPR 0.125	16-Nov-16	11:41:16
6	161116G1_6	1601388-01 MW-BG07-1016 0.12618	16-Nov-16	11:53:52
7	161116G1_7	1601388-02 MW-BG06-1016 0.12354	16-Nov-16	12:06:28
8	161116G1_8	1601388-03 MW-BG05-1016 0.12746	16-Nov-16	12:19:05
9	161116G1_9	1601388-04 MW-BG05P-1016 0.1237	16-Nov-16	12:31:42
10	161116G1_10	1601388-05 MW-BG04-1016 0.13102	16-Nov-16	12:44:20
11	161116G1_11	1601388-06 OC-FB-102816 0.12776	16-Nov-16	12:56:58
12	161116G1_12	1601388-07 MW-BG01-1016 0.12279	16-Nov-16	13:09:37
13	161116G1_13	1601388-08 MW-BG09-1016 0.12536	16-Nov-16	13:22:13
14	161116G1_14	B6K0053-MS1 Matrix Spike 0.13008	16-Nov-16	13:34:48
15	161116G1_15	B6K0053-MSD1 Matrix Spike Dup 0.12486	16-Nov-16	13:47:24
16	161116G1_16	1601388-09 OC-MW04-1016 0.12595	16-Nov-16	14:00:04
17	161116G1_17	1601388-10 MW-BG11-1016 0.12196	16-Nov-16	14:12:46
18	161116G1_18	IPA	16-Nov-16	14:25:24
19	161116G1_19	ST161116G1-2 PFC CS3 16K1605	16-Nov-16	14:38:02
20	161116G1_20	IPA	16-Nov-16	14:50:40
21	161116G1_21	1601434-01@5X OF-INF01-110916 0.12736	16-Nov-16	15:03:20
22	161116G1_22	1601434-01 OF-INF01-110916 0.12736	16-Nov-16	15:15:56
23	161116G1_23	1601434-02 OF-GAC-EFF01-110916 0.12569	16-Nov-16	15:28:32
24	161116G1_24	1601390-01 SP 4 0.12354	16-Nov-16	15:41:10
25	161116G1_25	1601390-02 SP 5 0.12756	16-Nov-16	15:53:48
26	161116G1_26	1601390-03 SP 6 0.12523	16-Nov-16	16:06:27
27	161116G1_27	1601390-04 102916-DUP 0.12766	16-Nov-16	16:19:01
28	161116G1_28	1601398-01 SW-NRES020-110116 0.12224	16-Nov-16	16:31:37
29	161116G1_29	1601399-01 860 SOUTH RD 0.12506	16-Nov-16	16:44:12
30	161116G1_30	1601382-02 AT028-SB15-102816-01-02 1	16-Nov-16	16:56:48
31	161116G1_31	IPA	16-Nov-16	17:09:24

Dataset: Untitled

Last Altered: Thursday, November 17, 2016 10:28:27 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:28:48 Pacific Standard Time

Compound name: PFBS

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32	161116G1_32	ST161116G1-3 PFC CS3 16K1605	16-Nov-16	17:22:01
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34	161116G1_34	1601382-03 AT028-SB15-102816-04-05 1	16-Nov-16	17:47:19
35	161116G1_35	1601382-04 AT028-SB16-102816-02-03 1	16-Nov-16	18:00:04
36	161116G1_36	1601395-01 26MW06_161101 0.12577	16-Nov-16	18:12:46
37	161116G1_37	1601395-02 26MW08_161101 0.12768	16-Nov-16	18:25:22
38	161116G1_38	1601395-03 26SW01_161101 0.12497	16-Nov-16	18:38:00
39	161116G1_39	1601395-04 26SW04_161101 0.12473	16-Nov-16	18:50:38
40	161116G1_40	1601395-05 DUP07_161101 0.12584	16-Nov-16	19:03:18
41	161116G1_41	1601395-12 EB18_161101 0.12291	16-Nov-16	19:15:54
42	161116G1_42	1601360-02 EB-M05-02_161025 0.1299	16-Nov-16	19:28:29
43	161116G1_43	1601360-03 EB-M05-03_161025 0.12768	16-Nov-16	19:41:05
44	161116G1_44	IPA	16-Nov-16	19:53:42
45	161116G1_45	ST161116G1-4 PFC CS3 16K1605	16-Nov-16	20:06:19
46	161116G1_46	IPA	16-Nov-16	20:18:58
47	161116G1_47	1601360-04 EB-M08-07_161025 0.12733	16-Nov-16	20:31:36
48	161116G1_48	1601360-05 EB-M10-01_161025 0.12742	16-Nov-16	20:44:13
49	161116G1_49	1601360-06 FB-M05-02_161025 0.1253	16-Nov-16	20:56:51
50	161116G1_50	1601360-07 FB-M05-03_161025 0.12885	16-Nov-16	21:09:26
51	161116G1_51	1601360-08 FB-M10-01_161025 0.12514	16-Nov-16	21:22:01
52	161116G1_52	1601380-02 EB-MW360-4_161027 0.12813	16-Nov-16	21:34:36
53	161116G1_53	1601380-05 FB-MW360-4_161027 0.12847	16-Nov-16	21:47:13
54	161116G1_54	IPA	16-Nov-16	21:59:52
55	161116G1_55	ST161116G1-5 PFC CS3 16K1605	16-Nov-16	22:12:34
56	161116G1_56	IPA	16-Nov-16	22:25:12

LC Calibration Standards Review Checklist Q1

			ION Ratio	Concentration	C-Cals Name	Sign Date	Correct I-Cal	Manaul Integrations	N/A
Calibration ID:	ST161116G1-3	L (M) H	N/A	☑	☑	☑	☑	☑	☐
Calibration ID:	-4	L (M) H	☐	☑	☑	☑	☑	☑	☐
Calibration ID:	-5	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: 6/29/16

Comments:

Reviewed By: PW 11/17/16
Initials/Date

Vista Analytical Laboratory Q1

Dataset: Untitled

Last Altered: Thursday, November 17, 2016 10:14:17 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:14:35 Pacific Standard Time

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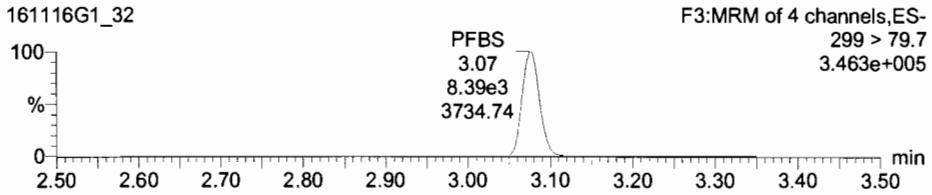
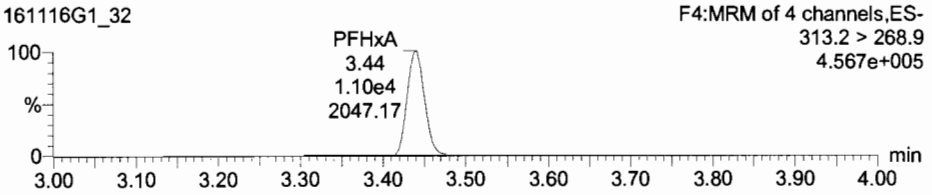
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161116G1_32, Date: 16-Nov-2016, Time: 17:22:01, ID: ST161116G1-3 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

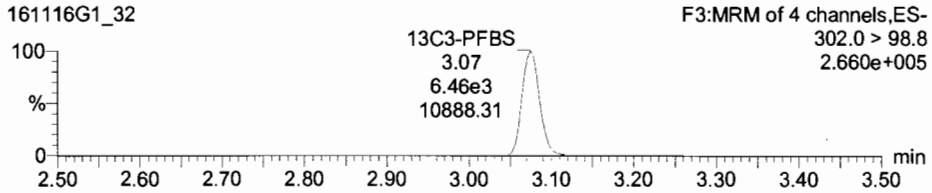
Total PFBS



PFHxA



13C3-PFBS



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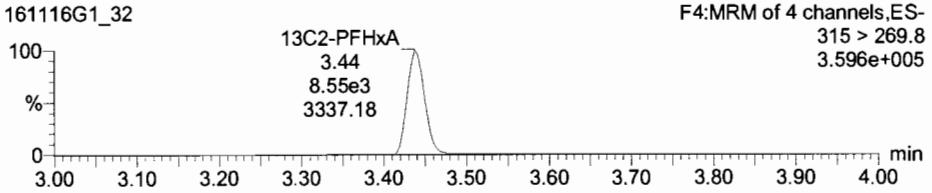
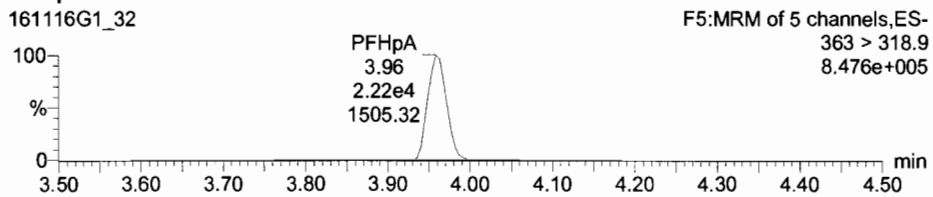
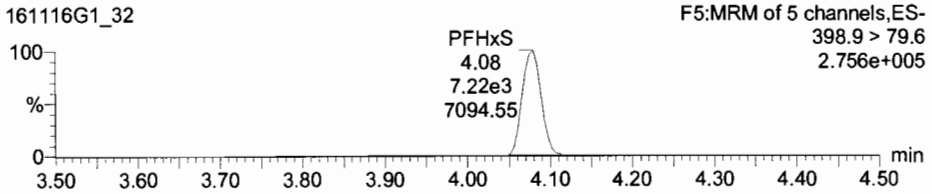


PFHpA



Total PFHxS



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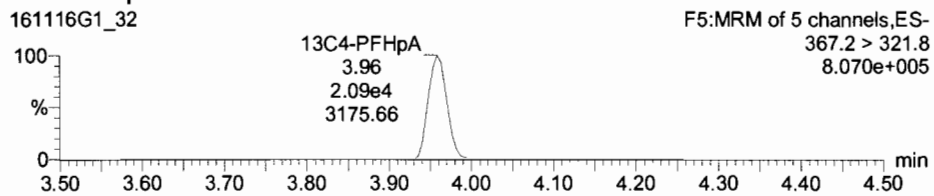
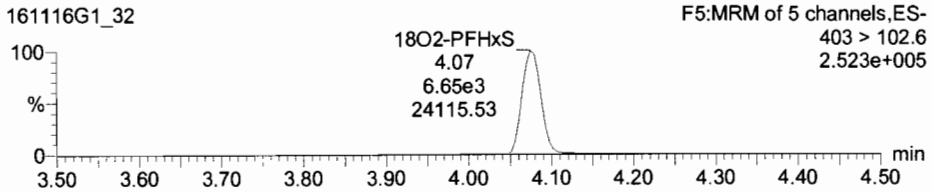


18O2-PFHxS



Vista Analytical Laboratory Q1

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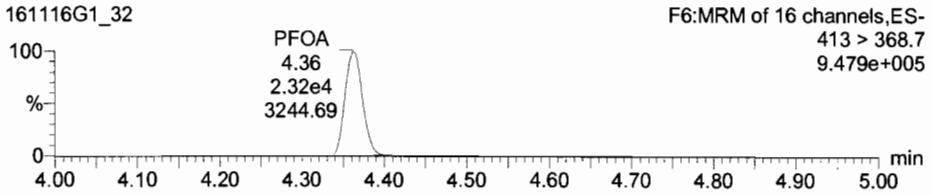
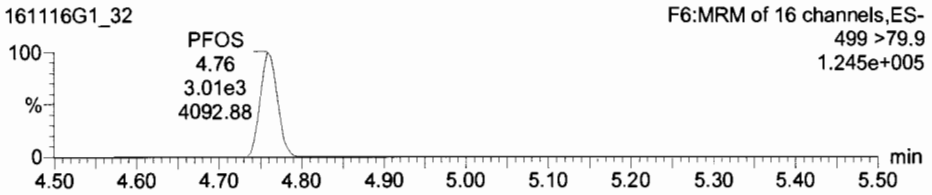
Printed: Thursday, November 17, 2016 10:14:35 Pacific Standard Time

Name: 161116G1_32, Date: 16-Nov-2016, Time: 17:22:01, ID: ST161116G1-3 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

Total PFOA



Total PFOS



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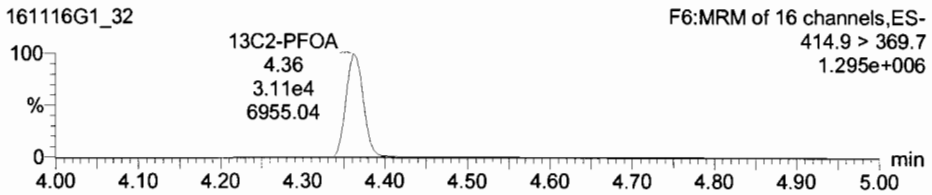
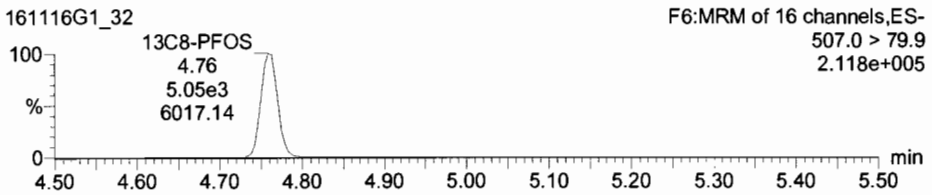
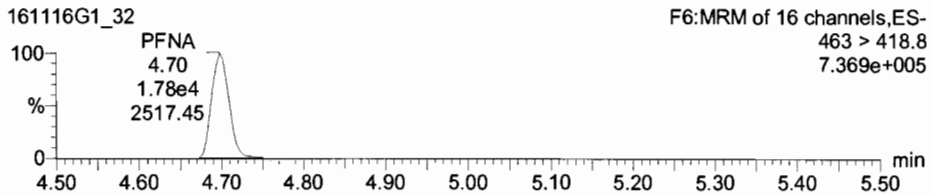


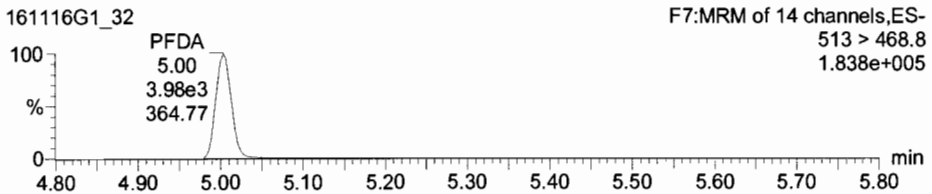
13C8-PFOS



PFNA



PFDA



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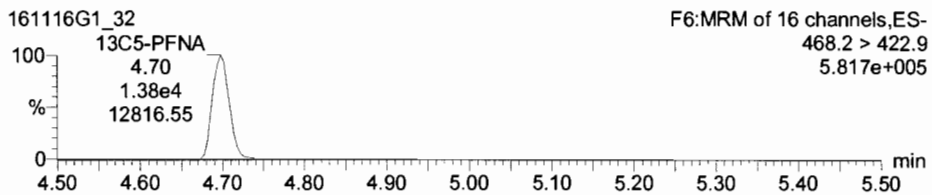

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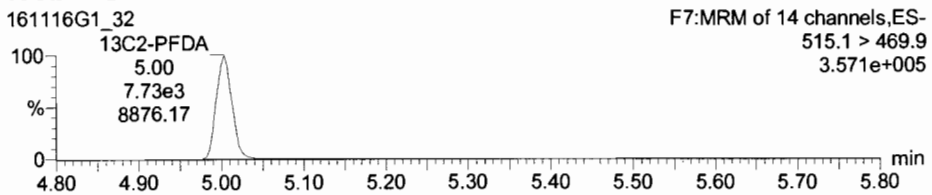

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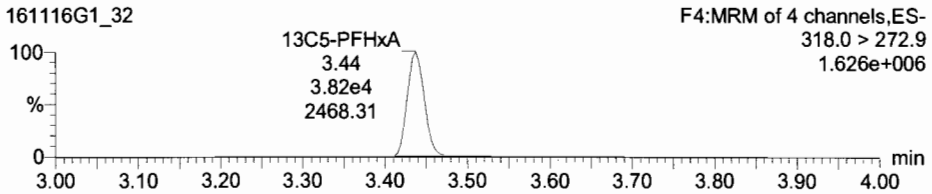
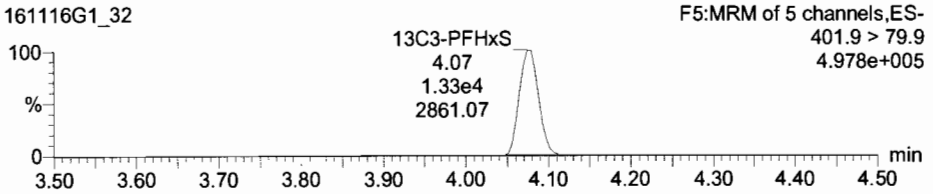
Last Altered: Thursday, November 17, 2016 10:14:17 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:14:35 Pacific Standard Time

Name: 161116G1_32, Date: 16-Nov-2016, Time: 17:22:01, ID: ST161116G1-3 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

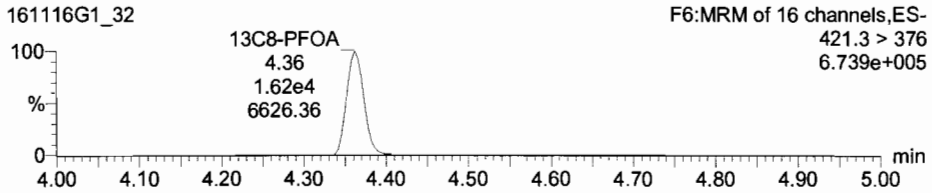
13C5-PFHxA



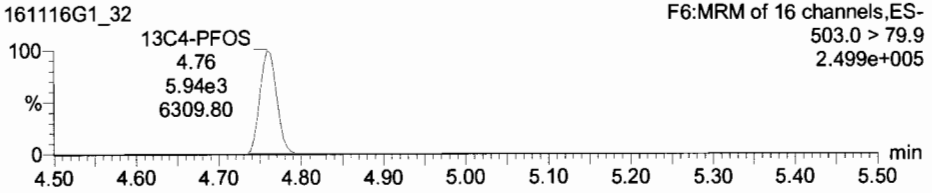
13C3-PFHxS



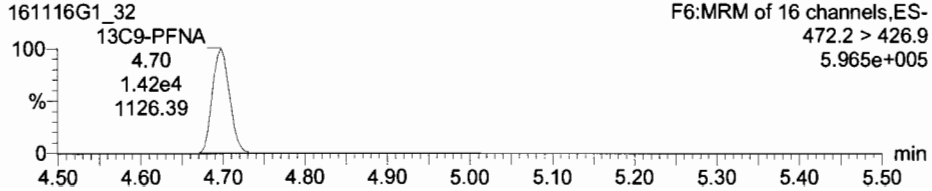
13C8-PFOA



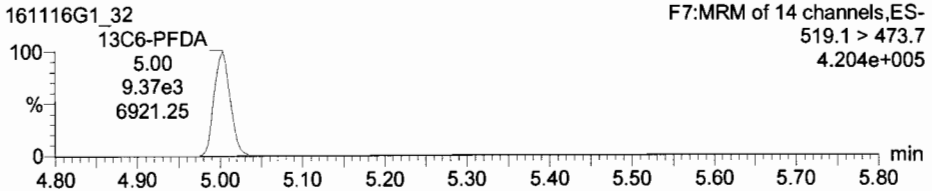
13C4-PFOS



13C9-PFNA



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-45.qld

Last Altered: Thursday, November 17, 2016 10:23:22 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:23:45 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161116G1_45, Date: 16-Nov-2016, Time: 20:06:19, ID: ST161116G1-4 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec	
1	1	PFBS	299 > 79.7	8.42e3	6.94e3		1.000	3.07	11.0	110.3	75-125
2	2	PFHxA	313.2 > 268.9	9.97e3	8.29e3		1.000	3.43	11.1	111.1	
3	3	PFHpA	363 > 318.9	2.35e4	2.23e4		1.000	3.96	10.9	108.6	
4	4	PFHxS	398.9 > 79.6	7.53e3	7.00e3		1.000	4.08	10.2	102.2	
5	5	PFOA	413 > 368.7	2.55e4	3.19e4		1.000	4.36	12.2	122.1	
6	6	PFOS	499 >79.9	2.75e3	4.77e3		1.000	4.76	10.0	100.2	
7	7	PFNA	463 > 418.8	1.76e4	1.29e4		1.000	4.70	10.6	106.4	
8	8	PFDA	513 > 468.8	3.78e3	6.93e3		1.000	5.00	12.4	123.8	
9	9	13C3-PFBS	302.0 > 98.8	6.94e3	3.62e4	0.250	1.000	3.07	9.59	76.7	60-150
10	10	13C2-PFHxA	315 > 269.8	8.29e3	3.62e4	0.741	1.000	3.43	3.86	77.2	
11	11	13C4-PFHpA	367.2 > 321.8	2.23e4	1.36e4	2.077	1.000	3.96	9.88	79.0	
12	12	18O2-PFHxS	403 > 102.6	7.00e3	1.36e4	0.603	1.000	4.08	10.7	85.4	
13	13	13C2-PFOA	414.9 > 369.7	3.19e4	1.66e4	2.438	1.000	4.36	9.83	78.6	
14	14	13C8-PFOS	507.0 > 79.9	4.77e3	5.56e3	1.055	1.000	4.76	10.2	81.3	
15	15	13C5-PFNA	468.2 > 422.9	1.29e4	1.45e4	1.158	1.000	4.70	9.63	77.0	50-150
16	16	13C2-PFDA	515.1 > 469.9	6.93e3	8.87e3	1.164	1.000	5.00	8.39	67.1	60-150
17	17	13C5-PFHxA	318.0 > 272.9	3.62e4	3.62e4	1.000	1.000	3.43	12.5	100.0	
18	18	13C3-PFHxS	401.9 > 79.9	1.36e4	1.36e4	1.000	1.000	4.08	12.5	100.0	
19	19	13C8-PFOA	421.3 > 376	1.66e4	1.66e4	1.000	1.000	4.36	12.5	100.0	
20	20	13C4-PFOS	503.0 > 79.9	5.56e3	5.56e3	1.000	1.000	4.76	12.5	100.0	
21	21	13C9-PFNA	472.2 > 426.9	1.45e4	1.45e4	1.000	1.000	4.70	12.5	100.0	
22	22	13C6-PFDA	519.1 > 473.7	8.87e3	8.87e3	1.000	1.000	5.00	12.5	100.0	

AC 11/17/16

PW 11/17/16

Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Thursday, November 17, 2016 10:28:27 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:28:48 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Compound name: PFBS

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1	161116G1_1	IPA	16-Nov-16	10:50:46
2	161116G1_2	ST161116G1-1 PFC CS3 16K1605	16-Nov-16	11:03:24
3	161116G1_3	B6K0076-BS1 OPR 0.125	16-Nov-16	11:16:03
4	161116G1_4	IPA	16-Nov-16	11:28:39
5	161116G1_5	B6K0076-BS1 OPR 0.125	16-Nov-16	11:41:16
6	161116G1_6	1601388-01 MW-BG07-1016 0.12618	16-Nov-16	11:53:52
7	161116G1_7	1601388-02 MW-BG06-1016 0.12354	16-Nov-16	12:06:28
8	161116G1_8	1601388-03 MW-BG05-1016 0.12746	16-Nov-16	12:19:05
9	161116G1_9	1601388-04 MW-BG05P-1016 0.1237	16-Nov-16	12:31:42
10	161116G1_10	1601388-05 MW-BG04-1016 0.13102	16-Nov-16	12:44:20
11	161116G1_11	1601388-06 OC-FB-102816 0.12776	16-Nov-16	12:56:58
12	161116G1_12	1601388-07 MW-BG01-1016 0.12279	16-Nov-16	13:09:37
13	161116G1_13	1601388-08 MW-BG09-1016 0.12536	16-Nov-16	13:22:13
14	161116G1_14	B6K0053-MS1 Matrix Spike 0.13008	16-Nov-16	13:34:48
15	161116G1_15	B6K0053-MSD1 Matrix Spike Dup 0.12486	16-Nov-16	13:47:24
16	161116G1_16	1601388-09 OC-MW04-1016 0.12595	16-Nov-16	14:00:04
17	161116G1_17	1601388-10 MW-BG11-1016 0.12196	16-Nov-16	14:12:46
18	161116G1_18	IPA	16-Nov-16	14:25:24
19	161116G1_19	ST161116G1-2 PFC CS3 16K1605	16-Nov-16	14:38:02
20	161116G1_20	IPA	16-Nov-16	14:50:40
21	161116G1_21	1601434-01@5X OF-INF01-110916 0.12736	16-Nov-16	15:03:20
22	161116G1_22	1601434-01 OF-INF01-110916 0.12736	16-Nov-16	15:15:56
23	161116G1_23	1601434-02 OF-GAC-EFF01-110916 0.12569	16-Nov-16	15:28:32
24	161116G1_24	1601390-01 SP 4 0.12354	16-Nov-16	15:41:10
25	161116G1_25	1601390-02 SP 5 0.12756	16-Nov-16	15:53:48
26	161116G1_26	1601390-03 SP 6 0.12523	16-Nov-16	16:06:27
27	161116G1_27	1601390-04 102916-DUP 0.12766	16-Nov-16	16:19:01
28	161116G1_28	1601398-01 SW-NRES020-110116 0.12224	16-Nov-16	16:31:37
29	161116G1_29	1601399-01 860 SOUTH RD 0.12506	16-Nov-16	16:44:12
30	161116G1_30	1601382-02 AT028-SB15-102816-01-02 1	16-Nov-16	16:56:48
31	161116G1_31	IPA	16-Nov-16	17:09:24

Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Thursday, November 17, 2016 10:28:27 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:28:48 Pacific Standard Time

Compound name: PFBS

	Name	ID	Acq.Date	Acq.Time
32	161116G1_32	ST161116G1-3 PFC CS3 16K1605	16-Nov-16	17:22:01
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34	161116G1_34	1601382-03 AT028-SB15-102816-04-05 1	16-Nov-16	17:47:19
35	161116G1_35	1601382-04 AT028-SB16-102816-02-03 1	16-Nov-16	18:00:04
36	161116G1_36	1601395-01 26MW06_161101 0.12577	16-Nov-16	18:12:46
37	161116G1_37	1601395-02 26MW08_161101 0.12768	16-Nov-16	18:25:22
38	161116G1_38	1601395-03 26SW01_161101 0.12497	16-Nov-16	18:38:00
39	161116G1_39	1601395-04 26SW04_161101 0.12473	16-Nov-16	18:50:38
40	161116G1_40	1601395-05 DUP07_161101 0.12584	16-Nov-16	19:03:18
41	161116G1_41	1601395-12 EB18_161101 0.12291	16-Nov-16	19:15:54
42	161116G1_42	1601360-02 EB-M05-02_161025 0.1299	16-Nov-16	19:28:29
43	161116G1_43	1601360-03 EB-M05-03_161025 0.12768	16-Nov-16	19:41:05
44	161116G1_44	IPA	16-Nov-16	19:53:42
45	161116G1_45	ST161116G1-4 PFC CS3 16K1605	16-Nov-16	20:06:19
46	161116G1_46	IPA	16-Nov-16	20:18:58
47	161116G1_47	1601360-04 EB-M08-07_161025 0.12733	16-Nov-16	20:31:36
48	161116G1_48	1601360-05 EB-M10-01_161025 0.12742	16-Nov-16	20:44:13
49	161116G1_49	1601360-06 FB-M05-02_161025 0.1253	16-Nov-16	20:56:51
50	161116G1_50	1601360-07 FB-M05-03_161025 0.12885	16-Nov-16	21:09:26
51	161116G1_51	1601360-08 FB-M10-01_161025 0.12514	16-Nov-16	21:22:01
52	161116G1_52	1601380-02 EB-MW360-4_161027 0.12813	16-Nov-16	21:34:36
53	161116G1_53	1601380-05 FB-MW360-4_161027 0.12847	16-Nov-16	21:47:13
54	161116G1_54	IPA	16-Nov-16	21:59:52
55	161116G1_55	ST161116G1-5 PFC CS3 16K1605	16-Nov-16	22:12:34
56	161116G1_56	IPA	16-Nov-16	22:25:12

Vista Analytical Laboratory Q1

Dataset: Untitled

Last Altered: Thursday, November 17, 2016 10:14:43 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:14:46 Pacific Standard Time

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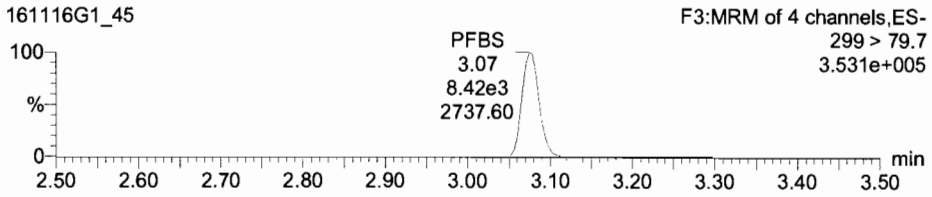
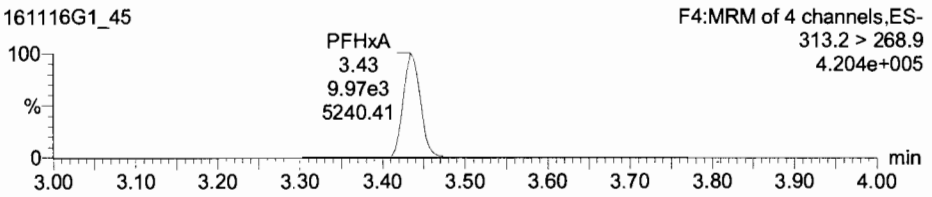
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161116G1_45, Date: 16-Nov-2016, Time: 20:06:19, ID: ST161116G1-4 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

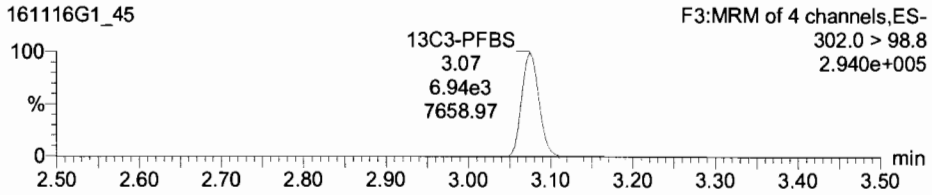
Total PFBS



PFHxA



13C3-PFBS



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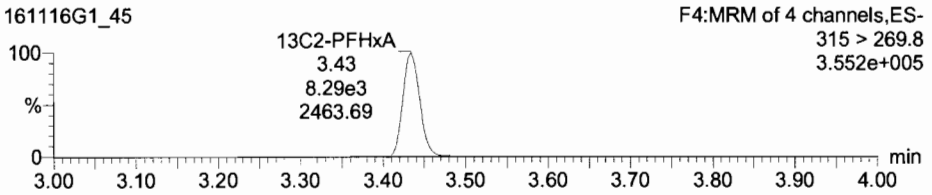
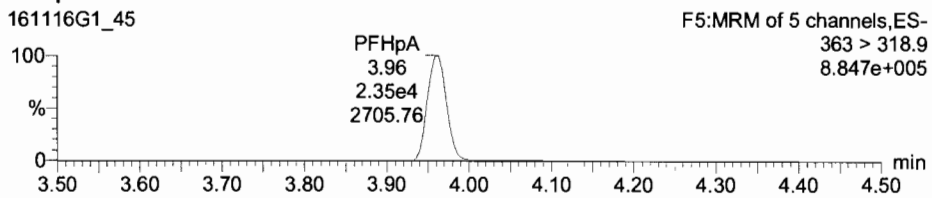
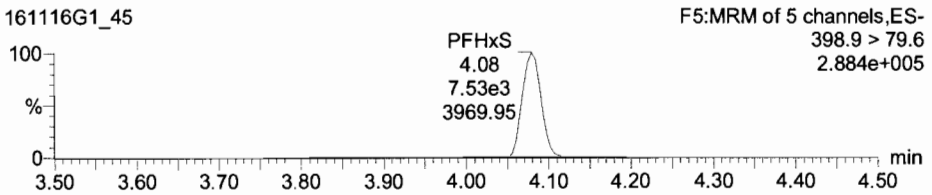


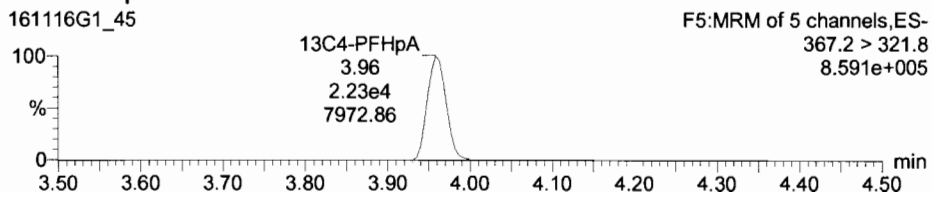
PFHpA



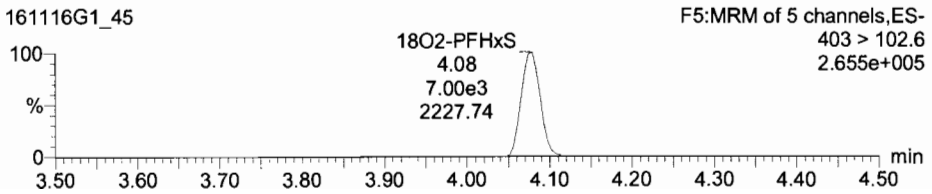
Total PFHxS



13C4-PFHpA



18O2-PFHxS



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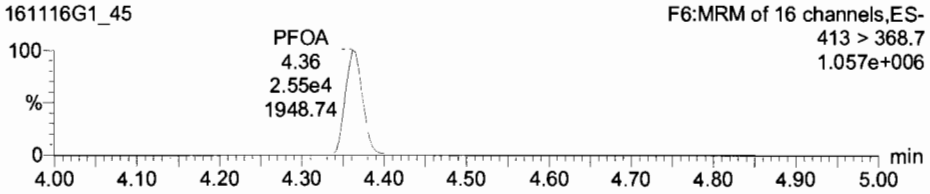
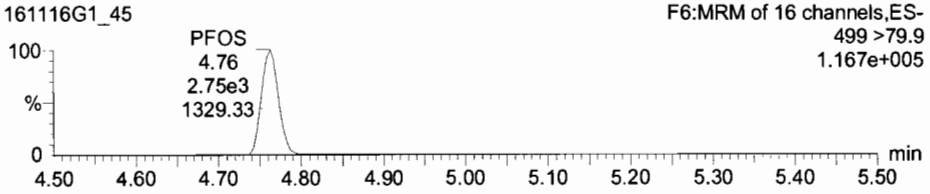
Last Altered: Thursday, November 17, 2016 10:14:43 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:14:46 Pacific Standard Time

Name: 161116G1_45, Date: 16-Nov-2016, Time: 20:06:19, ID: ST161116G1-4 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

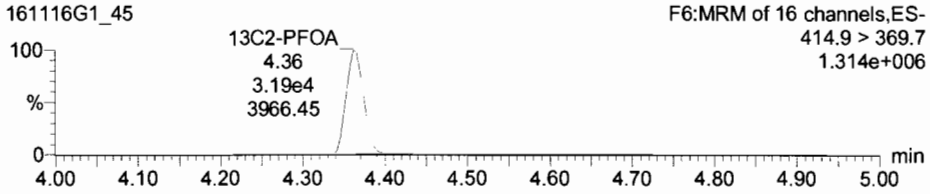
Total PFOA



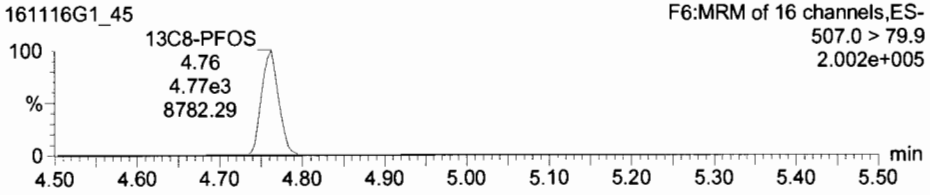
Total PFOS



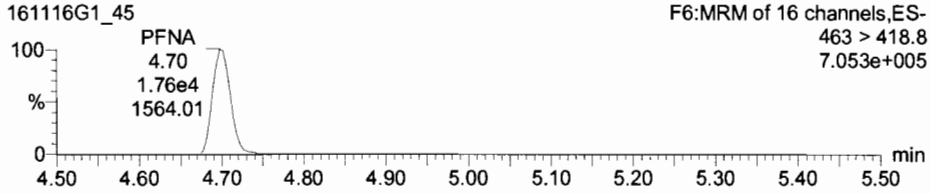
13C2-PFOA



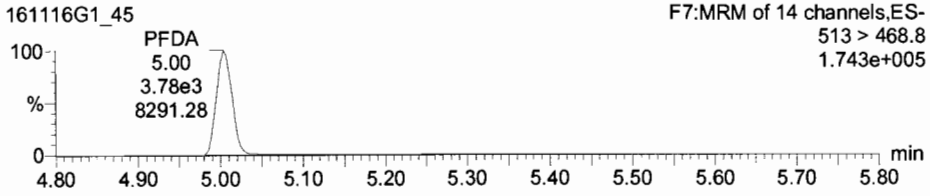
13C8-PFOS



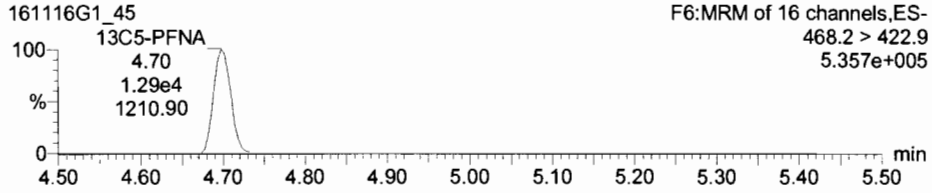
PFNA



PFDA



13C5-PFNA



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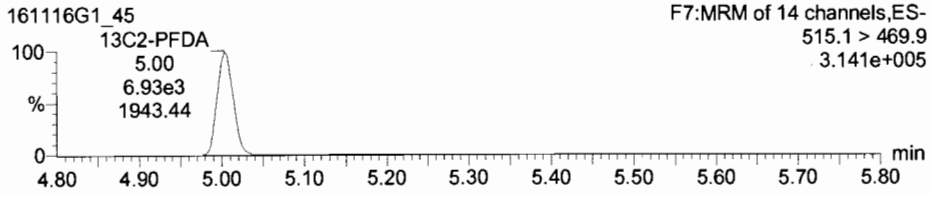

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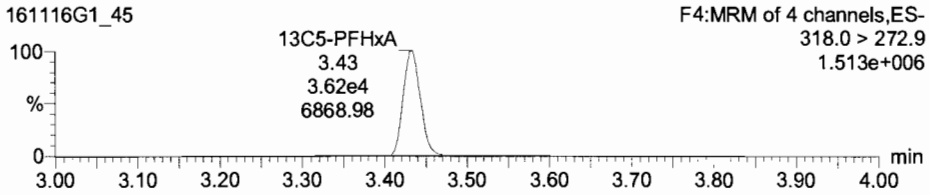
Printed: Thursday, November 17, 2016 10:14:46 Pacific Standard Time

Name: 161116G1_45, Date: 16-Nov-2016, Time: 20:06:19, ID: ST161116G1-4 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

13C5-PFHxA



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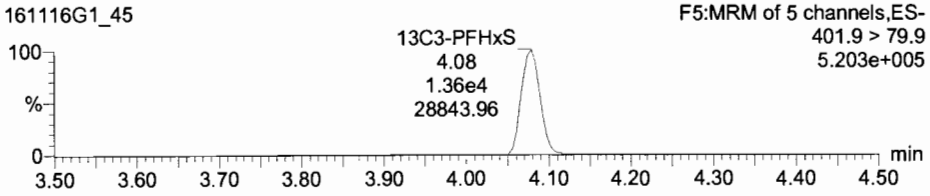

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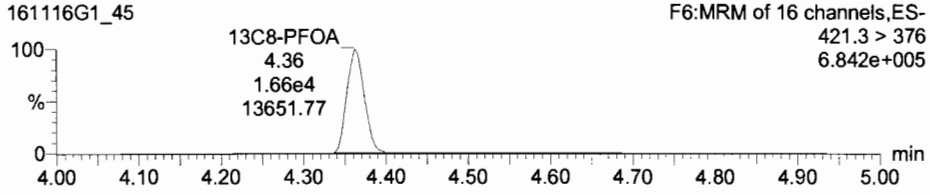

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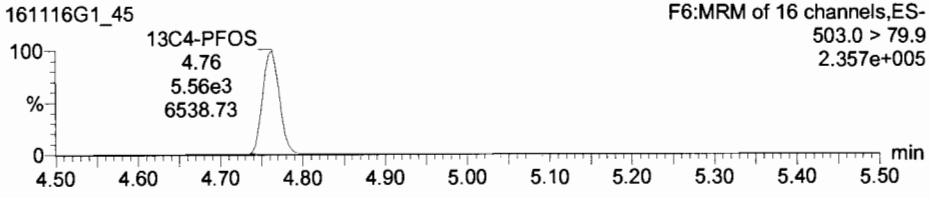
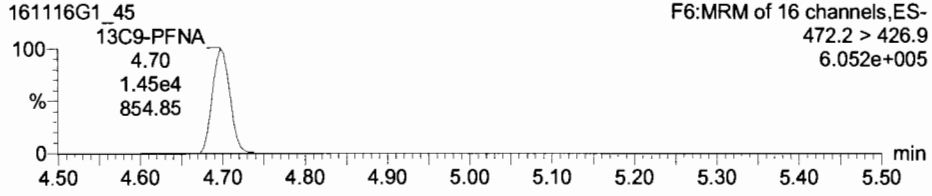
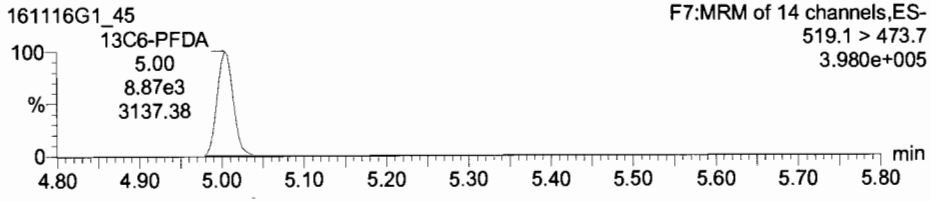


13C9-PFNA



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161116G1\161116G1-55.qld

Last Altered: Thursday, November 17, 2016 10:25:22 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:25:43 Pacific Standard Time

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Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161116G1_55, Date: 16-Nov-2016, Time: 22:12:34, ID: ST161116G1-5 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec	
1	1	PFBS	299 > 79.7	8.38e3	7.15e3		1.000	3.07	10.6	106.4	75-125
2	2	PFHxA	313.2 > 268.9	1.06e4	8.34e3		1.000	3.44	11.7	117.1	
3	3	PFHpA	363 > 318.9	2.26e4	2.06e4		1.000	3.96	11.3	113.5	
4	4	PFHxS	398.9 > 79.6	8.00e3	6.83e3		1.000	4.08	11.1	111.5	
5	5	PFOA	413 > 368.7	2.27e4	3.25e4		1.000	4.36	10.6	106.4	
6	6	PFOS	499 >79.9	2.86e3	4.85e3		1.000	4.76	10.2	102.5	
7	7	PFNA	463 > 418.8	1.73e4	1.16e4		1.000	4.70	11.6	116.4	
8	8	PFDA	513 > 468.8	3.53e3	6.51e3		1.000	5.00	12.3	122.8	
9	9	13C3-PFBS	302.0 > 98.8	7.15e3	3.82e4	0.250	1.000	3.07	9.36	74.9	60-150
10	10	13C2-PFHxA	315 > 269.8	8.34e3	3.82e4	0.741	1.000	3.43	3.68	73.6	
11	11	13C4-PFHpA	367.2 > 321.8	2.06e4	1.30e4	2.077	1.000	3.96	9.54	76.4	
12	12	18O2-PFHxS	403 > 102.6	6.83e3	1.30e4	0.603	1.000	4.07	10.9	87.1	
13	13	13C2-PFOA	414.9 > 369.7	3.25e4	1.56e4	2.438	1.000	4.36	10.6	85.1	
14	14	13C8-PFOS	507.0 > 79.9	4.85e3	4.96e3	1.055	1.000	4.76	11.6	92.7	
15	15	13C5-PFNA	468.2 > 422.9	1.16e4	1.29e4	1.158	1.000	4.70	9.71	77.7	50-150
16	16	13C2-PFDA	515.1 > 469.9	6.51e3	8.39e3	1.164	1.000	5.00	8.34	66.7	60-150
17	17	13C5-PFHxA	318.0 > 272.9	3.82e4	3.82e4	1.000	1.000	3.43	12.5	100.0	
18	18	13C3-PFHxS	401.9 > 79.9	1.30e4	1.30e4	1.000	1.000	4.07	12.5	100.0	
19	19	13C8-PFOA	421.3 > 376	1.56e4	1.56e4	1.000	1.000	4.36	12.5	100.0	
20	20	13C4-PFOS	503.0 > 79.9	4.96e3	4.96e3	1.000	1.000	4.76	12.5	100.0	
21	21	13C9-PFNA	472.2 > 426.9	1.29e4	1.29e4	1.000	1.000	4.70	12.5	100.0	
22	22	13C6-PFDA	519.1 > 473.7	8.39e3	8.39e3	1.000	1.000	5.00	12.5	100.0	

AC 11/17/16

PW 11/17/16

Quantify Compound Summary Report **MassLynx 4.1**
Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Thursday, November 17, 2016 10:28:27 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:28:48 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Compound name: PFBS

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1	161116G1_1	IPA	16-Nov-16	10:50:46
2	161116G1_2	ST161116G1-1 PFC CS3 16K1605	16-Nov-16	11:03:24
3	161116G1_3	B6K0076-BS1 OPR 0.125	16-Nov-16	11:16:03
4	161116G1_4	IPA	16-Nov-16	11:28:39
5	161116G1_5	B6K0076-BS1 OPR 0.125	16-Nov-16	11:41:16
6	161116G1_6	1601388-01 MW-BG07-1016 0.12618	16-Nov-16	11:53:52
7	161116G1_7	1601388-02 MW-BG06-1016 0.12354	16-Nov-16	12:06:28
8	161116G1_8	1601388-03 MW-BG05-1016 0.12746	16-Nov-16	12:19:05
9	161116G1_9	1601388-04 MW-BG05P-1016 0.1237	16-Nov-16	12:31:42
10	161116G1_10	1601388-05 MW-BG04-1016 0.13102	16-Nov-16	12:44:20
11	161116G1_11	1601388-06 OC-FB-102816 0.12776	16-Nov-16	12:56:58
12	161116G1_12	1601388-07 MW-BG01-1016 0.12279	16-Nov-16	13:09:37
13	161116G1_13	1601388-08 MW-BG09-1016 0.12536	16-Nov-16	13:22:13
14	161116G1_14	B6K0053-MS1 Matrix Spike 0.13008	16-Nov-16	13:34:48
15	161116G1_15	B6K0053-MSD1 Matrix Spike Dup 0.12486	16-Nov-16	13:47:24
16	161116G1_16	1601388-09 OC-MW04-1016 0.12595	16-Nov-16	14:00:04
17	161116G1_17	1601388-10 MW-BG11-1016 0.12196	16-Nov-16	14:12:46
18	161116G1_18	IPA	16-Nov-16	14:25:24
19	161116G1_19	ST161116G1-2 PFC CS3 16K1605	16-Nov-16	14:38:02
20	161116G1_20	IPA	16-Nov-16	14:50:40
21	161116G1_21	1601434-01@5X OF-INF01-110916 0.12736	16-Nov-16	15:03:20
22	161116G1_22	1601434-01 OF-INF01-110916 0.12736	16-Nov-16	15:15:56
23	161116G1_23	1601434-02 OF-GAC-EFF01-110916 0.12569	16-Nov-16	15:28:32
24	161116G1_24	1601390-01 SP 4 0.12354	16-Nov-16	15:41:10
25	161116G1_25	1601390-02 SP 5 0.12756	16-Nov-16	15:53:48
26	161116G1_26	1601390-03 SP 6 0.12523	16-Nov-16	16:06:27
27	161116G1_27	1601390-04 102916-DUP 0.12766	16-Nov-16	16:19:01
28	161116G1_28	1601398-01 SW-NRES020-110116 0.12224	16-Nov-16	16:31:37
29	161116G1_29	1601399-01 860 SOUTH RD 0.12506	16-Nov-16	16:44:12
30	161116G1_30	1601382-02 AT028-SB15-102816-01-02 1	16-Nov-16	16:56:48
31	161116G1_31	IPA	16-Nov-16	17:09:24

Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Thursday, November 17, 2016 10:28:27 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:28:48 Pacific Standard Time

Compound name: PFBS

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34	161116G1_34	1601382-03 AT028-SB15-102816-04-05 1	16-Nov-16	17:47:19
35	161116G1_35	1601382-04 AT028-SB16-102816-02-03 1	16-Nov-16	18:00:04
36	161116G1_36	1601395-01 26MW06_161101 0.12577	16-Nov-16	18:12:46
37	161116G1_37	1601395-02 26MW08_161101 0.12768	16-Nov-16	18:25:22
38	161116G1_38	1601395-03 26SW01_161101 0.12497	16-Nov-16	18:38:00
39	161116G1_39	1601395-04 26SW04_161101 0.12473	16-Nov-16	18:50:38
40	161116G1_40	1601395-05 DUP07_161101 0.12584	16-Nov-16	19:03:18
41	161116G1_41	1601395-12 EB18_161101 0.12291	16-Nov-16	19:15:54
42	161116G1_42	1601360-02 EB-M05-02_161025 0.1299	16-Nov-16	19:28:29
43	161116G1_43	1601360-03 EB-M05-03_161025 0.12768	16-Nov-16	19:41:05
44	161116G1_44	IPA	16-Nov-16	19:53:42
45	161116G1_45	ST161116G1-4 PFC CS3 16K1605	16-Nov-16	20:06:19
46	161116G1_46	IPA	16-Nov-16	20:18:58
47	161116G1_47	1601360-04 EB-M08-07_161025 0.12733	16-Nov-16	20:31:36
48	161116G1_48	1601360-05 EB-M10-01_161025 0.12742	16-Nov-16	20:44:13
49	161116G1_49	1601360-06 FB-M05-02_161025 0.1253	16-Nov-16	20:56:51
50	161116G1_50	1601360-07 FB-M05-03_161025 0.12885	16-Nov-16	21:09:26
51	161116G1_51	1601360-08 FB-M10-01_161025 0.12514	16-Nov-16	21:22:01
52	161116G1_52	1601380-02 EB-MW360-4_161027 0.12813	16-Nov-16	21:34:36
53	161116G1_53	1601380-05 FB-MW360-4_161027 0.12847	16-Nov-16	21:47:13
54	161116G1_54	IPA	16-Nov-16	21:59:52
55	161116G1_55	ST161116G1-5 PFC CS3 16K1605	16-Nov-16	22:12:34
56	161116G1_56	IPA	16-Nov-16	22:25:12

Dataset: Untitled

Last Altered: Thursday, November 17, 2016 10:14:54 Pacific Standard Time
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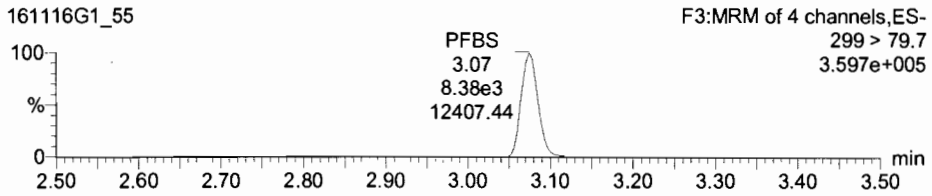
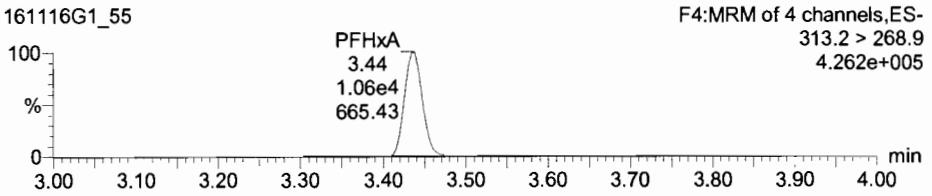
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161116G1_55, Date: 16-Nov-2016, Time: 22:12:34, ID: ST161116G1-5 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

Total PFBS



PFHxA



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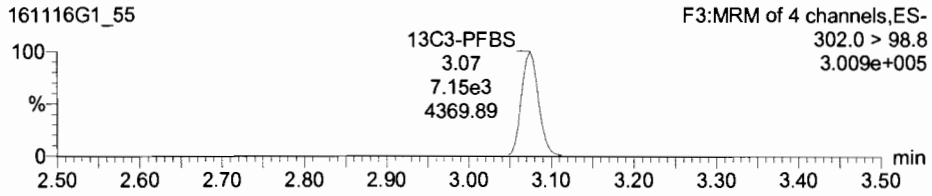

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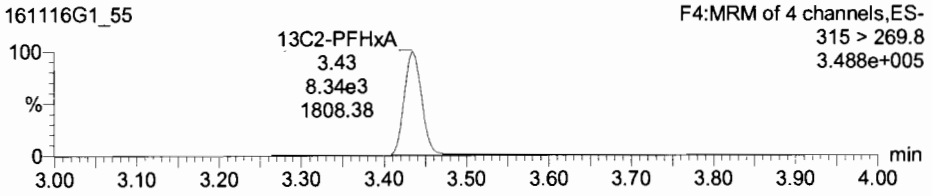
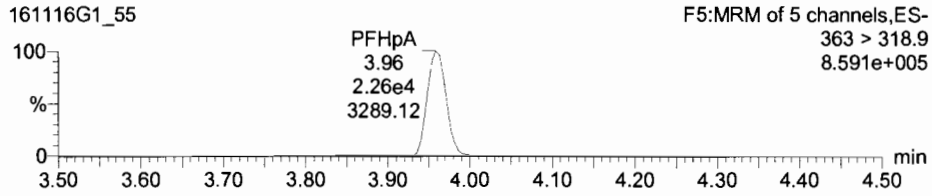
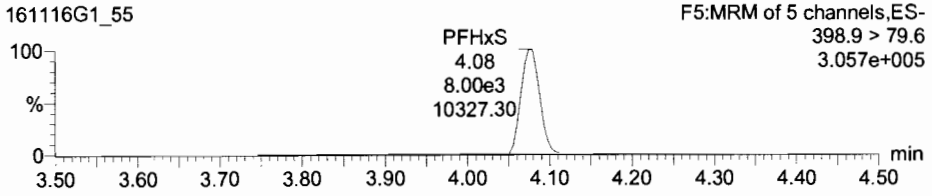


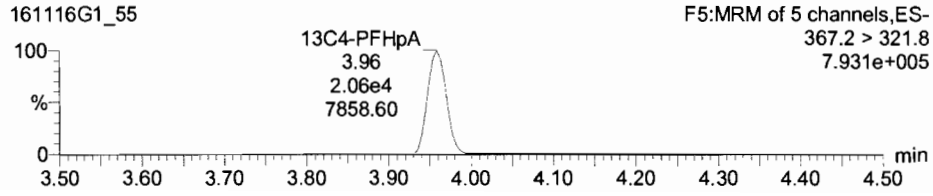
PFHpA



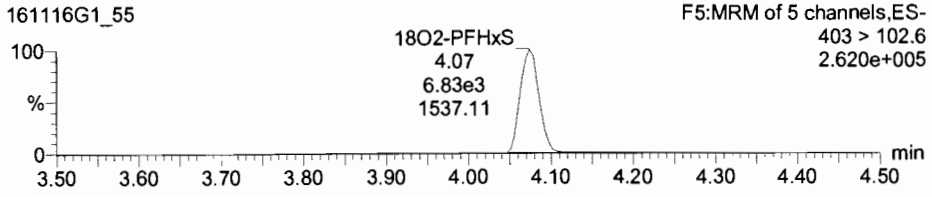
Total PFHxS



13C4-PFHpA



18O2-PFHxS



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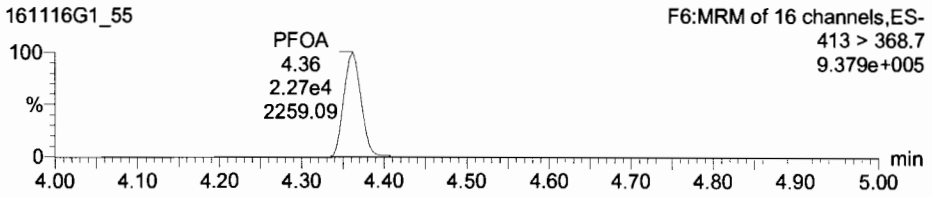
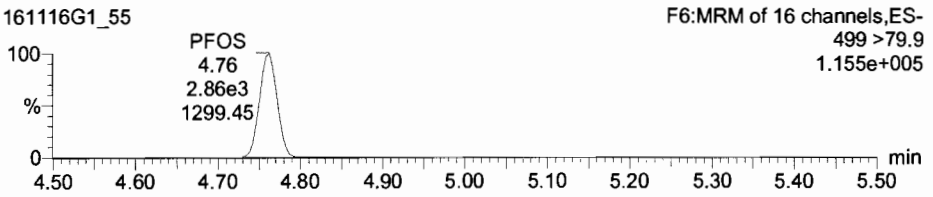
Printed: Thursday, November 17, 2016 10:14:58 Pacific Standard Time

Name: 161116G1_55, Date: 16-Nov-2016, Time: 22:12:34, ID: ST161116G1-5 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

Total PFOA



Total PFOS



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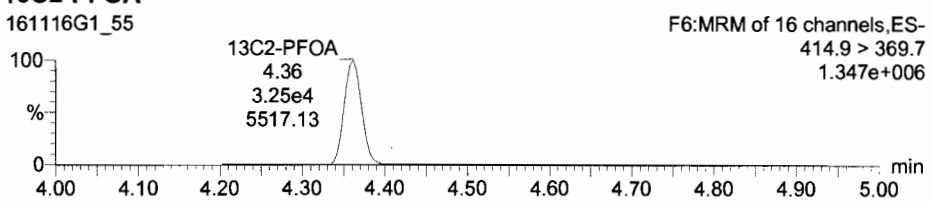
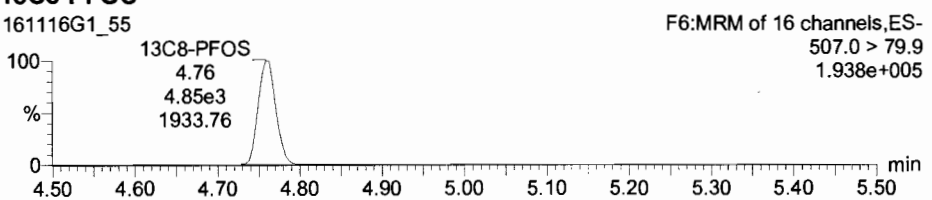


13C8-PFOS



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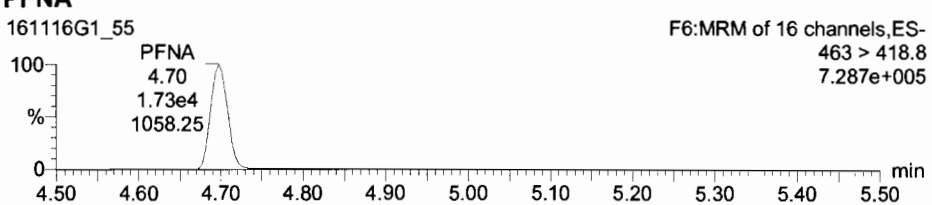
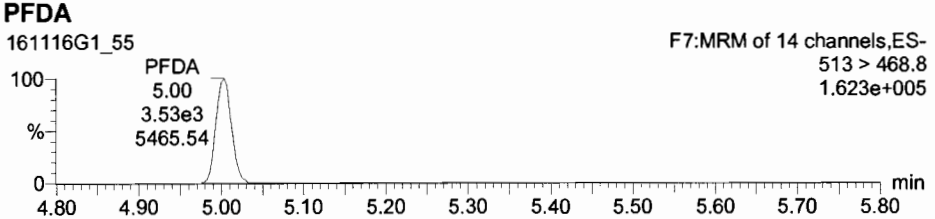


PFDA



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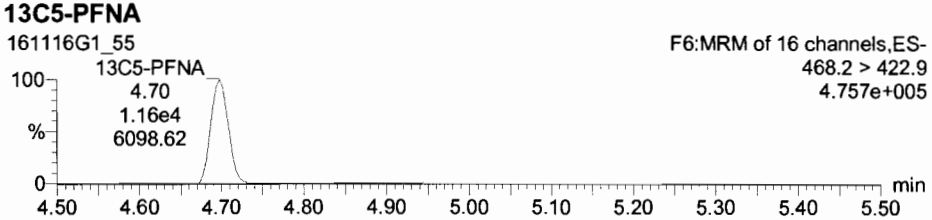

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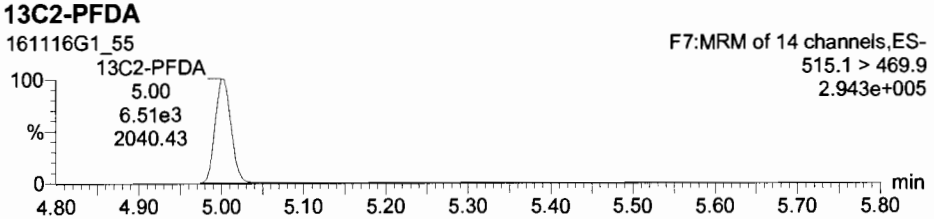

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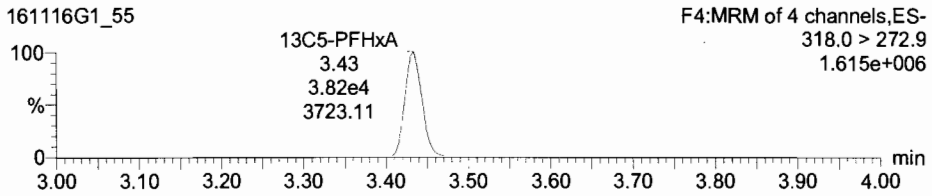
Last Altered: Thursday, November 17, 2016 10:14:54 Pacific Standard Time
Printed: Thursday, November 17, 2016 10:14:58 Pacific Standard Time

Name: 161116G1_55, Date: 16-Nov-2016, Time: 22:12:34, ID: ST161116G1-5 PFC CS3 16K1605, Description: PFC CS3 16K1605 A

13C5-PFHxA



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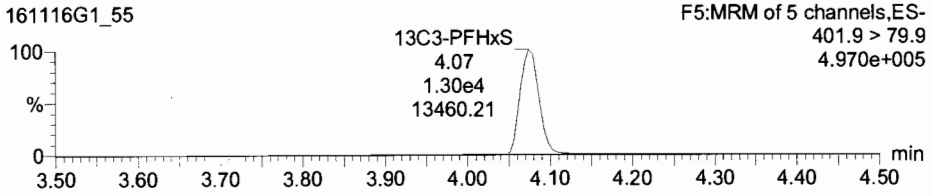

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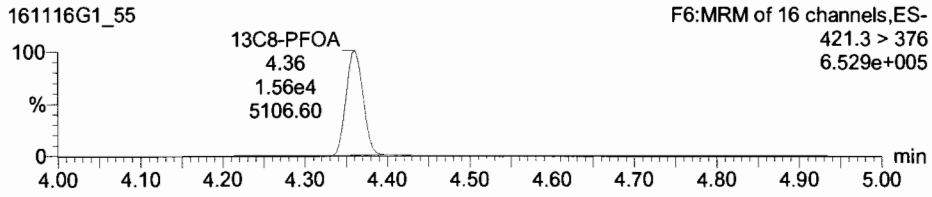

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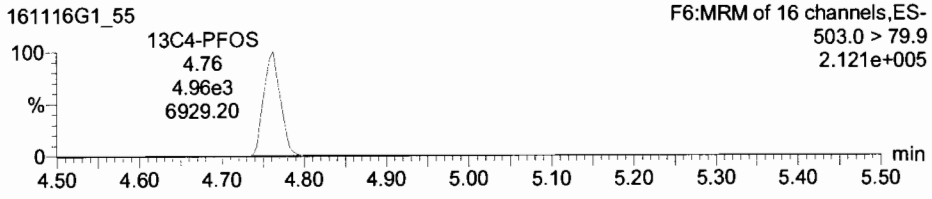
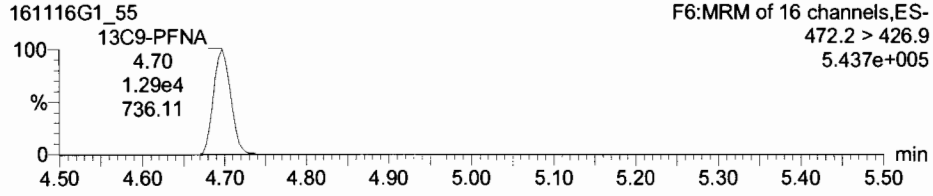
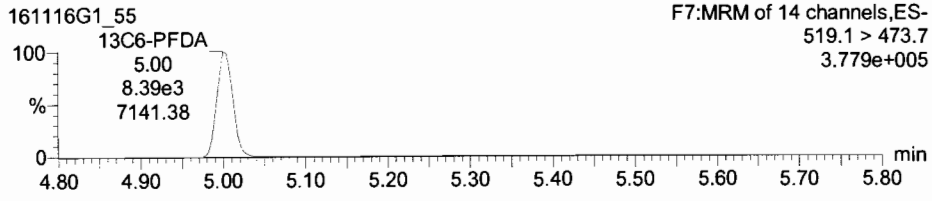


13C9-PFNA



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161118J1\161118J1_02.qld

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Printed: Saturday, November 19, 2016 12:31:27 Pacific Standard Time

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Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

Name: 161118J1_02.wiff, Date: 18-Nov-2016, Time: 14:59:37, ID: ST161118J1-1 PFC C3.5 16K1421, Description: PFC C3.5 16K1421 A

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
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2	2	PFPeA	218.90	2.74e4	1.28e4		1.000	3.09	29.3	117.3
3	3	PFBS	79.90	1.36e4	7.09e3		1.000	3.39	30.6	122.4
4	4	PFHxA	268.90	2.54e4	4.87e3		1.000	3.80	30.5	122.1
5	5	PFHpA	318.90	1.94e4	9.64e3		1.000	4.27	29.8	119.4
6	6	PFHxS	79.91	1.17e4	1.50e3		1.000	4.39	30.1	120.3
7	7	6:2 FTS	406.90	6.95e3	3.11e3		1.000	4.62	31.2	124.8
8	8	PFOA	368.90	2.38e4	9.03e3		1.000	4.67	26.4	105.8
9	9	PFNA	419.00	1.58e4	7.98e3		1.000	4.99	27.4	109.6
10	10	PFOS	79.92	1.20e4	4.34e3		1.000	5.05	27.5	110.2
11	11	PFDA	469.00	9.76e3	4.51e3		1.000	5.28	26.8	107.0
12	12	8:2 FTS	506.90	2.80e3	1.27e3		1.000	5.25	27.1	108.6
13	13	13C3-PFBA	172.00	1.17e4	1.51e4	0.894	1.000	1.88	10.8	86.1
14	14	13C3-PFPeA	221.90	1.28e4	1.54e4	0.945	1.000	3.09	11.0	87.7
15	15	13C3-PFBS	79.95	7.09e3	1.54e4	0.531	1.000	3.39	10.8	86.4
16	16	13C2-PFHxA	269.90	4.87e3	1.54e4	0.905	1.000	3.79	4.36	87.1
17	17	13C4-PFHpA	321.90	9.64e3	1.54e4	0.770	1.000	4.27	10.1	81.2
18	18	18O2-PFHxS	102.90	1.50e3	6.28e3	0.276	1.000	4.39	10.8	86.3
19	19	13C2-6:2 FTS	408.90	3.11e3	1.39e4	0.219	1.000	4.62	12.7	101.9
20	20	13C2-PFOA	369.90	9.03e3	1.39e4	0.663	1.000	4.67	12.2	97.6
21	21	13C5-PFNA	422.90	7.98e3	8.93e3	1.019	1.000	4.99	10.9	87.6
22	22	13C8-PFOS	79.93	4.34e3	5.04e3	0.921	1.000	5.05	11.7	93.5
23	23	13C2-PFDA	470.00	4.51e3	6.27e3	0.887	1.000	5.28	10.1	81.2
24	24	13C2-8:2 FTS	508.70	1.27e3	6.27e3	0.272	1.000	5.25	9.30	74.4
25	25	13C4-PFBA	171.90	1.51e4	1.51e4	1.000	1.000	1.88	12.5	100.0
26	26	13C5-PFHxA	273.00	1.54e4	1.54e4	1.000	1.000	3.79	12.5	100.0
27	27	13C3-PFHxS	80.01	6.28e3	6.28e3	1.000	1.000	4.38	12.5	100.0
28	28	13C8-PFOA	375.90	1.39e4	1.39e4	1.000	1.000	4.67	12.5	100.0
29	29	13C4-PFOS	79.94	5.04e3	5.04e3	1.000	1.000	5.05	12.5	100.0
30	30	13C9-PFNA	427.00	8.93e3	8.93e3	1.000	1.000	4.99	12.5	100.0
31	31	13C6-PFDA	474.00	6.27e3	6.27e3	1.000	1.000	5.28	12.5	100.0

75-125
60-150
40-150
60-150
50-150
60-150
40-150

AC 11/19/16

	Sample Name	Acquisition Date	Sample ID	Sample Comment
1	161118J1_01	11/18/2016 14:47:23	IPA	IPA
2	161118J1_02	11/18/2016 14:59:37	ST161118J1-1 PFC C3.5 16K1421	PFC C3.5 16K1421 A
3	161118J1_03	11/18/2016 15:11:51	IPA	IPA
4	161118J1_04	11/18/2016 15:24:05	1601395-03	26SW01_161101
5	161118J1_05	11/18/2016 15:36:19	1601395-04	26SW04_161101
6	161118J1_06	11/18/2016 15:48:33	1601395-12	EB18_161101
7	161118J1_07	11/18/2016 16:00:46	1601360-02	EB-M05-02_161025
8	161118J1_08	11/18/2016 16:12:57	1601442@5X	OF-INF01-110816
9	161118J1_09	11/18/2016 16:25:09	IPA	IPA
10	161118J1_10	11/18/2016 16:37:24	ST161118J1-2 PFC C3.5 16K1421	PFC C3.5 16K1421 A
11	161118J1_11	11/18/2016 16:49:37	IPA	IPA

LC Calibration Standards Review Checklist Q2

			ION Ratio	Concentration	C-Cals Name	Sign Date	Correct I-Cal	Manaul Integrations	N/A
Calibration ID:	ST161118J1-1	L (M) H	N/A	☑	☑	☑	☑	☑	☐
Calibration ID:	-2	L (M) H	☑	☑ (A)	☑	☑	☑	☑	☑
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: 10/14/16

Reviewed By: CJ 11/19/16
Initials/Date

Comments:
(A) PFHpA and 6:2 FTS outside limits. Not used in this sequence. AC 11/19/16

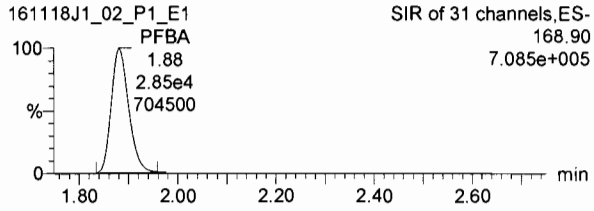
Dataset: Untitled

Last Altered: Saturday, November 19, 2016 12:27:47 Pacific Standard Time
Printed: Saturday, November 19, 2016 12:27:55 Pacific Standard Time

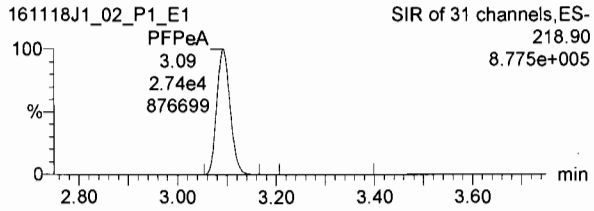
Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 15 Nov 2016 11:51:30
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

Name: 161118J1_02.wiff, Date: 18-Nov-2016, Time: 14:59:37, ID: ST161118J1-1 PFC C3.5 16K1421, Description: PFC C3.5 16K1421 A

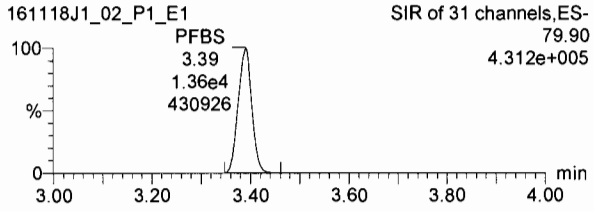
PFBA



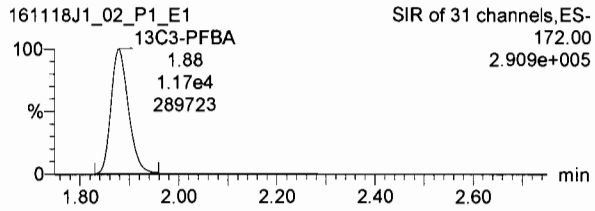
PFPeA



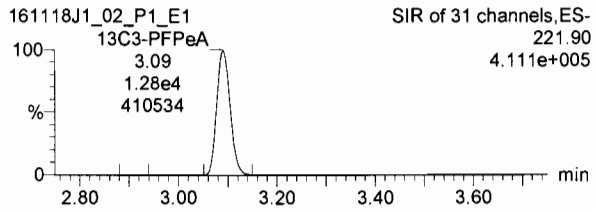
PFBS



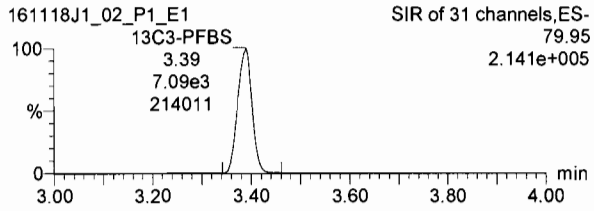
13C3-PFBA



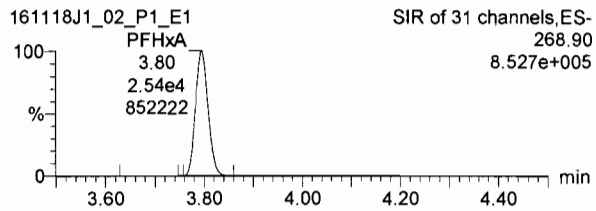
13C3-PFPeA



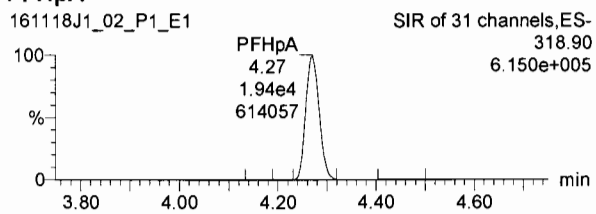
13C3-PFBS



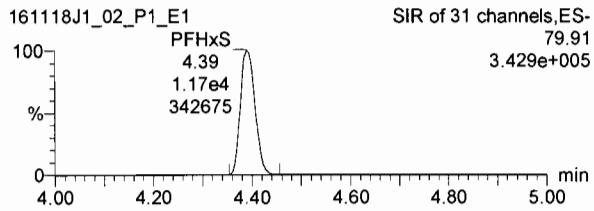
PFHxA



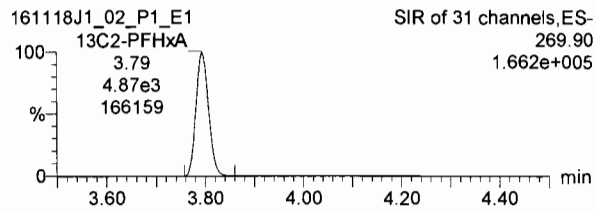
PFHpA



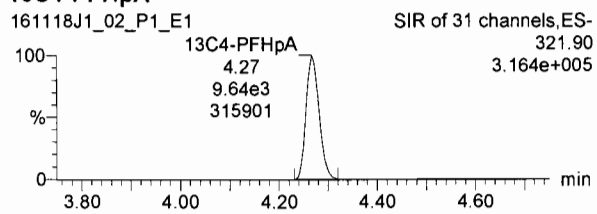
PFHxS



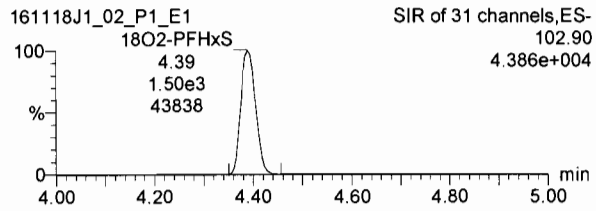
13C2-PFHxA



13C4-PFHpA



18O2-PFHxS



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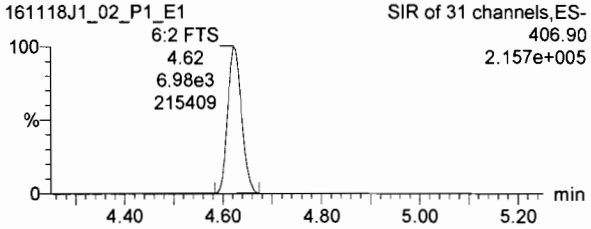
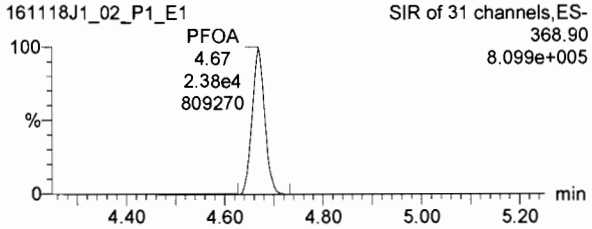
Last Altered: Saturday, November 19, 2016 12:27:47 Pacific Standard Time
Printed: Saturday, November 19, 2016 12:27:55 Pacific Standard Time

Name: 161118J1_02.wiff, Date: 18-Nov-2016, Time: 14:59:37, ID: ST161118J1-1 PFC C3.5 16K1421, Description: PFC C3.5 16K1421 A

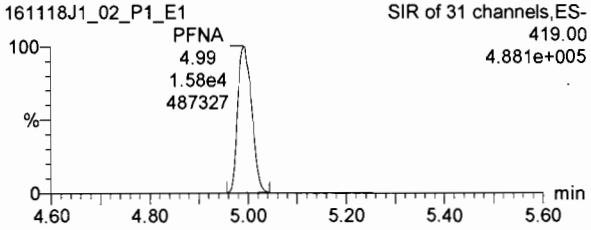
6:2 FTS



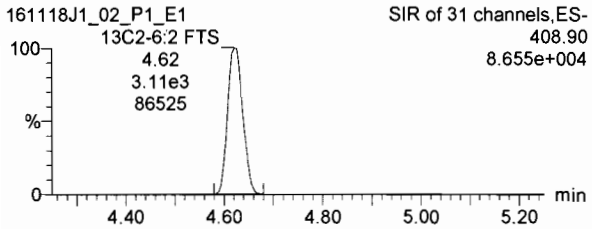
PFOA



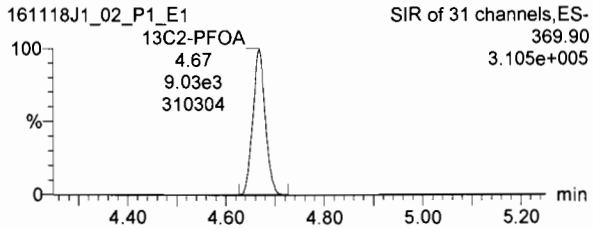
PFNA



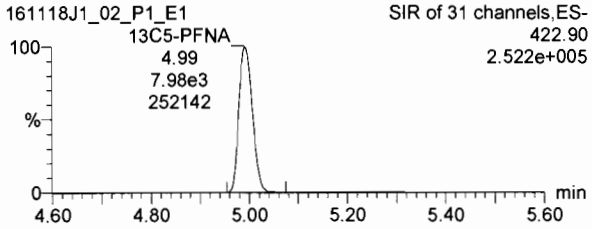
13C2-6:2 FTS



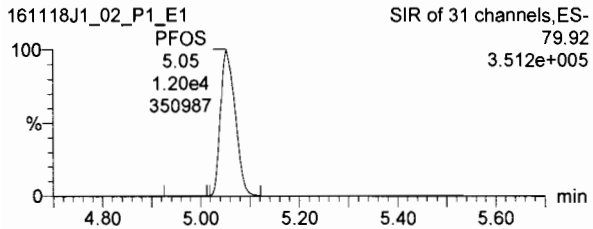
13C2-PFOA



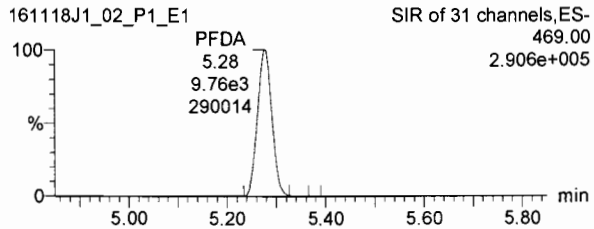
13C5-PFNA



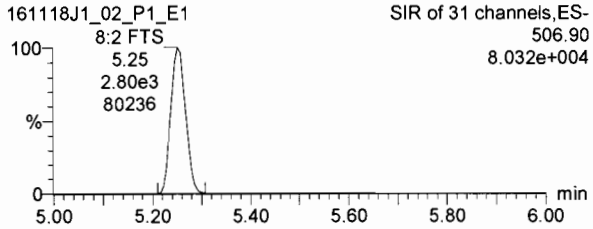
PFOS



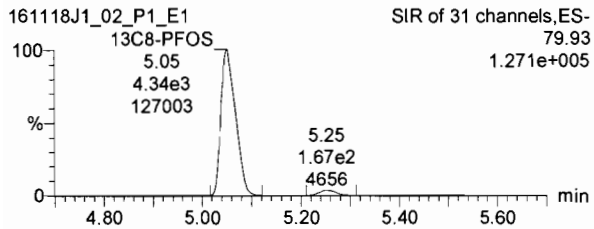
PFDA



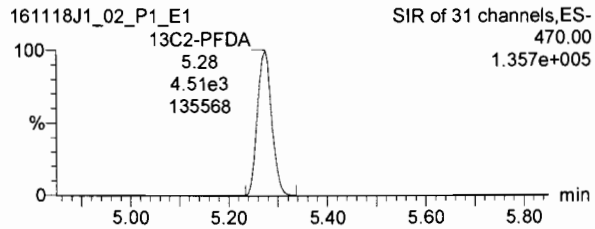
8:2 FTS



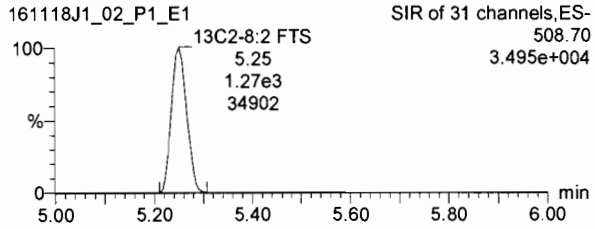
13C8-PFOS

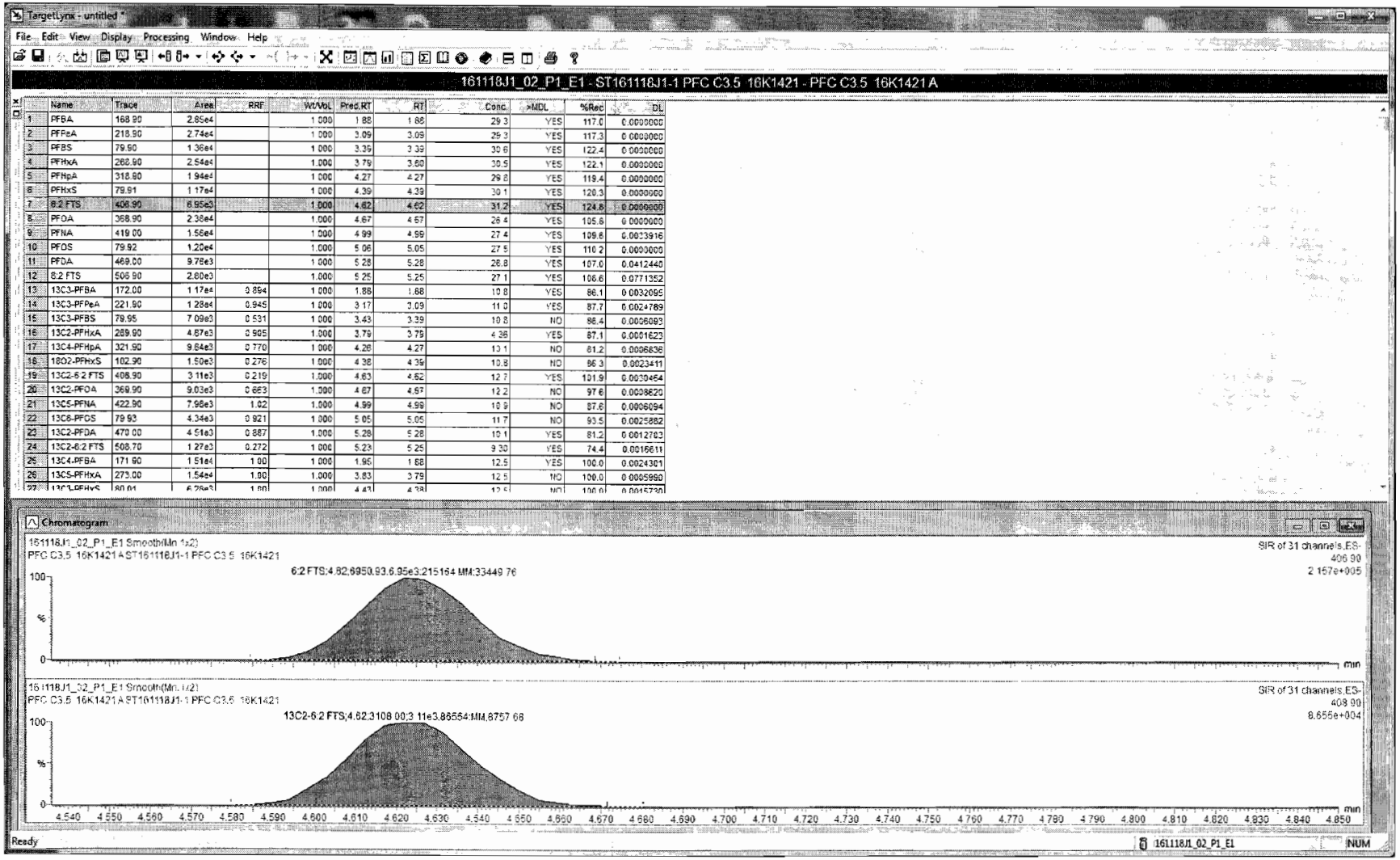


13C2-PFDA



13C2-8:2 FTS





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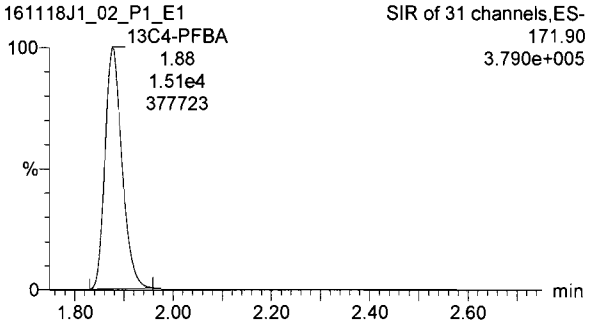
1	PFBA	168.90	2.85e4		1.000	1.88	1.88	29.3	YES	117.0	0.0000000
2	PFPeA	218.90	2.74e4		1.000	3.09	3.09	29.3	YES	117.3	0.0000000
3	PFBS	79.90	1.36e4		1.000	3.39	3.39	30.6	YES	122.4	0.0000000
4	PFHxA	268.90	2.54e4		1.000	3.79	3.80	30.5	YES	122.1	0.0000000
5	PFHpA	318.90	1.94e4		1.000	4.27	4.27	29.8	YES	119.4	0.0000000
6	PFHxS	79.91	1.17e4		1.000	4.39	4.39	30.1	YES	120.3	0.0000000
7	6:2 FTS	408.90	6.95e3		1.000	4.62	4.62	31.2	YES	124.8	0.0000000
8	PFOA	368.90	2.38e4		1.000	4.67	4.67	26.4	YES	105.6	0.0000000
9	PFNA	419.00	1.56e4		1.000	4.99	4.99	27.4	YES	109.6	0.0003916
10	PFOS	79.92	1.20e4		1.000	5.06	5.05	27.5	YES	110.2	0.0000000
11	PFDA	469.00	9.78e3		1.000	5.28	5.28	26.8	YES	107.0	0.0412440
12	8:2 FTS	508.90	2.80e3		1.000	5.25	5.25	27.1	YES	108.6	0.0771352
13	13C3-PFBA	172.00	1.17e4	0.894	1.000	1.88	1.88	10.8	YES	86.1	0.0032095
14	13C3-PFPeA	221.90	1.28e4	0.945	1.000	3.17	3.09	11.0	YES	87.7	0.0024789
15	13C3-PFBS	79.95	7.09e3	0.531	1.000	3.43	3.39	10.8	NO	86.4	0.0006083
16	13C2-PFHxA	289.90	4.87e3	0.905	1.000	3.79	3.79	4.36	YES	87.1	0.0001623
17	13C4-PFHpA	321.90	9.64e3	0.770	1.000	4.26	4.27	10.1	NO	81.2	0.0006836
18	18O2-PFHxS	102.90	1.50e3	0.276	1.000	4.38	4.39	10.8	NO	86.3	0.0023411
19	13C2-6:2 FTS	408.90	3.11e3	0.219	1.000	4.63	4.62	12.7	YES	101.9	0.0030464
20	13C2-PFOA	369.90	9.03e3	0.663	1.000	4.67	4.67	12.2	NO	97.6	0.0008629
21	13C5-PFNA	422.90	7.98e3	1.02	1.000	4.99	4.99	10.9	NO	87.6	0.0006094
22	13C8-PFOS	79.93	4.34e3	0.921	1.000	5.05	5.05	11.7	NO	93.5	0.0025882
23	13C2-PFDA	470.00	4.51e3	0.887	1.000	5.28	5.28	10.1	YES	81.2	0.0012783
24	13C2-8:2 FTS	508.70	1.27e3	0.272	1.000	5.23	5.25	9.30	YES	74.4	0.0016611
25	13C4-PFBA	171.90	1.51e4	1.00	1.000	1.95	1.88	12.5	YES	100.0	0.0024301
26	13C5-PFHxA	273.00	1.54e4	1.00	1.000	3.83	3.79	12.5	NO	100.0	0.0005990
27	13C4-PFHxS	80.01	6.26e3	1.00	1.000	4.43	4.38	12.5	NO	100.0	0.0015730

Dataset: Untitled

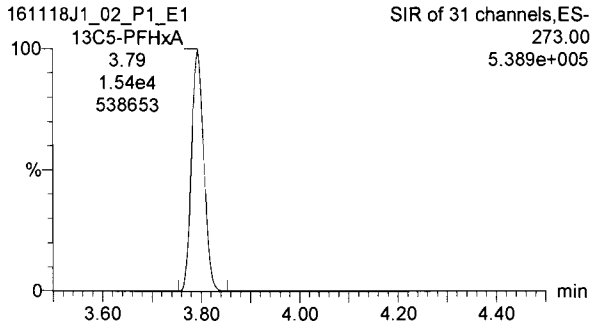
Last Altered: Saturday, November 19, 2016 12:27:47 Pacific Standard Time
Printed: Saturday, November 19, 2016 12:27:55 Pacific Standard Time

Name: 161118J1_02.wiff, Date: 18-Nov-2016, Time: 14:59:37, ID: ST161118J1-1 PFC C3.5 16K1421, Description: PFC C3.5 16K1421 A

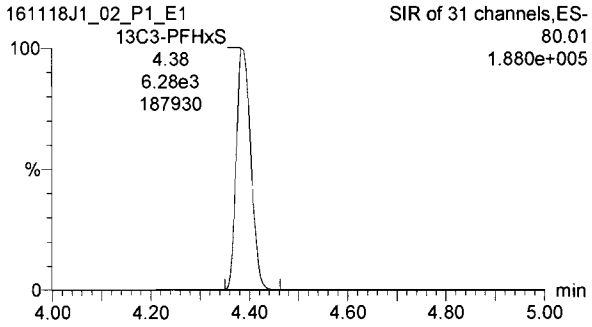
13C4-PFBA



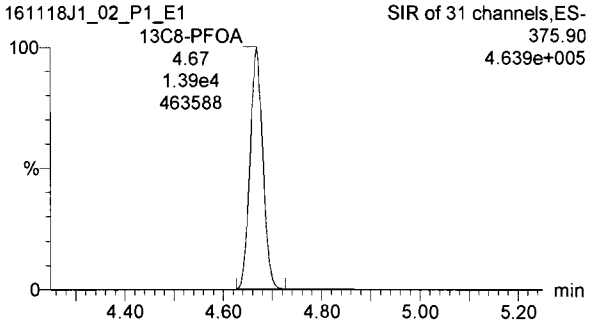
13C5-PFHxA



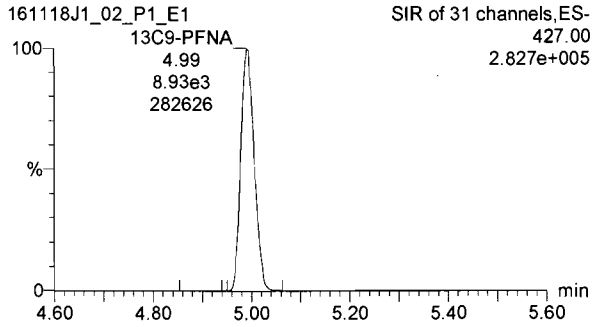
13C3-PFHxS



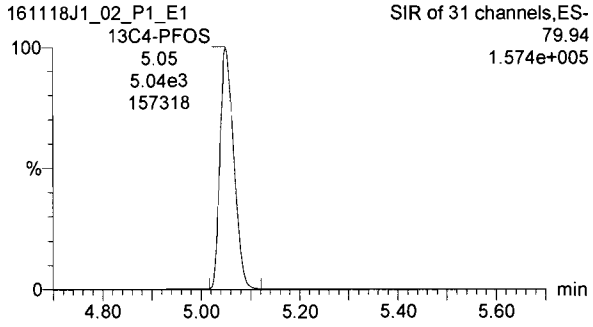
13C8-PFOA



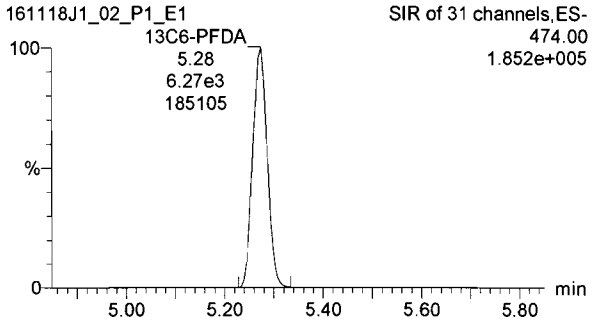
13C9-PFNA



13C4-PFOS



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161118J1\161118J1_10.qld

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Printed: Saturday, November 19, 2016 12:36:50 Pacific Standard Time

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Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

Name: 161118J1_10.wiff, Date: 18-Nov-2016, Time: 16:37:24, ID: ST161118J1-2 PFC C3.5 16K1421, Description: PFC C3.5 16K1421 A

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
1	1	PFBA	168.90	2.85e4	1.16e4		1.000	1.90	29.5	117.8
2	2	PFPeA	218.90	2.81e4	1.30e4		1.000	3.10	29.8	119.0
3	3	PFBS	79.90	1.44e4	7.58e3		1.000	3.40	30.3	121.3
4	4	PFHxA	268.90	2.45e4	4.76e3		1.000	3.80	30.1	120.5
5	5	PFHpA	318.90	2.01e4	9.41e3		1.000	4.27	31.5	126.2
6	6	PFHxS	79.91	1.09e4	1.43e3		1.000	4.39	29.2	116.9
7	7	6:2 FTS	406.90	6.44e3	2.86e3		1.000	4.63	31.4	125.6
8	8	PFOA	368.90	2.47e4	9.42e3		1.000	4.67	26.3	105.0
9	9	PFNA	419.00	1.59e4	7.97e3		1.000	5.01	27.6	110.5
10	10	PFOS	79.92	1.06e4	4.09e3		1.000	5.07	25.6	102.6
11	11	PFDA	469.00	9.16e3	4.06e3		1.000	5.30	27.9	111.7
12	12	8:2 FTS	506.90	2.47e3	1.15e3		1.000	5.27	26.2	105.0
13	13	13C3-PFBA	172.00	1.16e4	1.51e4	0.894	1.000	1.90	10.7	85.3
14	14	13C3-PFPeA	221.90	1.30e4	1.52e4	0.945	1.000	3.10	11.2	89.9
15	15	13C3-PFBS	79.95	7.58e3	1.52e4	0.531	1.000	3.40	11.7	93.8
16	16	13C2-PFHxA	269.90	4.76e3	1.52e4	0.905	1.000	3.80	4.31	86.3
17	17	13C4-PFHpA	321.90	9.41e3	1.52e4	0.770	1.000	4.27	10.0	80.3
18	18	18O2-PFHxS	102.90	1.43e3	5.81e3	0.276	1.000	4.39	11.2	89.2
19	19	13C2-6:2 FTS	408.90	2.86e3	1.50e4	0.219	1.000	4.63	10.9	87.3
20	20	13C2-PFOA	369.90	9.42e3	1.50e4	0.663	1.000	4.67	11.8	94.6
21	21	13C5-PFNA	422.90	7.97e3	9.35e3	1.019	1.000	5.00	10.5	83.6
22	22	13C8-PFOS	79.93	4.09e3	4.48e3	0.921	1.000	5.07	12.4	99.1
23	23	13C2-PFDA	470.00	4.06e3	5.35e3	0.887	1.000	5.29	10.7	85.5
24	24	13C2-8:2 FTS	508.70	1.15e3	5.35e3	0.272	1.000	5.27	9.90	79.2
25	25	13C4-PFBA	171.90	1.51e4	1.51e4	1.000	1.000	1.90	12.5	100.0
26	26	13C5-PFHxA	273.00	1.52e4	1.52e4	1.000	1.000	3.80	12.5	100.0
27	27	13C3-PFHxS	80.01	5.81e3	5.81e3	1.000	1.000	4.39	12.5	100.0
28	28	13C8-PFOA	375.90	1.50e4	1.50e4	1.000	1.000	4.67	12.5	100.0
29	29	13C4-PFOS	79.94	4.48e3	4.48e3	1.000	1.000	5.06	12.5	100.0
30	30	13C9-PFNA	427.00	9.35e3	9.35e3	1.000	1.000	5.01	12.5	100.0
31	31	13C6-PFDA	474.00	5.35e3	5.35e3	1.000	1.000	5.29	12.5	100.0

75-125
60-150
40-150
60-150
50-150
60-150
40-150

AC 11/19/16

(A) Not used in this sequence.

	Sample Name	Acquisition Date	Sample ID	Sample Comment
1	161118J1_01	11/18/2016 14:47:23	IPA	IPA
2	161118J1_02	11/18/2016 14:59:37	ST161118J1-1 PFC C3.5 16K1421	PFC C3.5 16K1421 A
3	161118J1_03	11/18/2016 15:11:51	IPA	IPA
4	161118J1_04	11/18/2016 15:24:05	1601395-03	26SW01_161101
5	161118J1_05	11/18/2016 15:36:19	1601395-04	26SW04_161101
6	161118J1_06	11/18/2016 15:48:33	1601395-12	EB18_161101
7	161118J1_07	11/18/2016 16:00:46	1601360-02	EB-M05-02_161025
8	161118J1_08	11/18/2016 16:12:57	1601442@5X	OF-INF01-110816
9	161118J1_09	11/18/2016 16:25:09	IPA	IPA
10	161118J1_10	11/18/2016 16:37:24	ST161118J1-2 PFC C3.5 16K1421	PFC C3.5 16K1421 A
11	161118J1_11	11/18/2016 16:49:37	IPA	IPA

Vista Analytical Laboratory Q2

Dataset: Untitled

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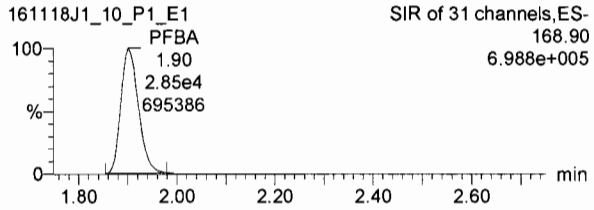
Printed: Saturday, November 19, 2016 12:28:12 Pacific Standard Time

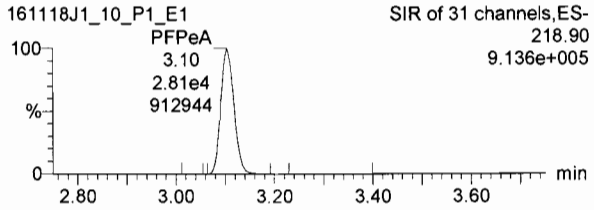
Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 15 Nov 2016 11:51:30
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

Name: 161118J1_10.wiff, Date: 18-Nov-2016, Time: 16:37:24, ID: ST161118J1-2 PFC C3.5 16K1421, Description: PFC C3.5 16K1421 A

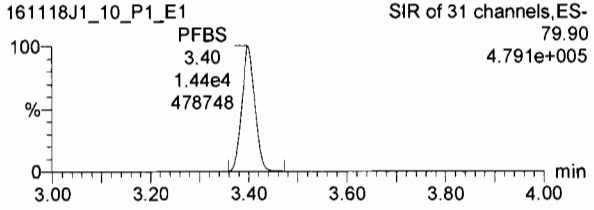
PFBA



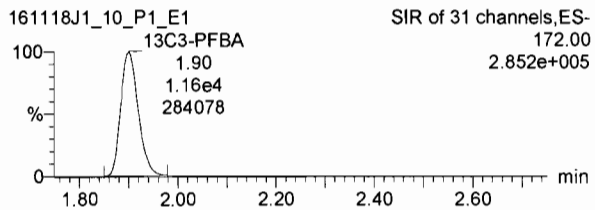
PFPeA



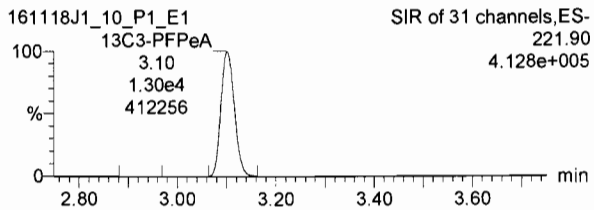
PFBS



13C3-PFBA



13C3-PFPeA



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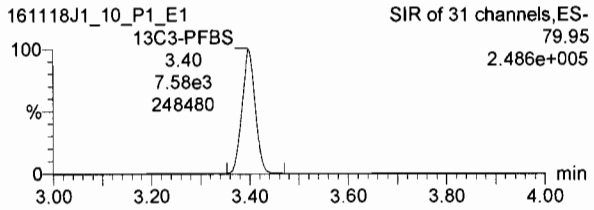
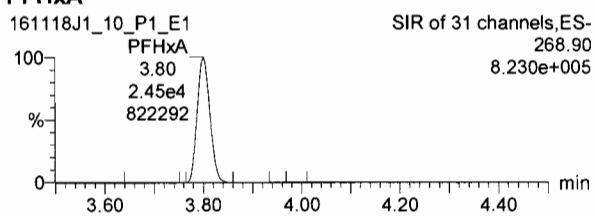
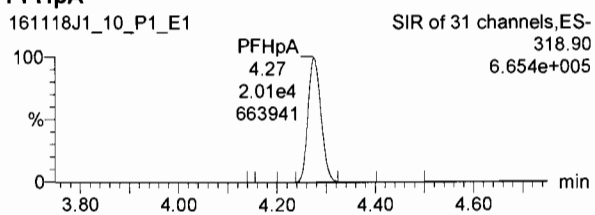


PFHxA



PFHpA



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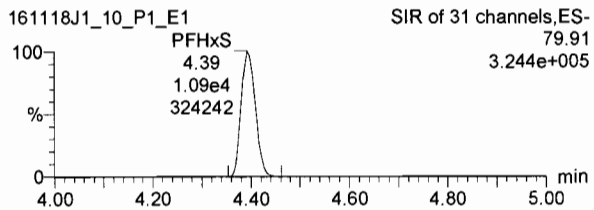

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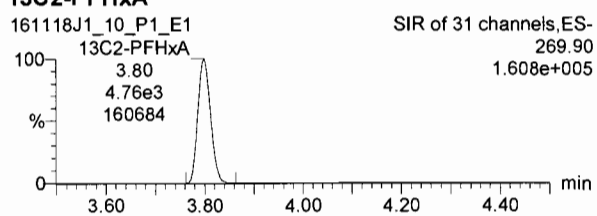
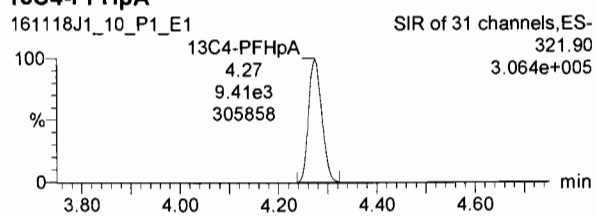
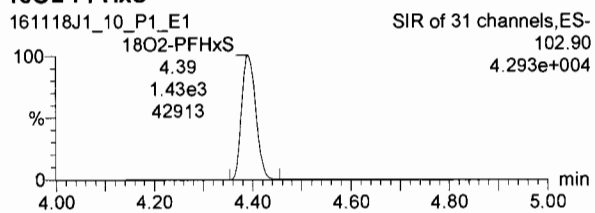


13C4-PFHpA



18O2-PFHxS



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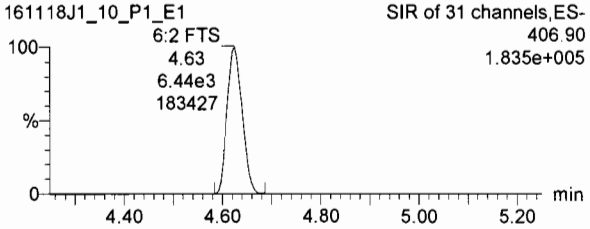
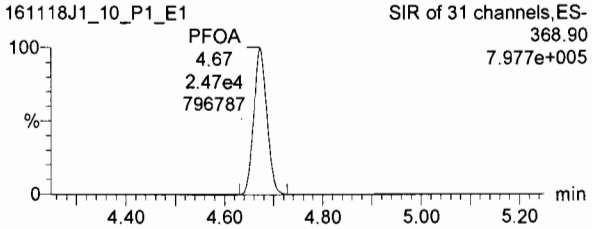
Printed: Saturday, November 19, 2016 12:28:12 Pacific Standard Time

Name: 161118J1_10.wiff, Date: 18-Nov-2016, Time: 16:37:24, ID: ST161118J1-2 PFC C3.5 16K1421, Description: PFC C3.5 16K1421 A

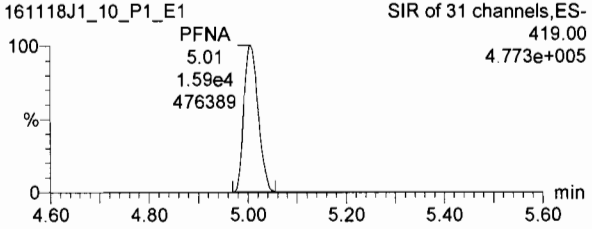
6:2 FTS



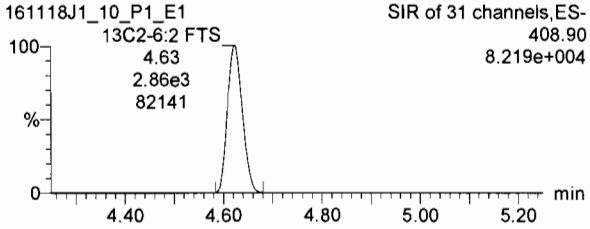
PFOA



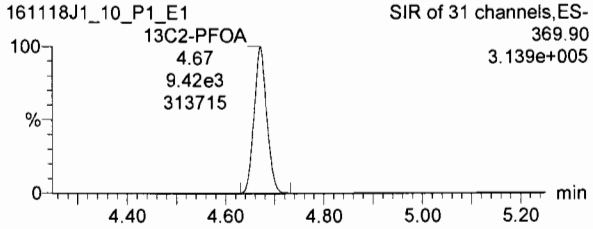
PFNA



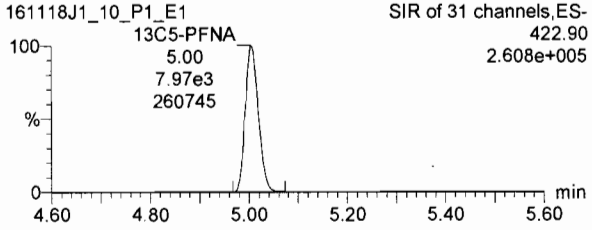
13C2-6:2 FTS



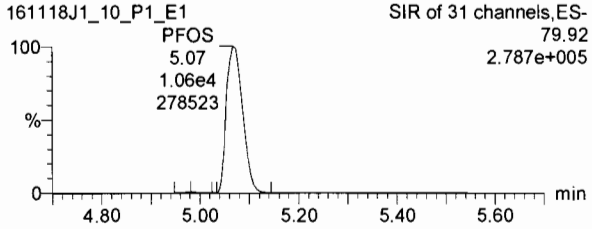
13C2-PFOA



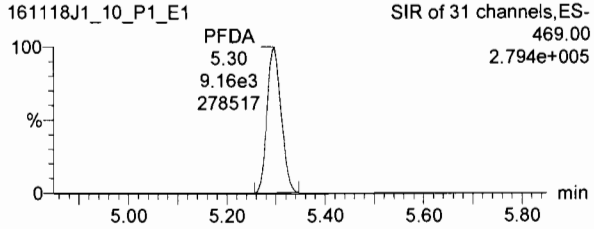
13C5-PFNA



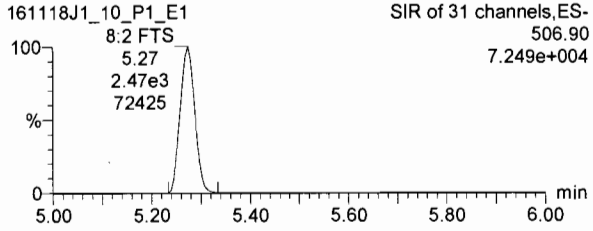
PFOS



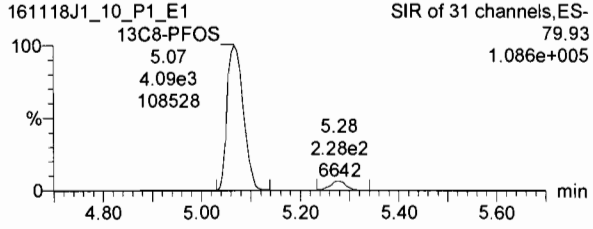
PFDA



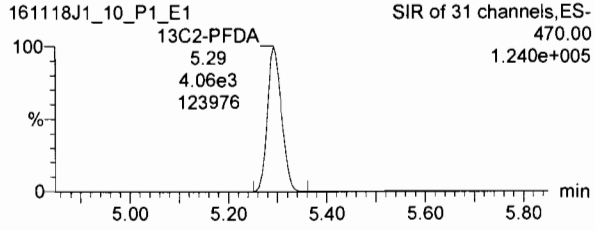
8:2 FTS



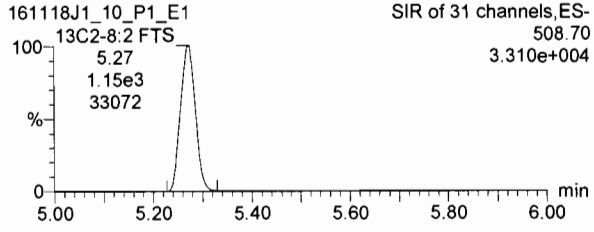
13C8-PFOS



13C2-PFDA



13C2-8:2 FTS



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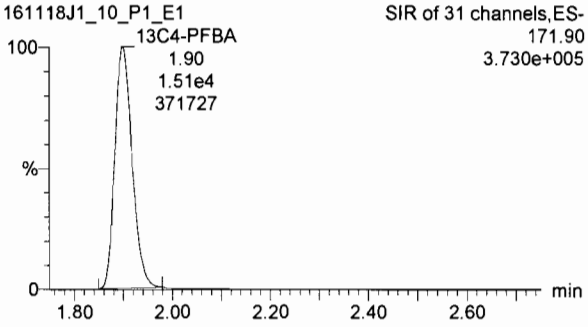
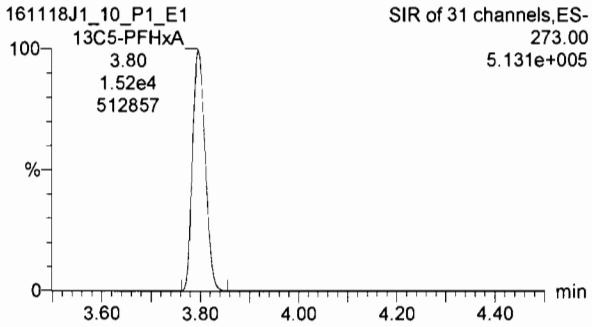
Printed: Saturday, November 19, 2016 12:28:12 Pacific Standard Time

Name: 161118J1_10.wiff, Date: 18-Nov-2016, Time: 16:37:24, ID: ST161118J1-2 PFC C3.5 16K1421, Description: PFC C3.5 16K1421 A

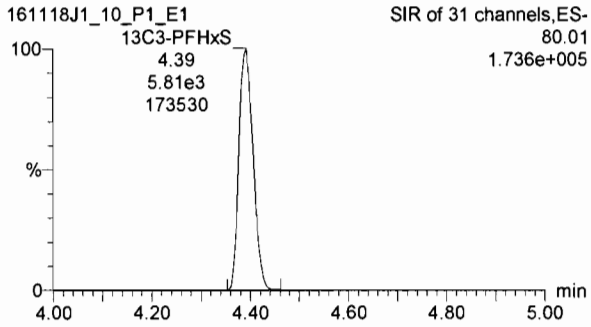
13C4-PFBA



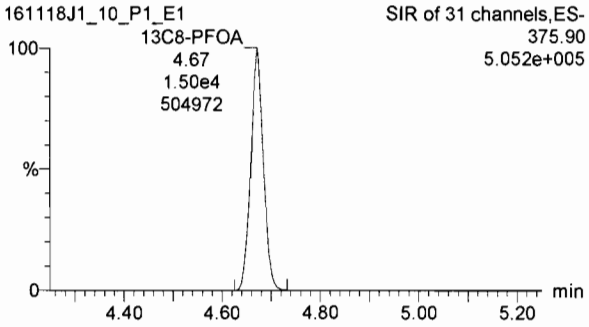
13C5-PFHxA



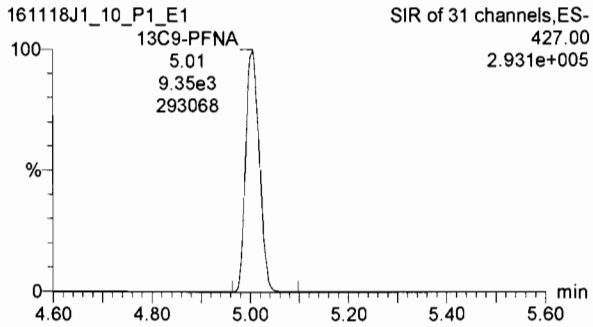
13C3-PFHxS



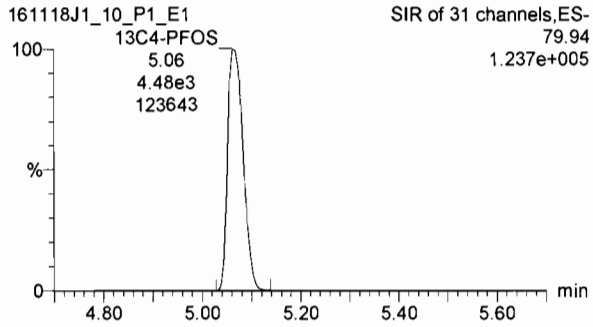
13C8-PFOA



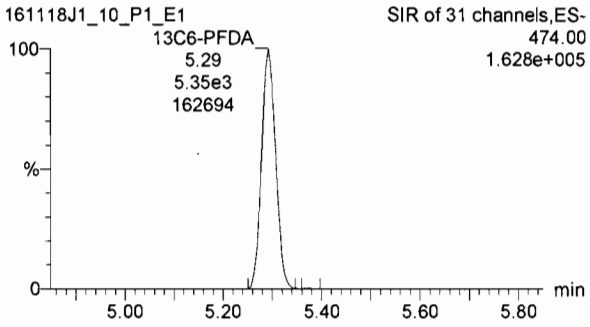
13C9-PFNA



13C4-PFOS



13C6-PFDA



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Last Altered: Monday, November 28, 2016 08:47:38 Pacific Standard Time
Printed: Monday, November 28, 2016 08:49:43 Pacific Standard Time

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Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

Name: 161127G1_2, Date: 27-Nov-2016, Time: 13:38:36, ID: ST161127G1-1 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

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2	2 PFPeA	263.1 > 218.9	1.86e4	8.49e3		1.000	2.82	27.4	109.5
3	3 PFBS	299 > 79.7	2.12e4	6.08e3		1.000	3.07	24.4	97.7
4	4 PFHxA	313.2 > 268.9	1.51e4	4.94e3		1.000	3.43	25.6	102.2
5	5 PFHpA	363 > 318.9	4.13e4	1.31e4		1.000	3.95	25.4	101.5
6	6 PFHxS	398.9 > 79.6	1.88e4	5.62e3		1.000	4.07	24.3	97.1
7	7 6:2 FTS	427.1 > 407	5.03e3	5.19e3		1.000	4.30	27.1	108.3
8	8 PFOA	413 > 368.7	4.13e4	2.16e4		1.000	4.35	26.5	105.9
9	9 PFHpS	449 > 98.7	4.58e3	2.16e4		1.000	4.43	29.0	115.9
10	10 PFOS	499 >79.9	1.36e4	6.69e3		1.000	4.75	30.7	122.7
11	11 PFNA	463 > 418.8	3.52e4	1.12e4		1.000	4.69	24.0	96.0
12	12 PFDA	513 > 468.8	9.61e3	7.22e3		1.000	5.00	27.9	111.7
13	13 8:2 FTS	527 > 506.9	3.30e3	3.23e3		1.000	4.97	26.0	104.2
14	14 13C3-PFBA	216.1 > 171.8	2.36e4	1.76e4	1.205	1.000	1.88	14.0	111.7
15	15 13C3-PFPeA	266>221.8	8.49e3	1.91e4	0.448	1.000	2.82	12.4	99.2
16	16 13C3-PFBS	302.0 > 98.8	6.08e3	1.91e4	0.302	1.000	3.07	13.2	105.3
17	17 13C2-PFHxA	315 > 269.8	4.94e3	1.91e4	0.620	1.000	3.43	5.22	104.4
18	18 13C4-PFHpA	367.2 > 321.8	1.31e4	1.21e4	1.139	1.000	3.95	11.9	95.5
19	19 18O2-PFHxS	403 > 102.6	5.62e3	1.21e4	0.449	1.000	4.06	12.9	103.6
20	20 13C2-6:2 FTS	429.1 > 408.9	5.19e3	5.06e3	1.073	1.000	4.31	12.0	95.7
21	21 13C2-PFOA	414.9 > 369.7	2.16e4	1.07e4	2.262	1.000	4.35	11.2	89.6
22	22 13C8-PFOS	507.0 > 79.9	6.69e3	7.41e3	0.944	1.000	4.75	12.0	95.7
23	23 13C5-PFNA	468.2 > 422.9	1.12e4	1.02e4	1.082	1.000	4.69	12.7	101.4
24	24 13C2-PFDA	515.1 > 469.9	7.22e3	8.08e3	1.019	1.000	5.00	11.0	87.7
25	25 13C2-8:2 FTS	529.1 > 508.7	3.23e3	5.06e3	0.569	1.000	4.97	14.0	112.3
26	26 13C4-PFBA	217 > 171.8	1.76e4	1.76e4	1.000	1.000	1.88	12.5	100.0
27	27 13C2-4:2 FTS	329.2 > 308.9	5.06e3	5.06e3	1.000	1.000	3.34	12.5	100.0
28	28 13C5-PFHxA	318.0 > 272.9	1.91e4	1.91e4	1.000	1.000	3.43	12.5	100.0
29	29 13C3-PFHxS	401.9 > 79.9	1.21e4	1.21e4	1.000	1.000	4.06	12.5	100.0
30	30 13C8-PFOA	421.3 > 376	1.07e4	1.07e4	1.000	1.000	4.35	12.5	100.0
31	31 13C4-PFOS	503.0 > 79.9	7.41e3	7.41e3	1.000	1.000	4.75	12.5	100.0

75-125
60-150
40-150
60-150
50-150
60-150
40-150

AC 11/28/16
PW 11/28/16

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-2.qld

Last Altered: Monday, November 28, 2016 08:47:38 Pacific Standard Time
Printed: Monday, November 28, 2016 08:49:43 Pacific Standard Time

Name: 161127G1_2, Date: 27-Nov-2016, Time: 13:38:36, ID: ST161127G1-1 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
32	32	13C9-PFNA	472.2 > 426.9	1.02e4	1.02e4	1.000	1.000	4.69	12.5	100.0
33	33	13C6-PFDA	519.1 > 473.7	8.08e3	8.08e3	1.000	1.000	5.00	12.5	100.0

LC Calibration Standards Review Checklist Q1

			ION Ratio	Concentration	C-Cals Name	Sign Date	Correct I-Cal	Manaul Integrations	N/A
Calibration ID:	ST161127G1-1	L (M) H	N/A	☑	☑	☑	☑	☑	☐
Calibration ID:	-2	L (M) H	☐	☑ (A)	☑	☑	☑	☑	☐
Calibration ID:	-3	L (M) H	☐	☑ (B)	☑	☑	☑	☑	☐
Calibration ID:	-4	L (M) H	☑	☑ (B)	☑	☑	☑	☑	☑
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: 11/21/16

Comments:
(A) Not used for 6:2 FTS
(B) Not used for 8:2 FTS
AC 11/28/16

Reviewed By: PW 11/28/16
Initials/Date

Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Monday, November 28, 2016 09:04:49 Pacific Standard Time
Printed: Monday, November 28, 2016 09:06:19 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

Compound name: PFBA

	Name	ID	Acq.Date	Acq.Time
1	161127G1_1	IPA	27-Nov-16	13:25:59
2	161127G1_2	ST161127G1-1 PFC CS3.5 16K2701	27-Nov-16	13:38:36
3	161127G1_3	IPA	27-Nov-16	13:51:12
4	161127G1_4	B6K0123-BS1 OPR 0.125	27-Nov-16	14:03:49
5	161127G1_5	B6K0142-BS1 OPR 1	27-Nov-16	14:16:25
6	161127G1_6	B6K0142-BSD1 LCS Dup 1	27-Nov-16	14:29:02
7	161127G1_7	B6K0143-BS1 OPR 0.125	27-Nov-16	14:41:38
8	161127G1_8	B6K0146-BS1 OPR 0.125	27-Nov-16	14:54:16
9	161127G1_9	IPA	27-Nov-16	15:06:54
10	161127G1_10	B6K0123-BLK1 Method Blank 0.125	27-Nov-16	15:19:32
11	161127G1_11	B6K0142-BLK1 Method Blank 1	27-Nov-16	15:32:11
12	161127G1_12	B6K0143-BLK1 Method Blank 0.125	27-Nov-16	15:44:49
13	161127G1_13	B6K0146-BLK1 Method Blank 0.125	27-Nov-16	15:57:25
14	161127G1_14	1601395-08RE2 EB-26SW04_161101 0.13015	27-Nov-16	16:10:00
15	161127G1_15	1601395-11RE2 FB-26SW04_161101 0.12796	27-Nov-16	16:22:37
16	161127G1_16	1601416-01 TW-2C 0.12384	27-Nov-16	16:35:13
17	161127G1_17	1601414-12 PFAS-SED01-110116 7.13	27-Nov-16	16:47:51
18	161127G1_18	1601414-13 PFAS-SED02-110116 1.6	27-Nov-16	17:00:28
19	161127G1_19	1601414-14 PFAS-SED03-110116 1.55	27-Nov-16	17:13:07
20	161127G1_20	1601414-15 PFAS-SED04-110216 1.41	27-Nov-16	17:25:45
21	161127G1_21	B6K0142-MS1 Matrix Spike 1.42	27-Nov-16	17:38:20
22	161127G1_22	B6K0142-MSD1 Matrix Spike Dup 1.56	27-Nov-16	17:50:56
23	161127G1_23	1601414-16 PFAS-SED05-110216 1.36	27-Nov-16	18:03:31
24	161127G1_24	1601414-17 PFAS-SED06-110216 1.39	27-Nov-16	18:16:08
25	161127G1_25	1601414-18 PFAS-SED07-110216 1.12	27-Nov-16	18:28:44
26	161127G1_26	IPA	27-Nov-16	18:41:22
27	161127G1_27	ST161127G1-2 PFC CS3.5 16K2701	27-Nov-16	18:53:59
28	161127G1_28	IPA	27-Nov-16	19:06:35
29	161127G1_29	1601414-19 PFAS-SED08-110216 1.24	27-Nov-16	19:19:13
30	161127G1_30	1601414-20 PFAS-SED-DUP1-110216 1.36	27-Nov-16	19:31:52
31	161127G1_31	1601451-01 SB01-20161114 0.12236	27-Nov-16	19:44:30

Dataset: Untitled

Last Altered: Monday, November 28, 2016 09:04:49 Pacific Standard Time
Printed: Monday, November 28, 2016 09:06:19 Pacific Standard Time

Compound name: PFBA

	Name	ID	Acq.Date	Acq.Time
32	161127G1_32	1601451-02 EB01-20161114 0.12642	27-Nov-16	19:57:06
33	161127G1_33	1601451-03 OUAI-MW13-20161114 0.13048	27-Nov-16	20:09:41
34	161127G1_34	1601451-04 OUAI-MW37-20161114 0.13083	27-Nov-16	20:22:16
35	161127G1_35	1601451-05 OUAI-MW37A-20161114 0.13037	27-Nov-16	20:34:53
36	161127G1_36	1601451-06 OUAI-HS03-20161114 0.12985	27-Nov-16	20:47:29
37	161127G1_37	B6K0143-MS1 Matrix Spike 0.12605	27-Nov-16	21:00:07
38	161127G1_38	B6K0143-MSD1 Matrix Spike Dup 0.12681	27-Nov-16	21:12:45
39	161127G1_39	1601451-07 OUAI-MW19-20161114 0.13066	27-Nov-16	21:25:23
40	161127G1_40	1601451-08 OUAI-MW18-20161114 0.12409	27-Nov-16	21:37:58
41	161127G1_41	IPA	27-Nov-16	21:50:34
42	161127G1_42	ST161127G1-3 PFC CS3.5 16K2701	27-Nov-16	22:03:12
43	161127G1_43	IPA	27-Nov-16	22:15:47
44	161127G1_44	1601451-09 OUAI-MW08-20161114 0.12647	27-Nov-16	22:28:25
45	161127G1_45	1601451-10 OUAI-MW06-20161114 0.12271	27-Nov-16	22:41:00
46	161127G1_46	1601461-01 EB02-20161115 0.12859	27-Nov-16	22:53:37
47	161127G1_47	1601461-02 OUAI-MW14-20161115 0.12795	27-Nov-16	23:06:13
48	161127G1_48	1601461-03 OUAI-MW15-20161115 0.12968	27-Nov-16	23:18:51
49	161127G1_49	1601461-04 OUAI-MW07-20161115 0.12742	27-Nov-16	23:31:28
50	161127G1_50	1601461-05 OUAI-MW23-20161115 0.12602	27-Nov-16	23:44:07
51	161127G1_51	1601461-06 OUAI-MW55-20161115 0.12709	27-Nov-16	23:56:41
52	161127G1_52	1601461-07 OUAI-MW55A-20161115 0.12204	28-Nov-16	00:09:16
53	161127G1_53	1601461-08 OUAI-MW27-20161115 0.12966	28-Nov-16	00:21:52
54	161127G1_54	IPA	28-Nov-16	00:34:30
55	161127G1_55	ST161127G1-4 PFC CS3.5 16K2701	28-Nov-16	00:47:08
56	161127G1_56	IPA	28-Nov-16	00:59:43

Vista Analytical Laboratory Q1

Dataset: Untitled

Last Altered: Monday, November 28, 2016 08:41:38 Pacific Standard Time
Printed: Monday, November 28, 2016 08:43:58 Pacific Standard Time

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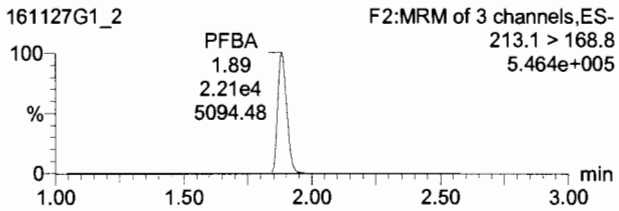
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

Name: 161127G1_2, Date: 27-Nov-2016, Time: 13:38:36, ID: ST161127G1-1 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

PFBA



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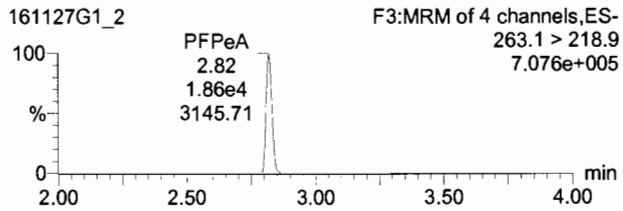

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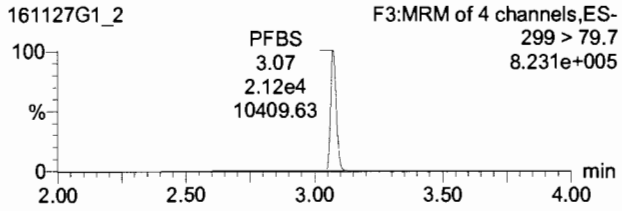

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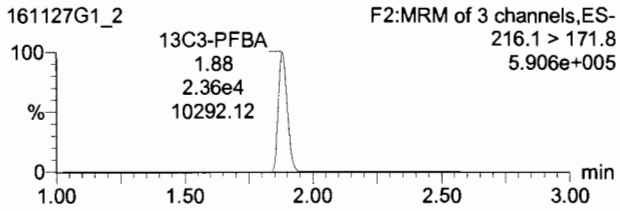

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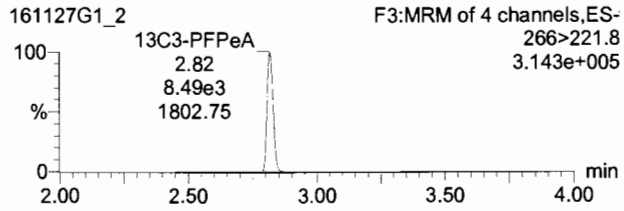

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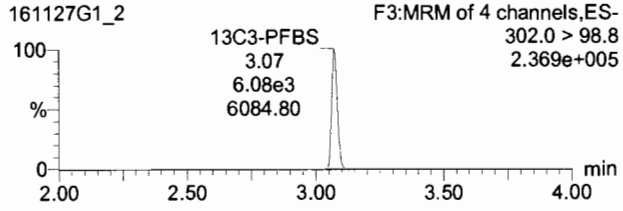
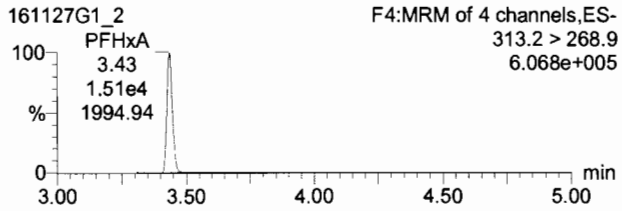
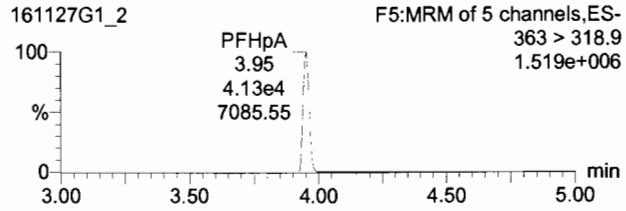


PFHxA



PFHpA



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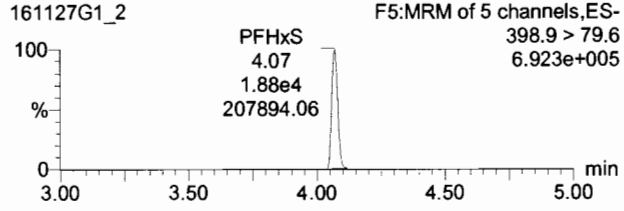

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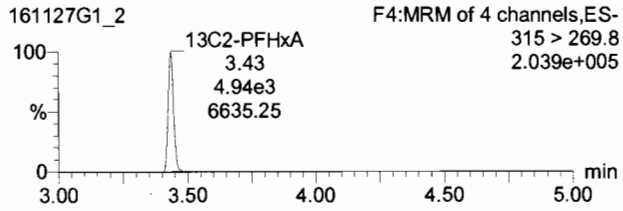

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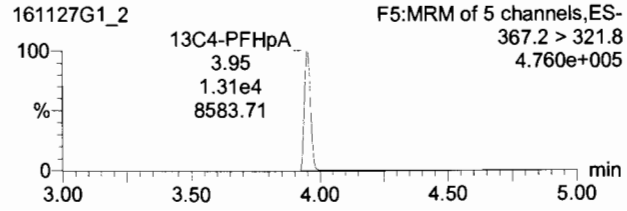
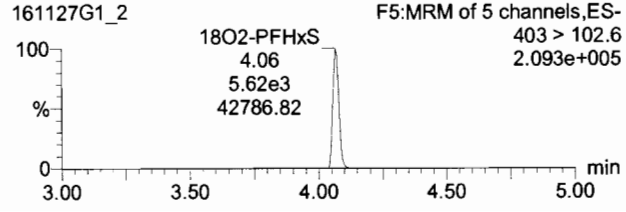


18O2-PFHxS



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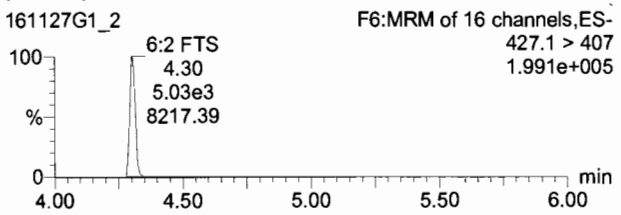
Last Altered: Monday, November 28, 2016 08:41:38 Pacific Standard Time
Printed: Monday, November 28, 2016 08:43:58 Pacific Standard Time

Name: 161127G1_2, Date: 27-Nov-2016, Time: 13:38:36, ID: ST161127G1-1 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

6:2 FTS



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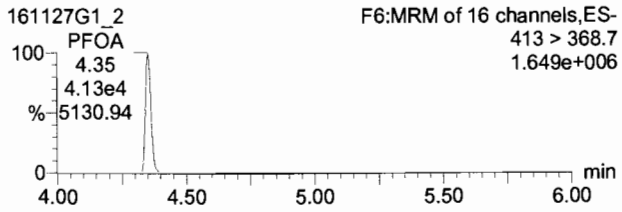
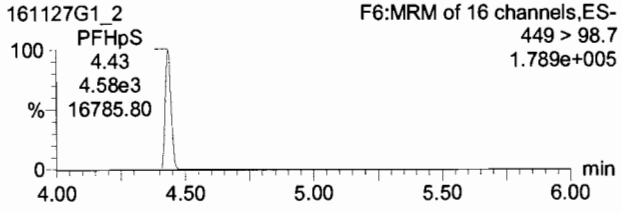
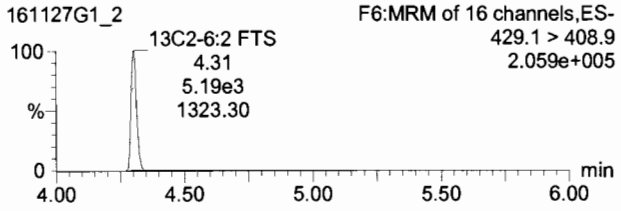


PFHpS



13C2-6:2 FTS



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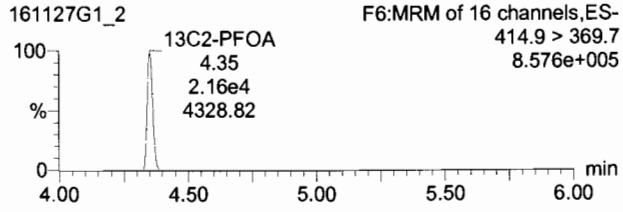

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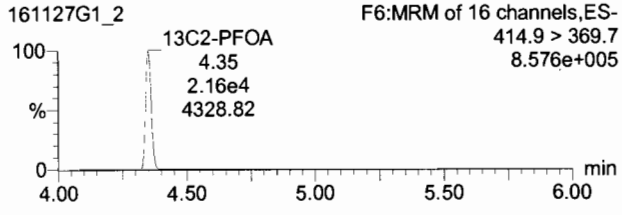
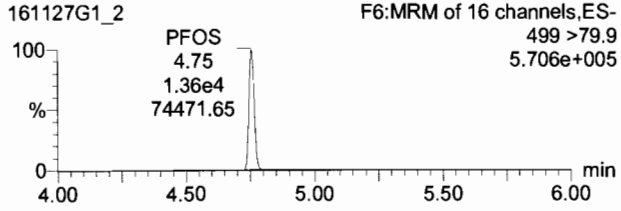


PFOS



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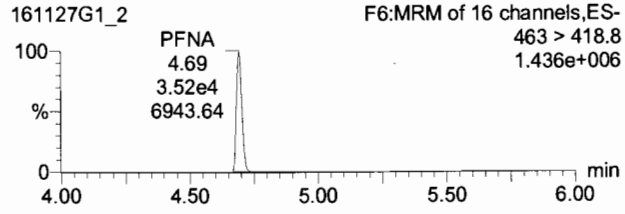

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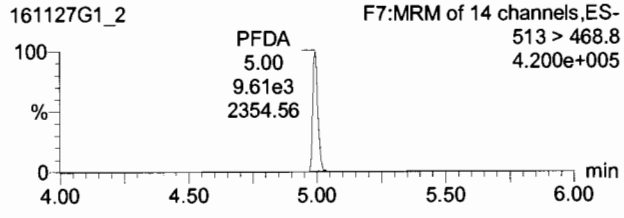

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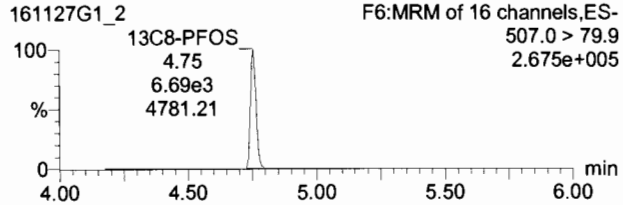

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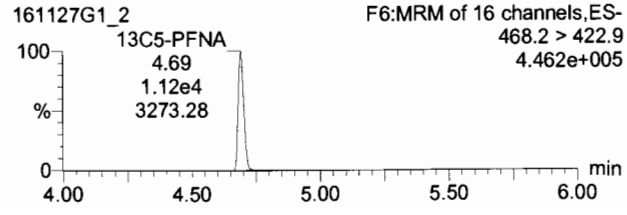
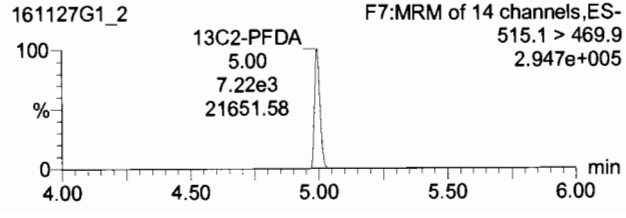


13C2-PFDA

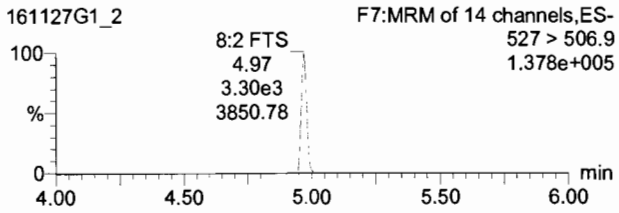


Dataset: Untitled

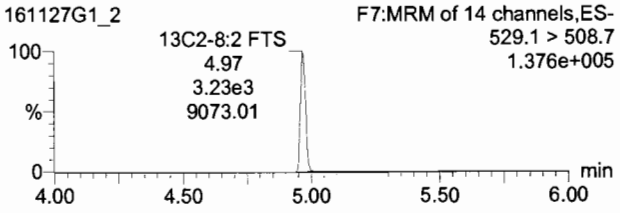
Last Altered: Monday, November 28, 2016 08:41:38 Pacific Standard Time
Printed: Monday, November 28, 2016 08:43:58 Pacific Standard Time

Name: 161127G1_2, Date: 27-Nov-2016, Time: 13:38:36, ID: ST161127G1-1 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

8:2 FTS



13C2-8:2 FTS



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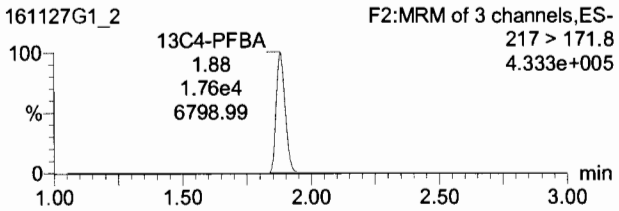
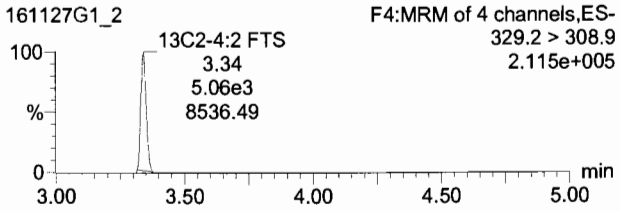
Last Altered: Monday, November 28, 2016 08:41:38 Pacific Standard Time
Printed: Monday, November 28, 2016 08:43:58 Pacific Standard Time

Name: 161127G1_2, Date: 27-Nov-2016, Time: 13:38:36, ID: ST161127G1-1 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

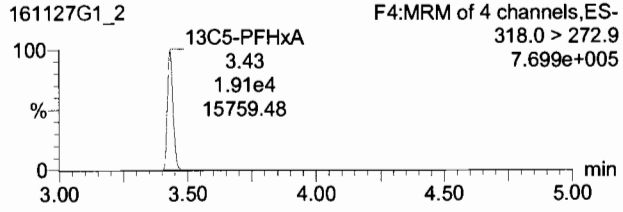
13C4-PFBA



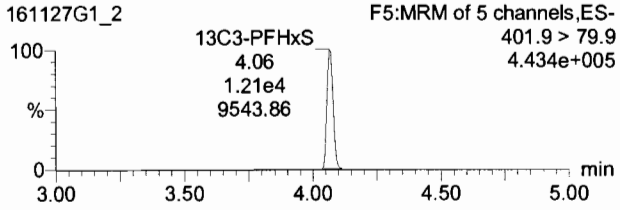
13C2-4:2 FTS



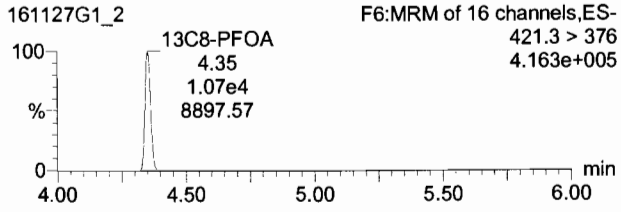
13C5-PFHxA



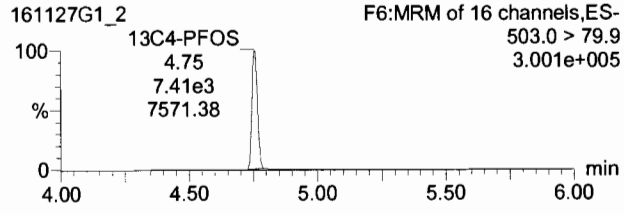
13C3-PFHxS



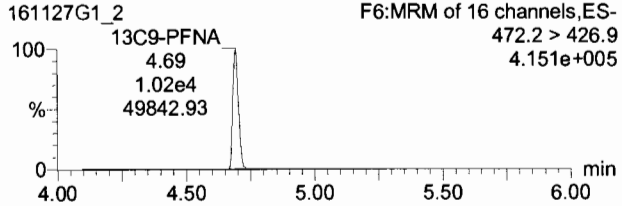
13C8-PFOA



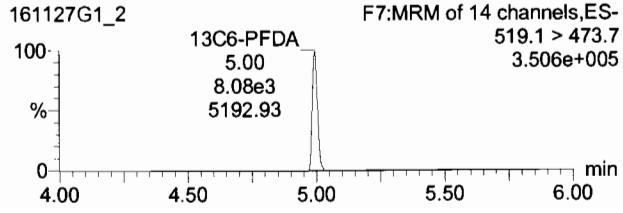
13C4-PFOS



13C9-PFNA



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-27.qld

Last Altered: Monday, November 28, 2016 08:51:10 Pacific Standard Time
Printed: Monday, November 28, 2016 08:51:39 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

Name: 161127G1_27, Date: 27-Nov-2016, Time: 18:53:59, ID: ST161127G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec	
1	1	PFBA	213.1 > 168.8	2.45e4	2.61e4		1.000	1.90	23.9	95.6	75-125
2	2	PFPeA	263.1 > 218.9	2.05e4	9.90e3		1.000	2.83	25.9	103.7	
3	3	PFBS	299 > 79.7	2.49e4	6.66e3		1.000	3.08	26.2	104.7	
4	4	PFHxA	313.2 > 268.9	1.70e4	5.47e3		1.000	3.44	26.0	103.8	
5	5	PFHpA	363 > 318.9	4.73e4	1.55e4		1.000	3.96	24.6	98.4	
6	6	PFHxS	398.9 > 79.6	2.14e4	6.35e3		1.000	4.07	24.4	97.8	
7	7	6:2 FTS	427.1 > 407	5.22e3	4.32e3		1.000	4.31	33.2	132.7	(A)
8	8	PFOA	413 > 368.7	5.01e4	2.64e4		1.000	4.36	26.3	105.1	
9	9	PFHpS	449 > 98.7	3.63e3	2.64e4		1.000	4.44	18.9	75.6	
10	10	PFOS	499 >79.9	1.18e4	7.15e3		1.000	4.76	25.0	99.8	
11	11	PFNA	463 > 418.8	3.90e4	1.20e4		1.000	4.70	24.9	99.8	
12	12	PFDA	513 > 468.8	8.67e3	7.48e3		1.000	5.00	24.3	97.3	
13	13	8:2 FTS	527 > 506.9	3.56e3	4.10e3		1.000	4.97	22.1	88.3	
14	14	13C3-PFBA	216.1 > 171.8	2.61e4	2.03e4	1.205	1.000	1.90	13.3	106.6	60-150
15	15	13C3-PFPeA	266>221.8	9.90e3	2.19e4	0.448	1.000	2.83	12.6	101.2	
16	16	13C3-PFBS	302.0 > 98.8	6.66e3	2.19e4	0.302	1.000	3.08	12.6	100.8	
17	17	13C2-PFHxA	315 > 269.8	5.47e3	2.19e4	0.620	1.000	3.44	5.04	100.9	
18	18	13C4-PFHpA	367.2 > 321.8	1.55e4	1.46e4	1.139	1.000	3.96	11.7	93.6	
19	19	18O2-PFHxS	403 > 102.6	6.35e3	1.46e4	0.449	1.000	4.07	12.1	97.0	
20	20	13C2-6:2 FTS	429.1 > 408.9	4.32e3	6.03e3	1.073	1.000	4.31	8.34	66.7	40-150
21	21	13C2-PFOA	414.9 > 369.7	2.64e4	1.13e4	2.262	1.000	4.36	13.0	103.6	60-150
22	22	13C8-PFOS	507.0 > 79.9	7.15e3	6.96e3	0.944	1.000	4.76	13.6	108.8	
23	23	13C5-PFNA	468.2 > 422.9	1.20e4	1.15e4	1.082	1.000	4.70	12.0	96.0	50-150
24	24	13C2-PFDA	515.1 > 469.9	7.48e3	8.60e3	1.019	1.000	5.00	10.7	85.3	60-150
25	25	13C2-8:2 FTS	529.1 > 508.7	4.10e3	6.03e3	0.569	1.000	4.97	14.9	119.6	40-150
26	26	13C4-PFBA	217 > 171.8	2.03e4	2.03e4	1.000	1.000	1.89	12.5	100.0	
27	27	13C2-4:2 FTS	329.2 > 308.9	6.03e3	6.03e3	1.000	1.000	3.35	12.5	100.0	
28	28	13C5-PFHxA	318.0 > 272.9	2.19e4	2.19e4	1.000	1.000	3.44	12.5	100.0	
29	29	13C3-PFHxS	401.9 > 79.9	1.46e4	1.46e4	1.000	1.000	4.07	12.5	100.0	
30	30	13C8-PFOA	421.3 > 376	1.13e4	1.13e4	1.000	1.000	4.36	12.5	100.0	
31	31	13C4-PFOS	503.0 > 79.9	6.96e3	6.96e3	1.000	1.000	4.76	12.5	100.0	

(A) Not used for 6:2 FTS.

AC 11/28/16

PW 11/28/16

Dataset: U:\G1.PRO\Results\2016\161127G1\161127G1-27.qld

Last Altered: Monday, November 28, 2016 08:51:10 Pacific Standard Time
Printed: Monday, November 28, 2016 08:51:39 Pacific Standard Time

Name: 161127G1_27, Date: 27-Nov-2016, Time: 18:53:59, ID: ST161127G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

	#.Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
32	32 13C9-PFNA	472.2 > 426.9	1.15e4	1.15e4	1.000	1.000	4.70	12.5	100.0
33	33 13C6-PFDA	519.1 > 473.7	8.60e3	8.60e3	1.000	1.000	5.00	12.5	100.0

Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Monday, November 28, 2016 09:04:49 Pacific Standard Time
Printed: Monday, November 28, 2016 09:06:19 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

Compound name: PFBA

	Name	ID	Acq.Date	Acq.Time
1	161127G1_1	IPA	27-Nov-16	13:25:59
2	161127G1_2	ST161127G1-1 PFC CS3.5 16K2701	27-Nov-16	13:38:36
3	161127G1_3	IPA	27-Nov-16	13:51:12
4	161127G1_4	B6K0123-BS1 OPR 0.125	27-Nov-16	14:03:49
5	161127G1_5	B6K0142-BS1 OPR 1	27-Nov-16	14:16:25
6	161127G1_6	B6K0142-BSD1 LCS Dup 1	27-Nov-16	14:29:02
7	161127G1_7	B6K0143-BS1 OPR 0.125	27-Nov-16	14:41:38
8	161127G1_8	B6K0146-BS1 OPR 0.125	27-Nov-16	14:54:16
9	161127G1_9	IPA	27-Nov-16	15:06:54
10	161127G1_10	B6K0123-BLK1 Method Blank 0.125	27-Nov-16	15:19:32
11	161127G1_11	B6K0142-BLK1 Method Blank 1	27-Nov-16	15:32:11
12	161127G1_12	B6K0143-BLK1 Method Blank 0.125	27-Nov-16	15:44:49
13	161127G1_13	B6K0146-BLK1 Method Blank 0.125	27-Nov-16	15:57:25
14	161127G1_14	1601395-08RE2 EB-26SW04_161101 0.13015	27-Nov-16	16:10:00
15	161127G1_15	1601395-11RE2 FB-26SW04_161101 0.12796	27-Nov-16	16:22:37
16	161127G1_16	1601416-01 TW-2C 0.12384	27-Nov-16	16:35:13
17	161127G1_17	1601414-12 PFAS-SED01-110116 7.13	27-Nov-16	16:47:51
18	161127G1_18	1601414-13 PFAS-SED02-110116 1.6	27-Nov-16	17:00:28
19	161127G1_19	1601414-14 PFAS-SED03-110116 1.55	27-Nov-16	17:13:07
20	161127G1_20	1601414-15 PFAS-SED04-110216 1.41	27-Nov-16	17:25:45
21	161127G1_21	B6K0142-MS1 Matrix Spike 1.42	27-Nov-16	17:38:20
22	161127G1_22	B6K0142-MSD1 Matrix Spike Dup 1.56	27-Nov-16	17:50:56
23	161127G1_23	1601414-16 PFAS-SED05-110216 1.36	27-Nov-16	18:03:31
24	161127G1_24	1601414-17 PFAS-SED06-110216 1.39	27-Nov-16	18:16:08
25	161127G1_25	1601414-18 PFAS-SED07-110216 1.12	27-Nov-16	18:28:44
26	161127G1_26	IPA	27-Nov-16	18:41:22
27	161127G1_27	ST161127G1-2 PFC CS3.5 16K2701	27-Nov-16	18:53:59
28	161127G1_28	IPA	27-Nov-16	19:06:35
29	161127G1_29	1601414-19 PFAS-SED08-110216 1.24	27-Nov-16	19:19:13
30	161127G1_30	1601414-20 PFAS-SED-DUP1-110216 1.36	27-Nov-16	19:31:52
31	161127G1_31	1601451-01 SB01-20161114 0.12236	27-Nov-16	19:44:30

Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Monday, November 28, 2016 09:04:49 Pacific Standard Time
Printed: Monday, November 28, 2016 09:06:19 Pacific Standard Time

Compound name: PFBA

	Name	ID	Acq.Date	Acq.Time
32	161127G1_32	1601451-02 EB01-20161114 0.12642	27-Nov-16	19:57:06
33	161127G1_33	1601451-03 OUAI-MW13-20161114 0.13048	27-Nov-16	20:09:41
34	161127G1_34	1601451-04 OUAI-MW37-20161114 0.13083	27-Nov-16	20:22:16
35	161127G1_35	1601451-05 OUAI-MW37A-20161114 0.13037	27-Nov-16	20:34:53
36	161127G1_36	1601451-06 OUAI-HS03-20161114 0.12985	27-Nov-16	20:47:29
37	161127G1_37	B6K0143-MS1 Matrix Spike 0.12605	27-Nov-16	21:00:07
38	161127G1_38	B6K0143-MSD1 Matrix Spike Dup 0.12681	27-Nov-16	21:12:45
39	161127G1_39	1601451-07 OUAI-MW19-20161114 0.13066	27-Nov-16	21:25:23
40	161127G1_40	1601451-08 OUAI-MW18-20161114 0.12409	27-Nov-16	21:37:58
41	161127G1_41	IPA	27-Nov-16	21:50:34
42	161127G1_42	ST161127G1-3 PFC CS3.5 16K2701	27-Nov-16	22:03:12
43	161127G1_43	IPA	27-Nov-16	22:15:47
44	161127G1_44	1601451-09 OUAI-MW08-20161114 0.12647	27-Nov-16	22:28:25
45	161127G1_45	1601451-10 OUAI-MW06-20161114 0.12271	27-Nov-16	22:41:00
46	161127G1_46	1601461-01 EB02-20161115 0.12859	27-Nov-16	22:53:37
47	161127G1_47	1601461-02 OUAI-MW14-20161115 0.12795	27-Nov-16	23:06:13
48	161127G1_48	1601461-03 OUAI-MW15-20161115 0.12968	27-Nov-16	23:18:51
49	161127G1_49	1601461-04 OUAI-MW07-20161115 0.12742	27-Nov-16	23:31:28
50	161127G1_50	1601461-05 OUAI-MW23-20161115 0.12602	27-Nov-16	23:44:07
51	161127G1_51	1601461-06 OUAI-MW55-20161115 0.12709	27-Nov-16	23:56:41
52	161127G1_52	1601461-07 OUAI-MW55A-20161115 0.12204	28-Nov-16	00:09:16
53	161127G1_53	1601461-08 OUAI-MW27-20161115 0.12966	28-Nov-16	00:21:52
54	161127G1_54	IPA	28-Nov-16	00:34:30
55	161127G1_55	ST161127G1-4 PFC CS3.5 16K2701	28-Nov-16	00:47:08
56	161127G1_56	IPA	28-Nov-16	00:59:43

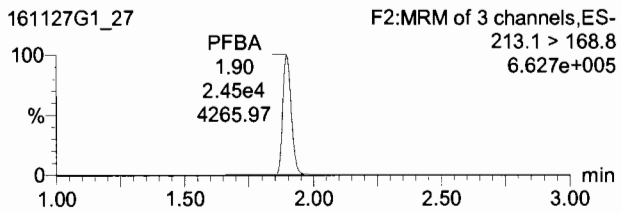
Dataset: Untitled

Last Altered: Monday, November 28, 2016 08:45:05 Pacific Standard Time
Printed: Monday, November 28, 2016 08:45:08 Pacific Standard Time

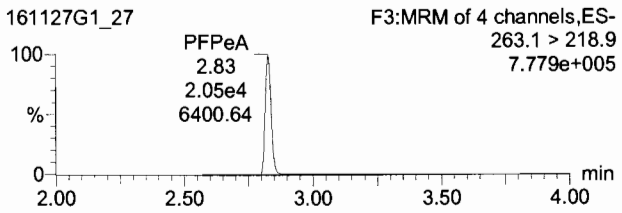
Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 28 Nov 2016 07:43:22
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

Name: 161127G1_27, Date: 27-Nov-2016, Time: 18:53:59, ID: ST161127G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

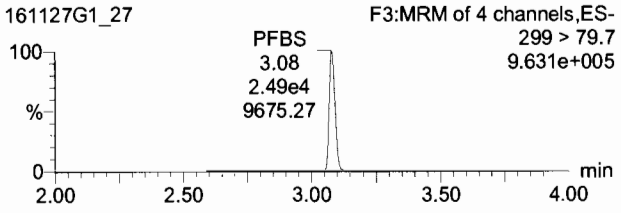
PFBA



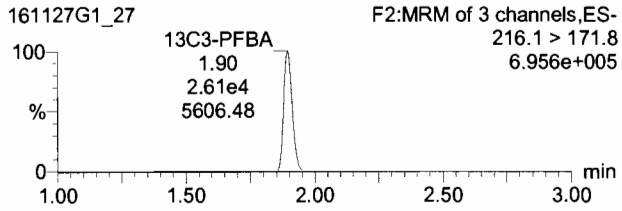
PFPeA



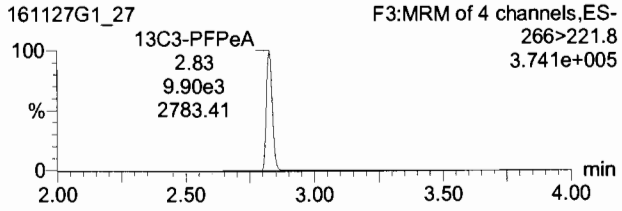
PFBS



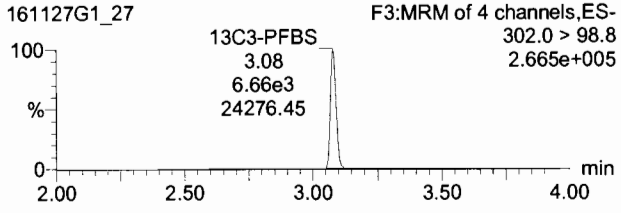
13C3-PFBA



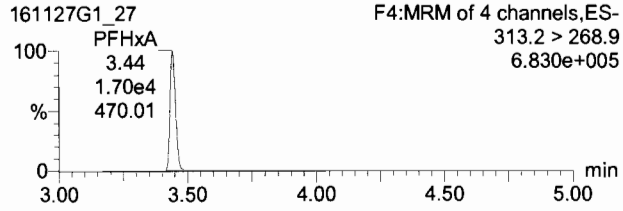
13C3-PFPeA



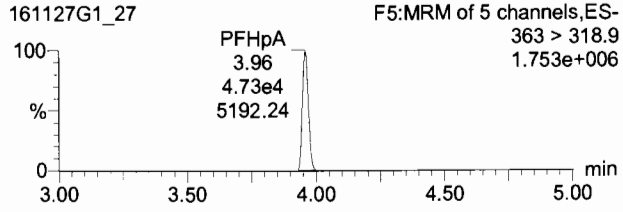
13C3-PFBS



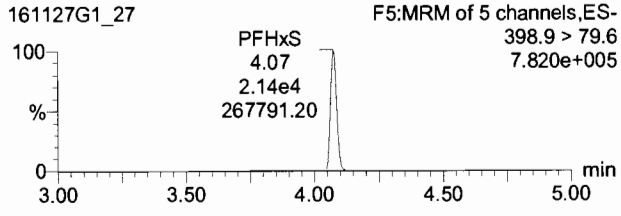
PFHxA



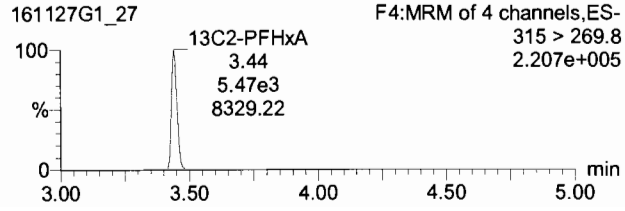
PFHpA



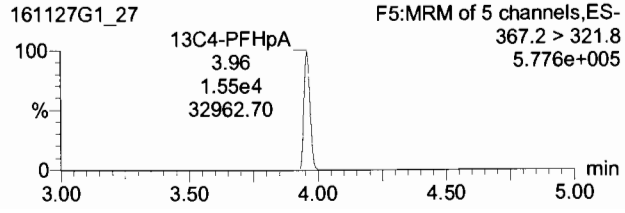
PFHxS



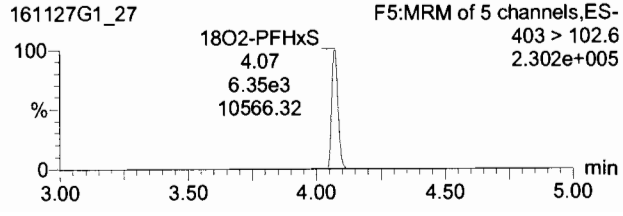
13C2-PFHxA



13C4-PFHpA



18O2-PFHxS



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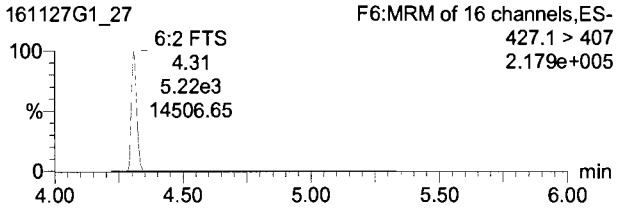
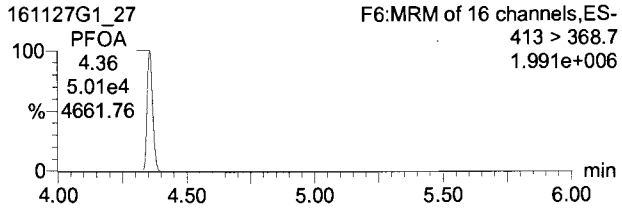
Last Altered: Monday, November 28, 2016 08:45:05 Pacific Standard Time
Printed: Monday, November 28, 2016 08:45:08 Pacific Standard Time

Name: 161127G1_27, Date: 27-Nov-2016, Time: 18:53:59, ID: ST161127G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

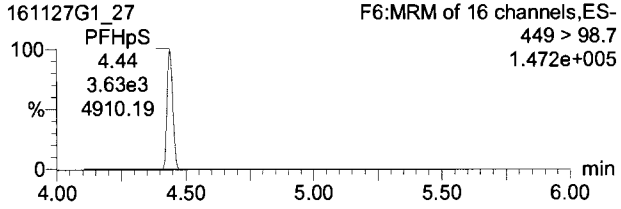
6:2 FTS



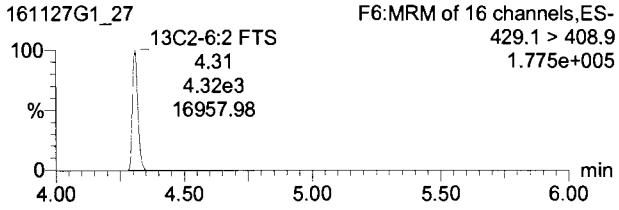
PFOA



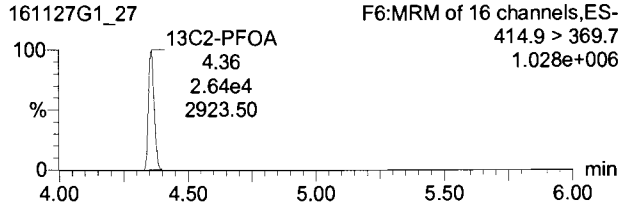
PFHpS



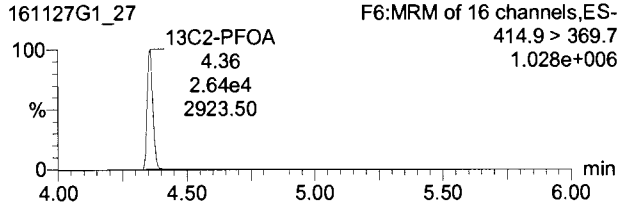
13C2-6:2 FTS



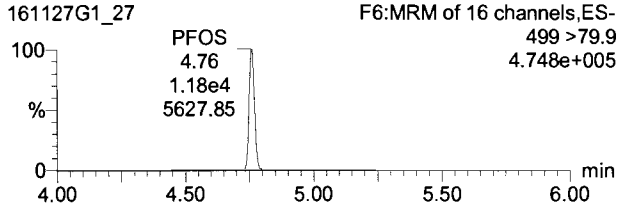
13C2-PFOA



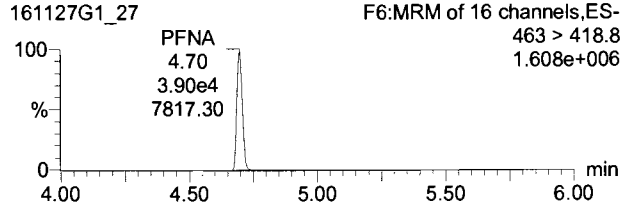
13C2-PFOA



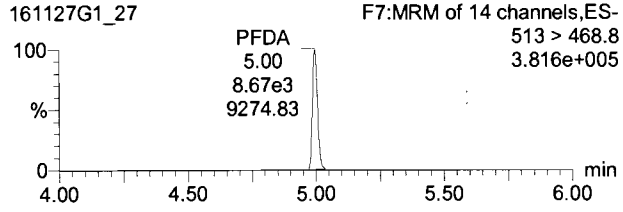
PFOS



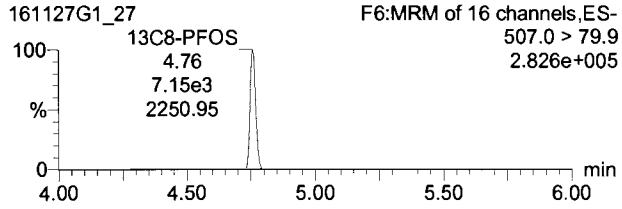
PFNA



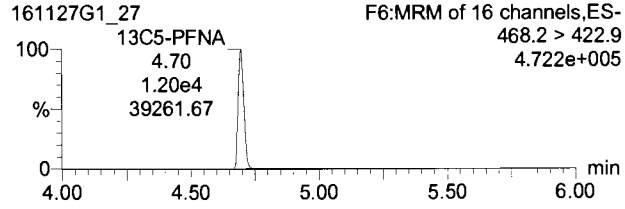
PFDA



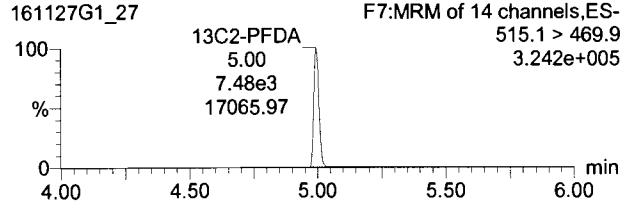
13C8-PFOS



13C5-PFNA



13C2-PFDA



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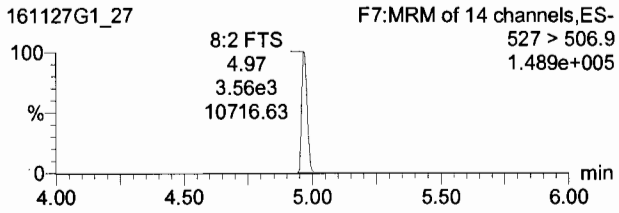
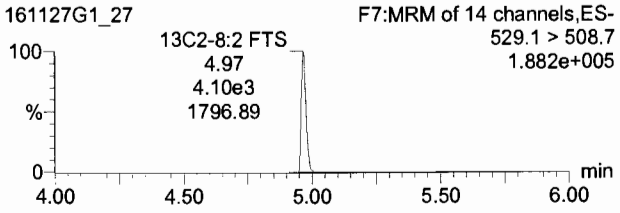
Last Altered: Monday, November 28, 2016 08:45:05 Pacific Standard Time
Printed: Monday, November 28, 2016 08:45:08 Pacific Standard Time

Name: 161127G1_27, Date: 27-Nov-2016, Time: 18:53:59, ID: ST161127G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

8:2 FTS



13C2-8:2 FTS

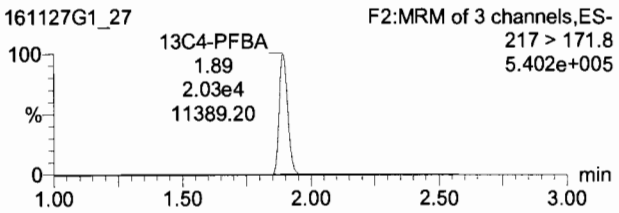


Dataset: Untitled

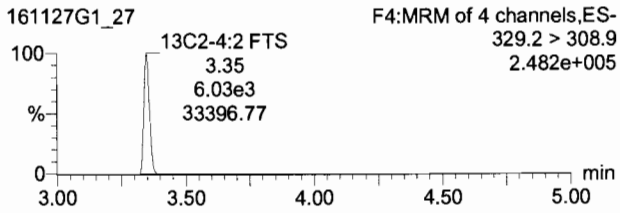
Last Altered: Monday, November 28, 2016 08:45:05 Pacific Standard Time
Printed: Monday, November 28, 2016 08:45:08 Pacific Standard Time

Name: 161127G1_27, Date: 27-Nov-2016, Time: 18:53:59, ID: ST161127G1-2 PFC CS3.5 16K2701, Description: PFC CS3.5 16K2701 A

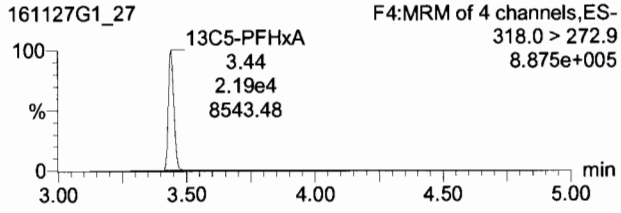
13C4-PFBA



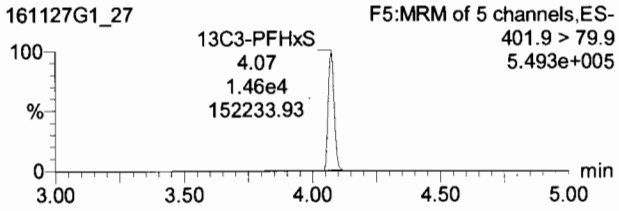
13C2-4:2 FTS



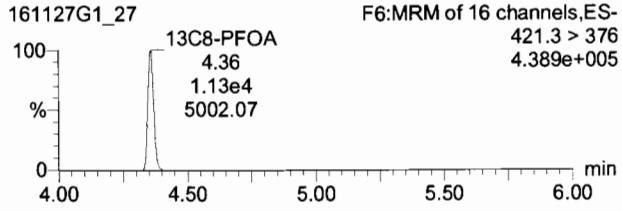
13C5-PFHxA



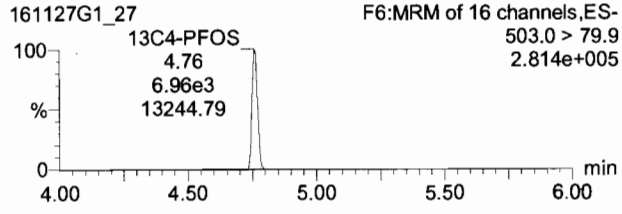
13C3-PFHxS



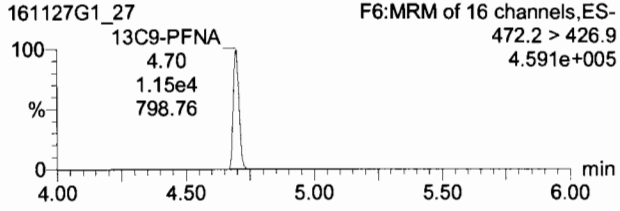
13C8-PFOA



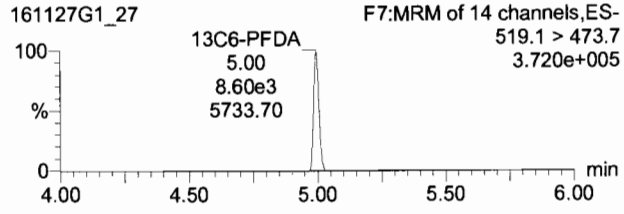
13C4-PFOS



13C9-PFNA



13C6-PFDA



INITIAL CALIBRATION

Vista Analytical Laboratory Q2

Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:53:42 Pacific Standard Time

Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 12 Nov 2016 10:51:05
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

Compound name: PFBA
Correlation coefficient: r = 0.998498, r^2 = 0.996999
Calibration curve: 1.04509 * x + 0.0382703
Response type: Internal Std (Ref 13), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	2.04	5.63e2	1.03e4	0.616	23.3	1.36
2	2	161111J2_04_P1_E1	1.00	2.04	9.71e2	1.10e4	1.02	2.2	1.11
3	3	161111J2_05_P1_E1	2.00	2.03	1.64e3	1.14e4	1.68	-15.9	0.898
4	4	161111J2_06_P1_E1	5.00	2.04	3.73e3	1.12e4	3.94	-21.3	0.830
5	5	161111J2_07_P1_E1	10.0	2.04	1.01e4	1.08e4	11.1	10.6	1.16
6	6	161111J2_08_P1_E1	25.0	2.04	2.07e4	8.98e3	27.6	10.3	1.15
7	7	161111J2_09_P1_E1	50.0	2.04	4.37e4	1.03e4	50.8	1.5	1.06
8	8	161111J2_10_P1_E1	75.0	2.04	6.53e4	1.05e4	74.4	-0.8	1.04
9	9	161111J2_11_P1_E1	100	2.04	8.30e4	1.02e4	97.5	-2.5	1.02

PW
11/12/16

✓AC 11/13/16

Compound name: PFPeA
Correlation coefficient: r = 0.998036, r^2 = 0.996076
Calibration curve: 0.910461 * x + 0.0566694
Response type: Internal Std (Ref 14), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	3.18	5.69e2	1.15e4	0.619	23.7	1.24
2	2	161111J2_04_P1_E1	1.00	3.19	1.04e3	1.26e4	1.07	7.4	1.03
3	3	161111J2_05_P1_E1	2.00	3.18	1.66e3	1.32e4	1.66	-16.9	0.785
4	4	161111J2_06_P1_E1	5.00	3.18	3.82e3	1.32e4	3.91	-21.8	0.723
5	5	161111J2_07_P1_E1	10.0	3.19	1.04e4	1.30e4	10.9	8.9	0.998
6	6	161111J2_08_P1_E1	25.0	3.18	2.17e4	1.06e4	28.1	12.6	1.03
7	7	161111J2_09_P1_E1	50.0	3.18	4.51e4	1.20e4	51.7	3.4	0.943
8	8	161111J2_10_P1_E1	75.0	3.18	6.59e4	1.22e4	74.0	-1.4	0.899
9	9	161111J2_11_P1_E1	100	3.18	8.26e4	1.17e4	96.5	-3.5	0.880

Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:53:42 Pacific Standard Time

Compound name: PFBS
Coefficient of Determination: R^2 = 0.977505
Calibration curve: 0.00122129 * x^2 + 0.743308 * x + 0.145497
Response type: Internal Std (Ref 15), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x^2, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	3.45	2.92e2	6.77e3	0.529	5.8	1.08
2	2	161111J2_04_P1_E1	1.00	3.47	4.88e2	6.92e3	0.988	-1.2	0.881
3	3	161111J2_05_P1_E1	2.00	3.46	8.48e2	7.66e3	1.66	-17.0	0.692
4	4	161111J2_06_P1_E1	5.00	3.46	1.89e3	7.70e3	3.90	-22.1	0.612
5	5	161111J2_07_P1_E1	10.0	3.47	5.15e3	7.23e3	11.6	15.7	0.891
6	6	161111J2_08_P1_E1	25.0	3.46	1.10e4	5.91e3	29.6	18.3	0.928
7	7	161111J2_09_P1_E1	50.0	3.46	2.22e4	6.45e3	53.1	6.2	0.861
8	8	161111J2_10_P1_E1	75.0	3.46	3.34e4	6.63e3	75.3	0.4	0.840
9	9	161111J2_11_P1_E1	100	3.46	4.15e4	6.50e3	93.1	-6.9	0.799

Compound name: PFHxA
Correlation coefficient: r = 0.996921, r^2 = 0.993852
Calibration curve: 0.852369 * x + 0.067677
Response type: Internal Std (Ref 16), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	3.84	5.34e2	4.46e3	0.623	24.6	1.20
2	2	161111J2_04_P1_E1	1.00	3.84	9.27e2	4.84e3	1.04	4.4	0.958
3	3	161111J2_05_P1_E1	2.00	3.83	1.51e3	5.10e3	1.65	-17.4	0.738
4	4	161111J2_06_P1_E1	5.00	3.84	3.45e3	5.09e3	3.90	-22.0	0.678
5	5	161111J2_07_P1_E1	10.0	3.84	9.48e3	4.93e3	11.2	12.0	0.962
6	6	161111J2_08_P1_E1	25.0	3.84	1.97e4	3.97e3	29.0	15.9	0.990
7	7	161111J2_09_P1_E1	50.0	3.84	4.06e4	4.55e3	52.3	4.6	0.893
8	8	161111J2_10_P1_E1	75.0	3.85	5.88e4	4.61e3	74.7	-0.4	0.850
9	9	161111J2_11_P1_E1	100	3.85	7.27e4	4.53e3	94.1	-5.9	0.803

Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:53:42 Pacific Standard Time

Compound name: PFHpA
Correlation coefficient: r = 0.998500, r^2 = 0.997002
Calibration curve: 0.842904 * x + 0.0395603
Response type: Internal Std (Ref 17), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	4.32	4.20e2	9.04e3	0.642	28.4	1.16
2	2	161111J2_04_P1_E1	1.00	4.33	7.53e2	9.91e3	1.08	7.9	0.949
3	3	161111J2_05_P1_E1	2.00	4.32	1.18e3	1.08e4	1.57	-21.4	0.682
4	4	161111J2_06_P1_E1	5.00	4.33	2.74e3	1.04e4	3.86	-22.8	0.659
5	5	161111J2_07_P1_E1	10.0	4.32	7.77e3	1.05e4	11.0	9.6	0.928
6	6	161111J2_08_P1_E1	25.0	4.32	1.58e4	8.54e3	27.4	9.8	0.927
7	7	161111J2_09_P1_E1	50.0	4.32	3.40e4	1.00e4	50.1	0.1	0.845
8	8	161111J2_10_P1_E1	75.0	4.33	5.23e4	1.04e4	74.6	-0.5	0.839
9	9	161111J2_11_P1_E1	100	4.32	6.50e4	9.81e3	98.3	-1.7	0.829

Compound name: PFHxS
Coefficient of Determination: R^2 = 0.998167
Calibration curve: 0.00081896 * x^2 + 3.22284 * x + 0.0419742
Response type: Internal Std (Ref 18), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	4.43	2.29e2	1.34e3	0.648	29.7	4.26
2	2	161111J2_04_P1_E1	1.00	4.44	3.76e2	1.41e3	1.02	1.8	3.32
3	3	161111J2_05_P1_E1	2.00	4.43	6.82e2	1.59e3	1.65	-17.4	2.68
4	4	161111J2_06_P1_E1	5.00	4.44	1.50e3	1.48e3	3.91	-21.8	2.53
5	5	161111J2_07_P1_E1	10.0	4.44	3.85e3	1.46e3	10.2	2.0	3.30
6	6	161111J2_08_P1_E1	25.0	4.44	8.40e3	1.22e3	26.6	6.3	3.45
7	7	161111J2_09_P1_E1	50.0	4.44	1.86e4	1.41e3	50.3	0.6	3.28
8	8	161111J2_10_P1_E1	75.0	4.44	2.65e4	1.37e3	73.8	-1.6	3.23
9	9	161111J2_11_P1_E1	100	4.43	3.33e4	1.25e3	100	0.4	3.32

Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:53:42 Pacific Standard Time

Compound name: 6:2 FTS
Coefficient of Determination: R^2 = 0.995743
Calibration curve: -0.00213642 * x^2 + 0.961467 * x + 0.0440674
Response type: Internal Std (Ref 19), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	4.66	1.33e2	2.51e3	0.643	28.6	1.32
2	2	161111J2_04_P1_E1	1.00	4.67	1.94e2	2.89e3	0.826	-17.4	0.837
3	3	161111J2_05_P1_E1	2.00	4.66	4.01e2	2.88e3	1.77	-11.7	0.868
4	4	161111J2_06_P1_E1	5.00	4.67	9.29e2	2.84e3	4.24	-15.2	0.817
5	5	161111J2_07_P1_E1	10.0	4.67	2.40e3	2.63e3	12.1	21.4	1.14
6	6	161111J2_08_P1_E1	25.0	4.66	4.58e3	2.68e3	23.4	-6.5	0.854
7	7	161111J2_09_P1_E1	50.0	4.67	1.00e4	2.95e3	49.6	-0.9	0.849
8	8	161111J2_10_P1_E1	75.0	4.67	1.51e4	3.07e3	77.3	3.0	0.821
9	9	161111J2_11_P1_E1	100	4.66	2.07e4	3.49e3	98.6	-1.4	0.741

Compound name: PFOA
Coefficient of Determination: R^2 = 0.996931
Calibration curve: -0.0025112 * x^2 + 1.31194 * x + 0.0471482
Response type: Internal Std (Ref 20), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	4.71	5.87e2	8.45e3	0.627	25.4	1.74
2	2	161111J2_04_P1_E1	1.00	4.71	1.03e3	8.64e3	1.10	10.2	1.49
3	3	161111J2_05_P1_E1	2.00	4.70	1.64e3	9.24e3	1.66	-17.2	1.11
4	4	161111J2_06_P1_E1	5.00	4.71	3.78e3	9.36e3	3.84	-23.2	1.01
5	5	161111J2_07_P1_E1	10.0	4.72	9.98e3	9.02e3	10.7	7.2	1.38
6	6	161111J2_08_P1_E1	25.0	4.71	2.00e4	7.47e3	26.9	7.7	1.34
7	7	161111J2_09_P1_E1	50.0	4.71	4.10e4	8.76e3	49.2	-1.7	1.17
8	8	161111J2_10_P1_E1	75.0	4.71	6.01e4	9.14e3	72.8	-2.9	1.10
9	9	161111J2_11_P1_E1	100	4.71	7.58e4	8.81e3	102	1.8	1.08

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Compound name: PFNA
Correlation coefficient: r = 0.998382, r^2 = 0.996768
Calibration curve: 0.905077 * x + 0.00552082
Response type: Internal Std (Ref 21), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	5.03	3.24e2	7.26e3	0.611	22.1	1.12
2	2	161111J2_04_P1_E1	1.00	5.03	6.34e2	8.73e3	0.997	-0.3	0.908
3	3	161111J2_05_P1_E1	2.00	5.03	1.10e3	8.84e3	1.71	-14.5	0.776
4	4	161111J2_06_P1_E1	5.00	5.05	2.80e3	1.02e4	3.79	-24.2	0.687
5	5	161111J2_07_P1_E1	10.0	5.06	8.36e3	9.95e3	11.6	16.0	1.05
6	6	161111J2_08_P1_E1	25.0	5.03	1.25e4	6.61e3	26.0	4.1	0.943
7	7	161111J2_09_P1_E1	50.0	5.03	2.75e4	7.56e3	50.3	0.6	0.911
8	8	161111J2_10_P1_E1	75.0	5.03	4.10e4	7.89e3	71.8	-4.3	0.866
9	9	161111J2_11_P1_E1	100	5.05	6.43e4	8.74e3	102	1.7	0.920

Compound name: PFOS
Correlation coefficient: r = 0.985935, r^2 = 0.972067
Calibration curve: 1.25111 * x + 0.123067
Response type: Internal Std (Ref 22), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x^2, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	5.09	2.07e2	3.18e3	0.553	10.7	1.63
2	2	161111J2_04_P1_E1	1.00	5.10	3.67e2	3.57e3	0.927	-7.3	1.28
3	3	161111J2_05_P1_E1	2.00	5.09	6.49e2	3.92e3	1.56	-22.2	1.04
4	4	161111J2_06_P1_E1	5.00	5.11	1.33e3	3.44e3	3.77	-24.6	0.968
5	5	161111J2_07_P1_E1	10.0	5.11	3.82e3	3.38e3	11.2	11.7	1.41
6	6	161111J2_08_P1_E1	25.0	5.09	8.42e3	2.92e3	28.7	14.8	1.44
7	7	161111J2_09_P1_E1	50.0	5.09	1.21e4	2.42e3	49.9	-0.2	1.25
8	8	161111J2_10_P1_E1	75.0	5.10	2.03e4	2.48e3	81.7	9.0	1.36
9	9	161111J2_11_P1_E1	100	5.11	2.75e4	2.53e3	108	8.2	1.35

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Compound name: PFDA
Correlation coefficient: r = 0.998849, r^2 = 0.997699
Calibration curve: 1.01138 * x + -0.0247569
Response type: Internal Std (Ref 23), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	5.31	1.89e2	4.48e3	0.547	9.4	1.06
2	2	161111J2_04_P1_E1	1.00	5.32	3.61e2	4.63e3	0.988	-1.2	0.975
3	3	161111J2_05_P1_E1	2.00	5.32	7.61e2	5.52e3	1.73	-13.6	0.861
4	4	161111J2_06_P1_E1	5.00	5.33	1.52e3	4.38e3	4.31	-13.7	0.867
5	5	161111J2_07_P1_E1	10.0	5.33	3.62e3	4.24e3	10.6	6.0	1.07
6	6	161111J2_08_P1_E1	25.0	5.31	8.34e3	3.84e3	26.9	7.5	1.09
7	7	161111J2_09_P1_E1	50.0	5.32	1.26e4	2.94e3	52.8	5.7	1.07
8	8	161111J2_10_P1_E1	75.0	5.31	1.79e4	3.02e3	73.3	-2.2	0.989
9	9	161111J2_11_P1_E1	100	5.32	2.62e4	3.33e3	97.3	-2.7	0.983

Compound name: 8:2 FTS
Coefficient of Determination: R^2 = 0.995769
Calibration curve: -0.00383329 * x^2 + 1.1235 * x + -0.0810222
Response type: Internal Std (Ref 24), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500	5.29	6.35e1	1.27e3	0.632	26.4	1.25
2	2	161111J2_04_P1_E1	1.00	5.29	1.02e2	1.36e3	0.910	-9.0	0.938
3	3	161111J2_05_P1_E1	2.00	5.30	2.14e2	1.48e3	1.69	-15.5	0.903
4	4	161111J2_06_P1_E1	5.00	5.31	4.03e2	1.23e3	3.77	-24.6	0.819
5	5	161111J2_07_P1_E1	10.0	5.31	1.09e3	1.27e3	9.94	-0.6	1.07
6	6	161111J2_08_P1_E1	25.0	5.29	2.44e3	1.08e3	27.7	10.8	1.12
7	7	161111J2_09_P1_E1	50.0	5.30	4.06e3	1.08e3	50.6	1.1	0.939
8	8	161111J2_10_P1_E1	75.0	5.29	5.24e3	1.08e3	71.7	-4.3	0.811
9	9	161111J2_11_P1_E1	100	5.30	6.59e3	1.10e3	102	1.8	0.746

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Compound name: 13C3-PFBA
Response Factor: 0.89422
RRF SD: 0.0909819, Relative SD: 10.1744
Response type: Internal Std (Ref 25), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	2.03	1.03e4	1.29e4	11.2	-10.3	0.802
2	2	161111J2_04_P1_E1	12.5	2.04	1.10e4	1.17e4	13.1	4.9	0.938
3	3	161111J2_05_P1_E1	12.5	2.03	1.14e4	1.19e4	13.4	7.2	0.958
4	4	161111J2_06_P1_E1	12.5	2.04	1.12e4	1.11e4	14.2	13.5	1.01
5	5	161111J2_07_P1_E1	12.5	2.04	1.08e4	1.11e4	13.6	9.0	0.974
6	6	161111J2_08_P1_E1	12.5	2.04	8.98e3	1.24e4	10.1	-19.3	0.721
7	7	161111J2_09_P1_E1	12.5	2.04	1.03e4	1.17e4	12.3	-1.7	0.879
8	8	161111J2_10_P1_E1	12.5	2.04	1.05e4	1.18e4	12.5	-0.3	0.891
9	9	161111J2_11_P1_E1	12.5	2.04	1.02e4	1.17e4	12.1	-2.8	0.869

Compound name: 13C3-PFPeA
Response Factor: 0.945444
RRF SD: 0.102116, Relative SD: 10.8009
Response type: Internal Std (Ref 26), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	3.18	1.15e4	1.41e4	10.8	-13.9	0.814
2	2	161111J2_04_P1_E1	12.5	3.19	1.26e4	1.31e4	12.7	1.5	0.960
3	3	161111J2_05_P1_E1	12.5	3.17	1.32e4	1.35e4	13.0	3.7	0.981
4	4	161111J2_06_P1_E1	12.5	3.18	1.32e4	1.23e4	14.2	13.9	1.08
5	5	161111J2_07_P1_E1	12.5	3.19	1.30e4	1.22e4	14.0	12.2	1.06
6	6	161111J2_08_P1_E1	12.5	3.18	1.06e4	1.38e4	10.1	-19.4	0.762
7	7	161111J2_09_P1_E1	12.5	3.18	1.20e4	1.25e4	12.6	1.0	0.955
8	8	161111J2_10_P1_E1	12.5	3.18	1.22e4	1.27e4	12.8	2.1	0.965
9	9	161111J2_11_P1_E1	12.5	3.18	1.17e4	1.26e4	12.4	-1.1	0.935

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Compound name: 13C3-PFBS
Response Factor: 0.530916
RRF SD: 0.0593801, Relative SD: 11.1845
Response type: Internal Std (Ref 26), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	3.45	6.77e3	1.41e4	11.3	-9.5	0.480
2	2	161111J2_04_P1_E1	12.5	3.47	6.92e3	1.31e4	12.4	-0.7	0.527
3	3	161111J2_05_P1_E1	12.5	3.46	7.66e3	1.35e4	13.4	7.3	0.570
4	4	161111J2_06_P1_E1	12.5	3.46	7.70e3	1.23e4	14.8	18.2	0.627
5	5	161111J2_07_P1_E1	12.5	3.47	7.23e3	1.22e4	13.9	11.2	0.590
6	6	161111J2_08_P1_E1	12.5	3.46	5.91e3	1.38e4	10.1	-19.6	0.427
7	7	161111J2_09_P1_E1	12.5	3.46	6.45e3	1.25e4	12.1	-3.0	0.515
8	8	161111J2_10_P1_E1	12.5	3.46	6.63e3	1.27e4	12.3	-1.3	0.524
9	9	161111J2_11_P1_E1	12.5	3.46	6.50e3	1.26e4	12.2	-2.5	0.518

Compound name: 13C2-PFHxA
Response Factor: 0.904554
RRF SD: 0.0988189, Relative SD: 10.9246
Response type: Internal Std (Ref 26), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	5.00	3.84	4.46e3	1.41e4	4.37	-12.5	0.791
2	2	161111J2_04_P1_E1	5.00	3.84	4.84e3	1.31e4	5.09	1.8	0.921
3	3	161111J2_05_P1_E1	5.00	3.83	5.10e3	1.35e4	5.24	4.9	0.948
4	4	161111J2_06_P1_E1	5.00	3.84	5.09e3	1.23e4	5.73	14.6	1.04
5	5	161111J2_07_P1_E1	5.00	3.84	4.93e3	1.22e4	5.56	11.3	1.01
6	6	161111J2_08_P1_E1	5.00	3.84	3.97e3	1.38e4	3.96	-20.7	0.717
7	7	161111J2_09_P1_E1	5.00	3.84	4.55e3	1.25e4	5.02	0.4	0.908
8	8	161111J2_10_P1_E1	5.00	3.84	4.61e3	1.27e4	5.03	0.7	0.911
9	9	161111J2_11_P1_E1	5.00	3.85	4.53e3	1.26e4	4.98	-0.3	0.902

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Compound name: 13C4-PFHpA
Response Factor: 0.769651
RRF SD: 0.0853478, Relative SD: 11.0892
Response type: Internal Std (Ref 26), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	4.32	9.04e3	1.41e4	10.4	-16.6	0.642
2	2	161111J2_04_P1_E1	12.5	4.33	9.91e3	1.31e4	12.3	-1.9	0.755
3	3	161111J2_05_P1_E1	12.5	4.31	1.08e4	1.35e4	13.1	4.8	0.806
4	4	161111J2_06_P1_E1	12.5	4.33	1.04e4	1.23e4	13.8	10.0	0.847
5	5	161111J2_07_P1_E1	12.5	4.32	1.05e4	1.22e4	13.9	11.1	0.855
6	6	161111J2_08_P1_E1	12.5	4.32	8.54e3	1.38e4	10.0	-19.8	0.617
7	7	161111J2_09_P1_E1	12.5	4.32	1.00e4	1.25e4	13.0	4.3	0.803
8	8	161111J2_10_P1_E1	12.5	4.33	1.04e4	1.27e4	13.3	6.6	0.821
9	9	161111J2_11_P1_E1	12.5	4.32	9.81e3	1.26e4	12.7	1.5	0.781

Compound name: 18O2-PFHxS
Response Factor: 0.275968
RRF SD: 0.0323848, Relative SD: 11.735
Response type: Internal Std (Ref 27), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	4.43	1.34e3	5.84e3	10.4	-16.6	0.230
2	2	161111J2_04_P1_E1	12.5	4.44	1.41e3	5.10e3	12.6	0.5	0.277
3	3	161111J2_05_P1_E1	12.5	4.43	1.59e3	5.19e3	13.9	10.9	0.306
4	4	161111J2_06_P1_E1	12.5	4.44	1.48e3	4.72e3	14.2	13.5	0.313
5	5	161111J2_07_P1_E1	12.5	4.44	1.46e3	4.92e3	13.4	7.4	0.296
6	6	161111J2_08_P1_E1	12.5	4.44	1.22e3	5.55e3	9.93	-20.5	0.219
7	7	161111J2_09_P1_E1	12.5	4.43	1.41e3	4.80e3	13.4	6.8	0.295
8	8	161111J2_10_P1_E1	12.5	4.44	1.37e3	4.97e3	12.4	-0.4	0.275
9	9	161111J2_11_P1_E1	12.5	4.43	1.25e3	4.61e3	12.3	-1.5	0.272

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Compound name: 13C2-6:2 FTS
Response Factor: 0.218688
RRF SD: 0.0312976, Relative SD: 14.3115
Response type: Internal Std (Ref 28), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	4.66	2.51e3	1.41e4	10.2	-18.7	0.178
2	2	161111J2_04_P1_E1	12.5	4.66	2.89e3	1.39e4	11.9	-4.9	0.208
3	3	161111J2_05_P1_E1	12.5	4.66	2.88e3	1.30e4	12.7	1.6	0.222
4	4	161111J2_06_P1_E1	12.5	4.67	2.84e3	1.35e4	12.0	-3.9	0.210
5	5	161111J2_07_P1_E1	12.5	4.67	2.63e3	1.28e4	11.8	-5.6	0.206
6	6	161111J2_08_P1_E1	12.5	4.66	2.68e3	1.42e4	10.8	-14.0	0.188
7	7	161111J2_09_P1_E1	12.5	4.66	2.95e3	1.26e4	13.4	7.0	0.234
8	8	161111J2_10_P1_E1	12.5	4.67	3.07e3	1.30e4	13.5	8.3	0.237
9	9	161111J2_11_P1_E1	12.5	4.66	3.49e3	1.23e4	16.3	30.1	0.284

Compound name: 13C2-PFOA
Response Factor: 0.663371
RRF SD: 0.0669504, Relative SD: 10.0924
Response type: Internal Std (Ref 28), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	4.71	8.45e3	1.41e4	11.3	-9.7	0.599
2	2	161111J2_04_P1_E1	12.5	4.71	8.64e3	1.39e4	11.7	-6.4	0.621
3	3	161111J2_05_P1_E1	12.5	4.70	9.24e3	1.30e4	13.4	7.3	0.712
4	4	161111J2_06_P1_E1	12.5	4.71	9.36e3	1.35e4	13.0	4.2	0.691
5	5	161111J2_07_P1_E1	12.5	4.72	9.02e3	1.28e4	13.3	6.6	0.707
6	6	161111J2_08_P1_E1	12.5	4.71	7.47e3	1.42e4	9.88	-21.0	0.524
7	7	161111J2_09_P1_E1	12.5	4.71	8.76e3	1.26e4	13.1	4.6	0.694
8	8	161111J2_10_P1_E1	12.5	4.71	9.14e3	1.30e4	13.3	6.2	0.704
9	9	161111J2_11_P1_E1	12.5	4.71	8.81e3	1.23e4	13.5	8.1	0.717

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Compound name: 13C5-PFNA
Response Factor: 1.01945
RRF SD: 0.110532, Relative SD: 10.8423
Response type: Internal Std (Ref 30), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	5.02	7.26e3	8.03e3	11.1	-11.3	0.904
2	2	161111J2_04_P1_E1	12.5	5.03	8.73e3	7.82e3	13.7	9.5	1.12
3	3	161111J2_05_P1_E1	12.5	5.03	8.84e3	8.19e3	13.2	5.8	1.08
4	4	161111J2_06_P1_E1	12.5	5.05	1.02e4	8.40e3	14.9	19.1	1.21
5	5	161111J2_07_P1_E1	12.5	5.05	9.95e3	1.00e4	12.2	-2.5	0.994
6	6	161111J2_08_P1_E1	12.5	5.03	6.61e3	7.86e3	10.3	-17.5	0.841
7	7	161111J2_09_P1_E1	12.5	5.03	7.56e3	7.38e3	12.6	0.5	1.02
8	8	161111J2_10_P1_E1	12.5	5.03	7.89e3	7.77e3	12.5	-0.4	1.02
9	9	161111J2_11_P1_E1	12.5	5.04	8.74e3	8.86e3	12.1	-3.2	0.987

Compound name: 13C8-PFOS
Response Factor: 0.92134
RRF SD: 0.0963018, Relative SD: 10.4524
Response type: Internal Std (Ref 29), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	5.09	3.18e3	4.04e3	10.7	-14.7	0.786
2	2	161111J2_04_P1_E1	12.5	5.10	3.57e3	3.65e3	13.3	6.3	0.979
3	3	161111J2_05_P1_E1	12.5	5.09	3.92e3	3.72e3	14.3	14.3	1.05
4	4	161111J2_06_P1_E1	12.5	5.11	3.44e3	3.47e3	13.5	7.6	0.991
5	5	161111J2_07_P1_E1	12.5	5.11	3.38e3	3.51e3	13.1	4.6	0.963
6	6	161111J2_08_P1_E1	12.5	5.09	2.92e3	3.88e3	10.2	-18.2	0.753
7	7	161111J2_09_P1_E1	12.5	5.09	2.42e3	2.58e3	12.7	1.9	0.939
8	8	161111J2_10_P1_E1	12.5	5.09	2.48e3	2.72e3	12.4	-1.1	0.912
9	9	161111J2_11_P1_E1	12.5	5.10	2.53e3	2.77e3	12.4	-0.7	0.915

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Compound name: 13C2-PFDA
Response Factor: 0.886754
RRF SD: 0.0917341, Relative SD: 10.3449
Response type: Internal Std (Ref 31), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	5.31	4.48e3	5.57e3	11.3	-9.3	0.805
2	2	161111J2_04_P1_E1	12.5	5.32	4.63e3	4.96e3	13.2	5.5	0.935
3	3	161111J2_05_P1_E1	12.5	5.32	5.52e3	5.51e3	14.1	13.0	1.00
4	4	161111J2_06_P1_E1	12.5	5.33	4.38e3	4.37e3	14.1	13.1	1.00
5	5	161111J2_07_P1_E1	12.5	5.32	4.24e3	4.61e3	13.0	3.6	0.919
6	6	161111J2_08_P1_E1	12.5	5.31	3.84e3	5.31e3	10.2	-18.5	0.722
7	7	161111J2_09_P1_E1	12.5	5.32	2.94e3	3.32e3	12.5	-0.3	0.884
8	8	161111J2_10_P1_E1	12.5	5.31	3.02e3	3.63e3	11.7	-6.4	0.830
9	9	161111J2_11_P1_E1	12.5	5.32	3.33e3	3.79e3	12.4	-0.8	0.880

Compound name: 13C2-8:2 FTS
Response Factor: 0.271622
RRF SD: 0.0363065, Relative SD: 13.3666
Response type: Internal Std (Ref 31), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	5.29	1.27e3	5.57e3	10.5	-16.3	0.227
2	2	161111J2_04_P1_E1	12.5	5.29	1.36e3	4.96e3	12.6	0.9	0.274
3	3	161111J2_05_P1_E1	12.5	5.30	1.48e3	5.51e3	12.4	-1.1	0.269
4	4	161111J2_06_P1_E1	12.5	5.31	1.23e3	4.37e3	13.0	3.6	0.281
5	5	161111J2_07_P1_E1	12.5	5.31	1.27e3	4.61e3	12.7	1.5	0.276
6	6	161111J2_08_P1_E1	12.5	5.29	1.08e3	5.31e3	9.39	-24.9	0.204
7	7	161111J2_09_P1_E1	12.5	5.29	1.08e3	3.32e3	15.0	19.7	0.325
8	8	161111J2_10_P1_E1	12.5	5.29	1.08e3	3.63e3	13.7	9.2	0.297
9	9	161111J2_11_P1_E1	12.5	5.30	1.10e3	3.79e3	13.4	7.3	0.291

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Compound name: 13C4-PFBA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 25), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	2.03	1.29e4	1.29e4	12.5	0.0	1.00
2	2	161111J2_04_P1_E1	12.5	2.04	1.17e4	1.17e4	12.5	0.0	1.00
3	3	161111J2_05_P1_E1	12.5	2.03	1.19e4	1.19e4	12.5	0.0	1.00
4	4	161111J2_06_P1_E1	12.5	2.03	1.11e4	1.11e4	12.5	0.0	1.00
5	5	161111J2_07_P1_E1	12.5	2.03	1.11e4	1.11e4	12.5	0.0	1.00
6	6	161111J2_08_P1_E1	12.5	2.04	1.24e4	1.24e4	12.5	0.0	1.00
7	7	161111J2_09_P1_E1	12.5	2.04	1.17e4	1.17e4	12.5	0.0	1.00
8	8	161111J2_10_P1_E1	12.5	2.04	1.18e4	1.18e4	12.5	0.0	1.00
9	9	161111J2_11_P1_E1	12.5	2.04	1.17e4	1.17e4	12.5	0.0	1.00

Compound name: 13C5-PFHxA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 26), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	3.83	1.41e4	1.41e4	12.5	0.0	1.00
2	2	161111J2_04_P1_E1	12.5	3.84	1.31e4	1.31e4	12.5	0.0	1.00
3	3	161111J2_05_P1_E1	12.5	3.83	1.35e4	1.35e4	12.5	0.0	1.00
4	4	161111J2_06_P1_E1	12.5	3.84	1.23e4	1.23e4	12.5	0.0	1.00
5	5	161111J2_07_P1_E1	12.5	3.84	1.22e4	1.22e4	12.5	0.0	1.00
6	6	161111J2_08_P1_E1	12.5	3.84	1.38e4	1.38e4	12.5	0.0	1.00
7	7	161111J2_09_P1_E1	12.5	3.83	1.25e4	1.25e4	12.5	0.0	1.00
8	8	161111J2_10_P1_E1	12.5	3.84	1.27e4	1.27e4	12.5	0.0	1.00
9	9	161111J2_11_P1_E1	12.5	3.85	1.26e4	1.26e4	12.5	0.0	1.00

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Compound name: 13C3-PFHxS
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 27), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	4.43	5.84e3	5.84e3	12.5	0.0	1.00
2	2	161111J2_04_P1_E1	12.5	4.43	5.10e3	5.10e3	12.5	0.0	1.00
3	3	161111J2_05_P1_E1	12.5	4.43	5.19e3	5.19e3	12.5	0.0	1.00
4	4	161111J2_06_P1_E1	12.5	4.44	4.72e3	4.72e3	12.5	0.0	1.00
5	5	161111J2_07_P1_E1	12.5	4.44	4.92e3	4.92e3	12.5	0.0	1.00
6	6	161111J2_08_P1_E1	12.5	4.43	5.55e3	5.55e3	12.5	0.0	1.00
7	7	161111J2_09_P1_E1	12.5	4.43	4.80e3	4.80e3	12.5	0.0	1.00
8	8	161111J2_10_P1_E1	12.5	4.44	4.97e3	4.97e3	12.5	0.0	1.00
9	9	161111J2_11_P1_E1	12.5	4.43	4.61e3	4.61e3	12.5	0.0	1.00

Compound name: 13C8-PFOA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 28), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	4.70	1.41e4	1.41e4	12.5	0.0	1.00
2	2	161111J2_04_P1_E1	12.5	4.71	1.39e4	1.39e4	12.5	0.0	1.00
3	3	161111J2_05_P1_E1	12.5	4.70	1.30e4	1.30e4	12.5	0.0	1.00
4	4	161111J2_06_P1_E1	12.5	4.71	1.35e4	1.35e4	12.5	0.0	1.00
5	5	161111J2_07_P1_E1	12.5	4.72	1.28e4	1.28e4	12.5	0.0	1.00
6	6	161111J2_08_P1_E1	12.5	4.71	1.42e4	1.42e4	12.5	0.0	1.00
7	7	161111J2_09_P1_E1	12.5	4.71	1.26e4	1.26e4	12.5	0.0	1.00
8	8	161111J2_10_P1_E1	12.5	4.71	1.30e4	1.30e4	12.5	0.0	1.00
9	9	161111J2_11_P1_E1	12.5	4.71	1.23e4	1.23e4	12.5	0.0	1.00

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Compound name: 13C4-PFOS
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 29), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	5.09	4.04e3	4.04e3	12.5	-0.0	1.00
2	2	161111J2_04_P1_E1	12.5	5.09	3.65e3	3.65e3	12.5	0.0	1.00
3	3	161111J2_05_P1_E1	12.5	5.09	3.72e3	3.72e3	12.5	0.0	1.00
4	4	161111J2_06_P1_E1	12.5	5.10	3.47e3	3.47e3	12.5	0.0	1.00
5	5	161111J2_07_P1_E1	12.5	5.11	3.51e3	3.51e3	12.5	0.0	1.00
6	6	161111J2_08_P1_E1	12.5	5.08	3.88e3	3.88e3	12.5	0.0	1.00
7	7	161111J2_09_P1_E1	12.5	5.09	2.58e3	2.58e3	12.5	0.0	1.00
8	8	161111J2_10_P1_E1	12.5	5.09	2.72e3	2.72e3	12.5	0.0	1.00
9	9	161111J2_11_P1_E1	12.5	5.10	2.77e3	2.77e3	12.5	0.0	1.00

Compound name: 13C9-PFNA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 30), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	5.02	8.03e3	8.03e3	12.5	0.0	1.00
2	2	161111J2_04_P1_E1	12.5	5.03	7.82e3	7.82e3	12.5	0.0	1.00
3	3	161111J2_05_P1_E1	12.5	5.03	8.19e3	8.19e3	12.5	0.0	1.00
4	4	161111J2_06_P1_E1	12.5	5.04	8.40e3	8.40e3	12.5	0.0	1.00
5	5	161111J2_07_P1_E1	12.5	5.05	1.00e4	1.00e4	12.5	0.0	1.00
6	6	161111J2_08_P1_E1	12.5	5.03	7.86e3	7.86e3	12.5	0.0	1.00
7	7	161111J2_09_P1_E1	12.5	5.03	7.38e3	7.38e3	12.5	0.0	1.00
8	8	161111J2_10_P1_E1	12.5	5.03	7.77e3	7.77e3	12.5	0.0	1.00
9	9	161111J2_11_P1_E1	12.5	5.05	8.86e3	8.86e3	12.5	0.0	1.00

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Compound name: 13C6-PFDA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 31), Area * (IS Conc. / IS Area)
Curve type: RF

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	12.5	5.30	5.57e3	5.57e3	12.5	0.0	1.00
2	2	161111J2_04_P1_E1	12.5	5.31	4.96e3	4.96e3	12.5	0.0	1.00
3	3	161111J2_05_P1_E1	12.5	5.32	5.51e3	5.51e3	12.5	0.0	1.00
4	4	161111J2_06_P1_E1	12.5	5.33	4.37e3	4.37e3	12.5	0.0	1.00
5	5	161111J2_07_P1_E1	12.5	5.32	4.61e3	4.61e3	12.5	0.0	1.00
6	6	161111J2_08_P1_E1	12.5	5.31	5.31e3	5.31e3	12.5	0.0	1.00
7	7	161111J2_09_P1_E1	12.5	5.31	3.32e3	3.32e3	12.5	0.0	1.00
8	8	161111J2_10_P1_E1	12.5	5.31	3.63e3	3.63e3	12.5	-0.0	1.00
9	9	161111J2_11_P1_E1	12.5	5.32	3.79e3	3.79e3	12.5	0.0	1.00

Compound name: Total PFBS
Coefficient of Determination: R^2 = 0.977505
Calibration curve: 0.00122129 * x^2 + 0.743308 * x + 0.145497
Response type: Internal Std (Ref 15), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x^2, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500			6.77e3	0.529		
2	2	161111J2_04_P1_E1	1.00			6.92e3	0.988		
3	3	161111J2_05_P1_E1	2.00			7.66e3	1.66		
4	4	161111J2_06_P1_E1	5.00			7.70e3	3.90		
5	5	161111J2_07_P1_E1	10.0			7.23e3	11.6		
6	6	161111J2_08_P1_E1	25.0			5.91e3	29.6		
7	7	161111J2_09_P1_E1	50.0			6.45e3	53.1		
8	8	161111J2_10_P1_E1	75.0			6.63e3	75.3		
9	9	161111J2_11_P1_E1	100			6.50e3	93.1		

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Compound name: Total PFHxS
Coefficient of Determination: R^2 = 0.998167
Calibration curve: 0.00081896 * x^2 + 3.22284 * x + 0.0419742
Response type: Internal Std (Ref 18), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500			1.34e3	0.648		
2	2	161111J2_04_P1_E1	1.00			1.41e3	1.02		
3	3	161111J2_05_P1_E1	2.00			1.59e3	1.65		
4	4	161111J2_06_P1_E1	5.00			1.48e3	3.91		
5	5	161111J2_07_P1_E1	10.0			1.46e3	10.2		
6	6	161111J2_08_P1_E1	25.0			1.22e3	26.6		
7	7	161111J2_09_P1_E1	50.0			1.41e3	50.3		
8	8	161111J2_10_P1_E1	75.0			1.37e3	73.8		
9	9	161111J2_11_P1_E1	100			1.25e3	100		

Compound name: Total PFOA
Coefficient of Determination: R^2 = 0.996931
Calibration curve: -0.0025112 * x^2 + 1.31194 * x + 0.0471482
Response type: Internal Std (Ref 20), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500			8.45e3	0.627		
2	2	161111J2_04_P1_E1	1.00			8.64e3	1.19		
3	3	161111J2_05_P1_E1	2.00			9.24e3	1.66		
4	4	161111J2_06_P1_E1	5.00			9.36e3	3.84		
5	5	161111J2_07_P1_E1	10.0			9.02e3	10.7		
6	6	161111J2_08_P1_E1	25.0			7.47e3	27.0		
7	7	161111J2_09_P1_E1	50.0			8.76e3	49.2		
8	8	161111J2_10_P1_E1	75.0			9.14e3	72.8		
9	9	161111J2_11_P1_E1	100			8.81e3	102		

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Compound name: Total PFOS
Correlation coefficient: r = 0.985935, r^2 = 0.972067
Calibration curve: 1.25111 * x + 0.123067
Response type: Internal Std (Ref 22), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x^2, Axis trans: None

	#	Name	Std. Conc	RT	Resp	IS Resp	Conc.	%Dev	RRF
1	1	161111J2_03_P1_E1	0.500			3.18e3	0.553		
2	2	161111J2_04_P1_E1	1.00			3.57e3	0.927		
3	3	161111J2_05_P1_E1	2.00			3.92e3	1.56		
4	4	161111J2_06_P1_E1	5.00			3.44e3	3.77		
5	5	161111J2_07_P1_E1	10.0			3.38e3	11.2		
6	6	161111J2_08_P1_E1	25.0			2.92e3	28.7		
7	7	161111J2_09_P1_E1	50.0			2.42e3	50.0		
8	8	161111J2_10_P1_E1	75.0			2.48e3	81.9		
9	9	161111J2_11_P1_E1	100			2.53e3	108		

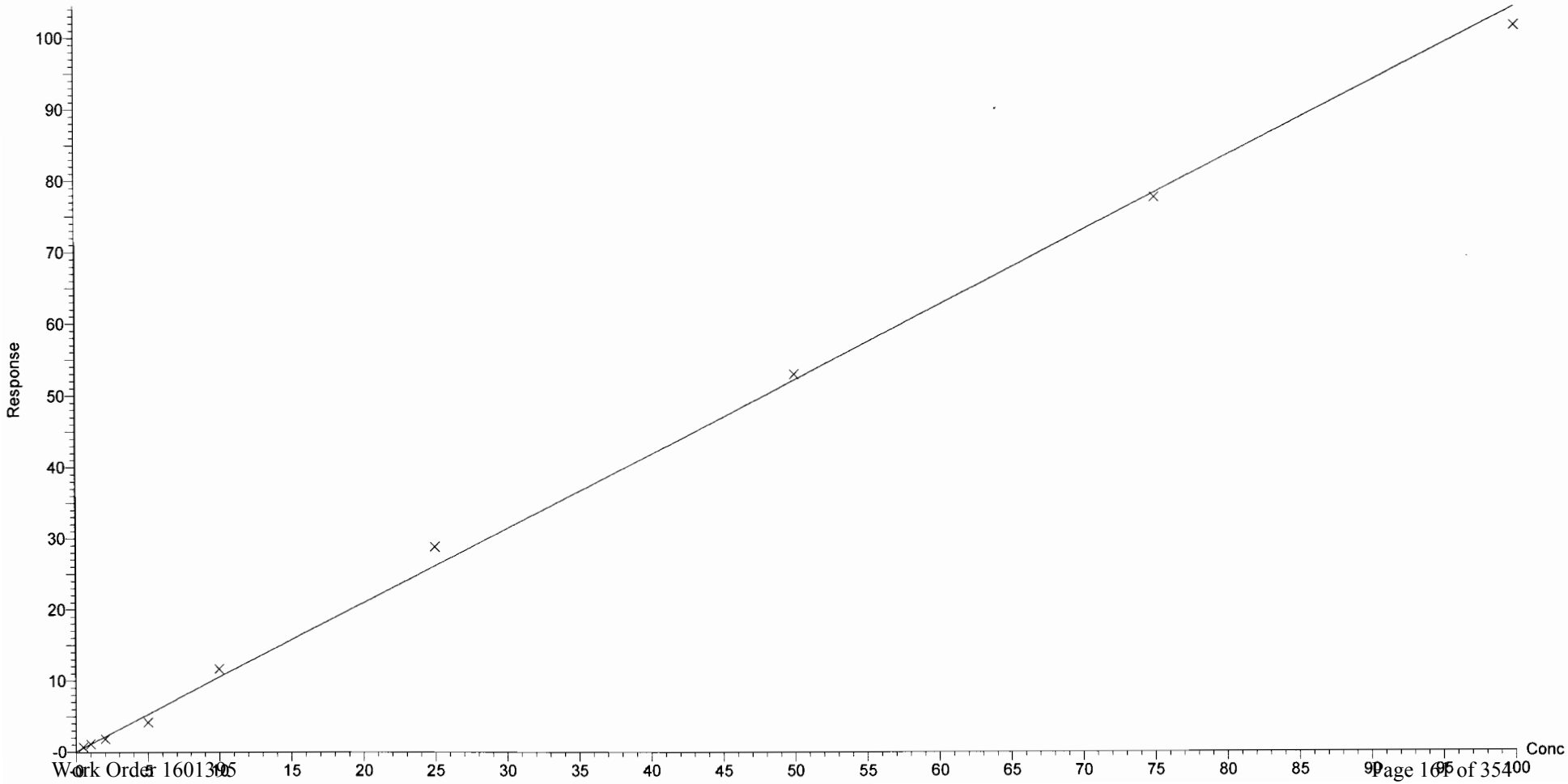
Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 12 Nov 2016 10:51:05
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

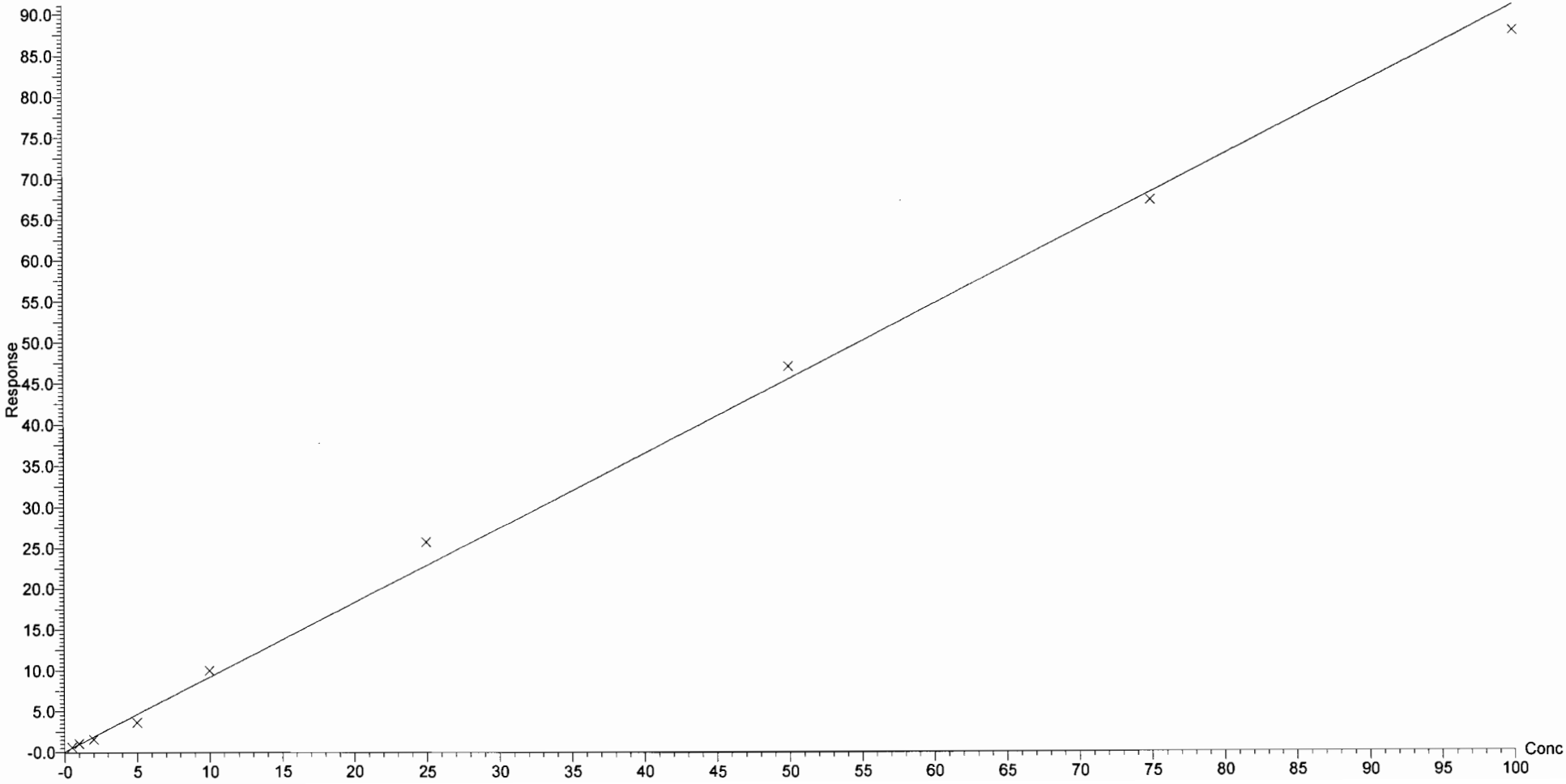
Compound name: PFBA
Correlation coefficient: r = 0.998498, r^2 = 0.996999
Calibration curve: 1.04509 * x + 0.0382703
Response type: Internal Std (Ref 13), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

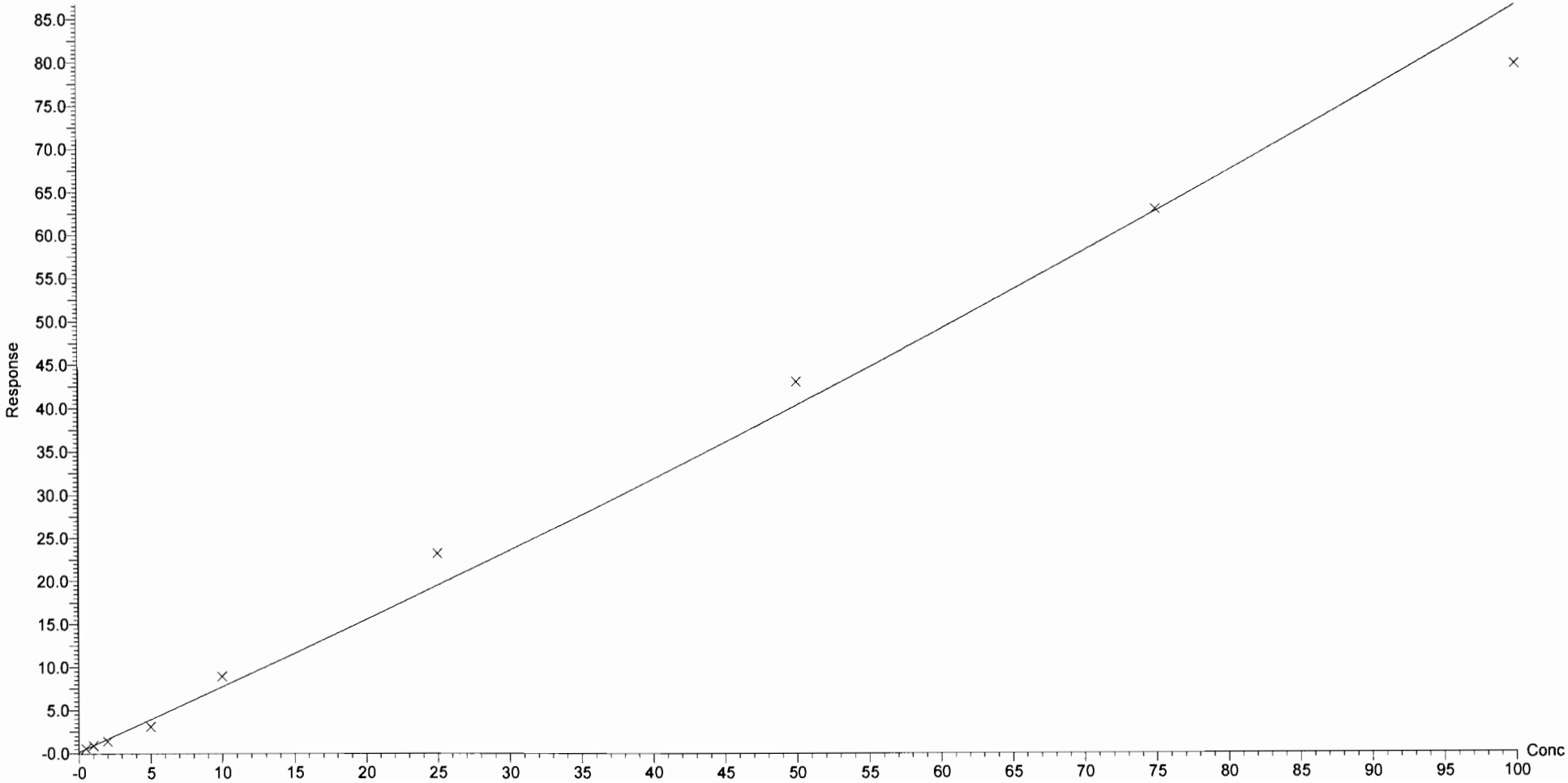
Compound name: PFPeA
Correlation coefficient: r = 0.998036, r^2 = 0.996076
Calibration curve: 0.910461 * x + 0.0566694
Response type: Internal Std (Ref 14), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

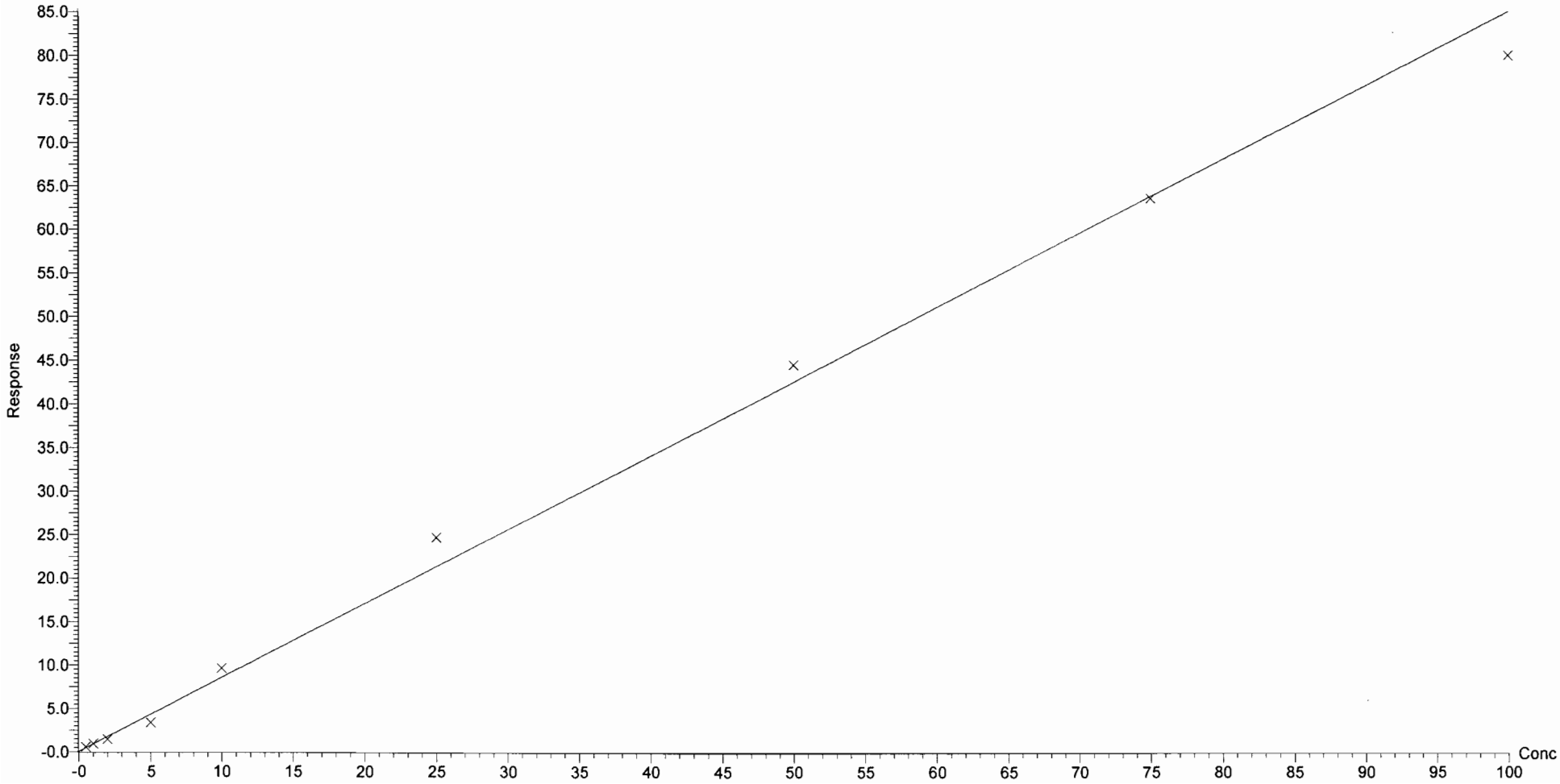
Compound name: PFBS
Coefficient of Determination: R^2 = 0.977505
Calibration curve: 0.00122129 * x^2 + 0.743308 * x + 0.145497
Response type: Internal Std (Ref 15), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x^2, Axis trans: None



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

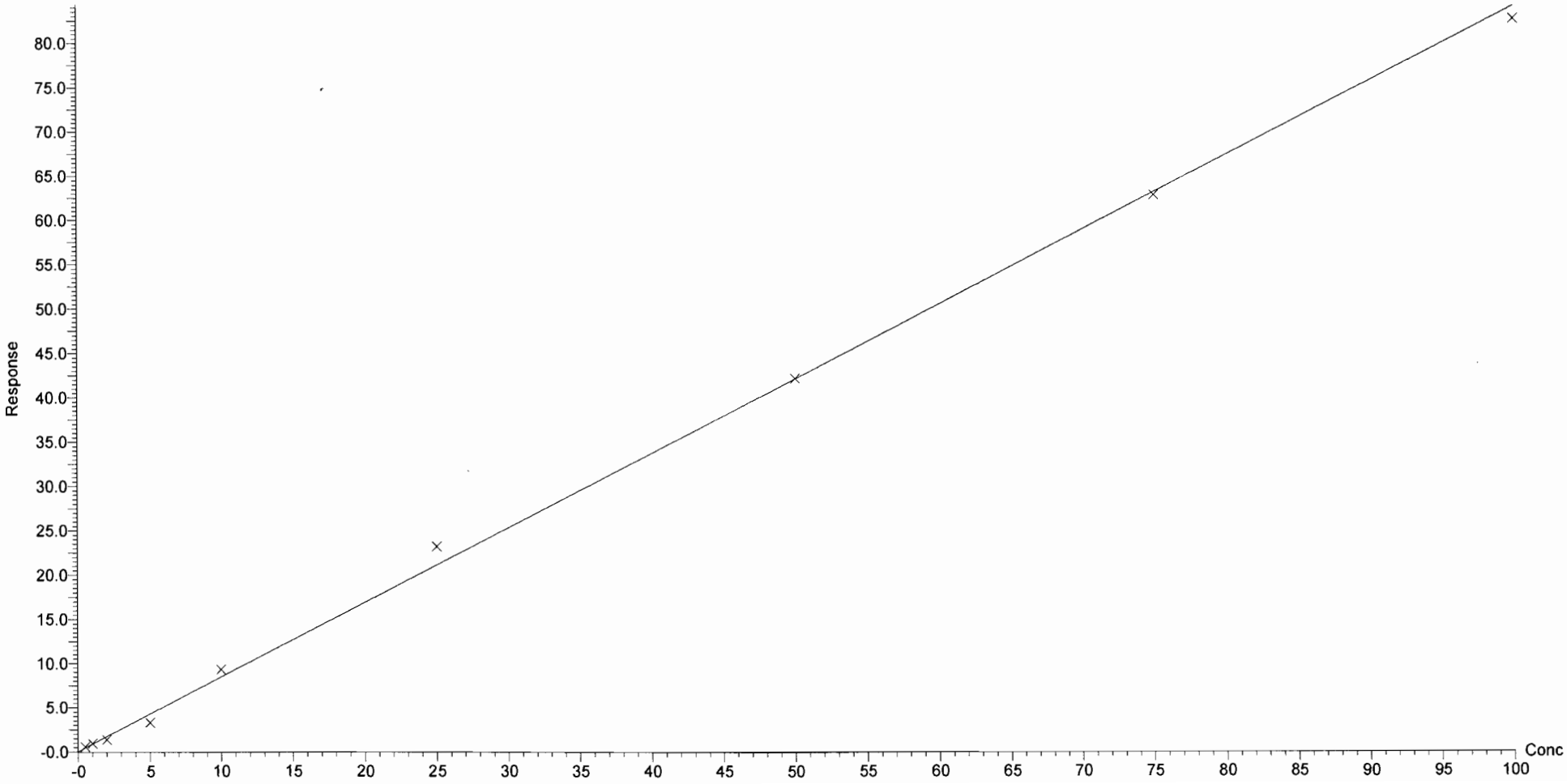
Compound name: PFHxA
Correlation coefficient: r = 0.996921, r^2 = 0.993852
Calibration curve: 0.852369 * x + 0.067677
Response type: Internal Std (Ref 16), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

Compound name: PFHpA
Correlation coefficient: r = 0.998500, r^2 = 0.997002
Calibration curve: 0.842904 * x + 0.0395603
Response type: Internal Std (Ref 17), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

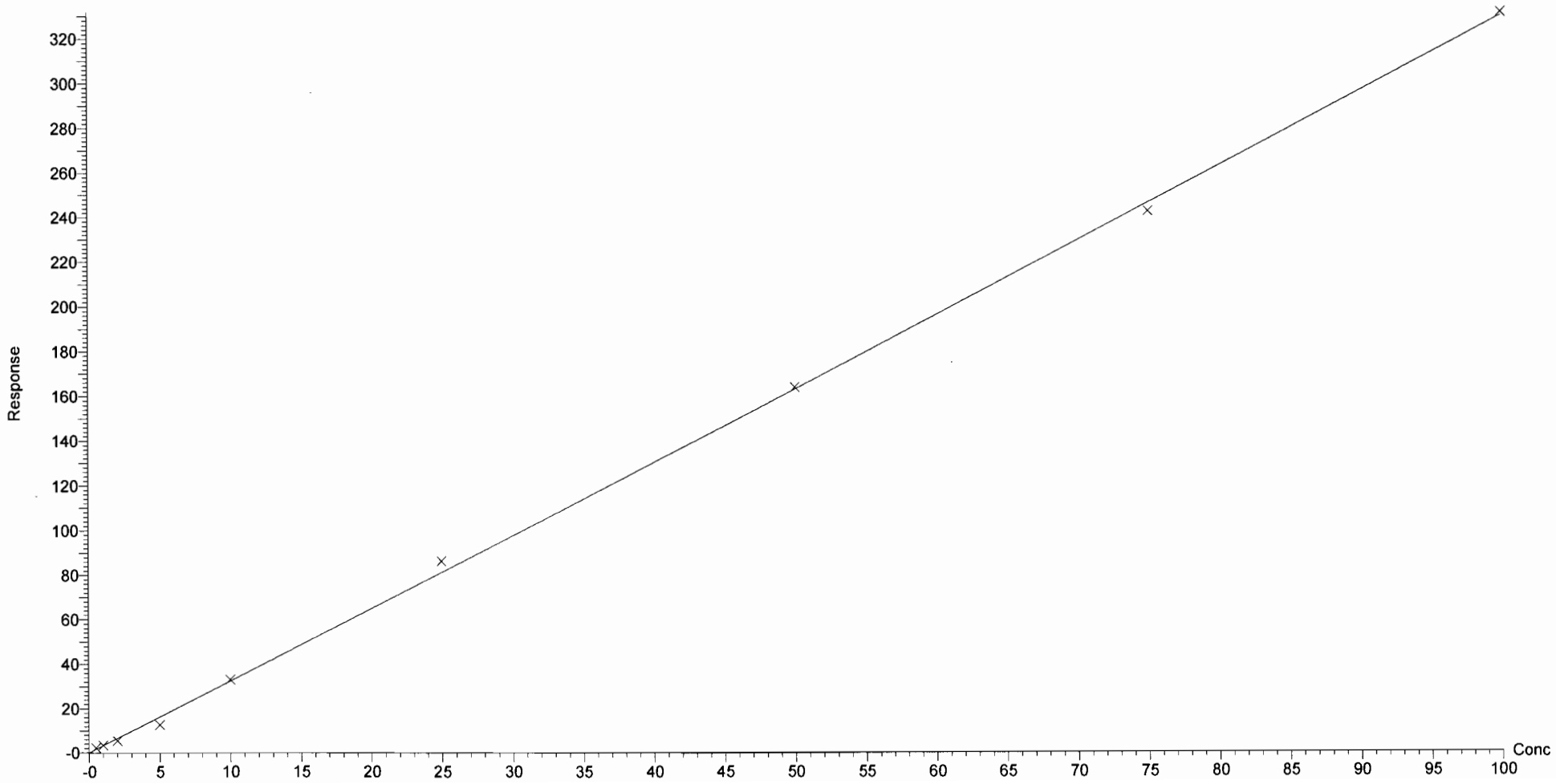


Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

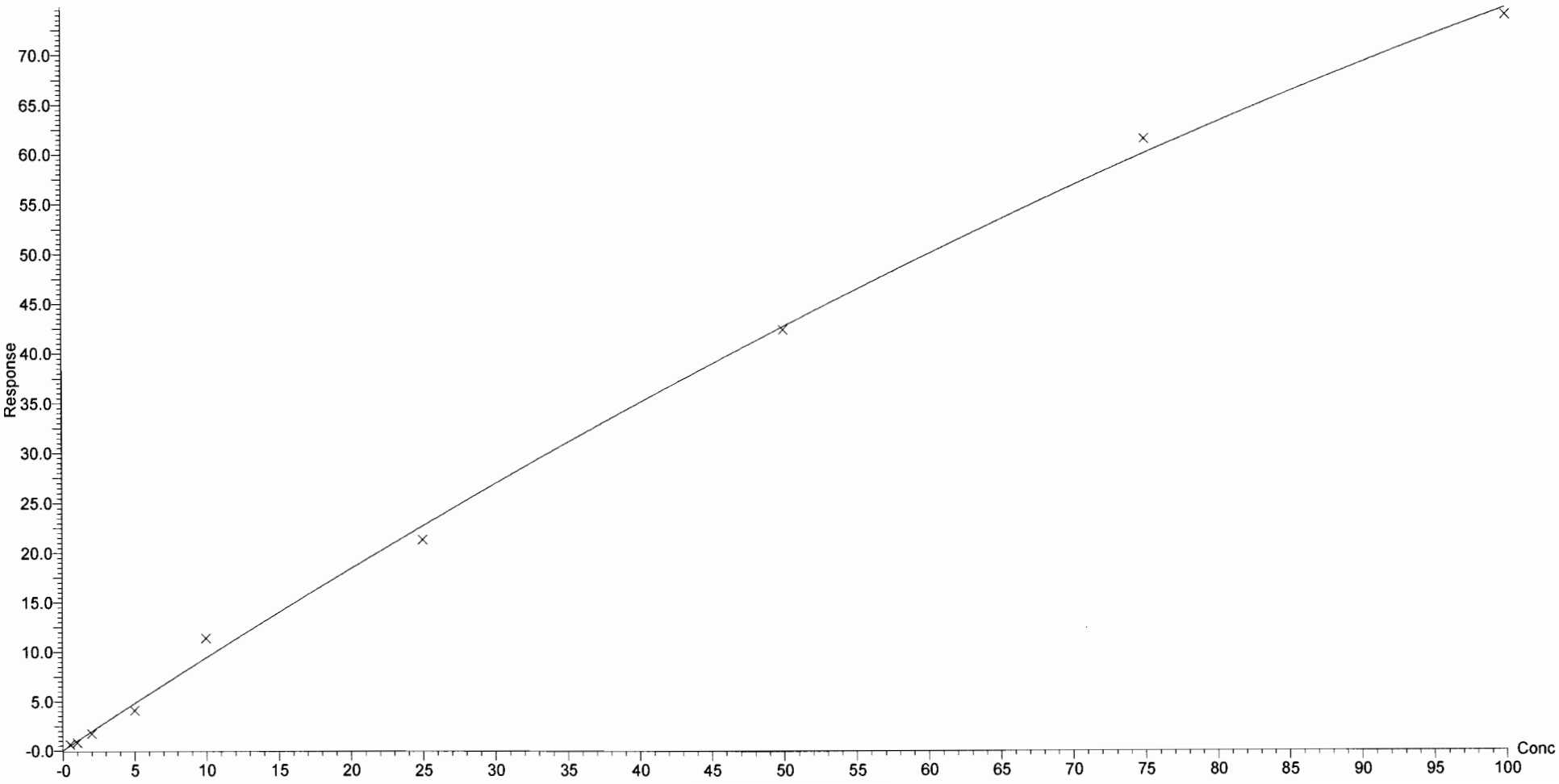
Compound name: PFHxS
Coefficient of Determination: R^2 = 0.998167
Calibration curve: 0.00081896 * x^2 + 3.22284 * x + 0.0419742
Response type: Internal Std (Ref 18), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

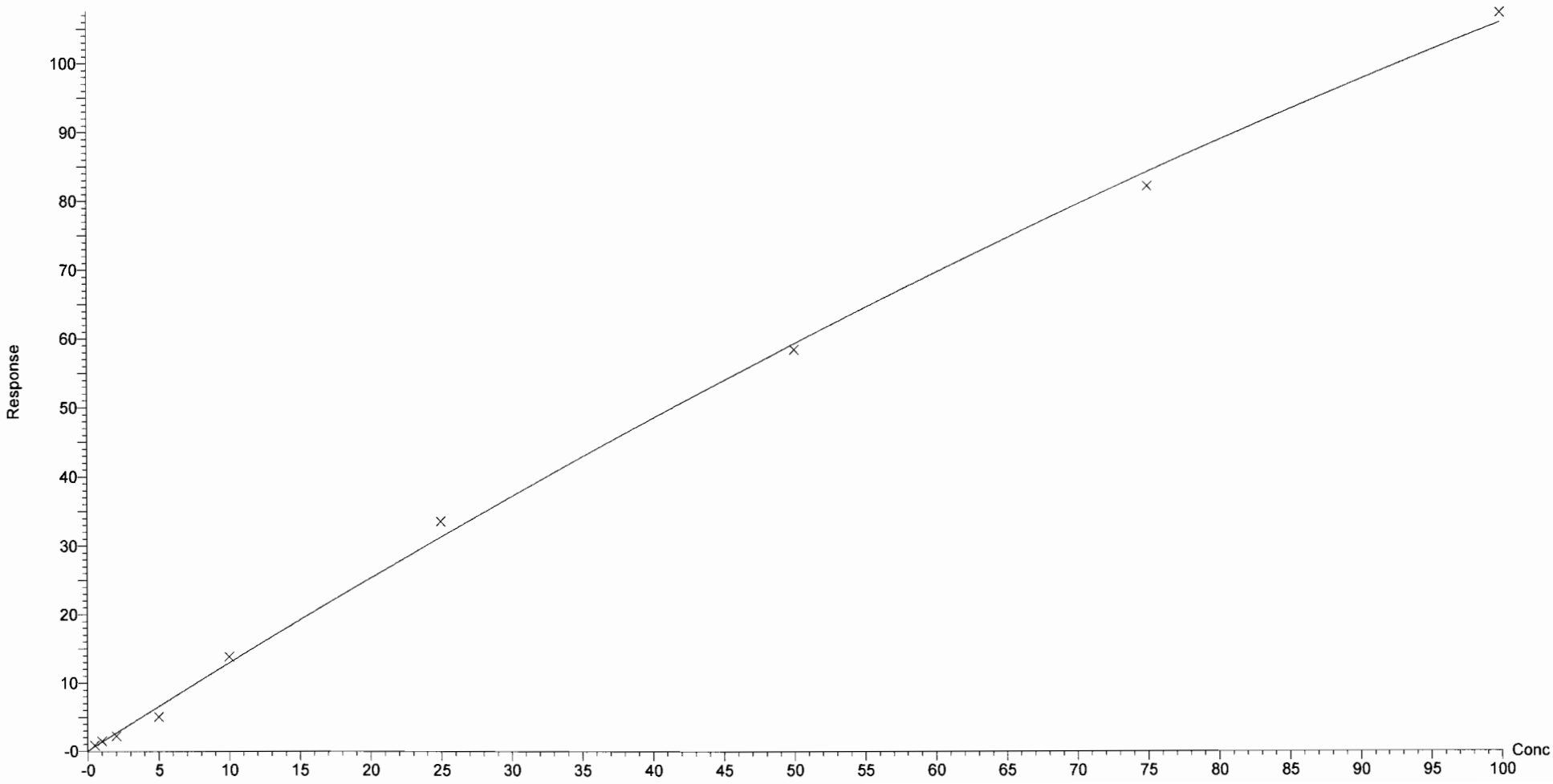
Compound name: 6:2 FTS
Coefficient of Determination: R^2 = 0.995743
Calibration curve: -0.00213642 * x^2 + 0.961467 * x + 0.0440674
Response type: Internal Std (Ref 19), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

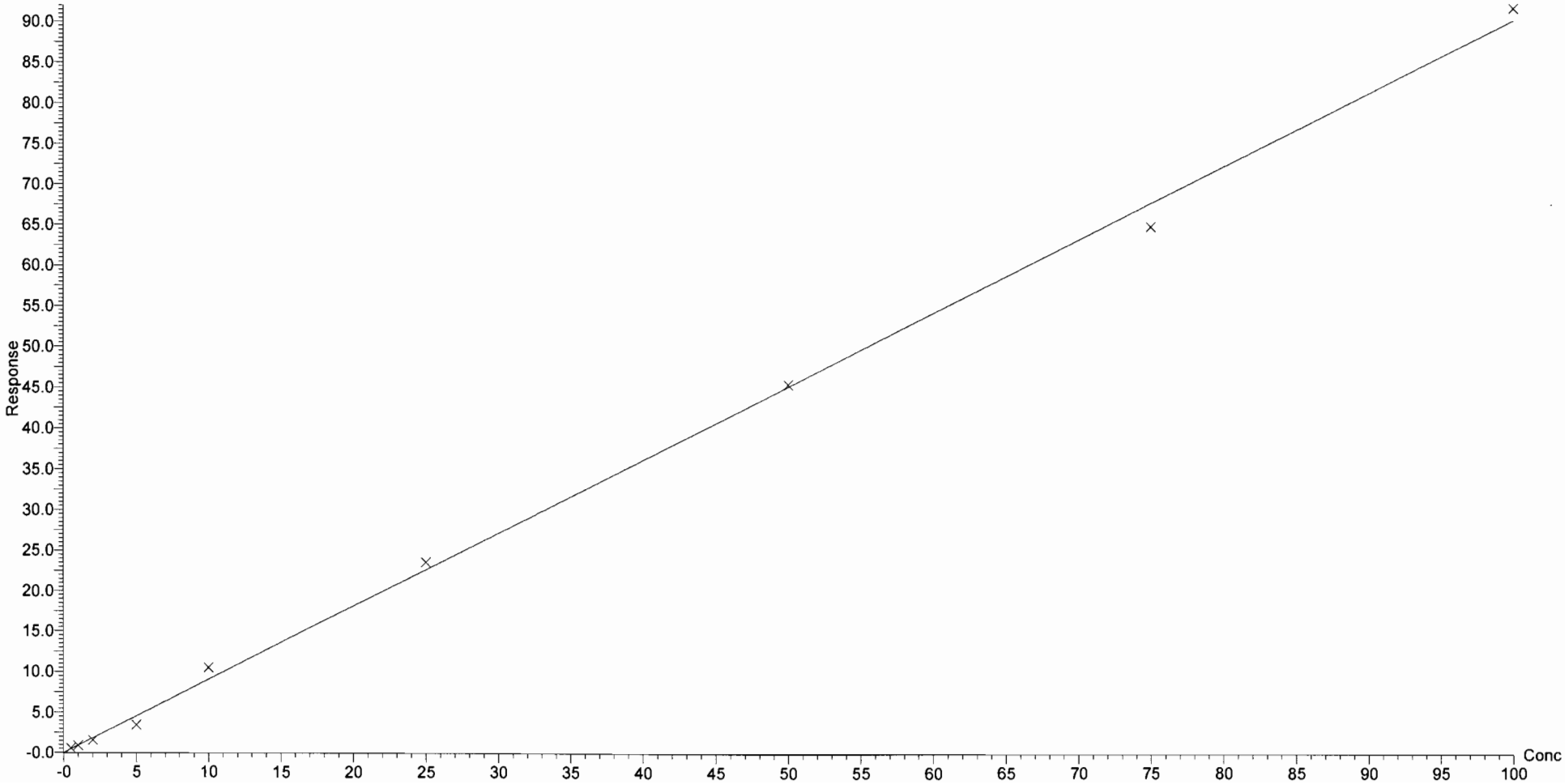
Compound name: PFOA
Coefficient of Determination: R^2 = 0.996931
Calibration curve: -0.0025112 * x^2 + 1.31194 * x + 0.0471482
Response type: Internal Std (Ref 20), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

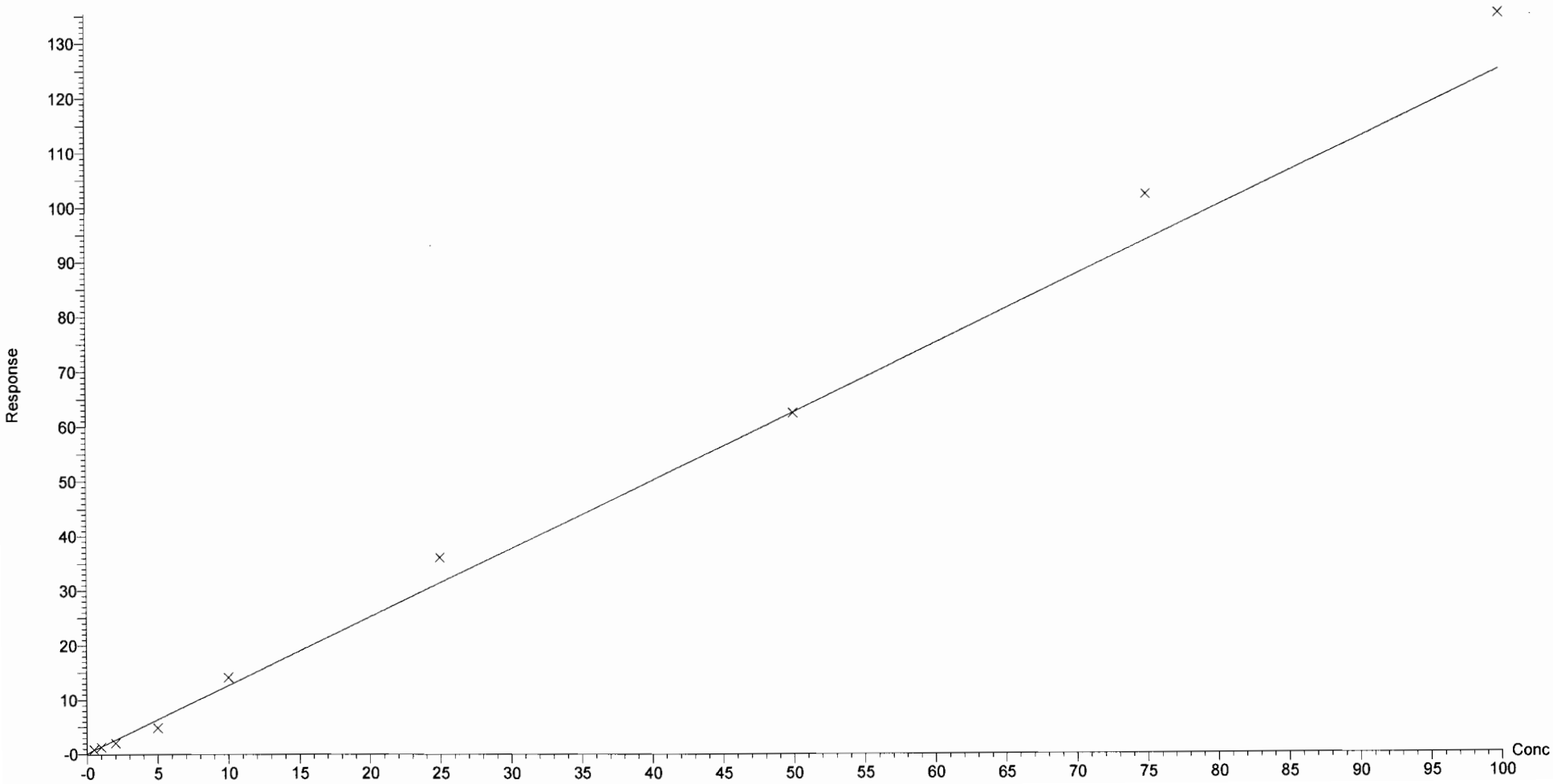
Compound name: PFNA
Correlation coefficient: r = 0.998382, r^2 = 0.996768
Calibration curve: 0.905077 * x + 0.00552082
Response type: Internal Std (Ref 21), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

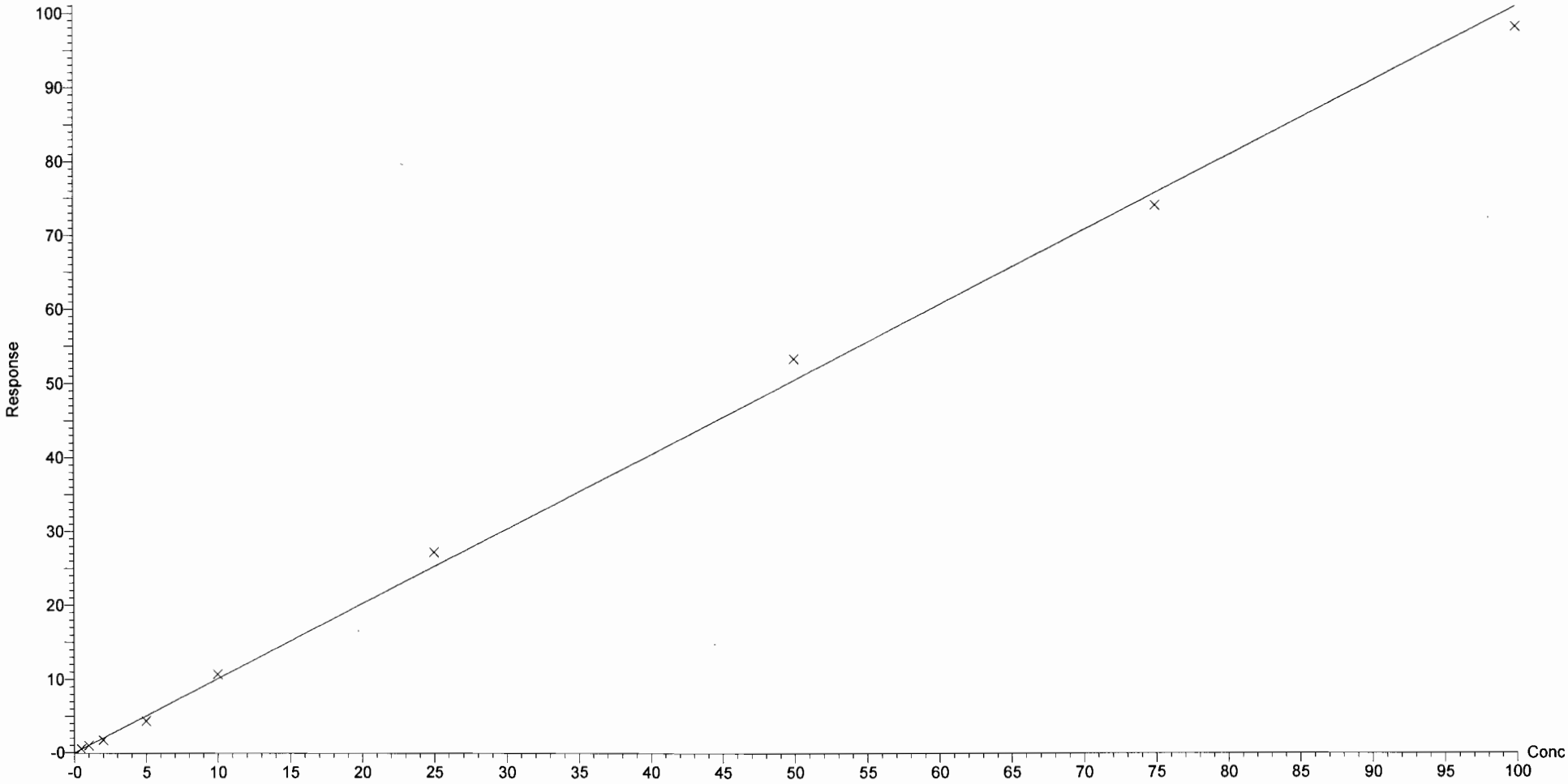
Compound name: PFOS
Correlation coefficient: r = 0.985935, r^2 = 0.972067
Calibration curve: 1.25111 * x + 0.123067
Response type: Internal Std (Ref 22), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x^2, Axis trans: None



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

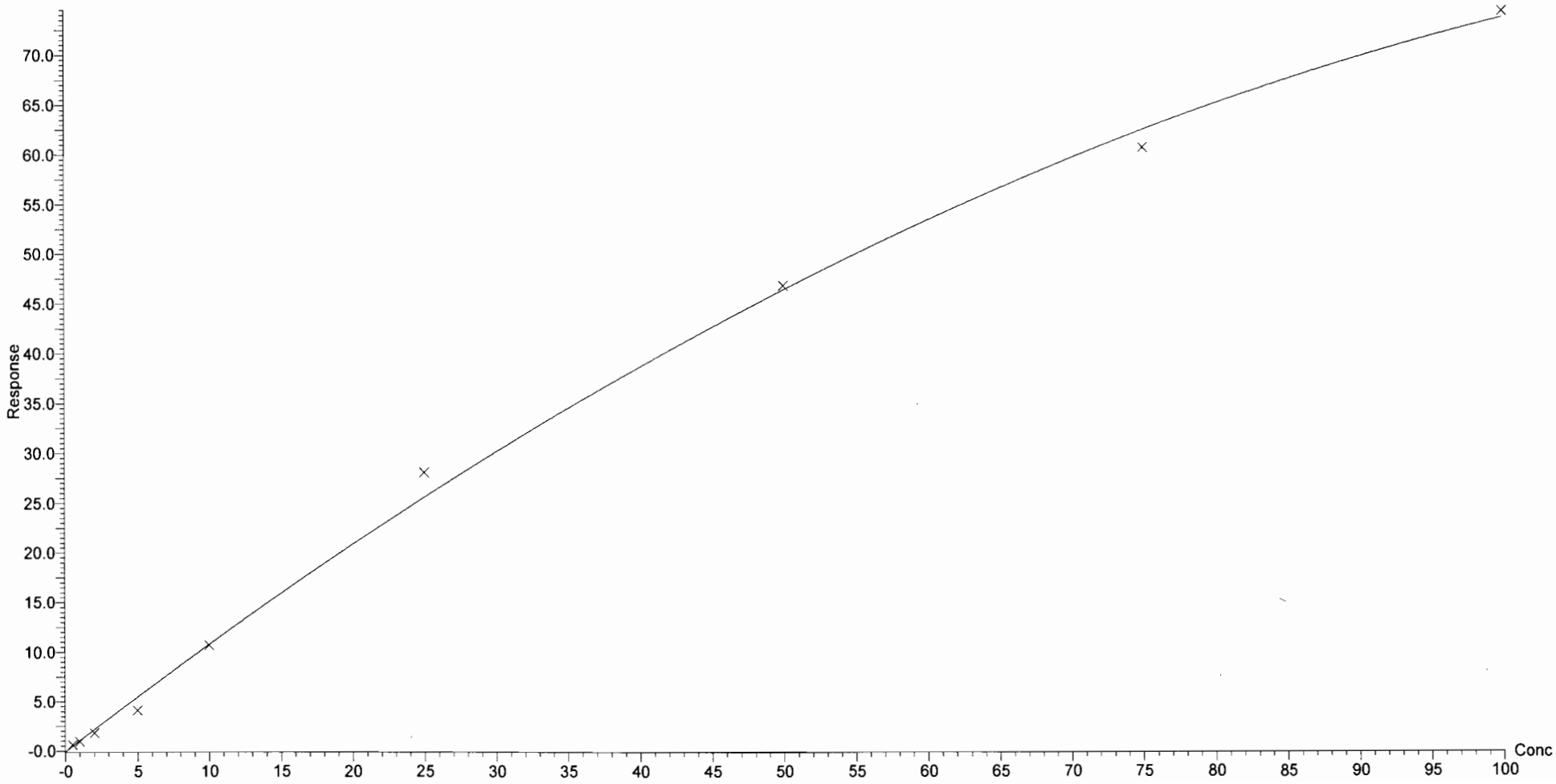
Compound name: PFDA
Correlation coefficient: r = 0.998849, r^2 = 0.997699
Calibration curve: 1.01138 * x + -0.0247569
Response type: Internal Std (Ref 23), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:54:20 Pacific Standard Time

Compound name: 8:2 FTS
Coefficient of Determination: R^2 = 0.995769
Calibration curve: -0.00383329 * x^2 + 1.1235 * x + -0.0810222
Response type: Internal Std (Ref 24), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Include, Weighting: 1/x, Axis trans: None



	Sample Name	Acquisition Date	Sample ID	Sample Comment
1	161111J2_01	11/11/2016 16:27:18	IPA	IPA
2	161111J2_02	11/11/2016 16:39:32	ST161111J2-1 PFC CS(-2)16K1114	PFC CS(-2)16K1114 A
3	161111J2_03	11/11/2016 16:51:46	ST161111J2-2 PFC CS(-1) 16K1115	PFC CS(-1) 16K1115 A
4	161111J2_04	11/11/2016 17:04:00	ST161111J2-3 PFC CS0 16K1116	PFC CS0 16K1116 A
5	161111J2_05	11/11/2016 17:16:11	ST161111J2-4 PFC CS1 16K1117	PFC CS1 16K1117 A
6	161111J2_06	11/11/2016 17:28:26	ST161111J2-5 PFC CS2 16K1118	PFC CS2 16K1118 A
7	161111J2_07	11/11/2016 17:40:40	ST161111J2-6 PFC CS3 16K1119	PFC CS3 16K1119 A
8	161111J2_08	11/11/2016 17:52:55	ST161111J2-7 PFC C3.5 16K1120	PFC C3.5 16K1120 A
9	161111J2_09	11/11/2016 18:05:09	ST161111J2-8 PFC CS4 16K1121	PFC CS4 16K1121 A
10	161111J2_10	11/11/2016 18:17:21	ST161111J2-9 PFC CS4.5 16K1122	PFC CS4.5 16K1122 A
11	161111J2_11	11/11/2016 18:29:38	ST161111J2-10 PFC CS5 16K1123	PFC CS5 16K1123 A
12	161111J2_12	11/11/2016 18:41:52	IPA	IPA
13	161111J2_13	11/11/2016 18:54:07	SS161111J2-1 PFC SSS 16J1810	PFC SSS 16J1810 A
14	161111J2_14	11/11/2016 19:06:23	IPA	IPA
15	161111J2_15	11/11/2016 19:18:38	B6K0030-BS1	OPR
16	161111J2_16	11/11/2016 19:30:51	B6K0033-BS1	OPR
17	161111J2_17	11/11/2016 19:43:07	IPA	IPA
18	161111J2_18	11/11/2016 19:55:22	B6K0033-BLK1	Method Blank
19	161111J2_19	11/11/2016 20:07:37	B6K0030-BLK1	Method Blank
20	161111J2_20	11/11/2016 20:19:48	1601384-01	WURTS_EB001JH-102416
21	161111J2_21	11/11/2016 20:32:00	1601384-02	WURTS_VAS01014-27-30
22	161111J2_22	11/11/2016 20:44:16	1601384-03	WURTS_VAS01014-37-40
23	161111J2_23	11/11/2016 20:56:27	1601384-04	WURTS_VAS01014-47-50
24	161111J2_24	11/11/2016 21:08:40	1601384-05	WURTS_VAS13004-20-23
25	161111J2_25	11/11/2016 21:20:55	1601384-06	WURTS_VAS13004-30-33
26	161111J2_26	11/11/2016 21:33:11	1601384-07	WURTS_VAS13004-40-43
27	161111J2_27	11/11/2016 21:45:25	1601384-08	WURTS_VAS13004-50-53
28	161111J2_28	11/11/2016 21:57:40	1601384-09	WURTS_VAS13005-26-29
29	161111J2_29	11/11/2016 22:09:56	1601384-10	WURTS_VAS13005-36-39
30	161111J2_30	11/11/2016 22:22:11	IPA	IPA
31	161111J2_31	11/11/2016 22:34:26	ST161111J2-11 PFC C3.5 16K1120	PFC C3.5 16K0713 A
32	161111J2_32	11/11/2016 22:46:37	IPA	IPA
33	161111J2_33	11/11/2016 22:58:52	1601384-11	WURTS_VAS13005-46-49
34	161111J2_34	11/11/2016 23:11:09	1601384-12	WURTS_VAS13005-56-59
35	161111J2_35	11/11/2016 23:23:24	1601386-01	WURTS_EB002JH-102516
36	161111J2_36	11/11/2016 23:35:37	1601386-02	WURTS_EB003JH-102616
37	161111J2_37	11/11/2016 23:47:49	1601386-03	WURTS_VAS01012-18-21
38	161111J2_38	11/12/2016 00:00:10	1601386-04	WURTS_VAS01012-18-21_FD
39	161111J2_39	11/12/2016 00:12:24	1601386-05	WURTS_VAS01012-28-31
40	161111J2_40	11/12/2016 00:24:39	1601386-06	WURTS_VAS01012-38-41
41	161111J2_41	11/12/2016 00:36:54	1601386-07	WURTS_VAS01012-48-51
42	161111J2_42	11/12/2016 00:49:08	1601386-08	WURTS_VAS01013-20-23
43	161111J2_43	11/12/2016 01:01:20	IPA	IPA
44	161111J2_44	11/12/2016 01:13:36	ST161111J2-12 PFC C3.5 16K1120	PFC C3.5 16K0713 A
45	161111J2_45	11/12/2016 01:25:47	IPA	IPA
46	161111J2_46	11/12/2016 01:38:02	1601386-09	WURTS_VAS01013-30-33
47	161111J2_47	11/12/2016 01:50:17	1601386-10	WURTS_VAS01013-40-43
48	161111J2_48	11/12/2016 02:02:33	1601386-11	WURTS_VAS01013-50-53
49	161111J2_49	11/12/2016 02:14:49	1601386-12	WURTS_VAS01014-57-60
50	161111J2_50	11/12/2016 02:27:05	1601386-13	WURTS_EB005JH-102816
51	161111J2_51	11/12/2016 02:39:20	1601386-14	WURTS_VAS15010-40-43
52	161111J2_52	11/12/2016 02:51:36	1601386-15	WURTS_VAS15010-50-53
53	161111J2_53	11/12/2016 03:03:48	1601359-10	FB-M08-07_161025
54	161111J2_54	11/12/2016 03:16:02	B6K0033-MS1	Matrix Spike
55	161111J2_55	11/12/2016 03:28:18	B6K0033-MSD1	Matrix Spike Dup
56	161111J2_56	11/12/2016 03:40:31	IPA	IPA
57	161111J2_57	11/12/2016 03:52:46	ST161111J2-13 PFC C3.5 16K1120	PFC C3.5 16K0713 A
58	161111J2_58	11/12/2016 04:05:00	IPA	IPA

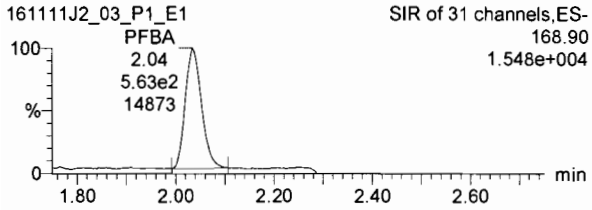
Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:55:05 Pacific Standard Time

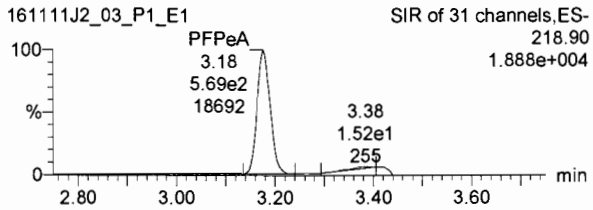
Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 12 Nov 2016 10:51:05
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

Name: 161111J2_03.wiff, Date: 11-Nov-2016, Time: 16:51:46, ID: ST161111J2-2 PFC CS(-1) 16K1115, Description: PFC CS(-1) 16K1115 A

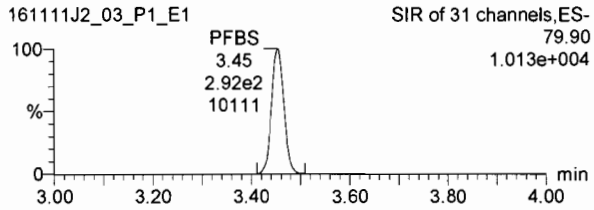
PFBA



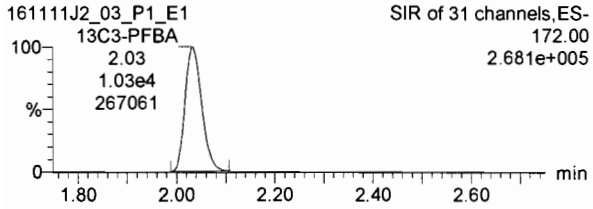
PFPeA



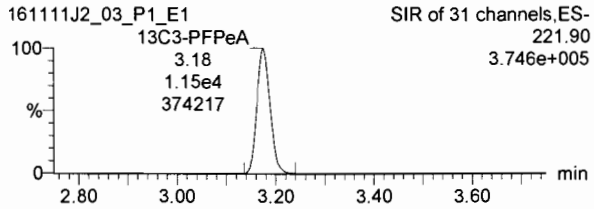
PFBS



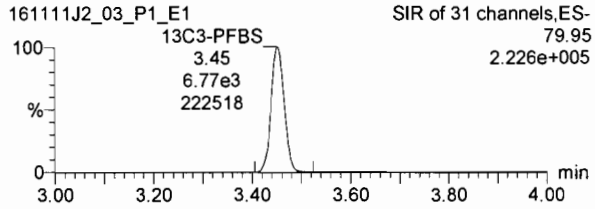
13C3-PFBA



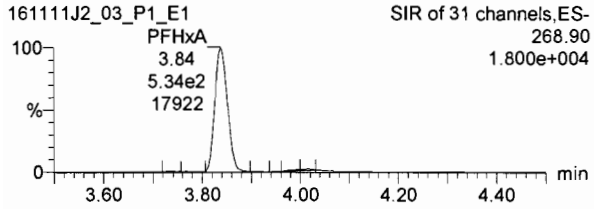
13C3-PFPeA



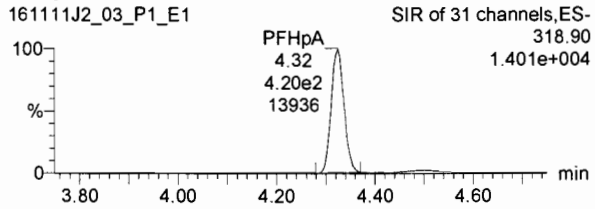
13C3-PFBS



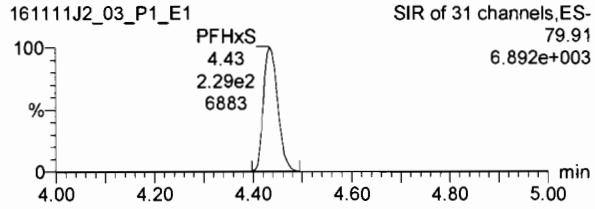
PFHxA



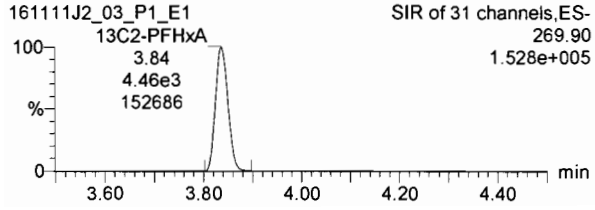
PFHpA



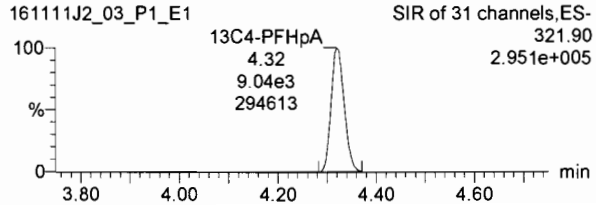
PFHxS



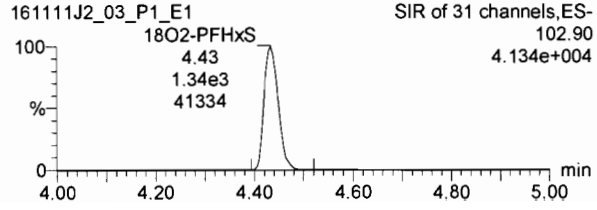
13C2-PFHxA



13C4-PFHpA



18O2-PFHxS



Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

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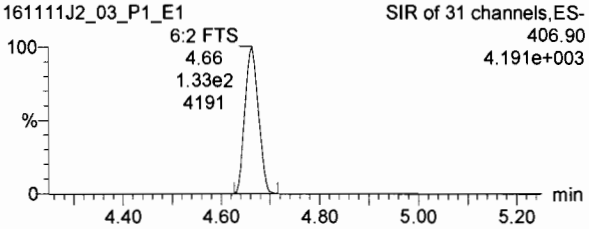
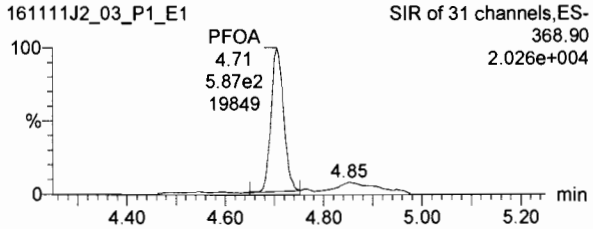
Printed: Saturday, November 12, 2016 10:55:05 Pacific Standard Time

Name: 161111J2_03.wiff, Date: 11-Nov-2016, Time: 16:51:46, ID: ST161111J2-2 PFC CS(-1) 16K1115, Description: PFC CS(-1) 16K1115 A

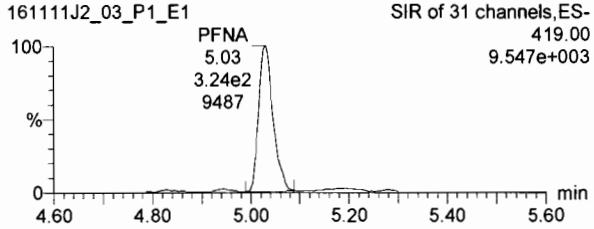
6:2 FTS



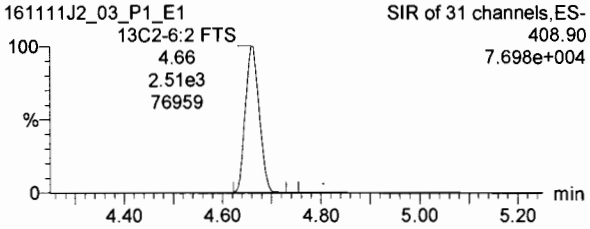
PFOA



PFNA



13C2-6:2 FTS



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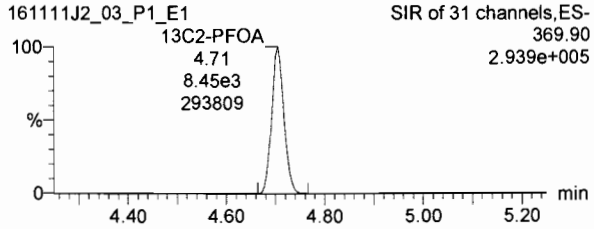

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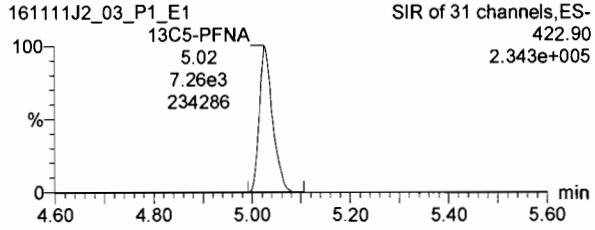
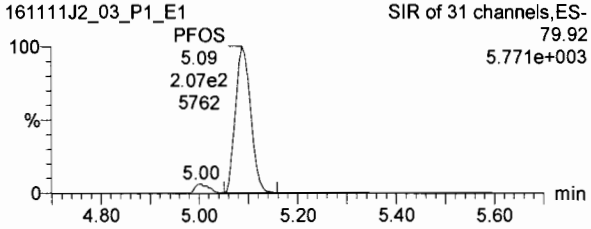


PFOS



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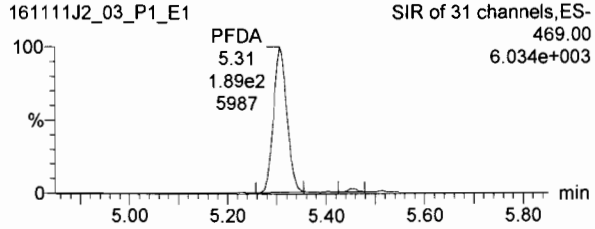

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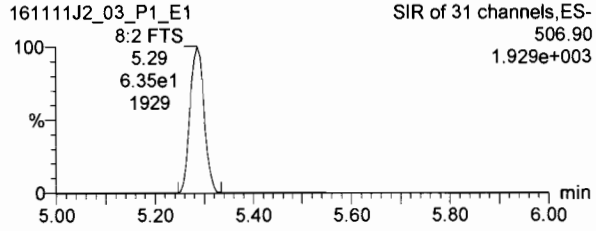

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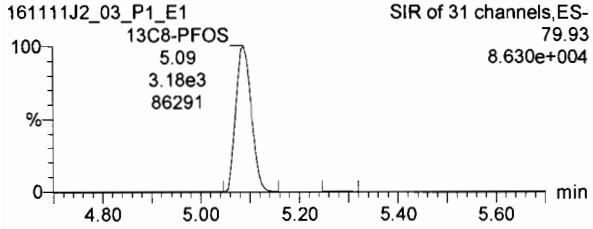

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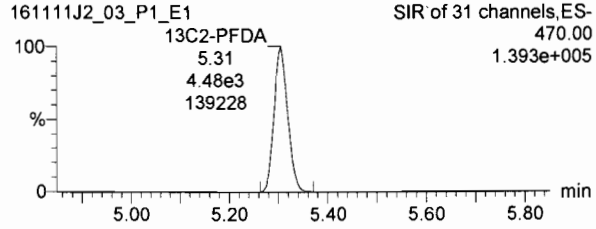
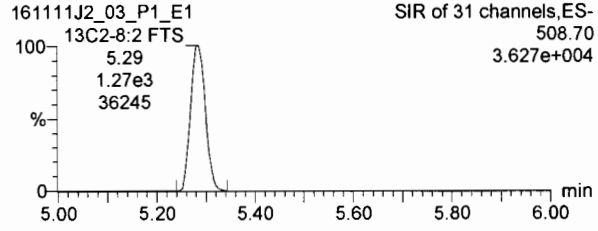


13C2-8:2 FTS



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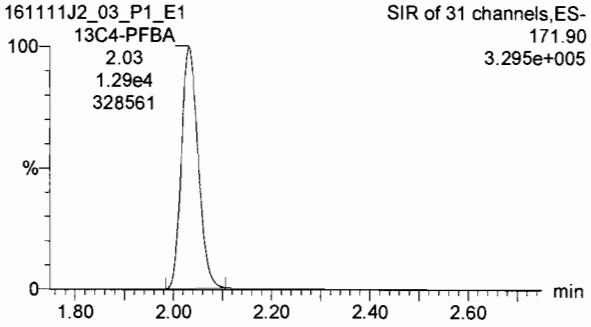
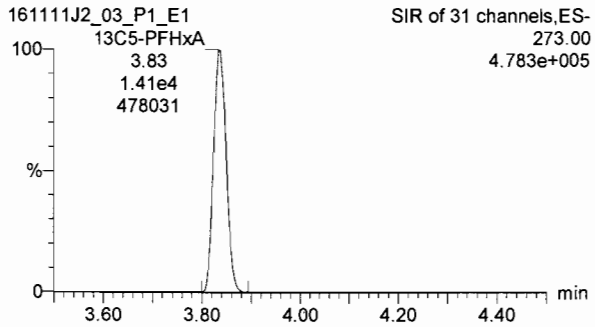
Name: 161111J2_03.wiff, Date: 11-Nov-2016, Time: 16:51:46, ID: ST161111J2-2 PFC CS(-1) 16K1115, Description: PFC CS(-1) 16K1115 A

13C4-PFBA



13C5-PFHxA



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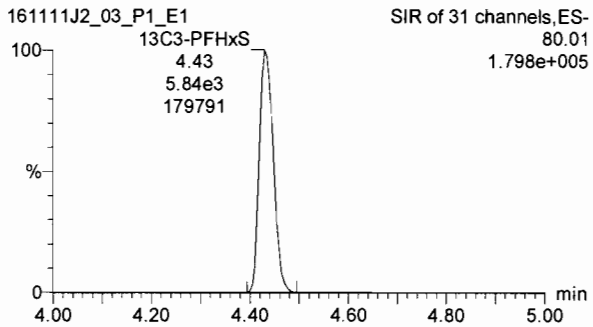

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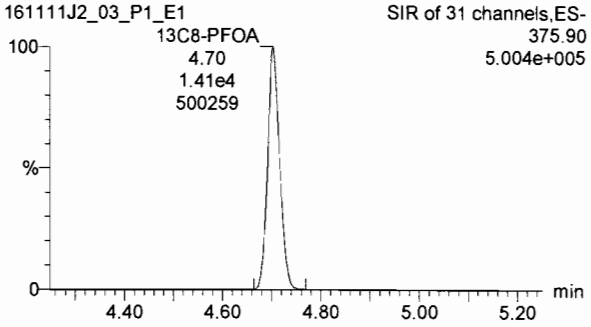

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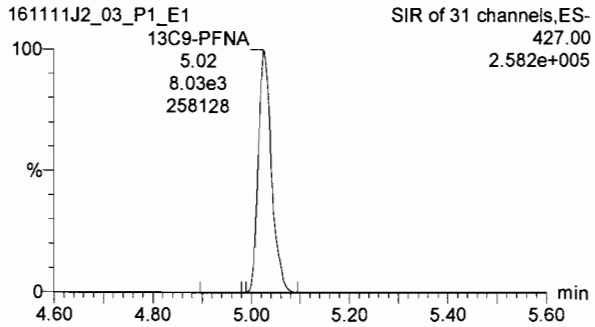

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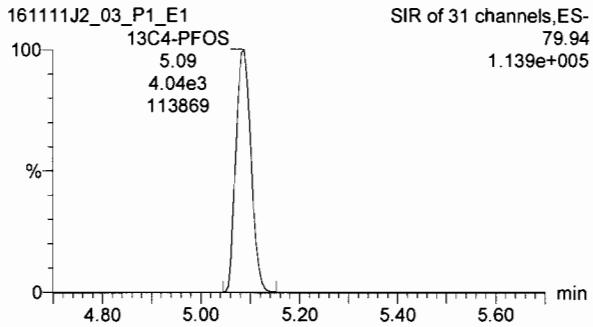

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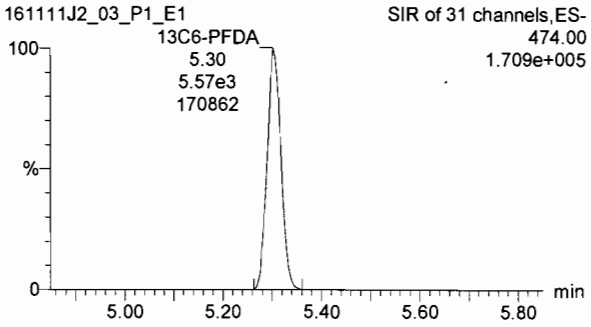

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Name: 161111J2_04.wiff, Date: 11-Nov-2016, Time: 17:04:00, ID: ST161111J2-3 PFC CS0 16K1116, Description: PFC CS0 16K1116 A

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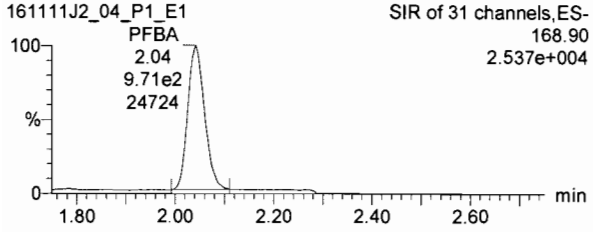

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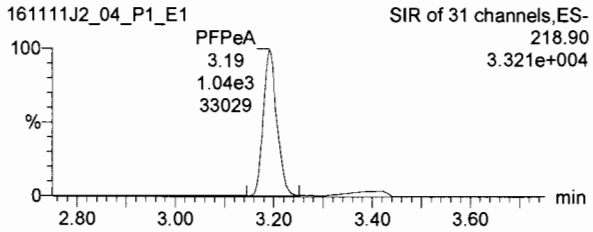

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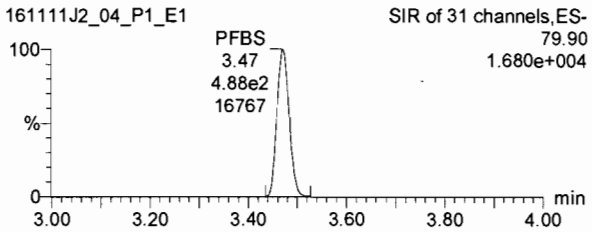

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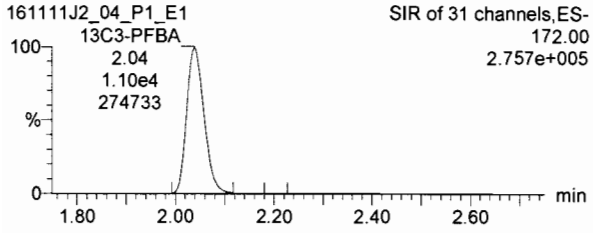

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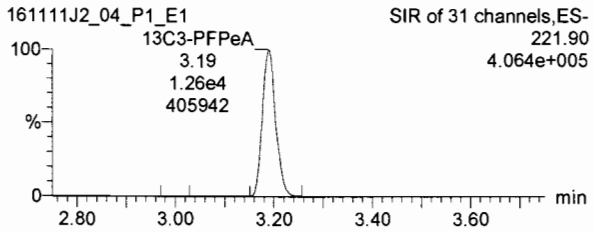

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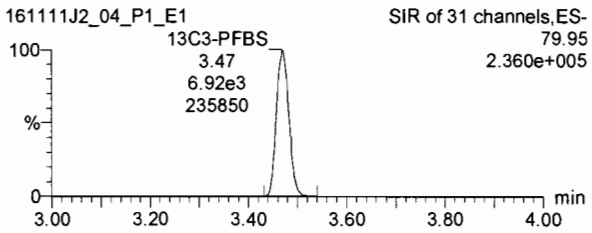

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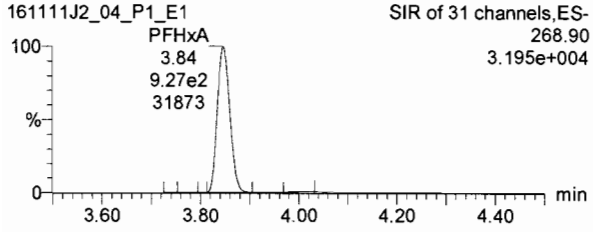

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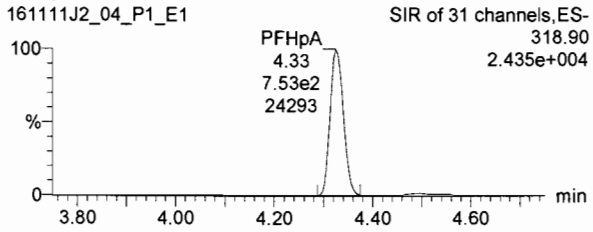

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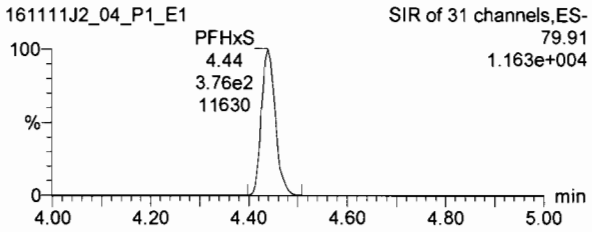

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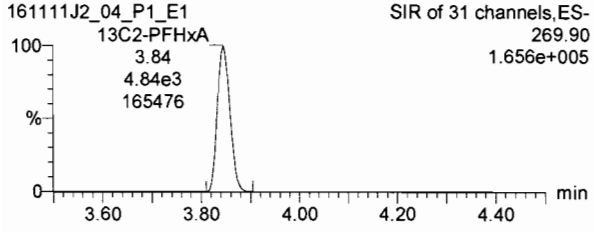
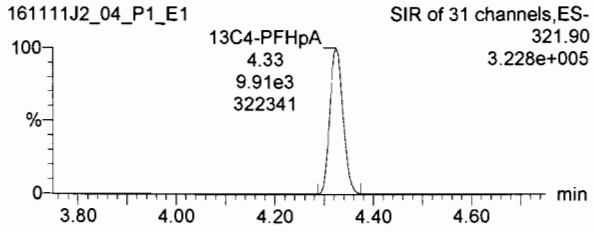
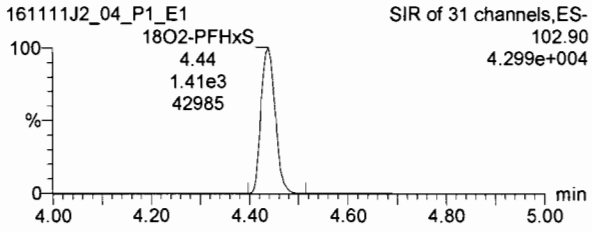


13C4-PFHpA



18O2-PFHxS



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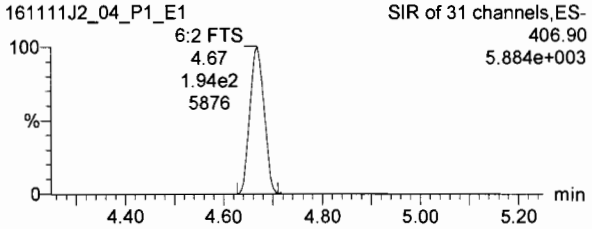
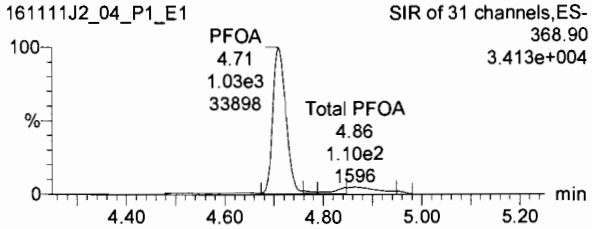
Name: 161111J2_04.wiff, Date: 11-Nov-2016, Time: 17:04:00, ID: ST161111J2-3 PFC CS0 16K1116, Description: PFC CS0 16K1116 A

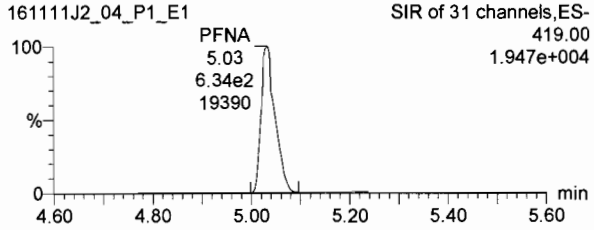
6:2 FTS



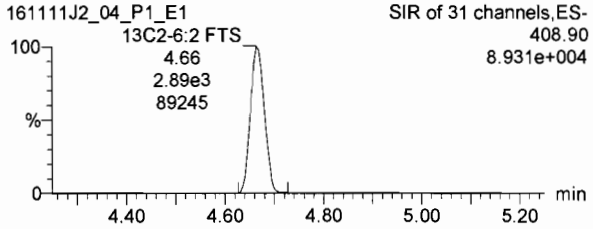
PFOA



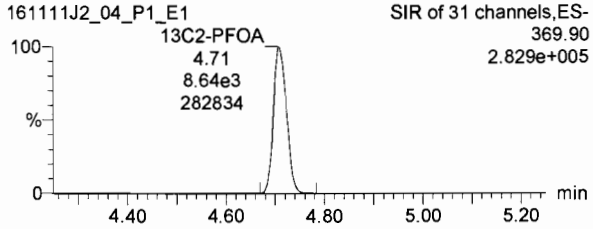
PFNA



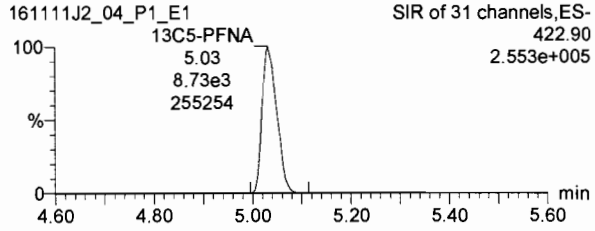
13C2-6:2 FTS



13C2-PFOA



13C5-PFNA



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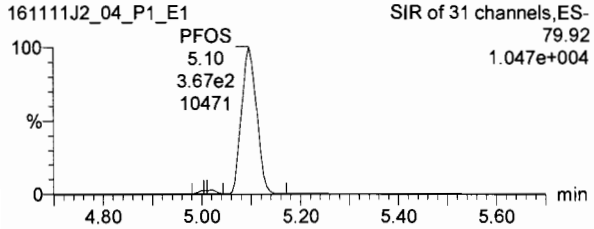
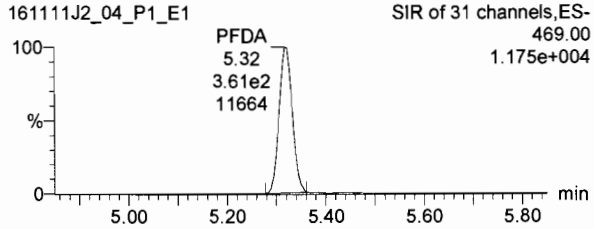
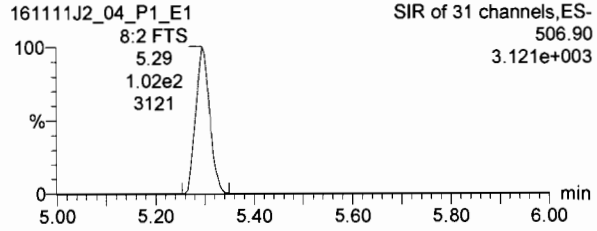


PFDA



8:2 FTS



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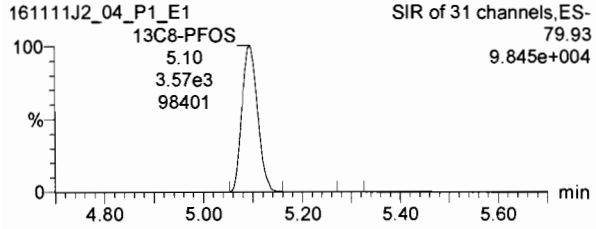

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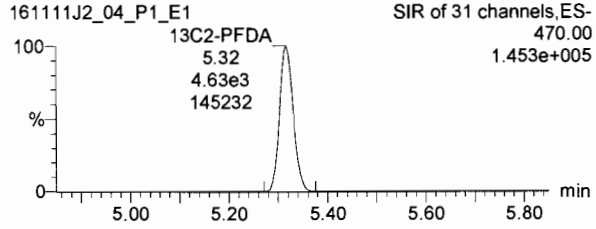
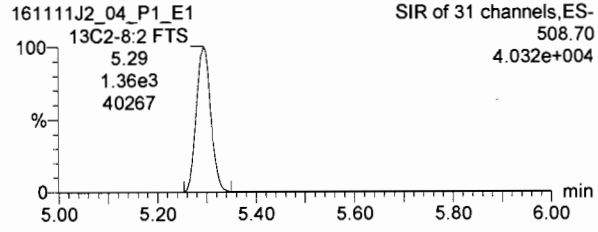


13C2-8:2 FTS



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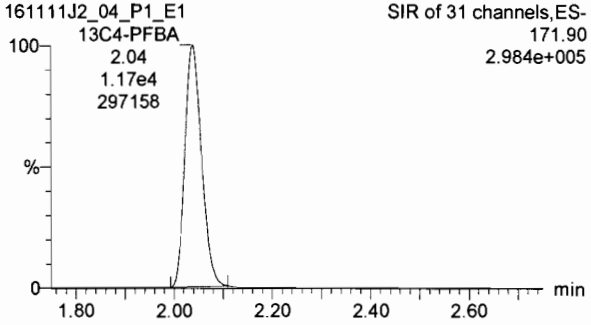
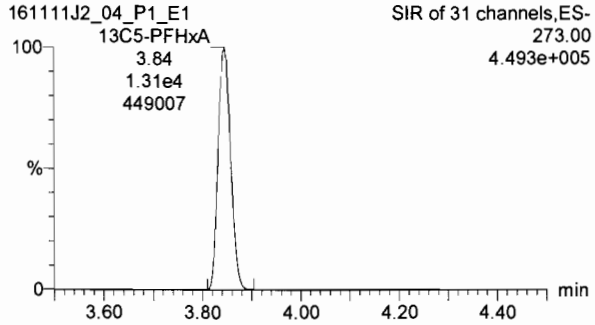
Name: 161111J2_04.wiff, Date: 11-Nov-2016, Time: 17:04:00, ID: ST161111J2-3 PFC CS0 16K1116, Description: PFC CS0 16K1116 A

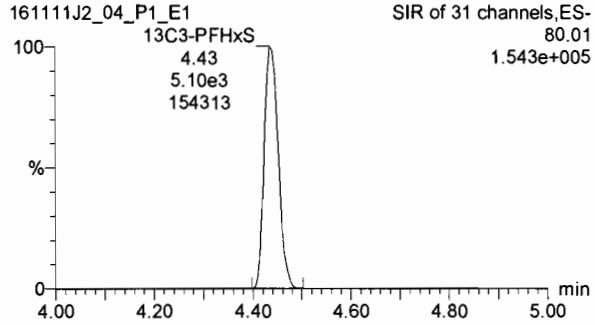
13C4-PFBA



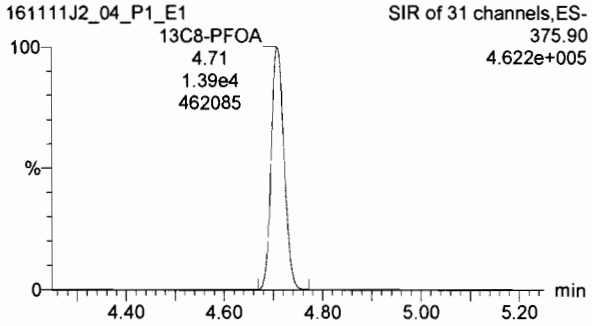
13C5-PFHxA



13C3-PFHxS



13C8-PFOA



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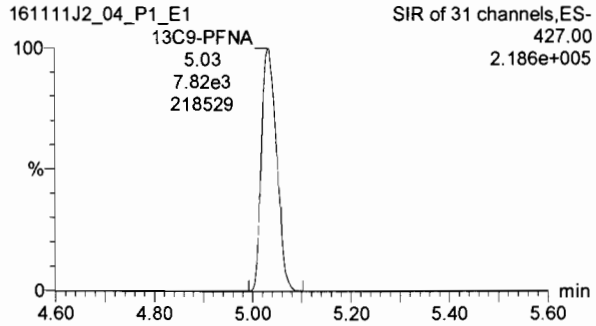

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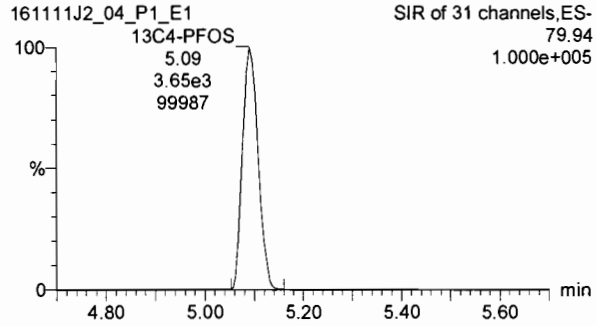
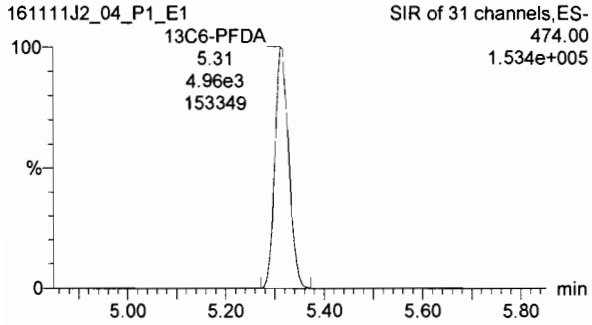


13C6-PFDA



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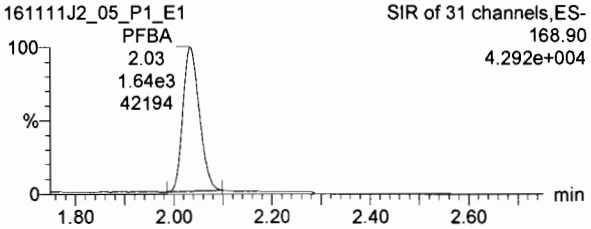
Name: 161111J2_05.wiff, Date: 11-Nov-2016, Time: 17:16:11, ID: ST161111J2-4 PFC CS1 16K1117, Description: PFC CS1 16K1117 A

PFBA



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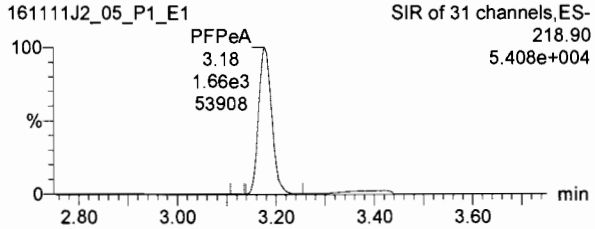

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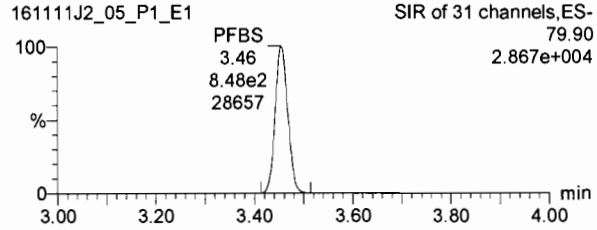

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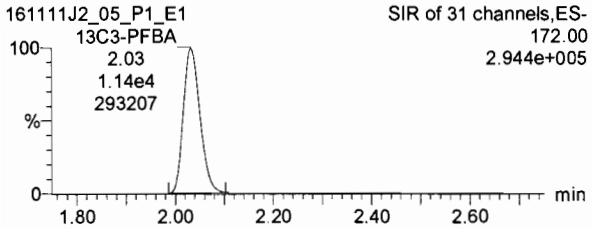

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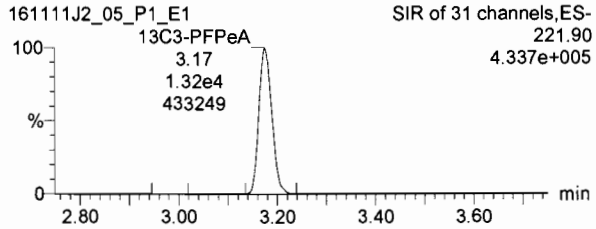

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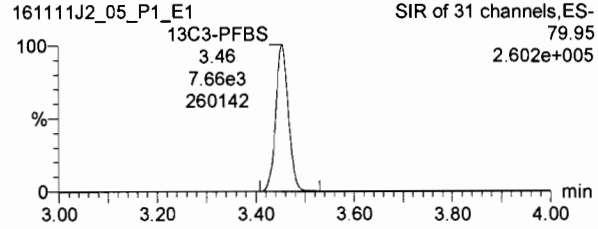

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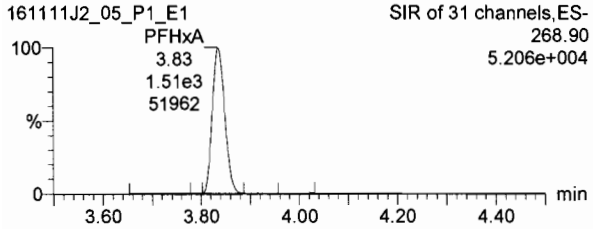

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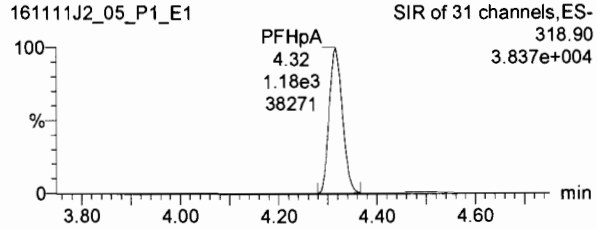

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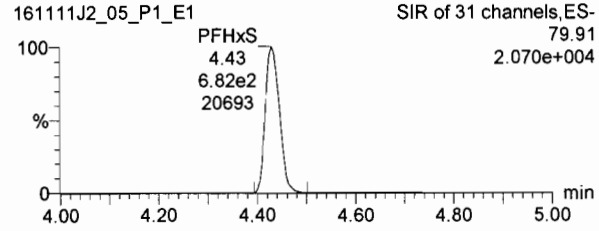

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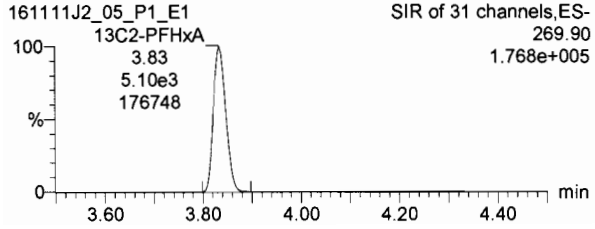

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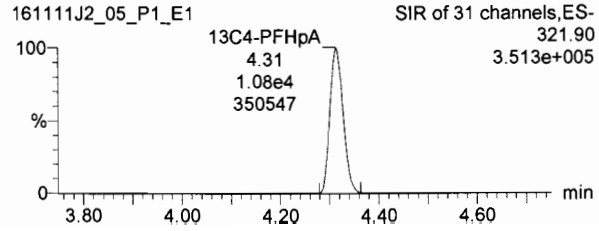
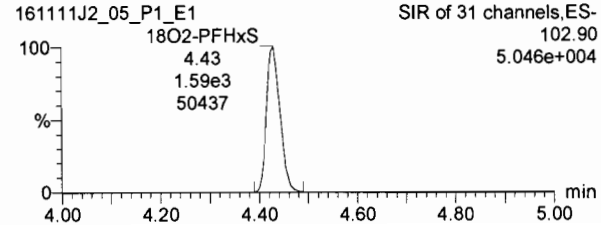


18O2-PFHxS



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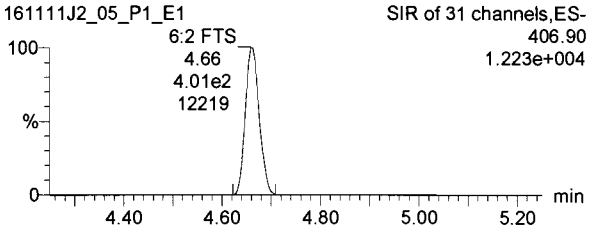
Name: 161111J2_05.wiff, Date: 11-Nov-2016, Time: 17:16:11, ID: ST161111J2-4 PFC CS1 16K1117, Description: PFC CS1 16K1117 A

6:2 FTS



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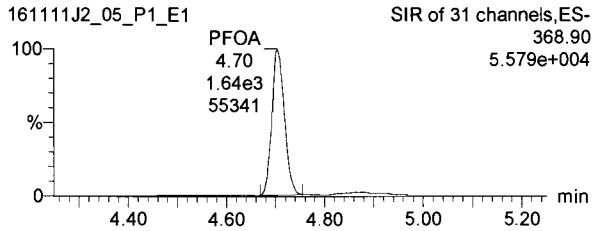

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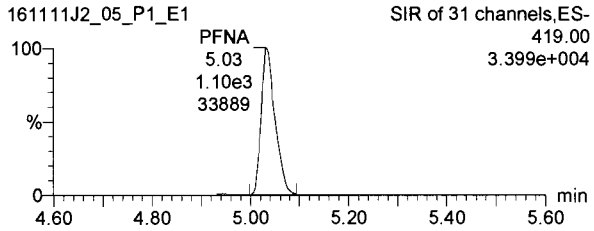
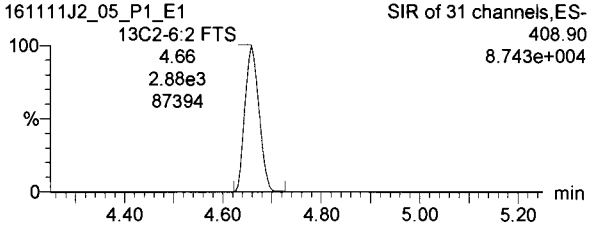


13C2-6:2 FTS



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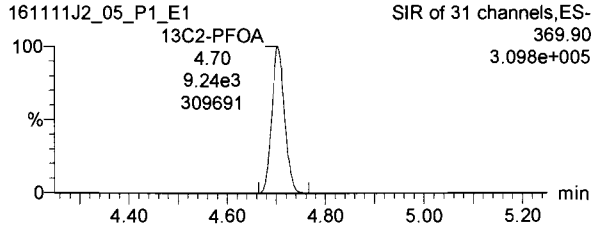

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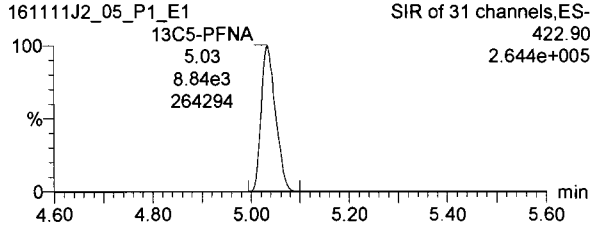

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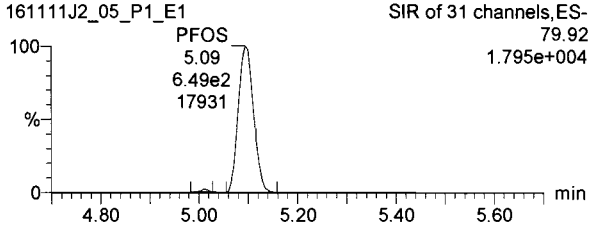

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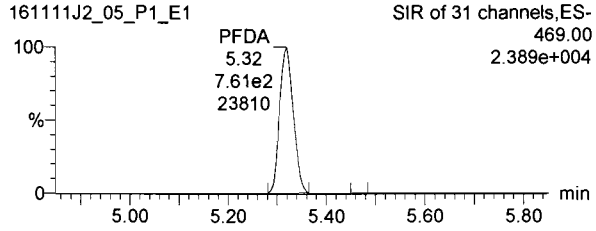

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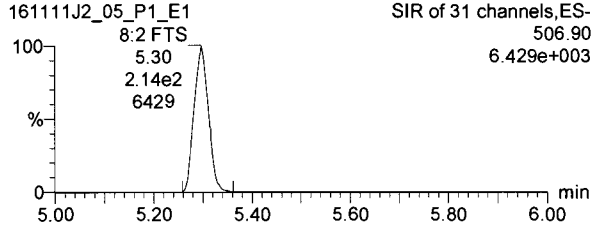

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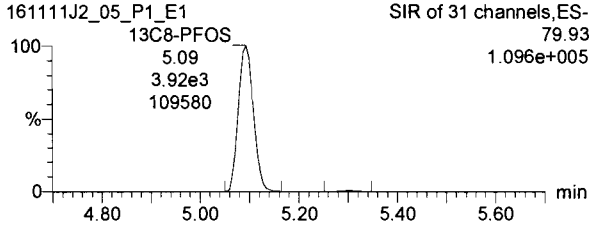

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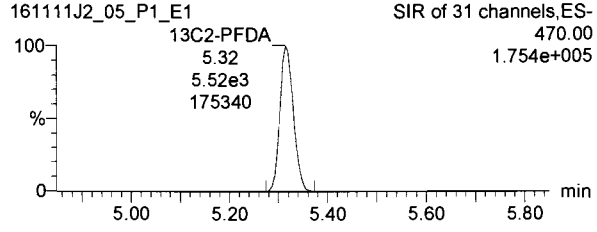

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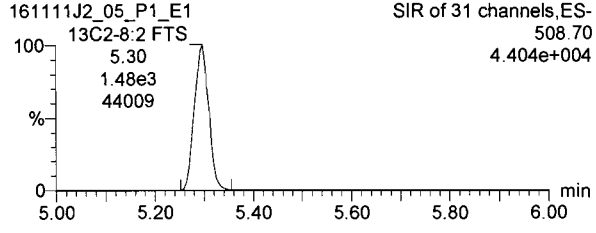

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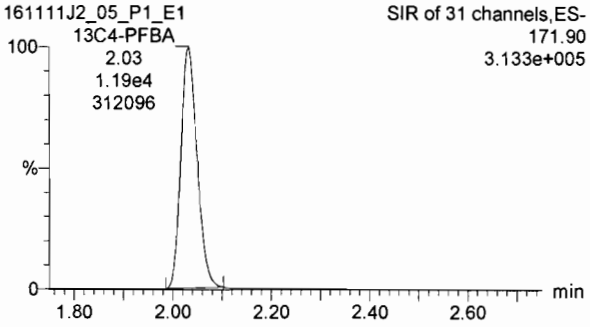
Name: 161111J2_05.wiff, Date: 11-Nov-2016, Time: 17:16:11, ID: ST161111J2-4 PFC CS1 16K1117, Description: PFC CS1 16K1117 A

13C4-PFBA



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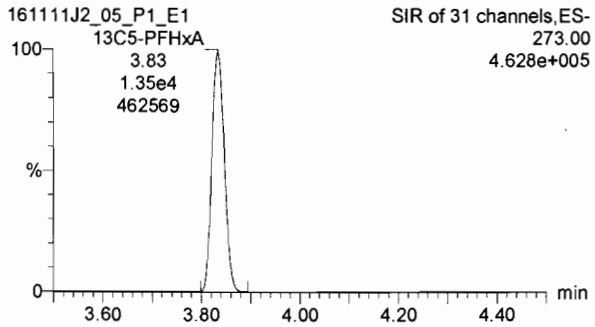

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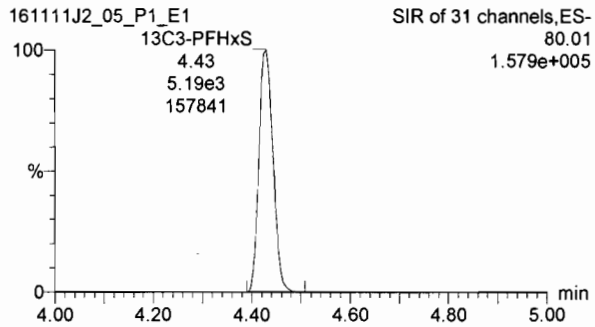

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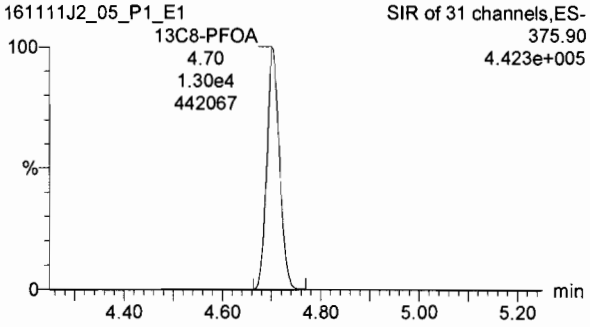

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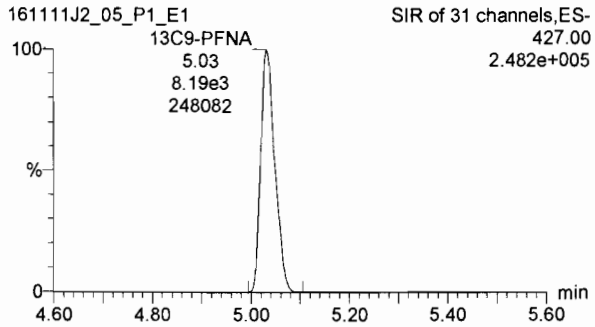

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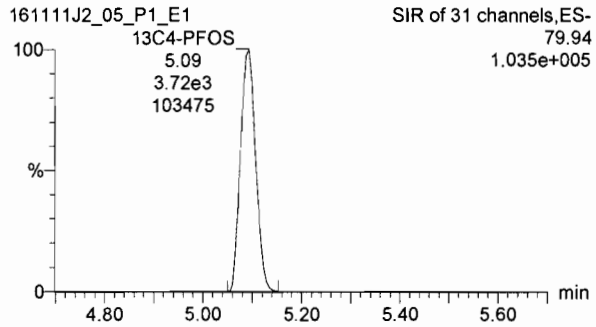

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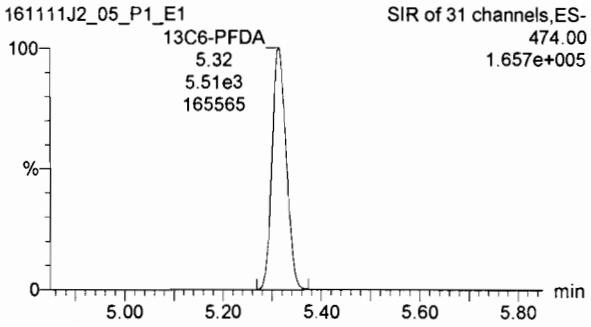

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Name: 161111J2_06.wiff, Date: 11-Nov-2016, Time: 17:28:26, ID: ST161111J2-5 PFC CS2 16K1118, Description: PFC CS2 16K1118 A

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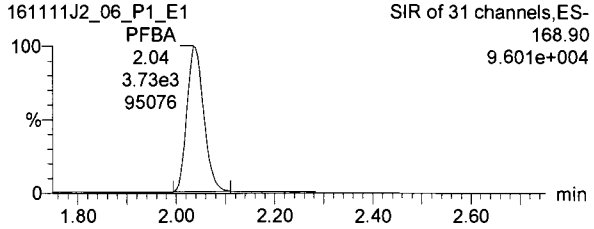

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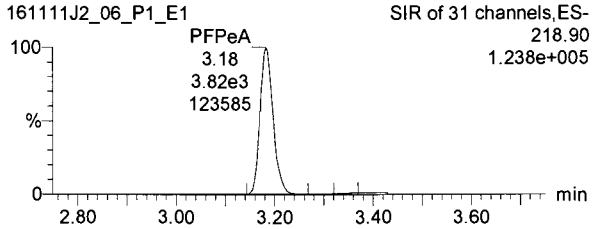

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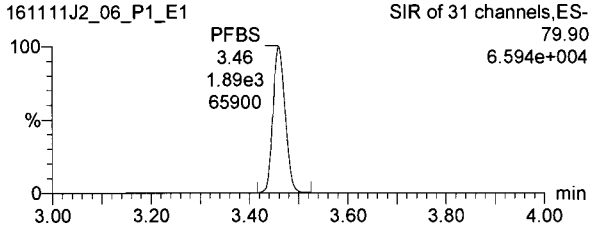

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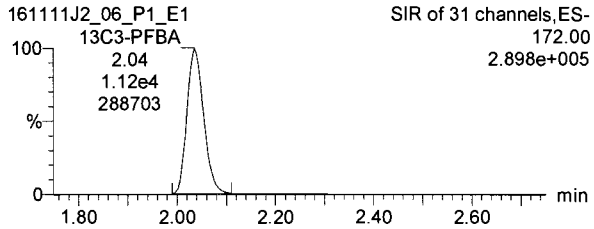

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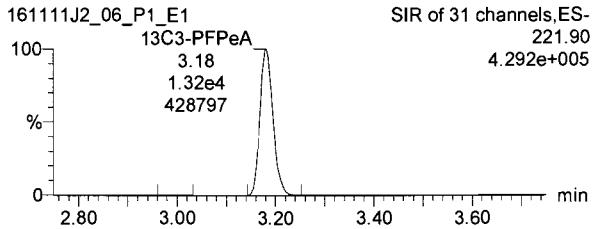

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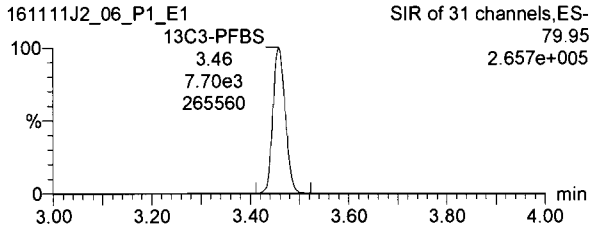

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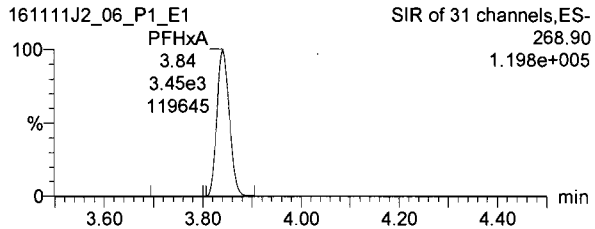

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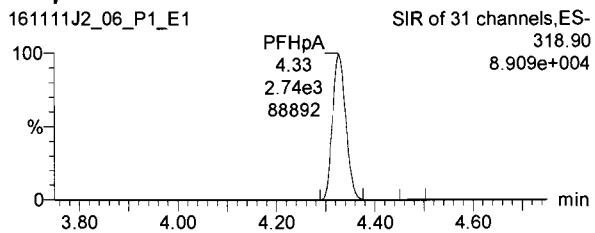

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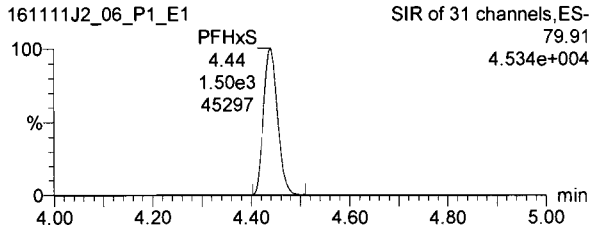

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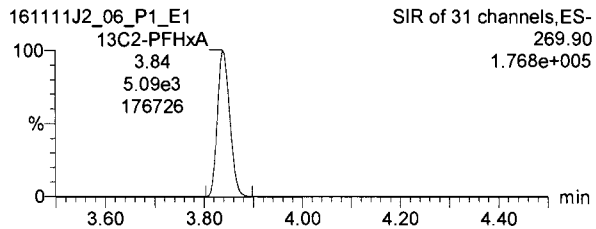

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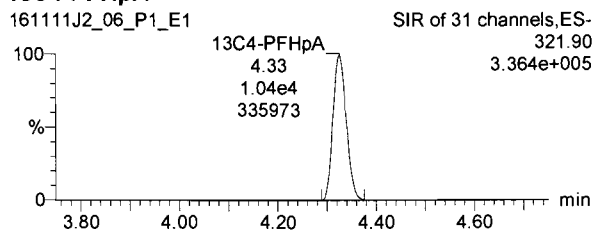
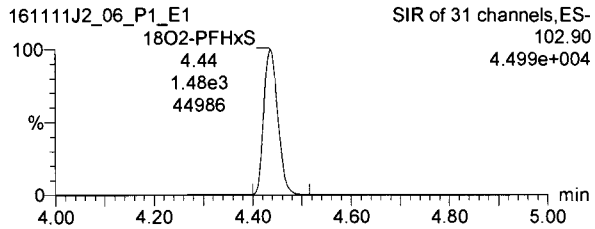


18O2-PFHxS



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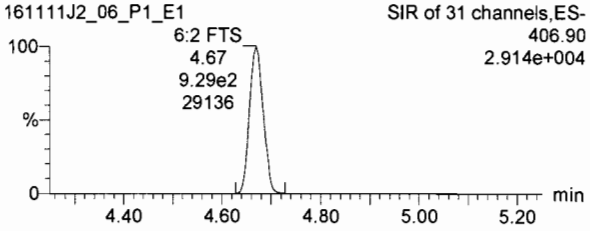
Name: 161111J2_06.wiff, Date: 11-Nov-2016, Time: 17:28:26, ID: ST161111J2-5 PFC CS2 16K1118, Description: PFC CS2 16K1118 A

6:2 FTS



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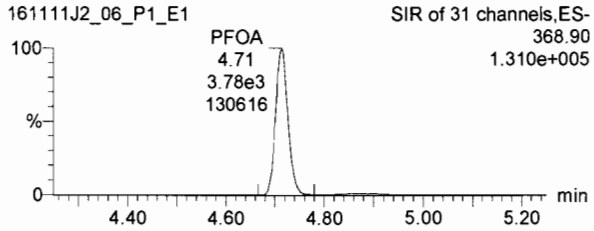

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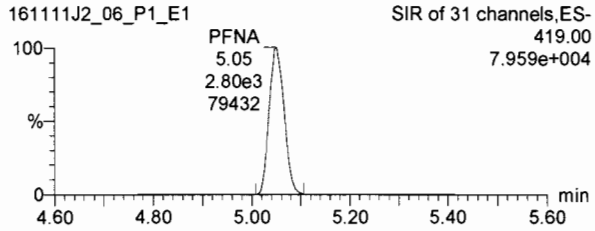
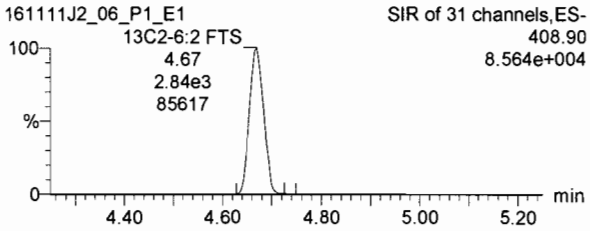


13C2-6:2 FTS



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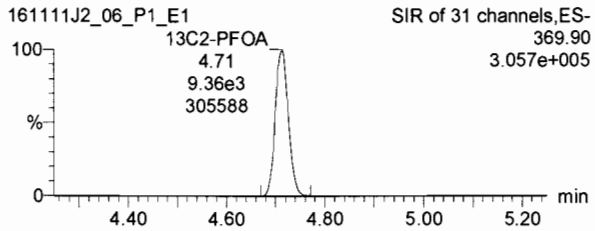

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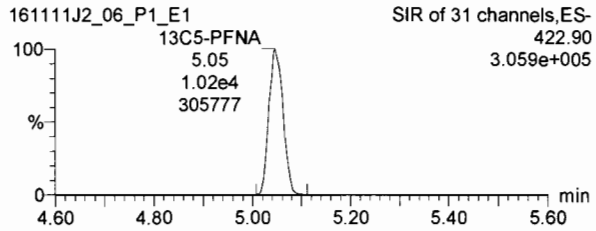
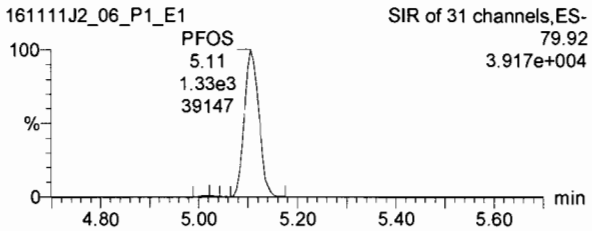


PFOS



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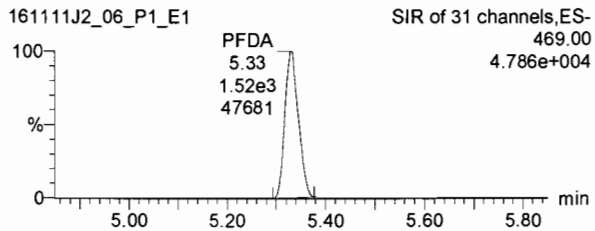
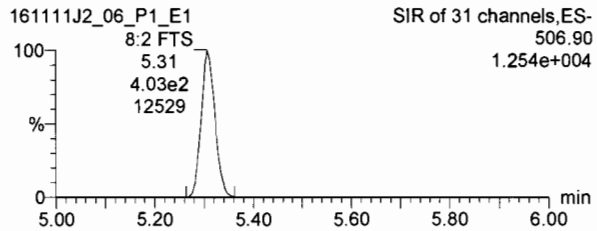
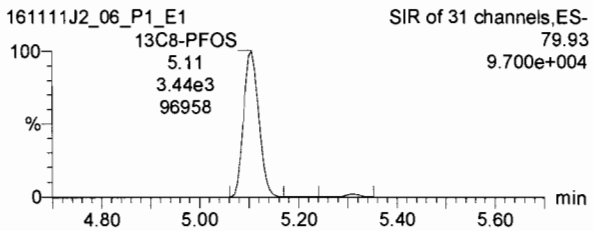


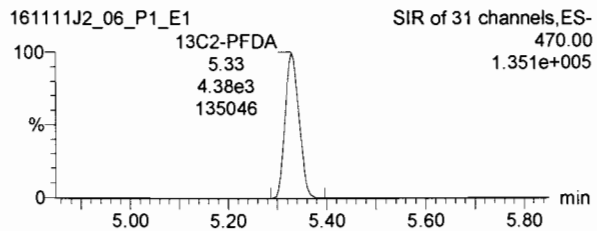
8:2 FTS



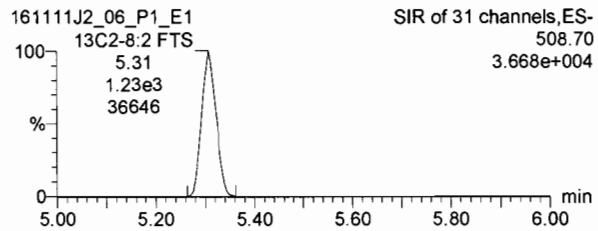
13C8-PFOS



13C2-PFDA



13C2-8:2 FTS



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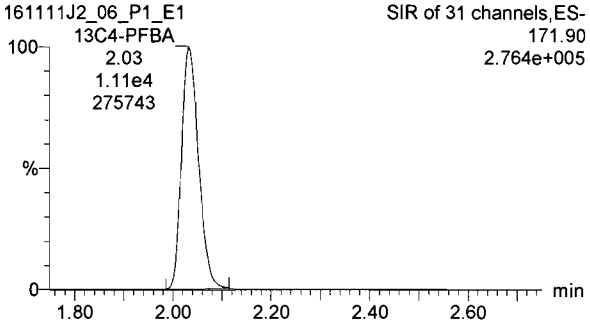
Name: 161111J2_06.wiff, Date: 11-Nov-2016, Time: 17:28:26, ID: ST161111J2-5 PFC CS2 16K1118, Description: PFC CS2 16K1118 A

13C4-PFBA



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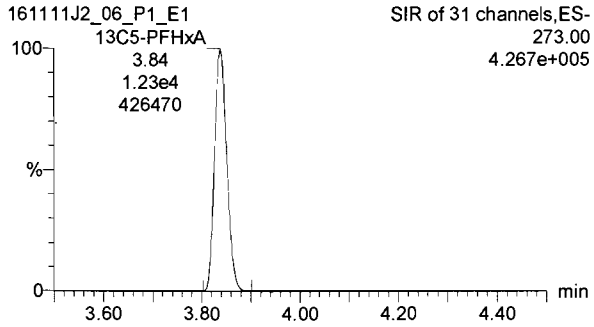

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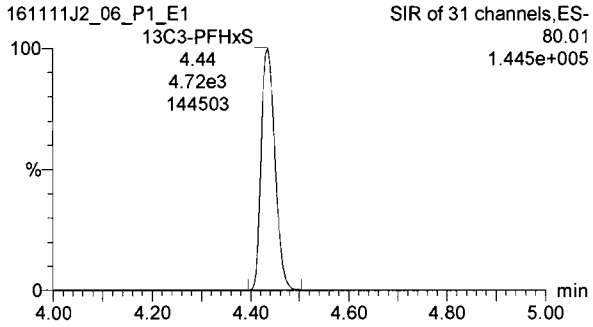

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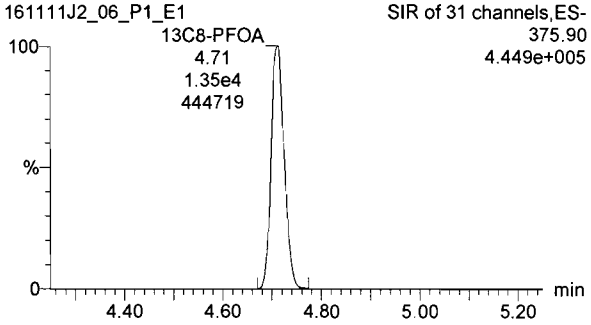
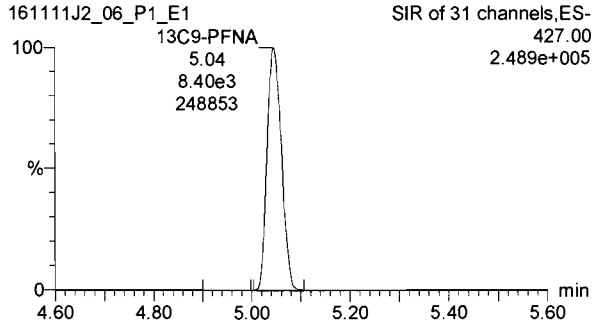


13C9-PFNA



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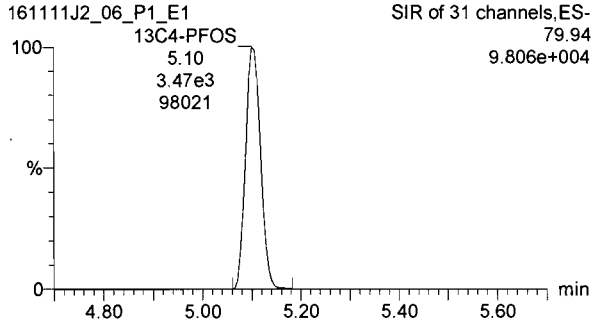

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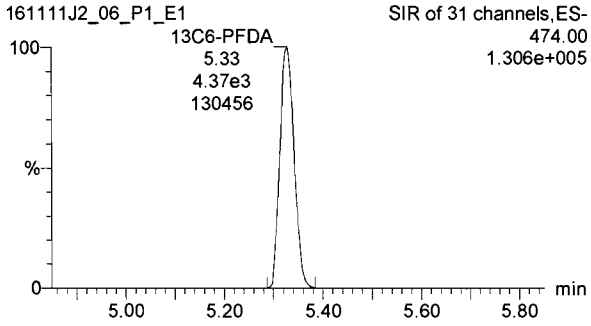

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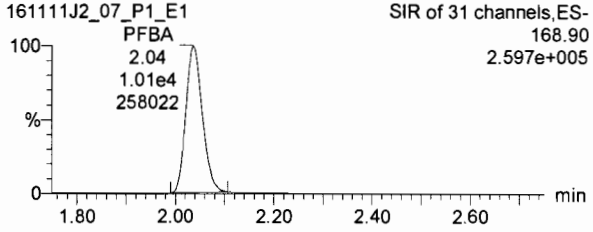
PFBA



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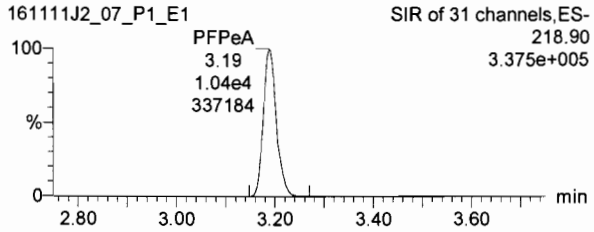

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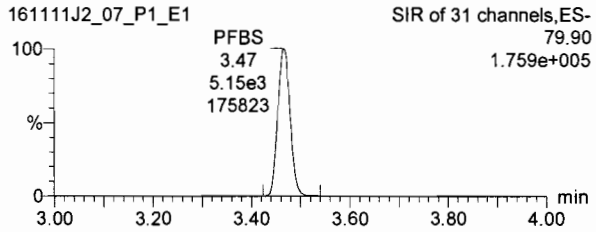

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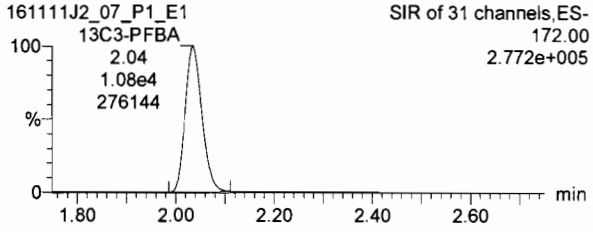

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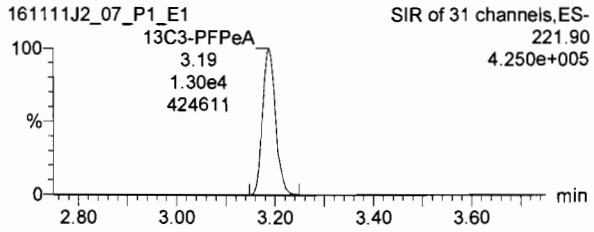

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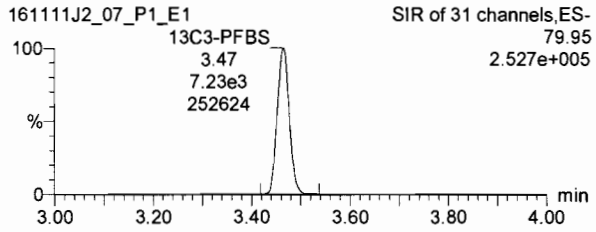

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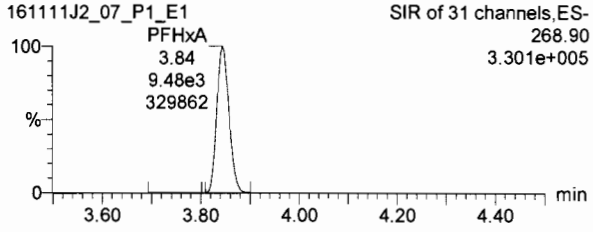

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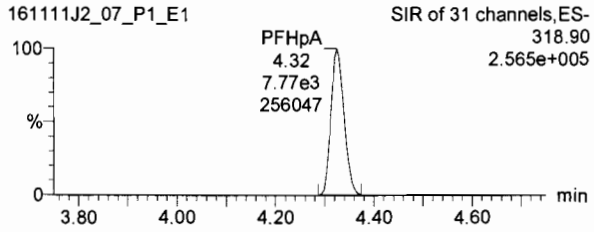

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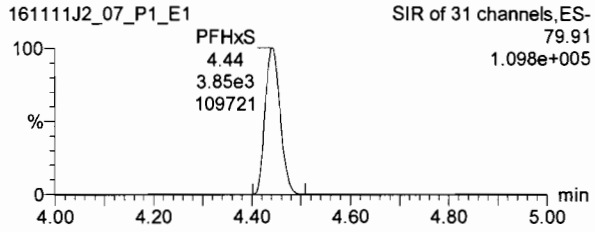

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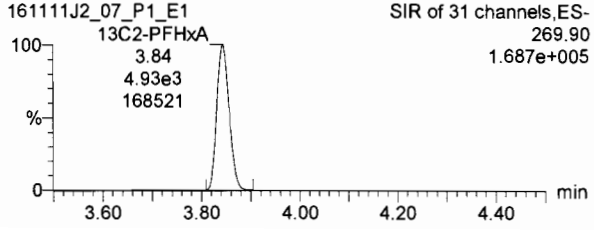
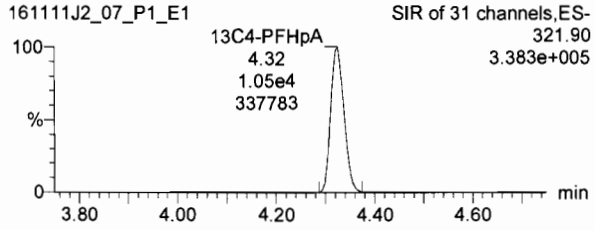


13C4-PFHpA



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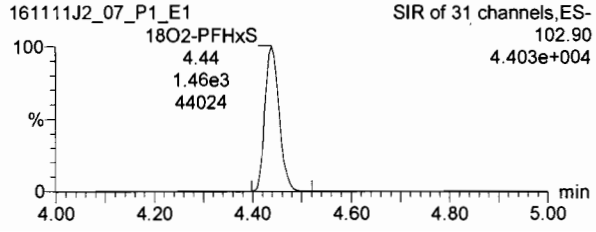

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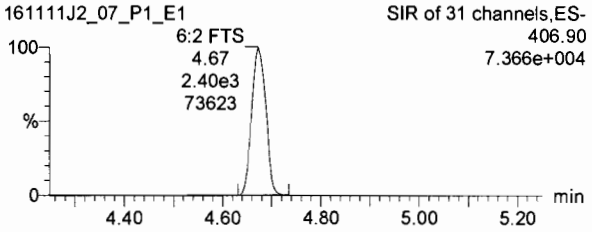
6:2 FTS



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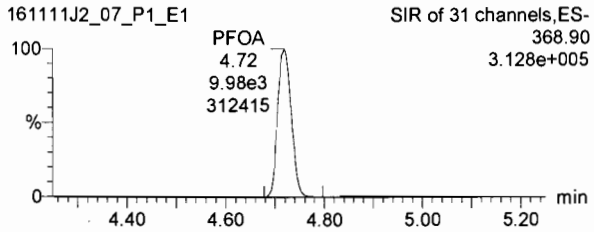

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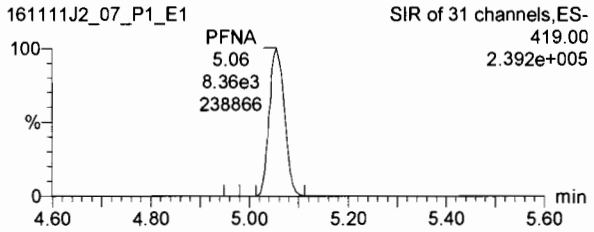
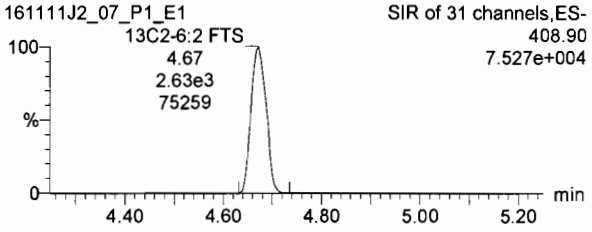


13C2-6:2 FTS



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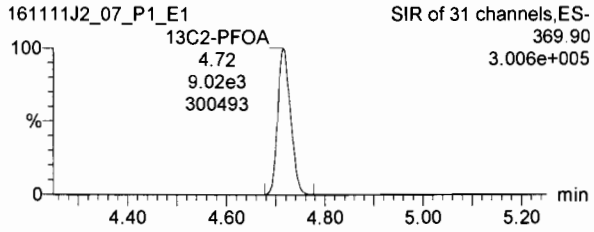

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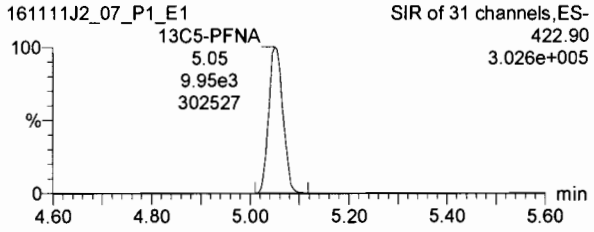

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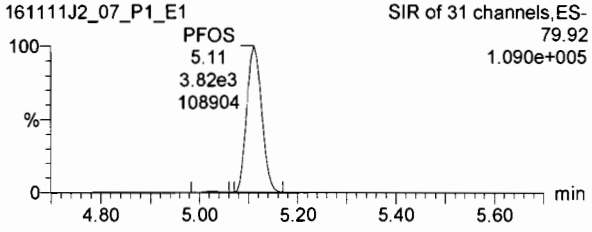
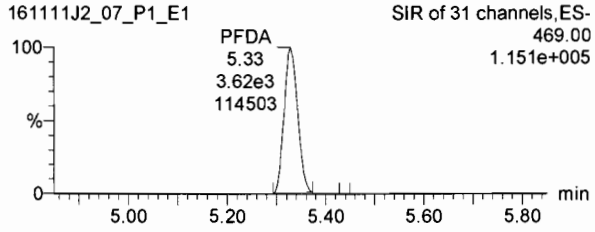
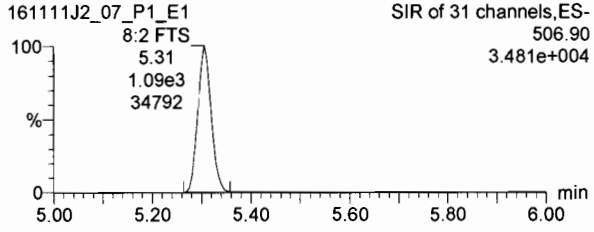


PFDA



8:2 FTS



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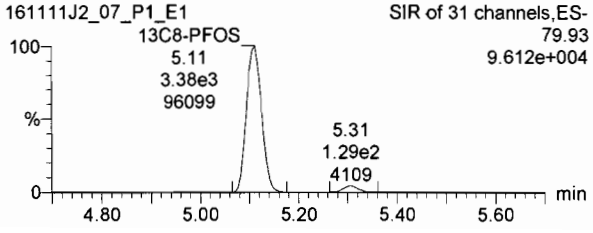

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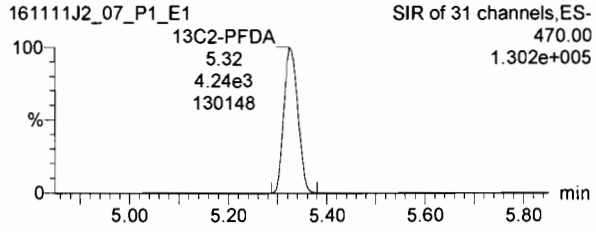
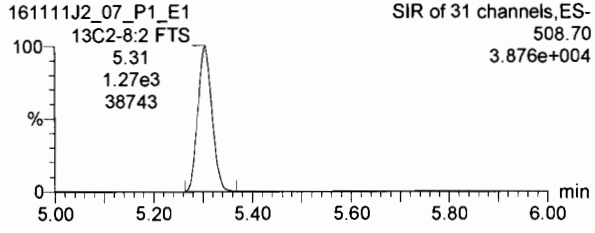


13C2-8:2 FTS



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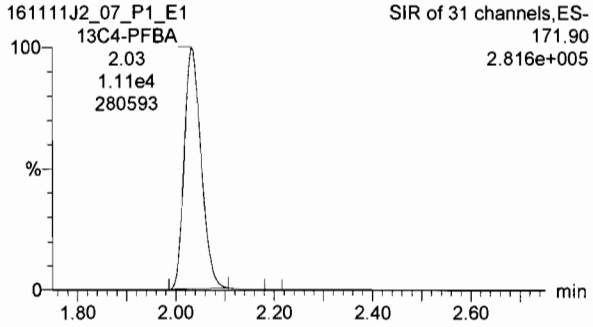
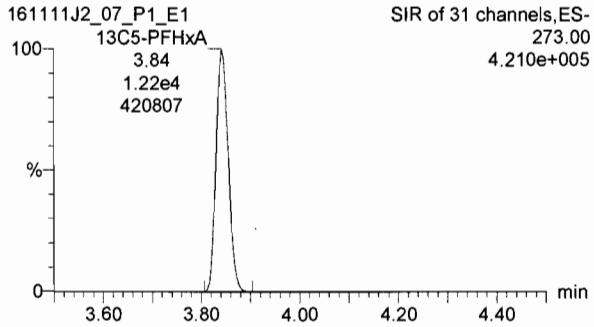
Name: 161111J2_07.wiff, Date: 11-Nov-2016, Time: 17:40:40, ID: ST161111J2-6 PFC CS3 16K1119, Description: PFC CS3 16K1119 A

13C4-PFBA



13C5-PFHxA



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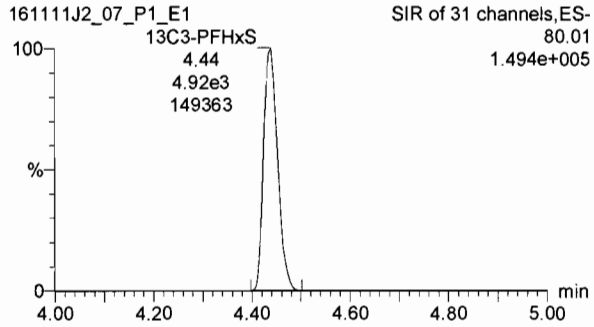

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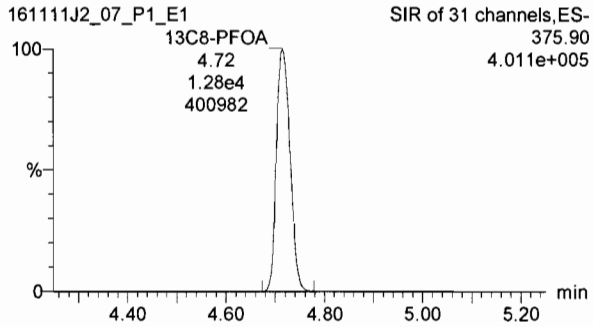

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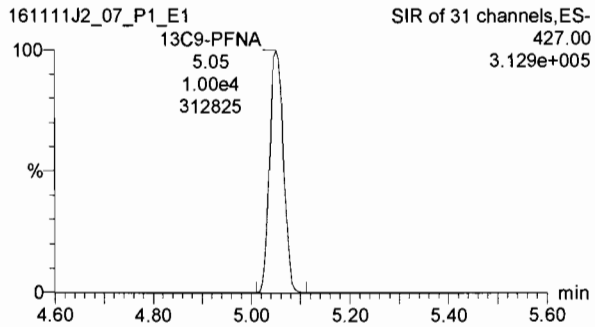

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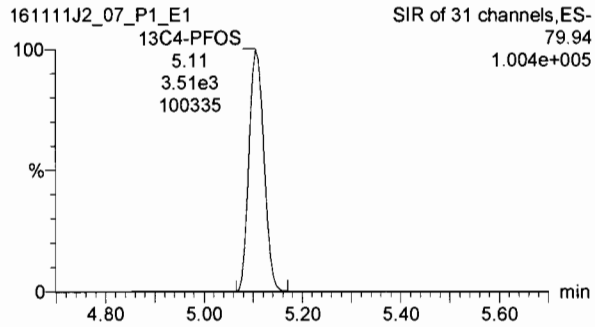

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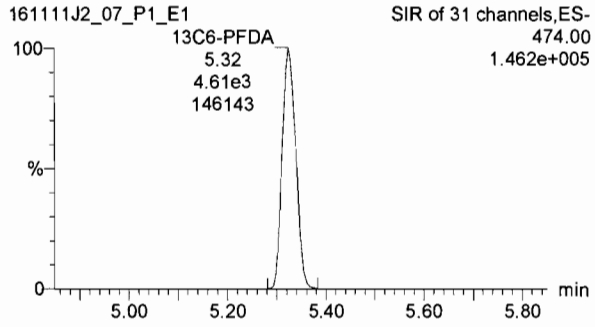

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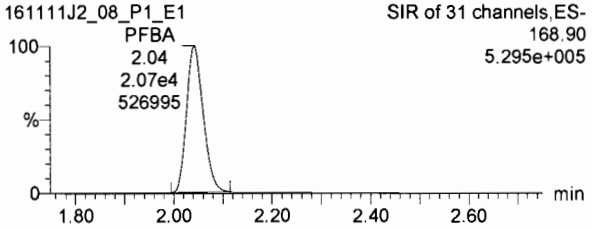

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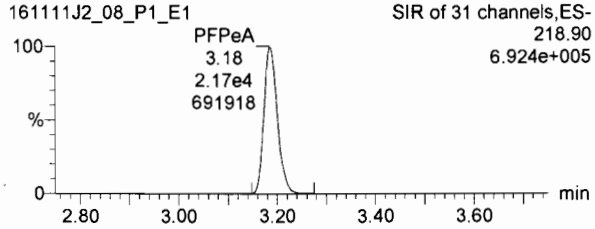

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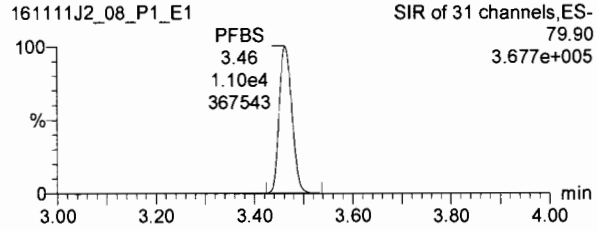

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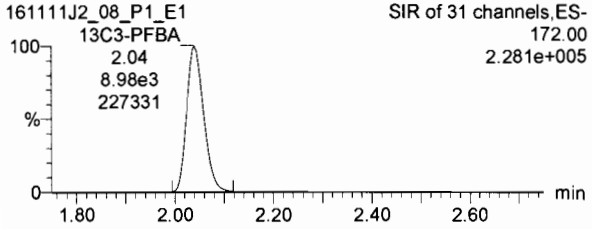

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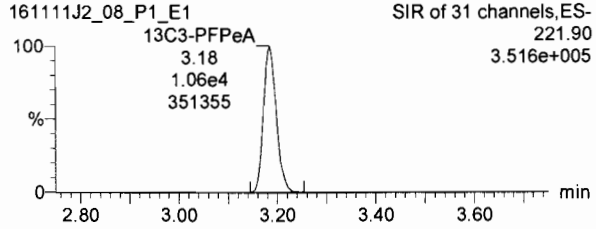

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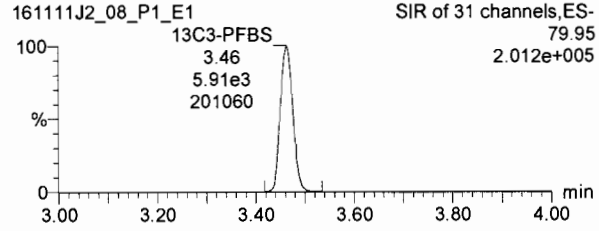

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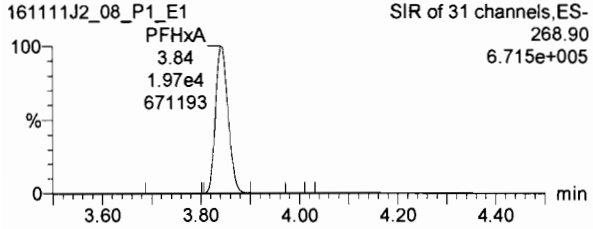

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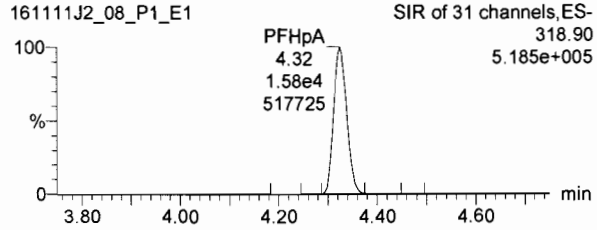

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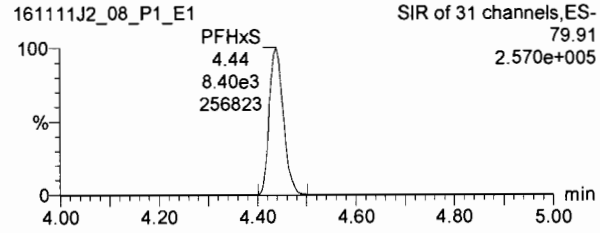

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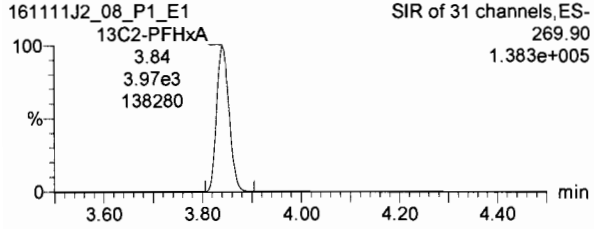
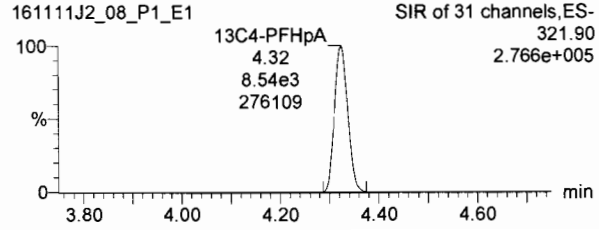
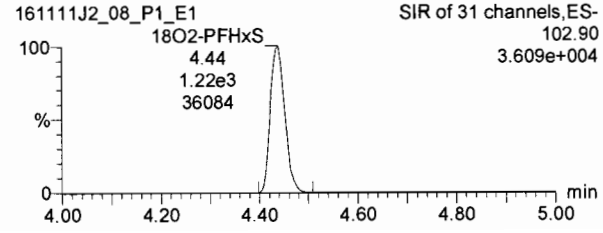


13C4-PFHpA



18O2-PFHxS



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Name: 161111J2_08.wiff, Date: 11-Nov-2016, Time: 17:52:55, ID: ST161111J2-7 PFC C3.5 16K1120, Description: PFC C3.5 16K1120 A

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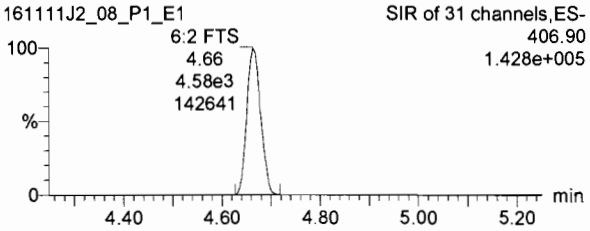

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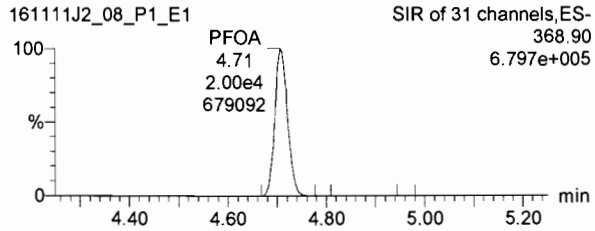

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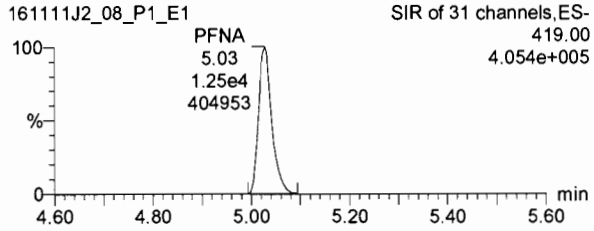

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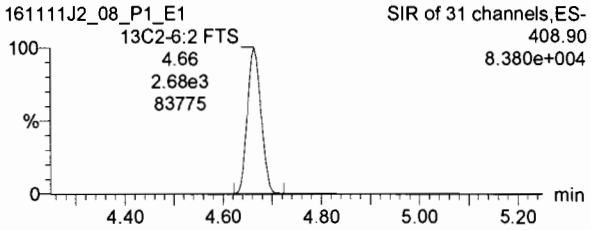

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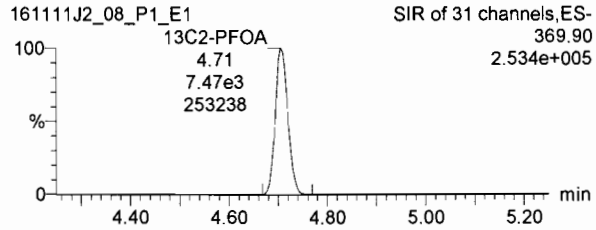

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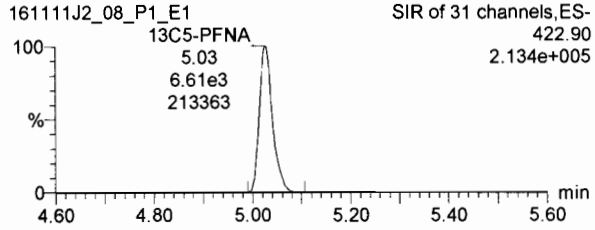

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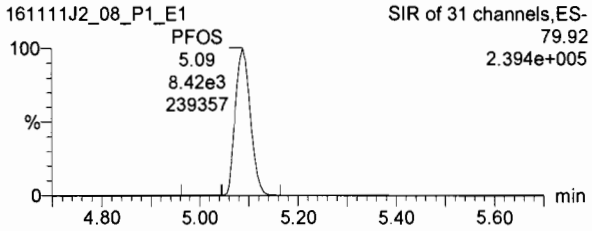
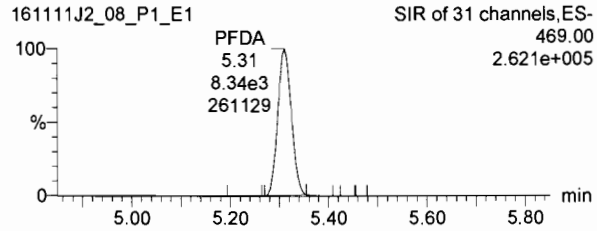


PFDA



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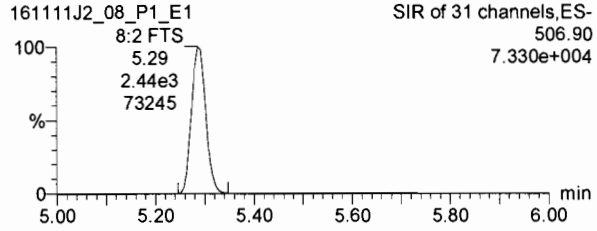

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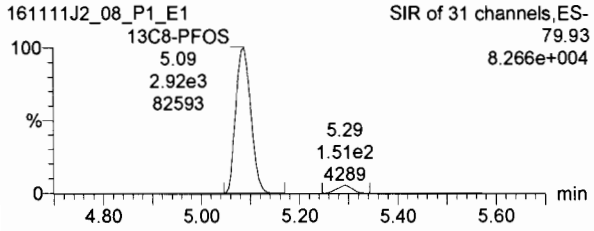

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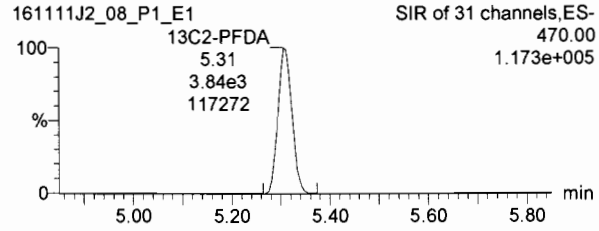

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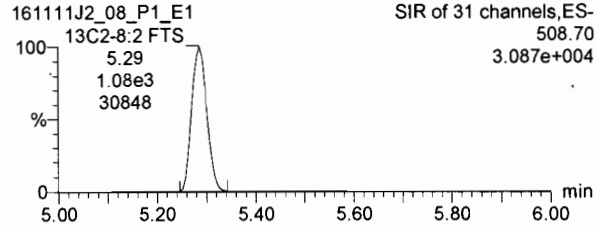

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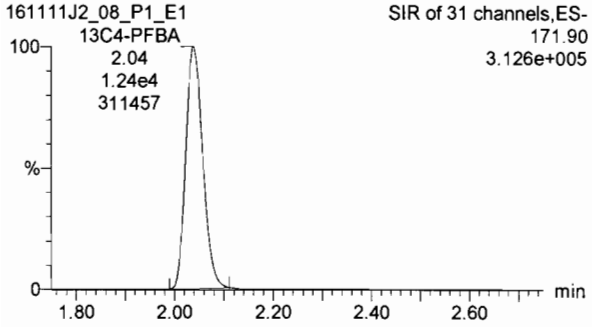
Name: 161111J2_08.wiff, Date: 11-Nov-2016, Time: 17:52:55, ID: ST161111J2-7 PFC C3.5 16K1120, Description: PFC C3.5 16K1120 A

13C4-PFBA



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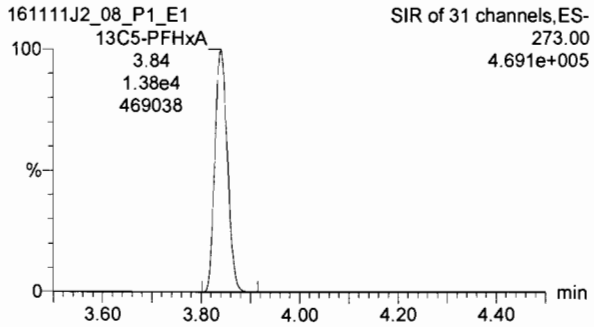

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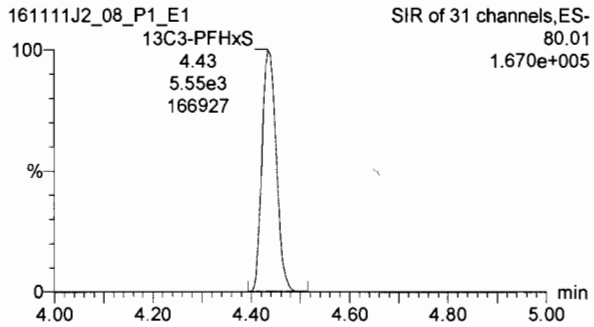

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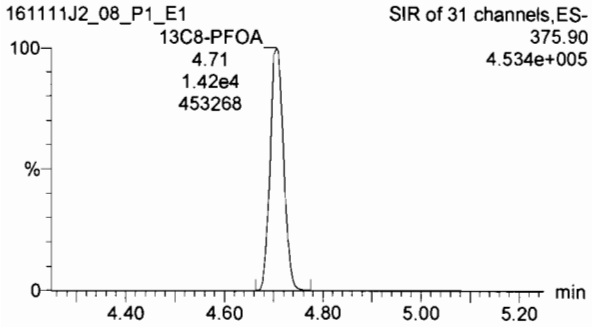

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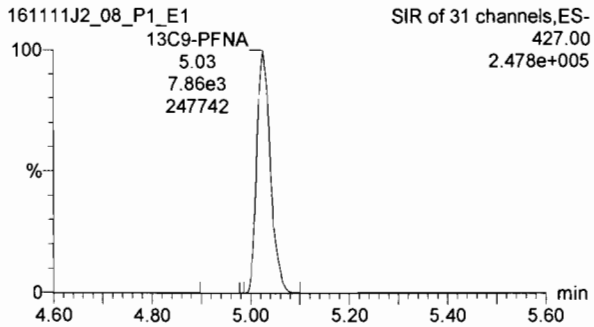

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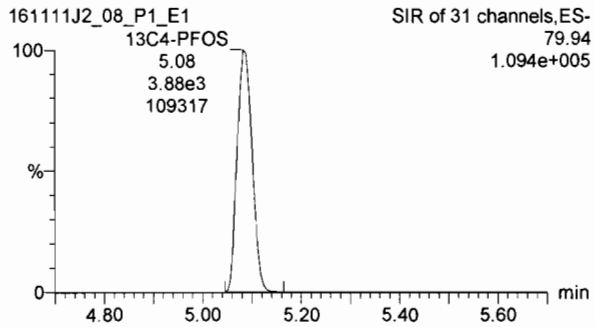

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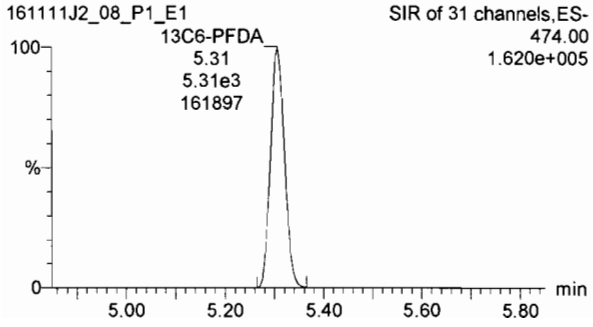

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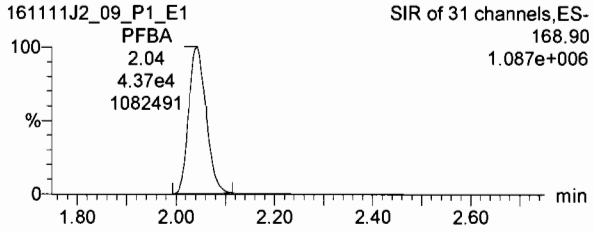

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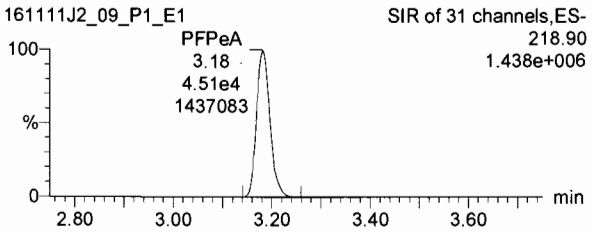

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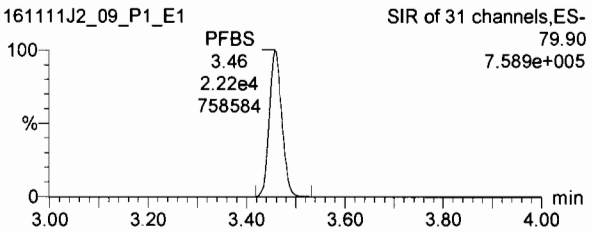

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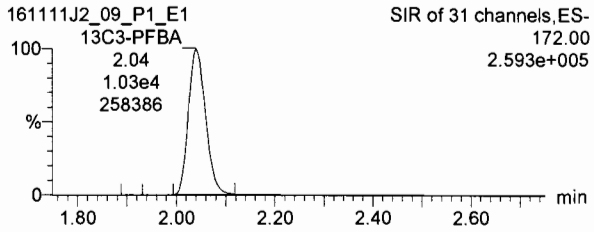

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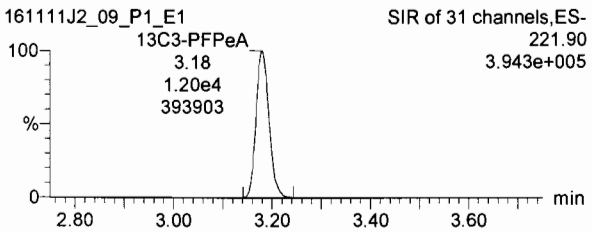

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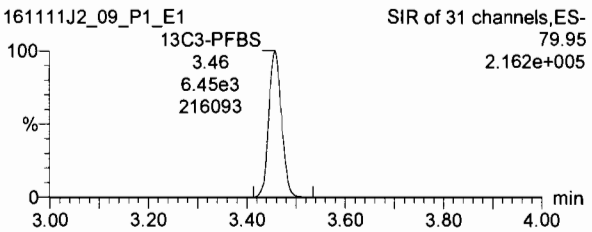

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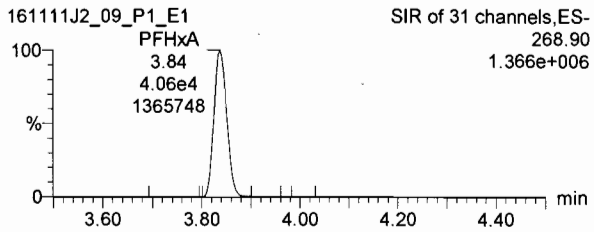
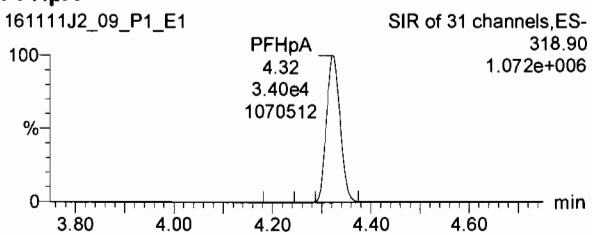


PFHpA



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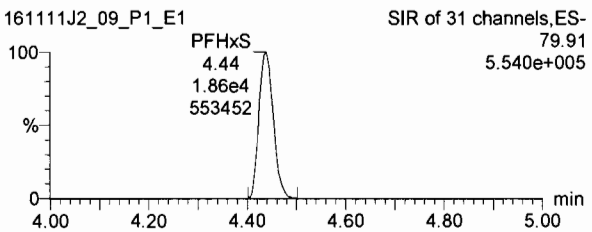

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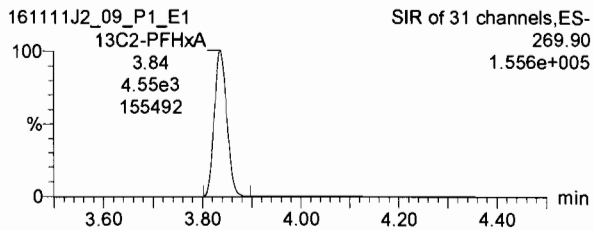
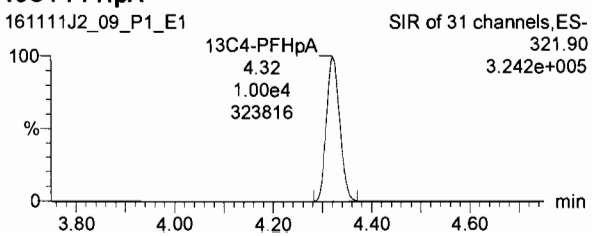
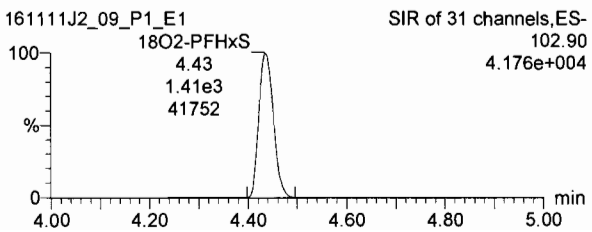


13C4-PFHpA



18O2-PFHxS



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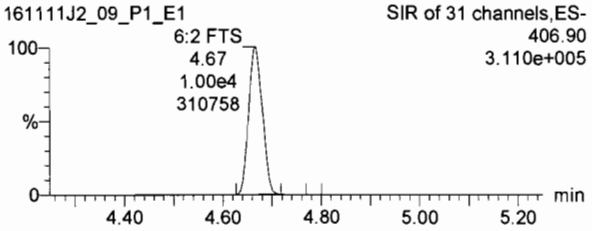
Name: 161111J2_09.wiff, Date: 11-Nov-2016, Time: 18:05:09, ID: ST161111J2-8 PFC CS4 16K1121, Description: PFC CS4 16K1121 A

6:2 FTS



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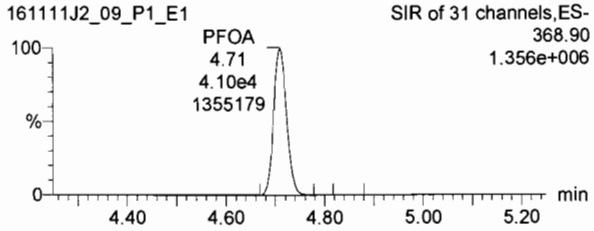

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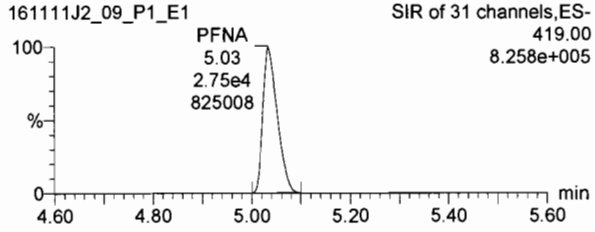
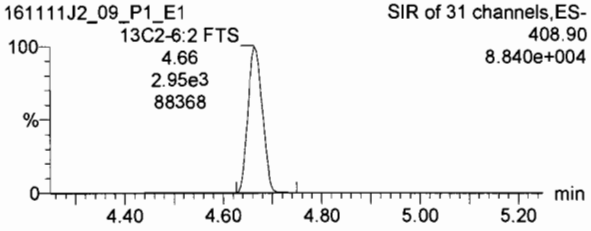


13C2-6:2 FTS



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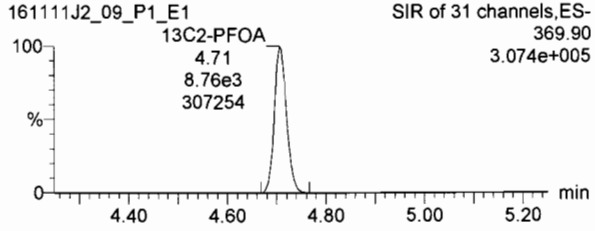

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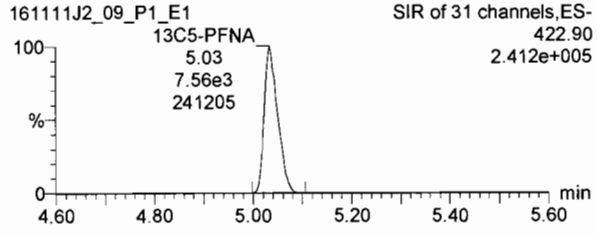
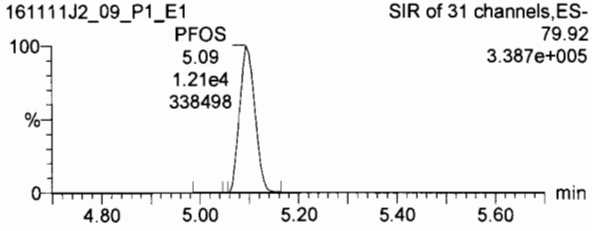
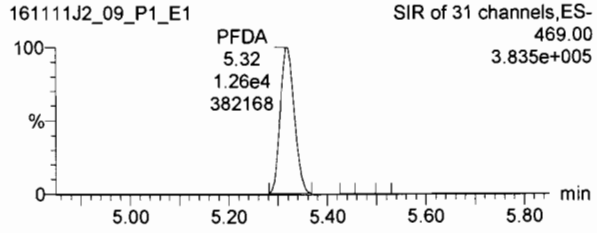


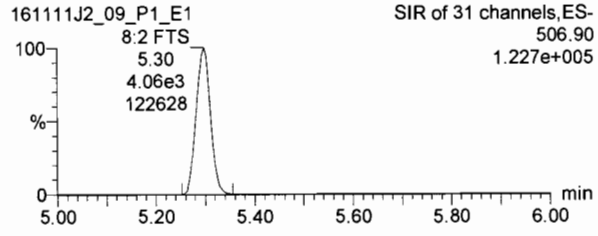
PFOS



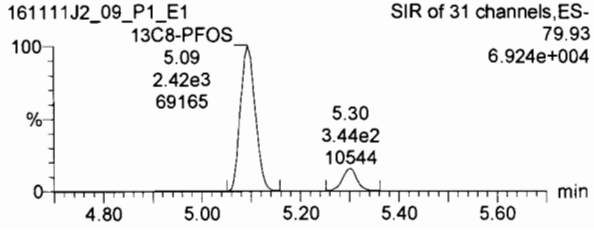
PFDA



8:2 FTS



13C8-PFOS



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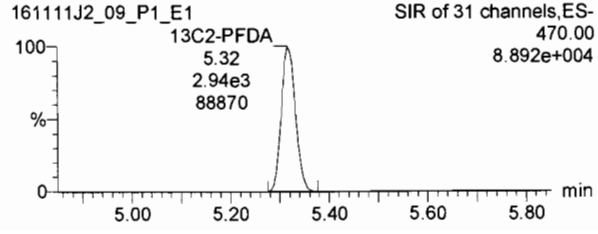
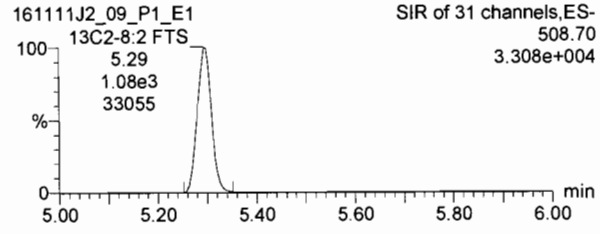


13C2-8:2 FTS



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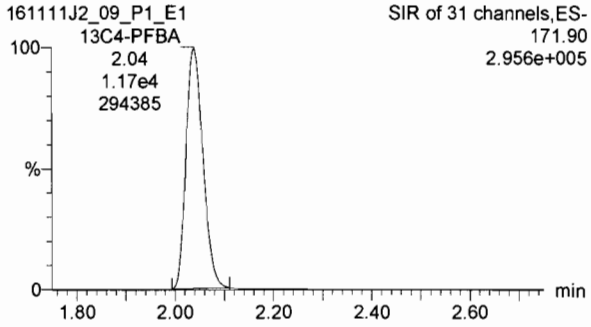
Name: 161111J2_09.wiff, Date: 11-Nov-2016, Time: 18:05:09, ID: ST161111J2-8 PFC CS4 16K1121, Description: PFC CS4 16K1121 A

13C4-PFBA



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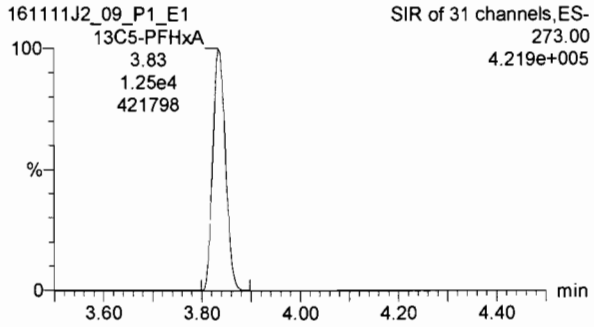
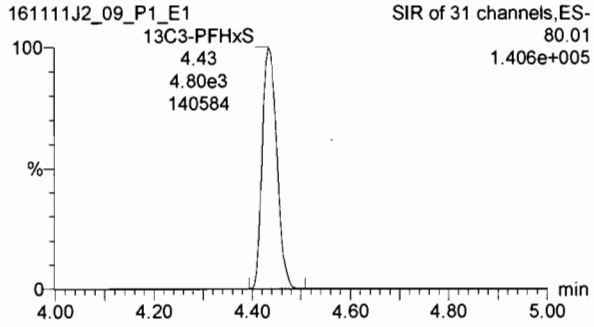


13C3-PFHxS



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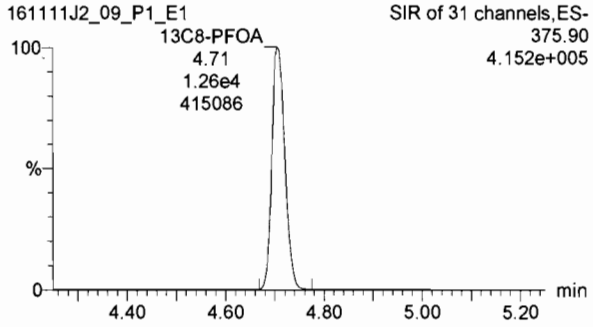

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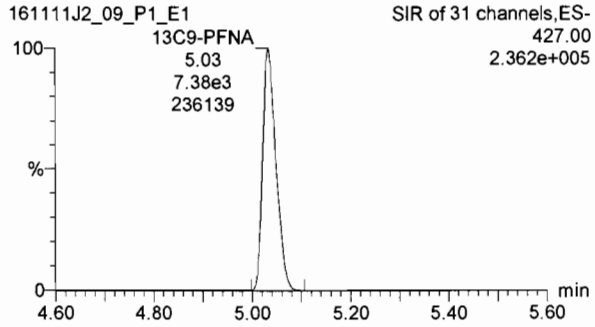

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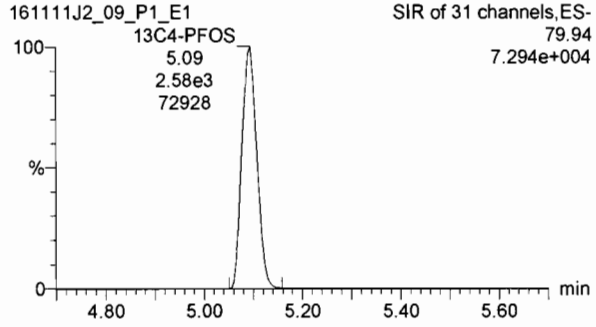
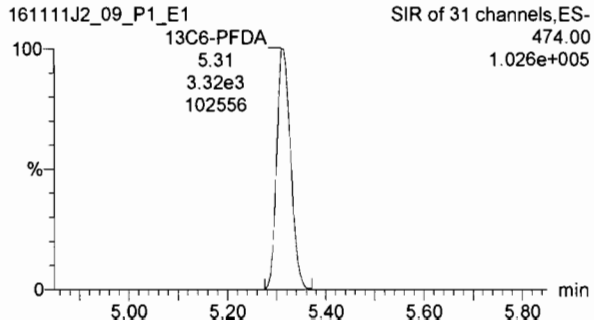


13C6-PFDA



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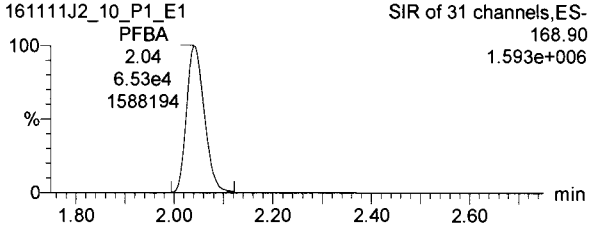
Name: 161111J2_10.wiff, Date: 11-Nov-2016, Time: 18:17:21, ID: ST161111J2-9 PFC CS4.5 16K1122, Description: PFC CS4.5 16K1122 A

PFBA



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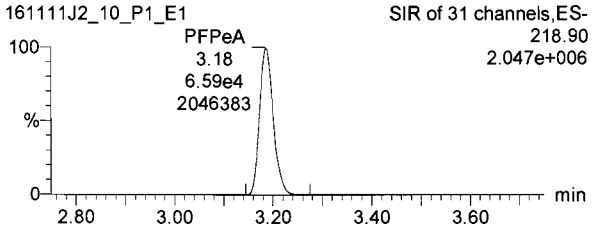

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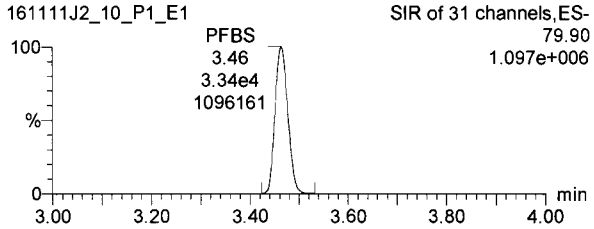

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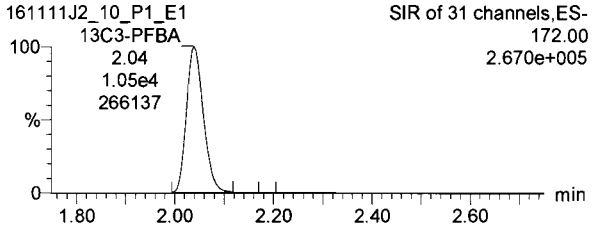

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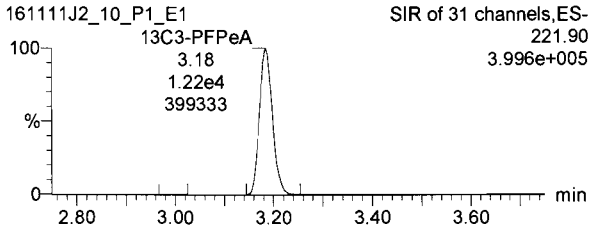

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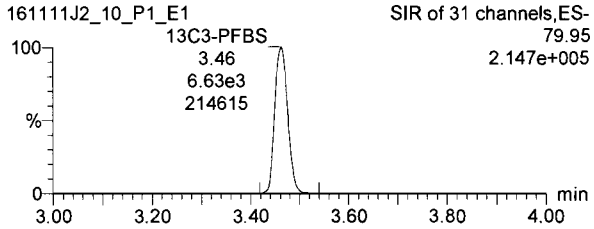

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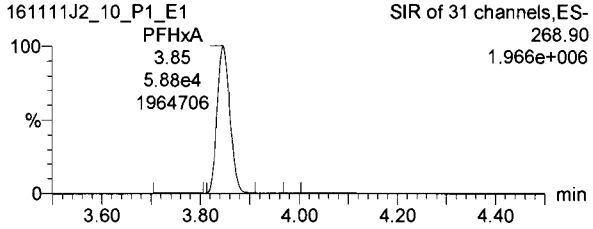

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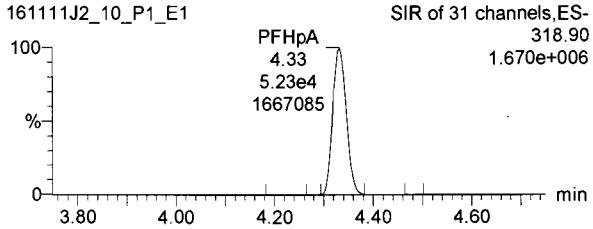

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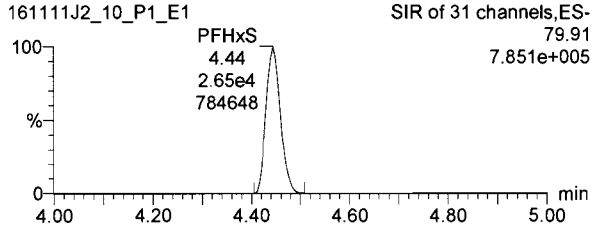
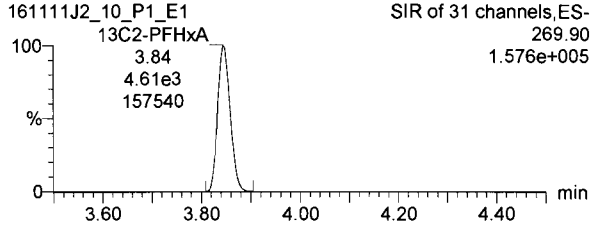


13C2-PFHxA



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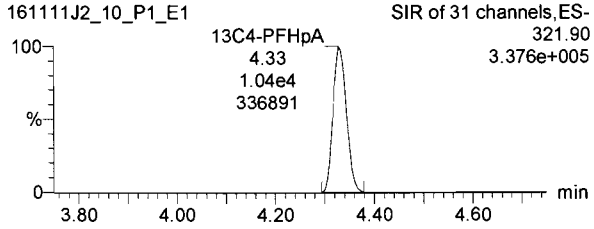
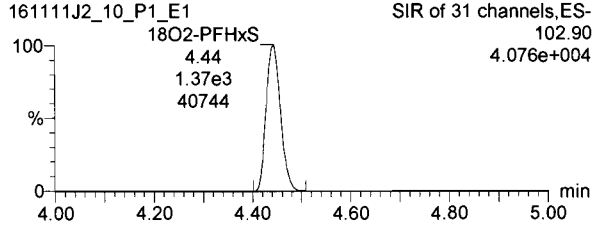


18O2-PFHxS



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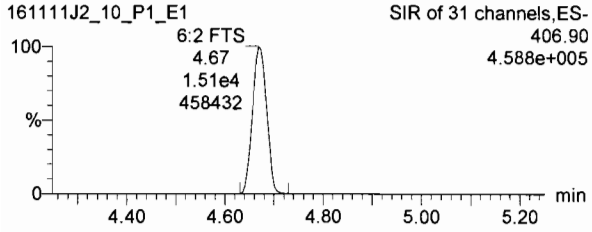
Name: 161111J2_10.wiff, Date: 11-Nov-2016, Time: 18:17:21, ID: ST161111J2-9 PFC CS4.5 16K1122, Description: PFC CS4.5 16K1122 A

6:2 FTS



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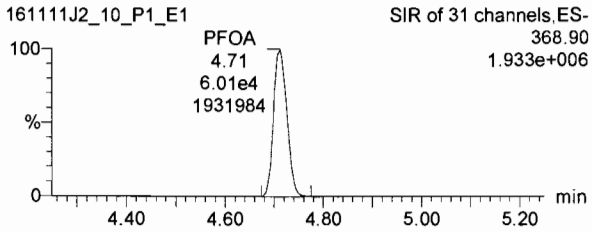

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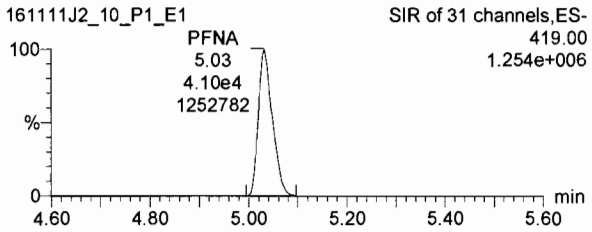
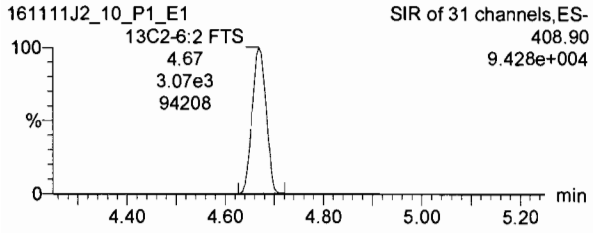


13C2-6:2 FTS



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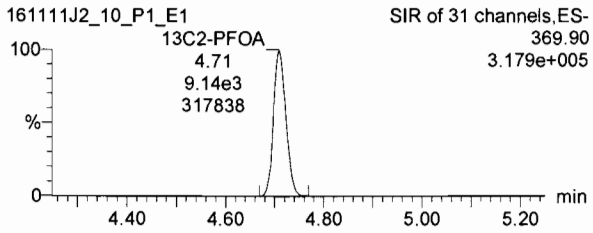

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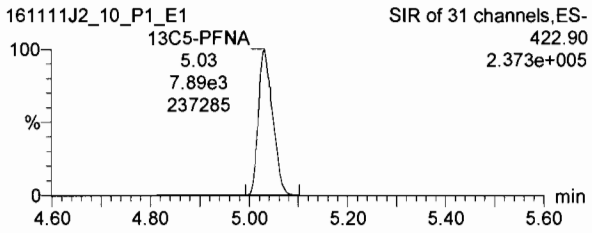

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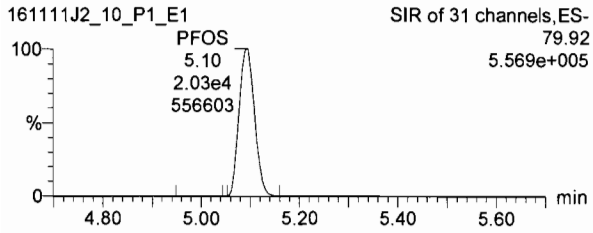

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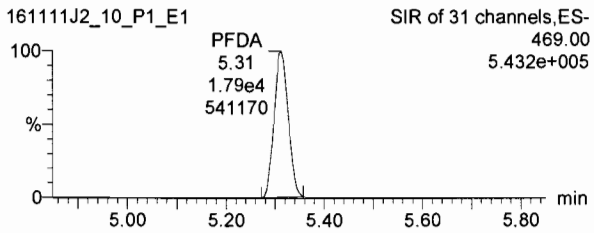
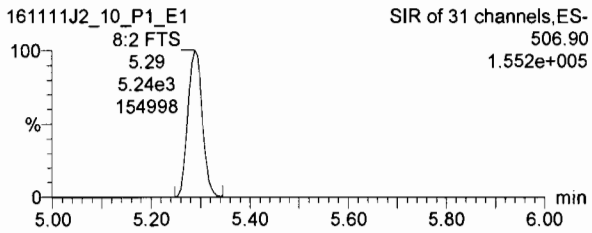


8:2 FTS



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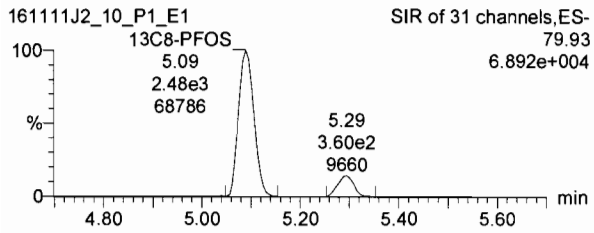

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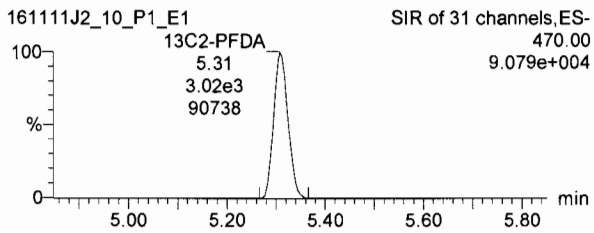

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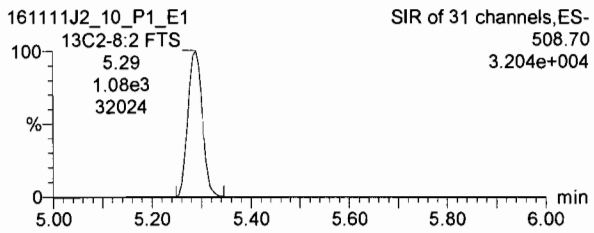

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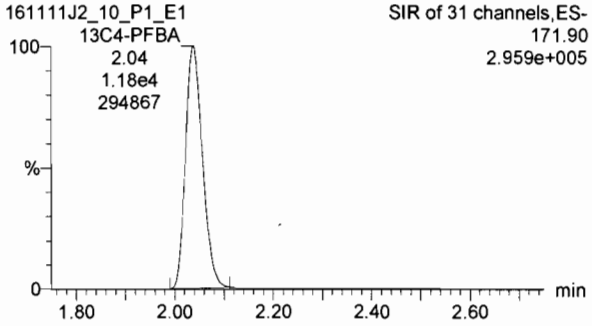
Name: 161111J2_10.wiff, Date: 11-Nov-2016, Time: 18:17:21, ID: ST161111J2-9 PFC CS4.5 16K1122, Description: PFC CS4.5 16K1122 A

13C4-PFBA



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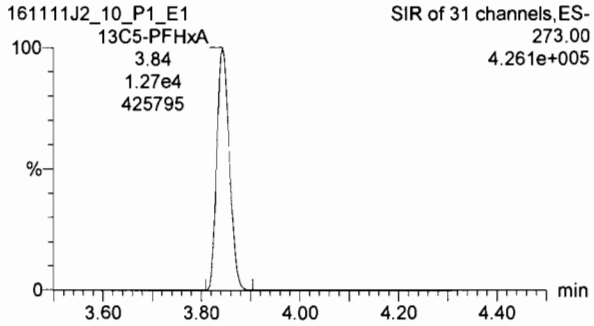

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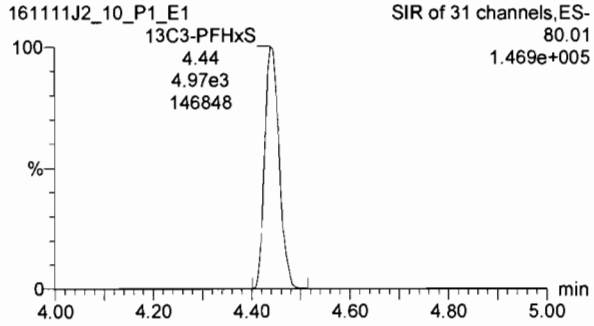

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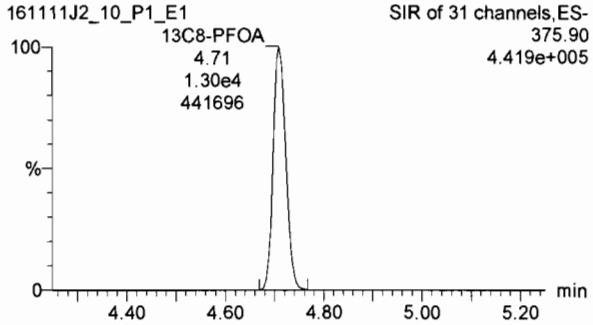

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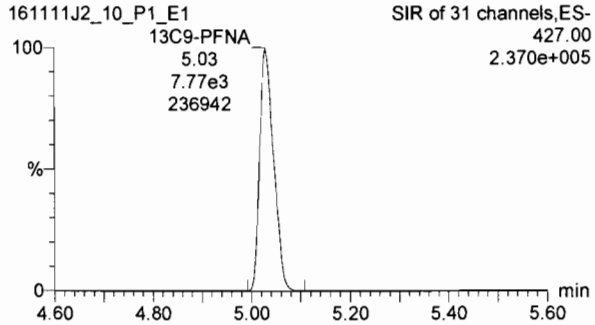

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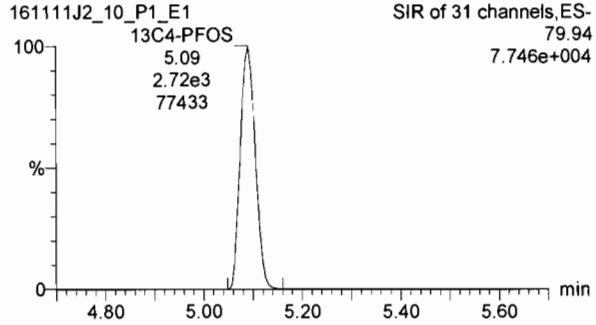

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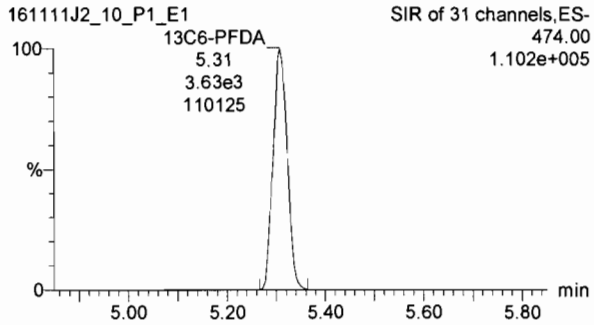

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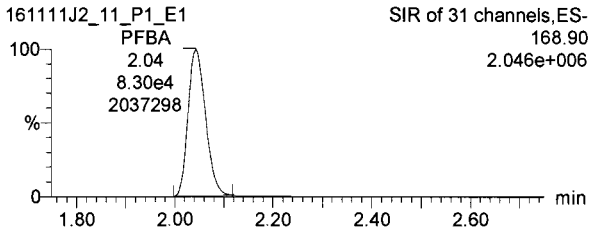

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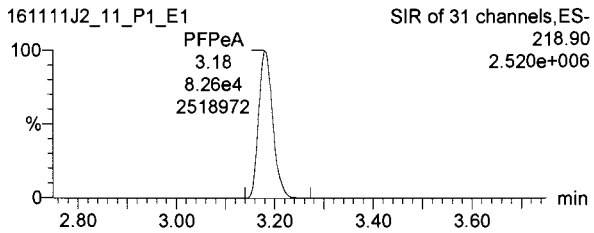

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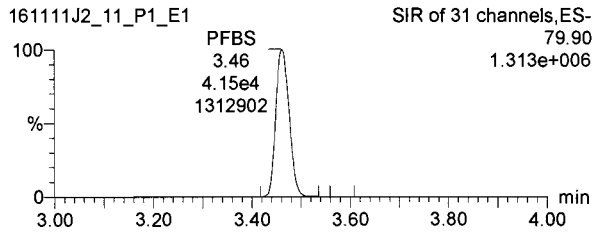

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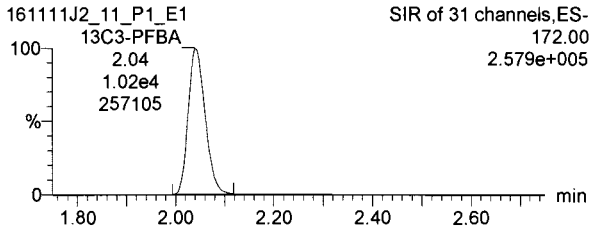

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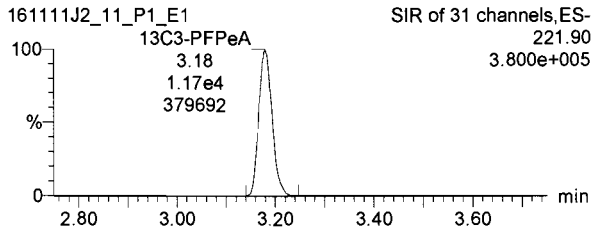

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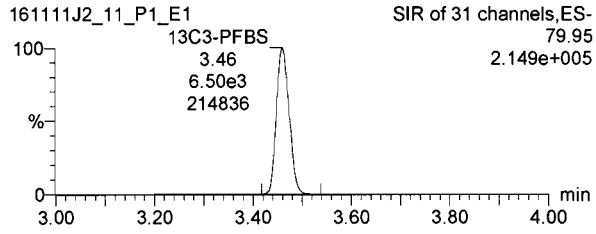
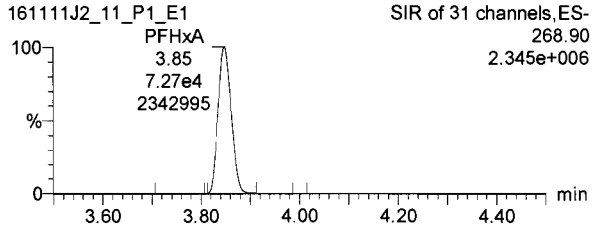
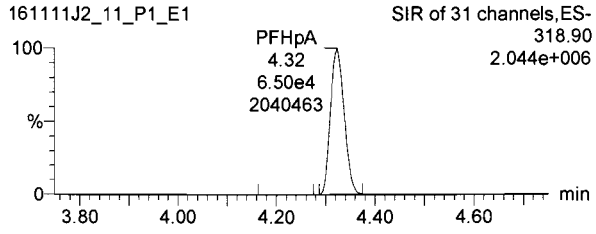


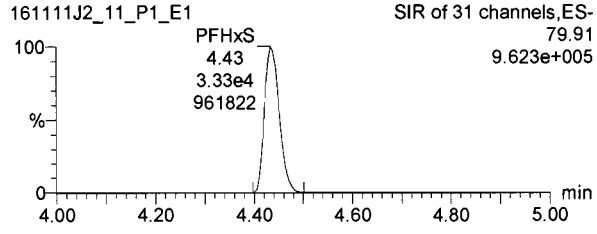
PFHxA



PFHpA



PFHxS



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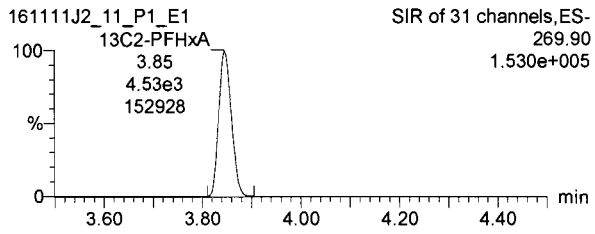
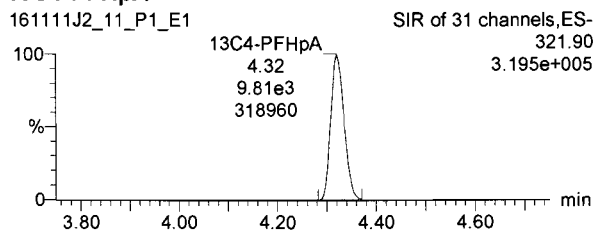
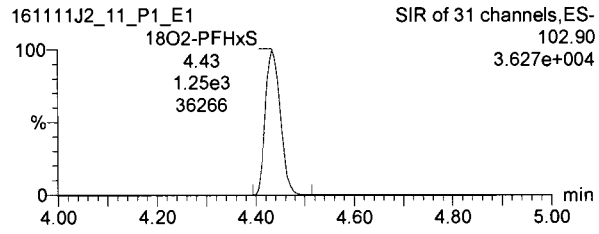


13C4-PFHpA



18O2-PFHxS



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Name: 161111J2_11.wiff, Date: 11-Nov-2016, Time: 18:29:38, ID: ST161111J2-10 PFC CS5 16K1123, Description: PFC CS5 16K1123 A

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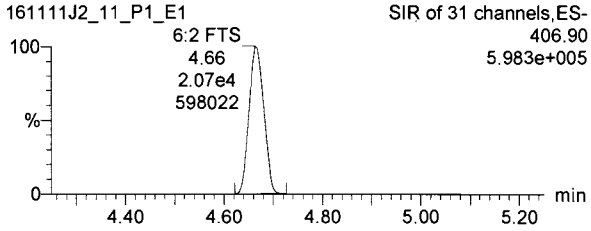

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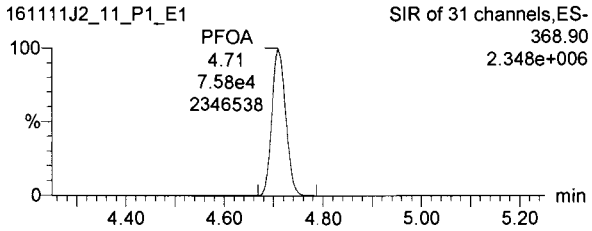

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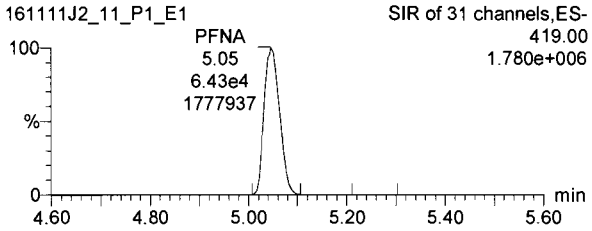
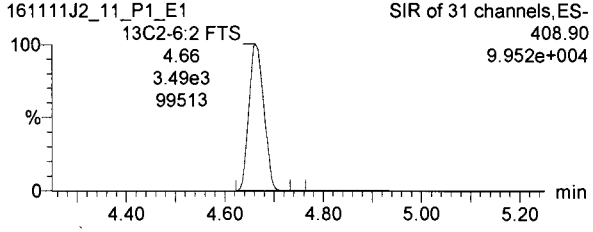


13C2-6:2 FTS



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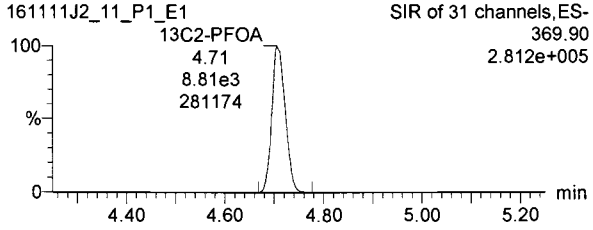

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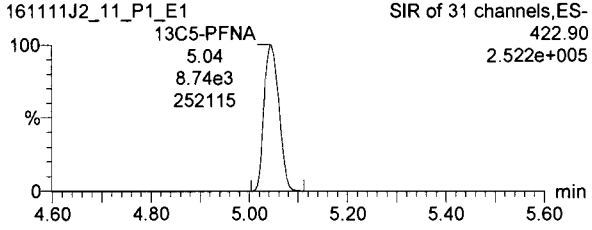
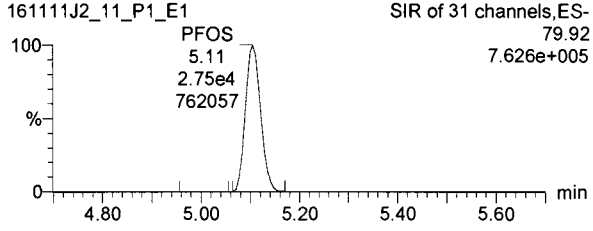
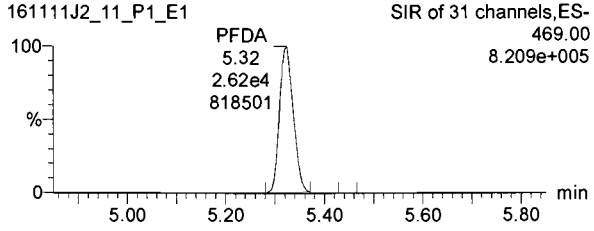


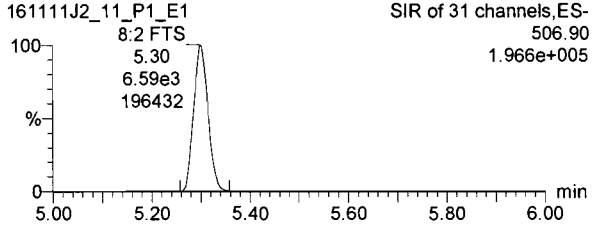
PFOS



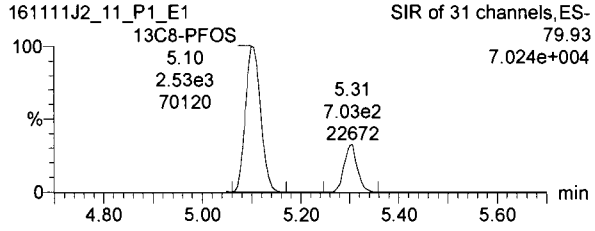
PFDA



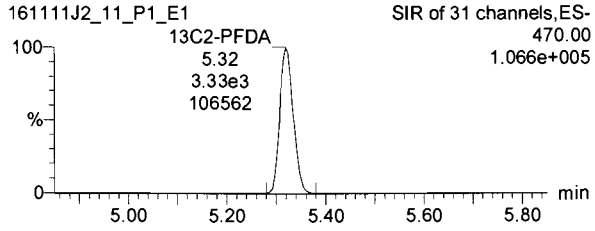
8:2 FTS



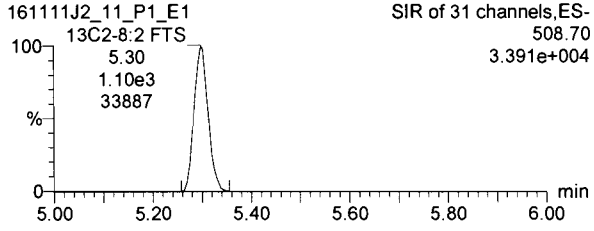
13C8-PFOS



13C2-PFDA



13C2-8:2 FTS

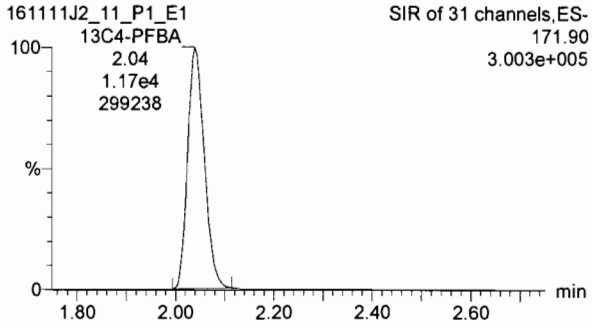


Dataset: U:\Q2.PRO\Results\161112J2\161111J2crv.qld

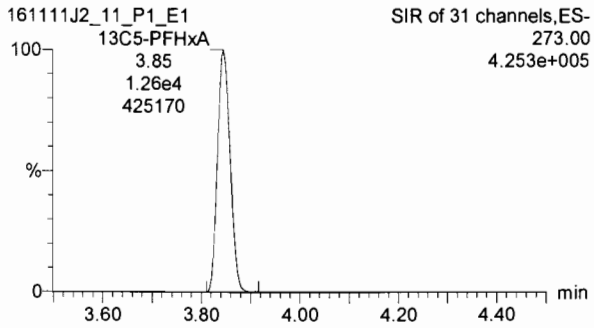
Last Altered: Saturday, November 12, 2016 10:51:18 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:55:05 Pacific Standard Time

Name: 161111J2_11.wiff, Date: 11-Nov-2016, Time: 18:29:38, ID: ST161111J2-10 PFC CS5 16K1123, Description: PFC CS5 16K1123 A

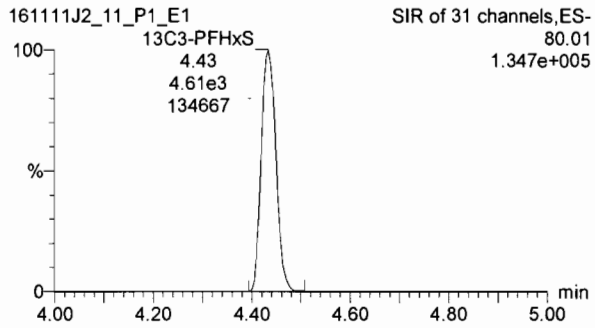
13C4-PFBA



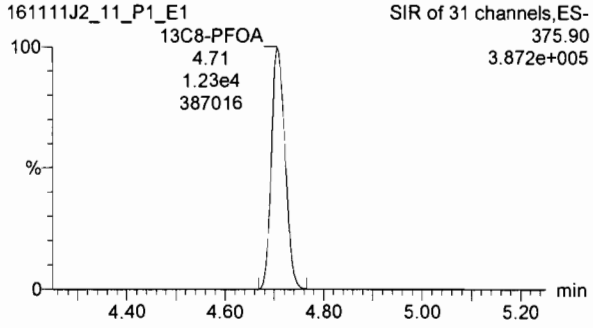
13C5-PFHxA



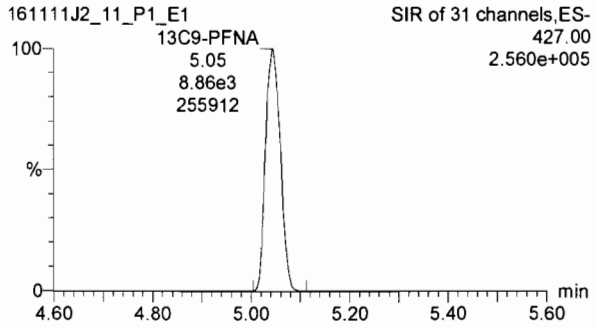
13C3-PFHxS



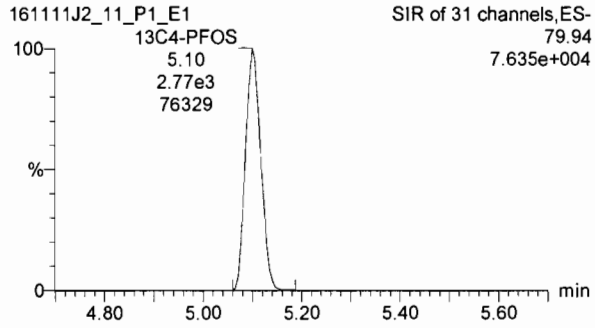
13C8-PFOA



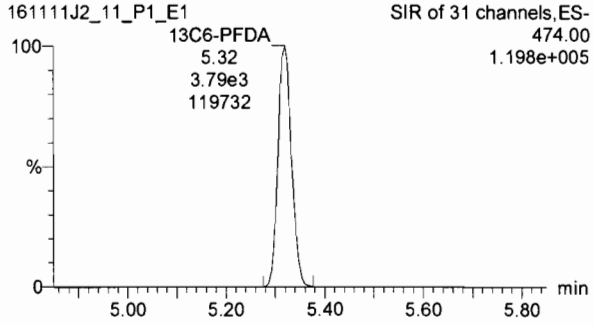
13C9-PFNA



13C4-PFOS



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161112J2\161111J2_13.qld

Last Altered: Saturday, November 12, 2016 10:56:35 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:57:30 Pacific Standard Time

Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 12 Nov 2016 10:51:05
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

Name: 161111J2_13.wiff, Date: 11-Nov-2016, Time: 18:54:07, ID: SS161111J2-1 PFC SSS 16J1810, Description: PFC SSS 16J1810 A

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
1	1	PFBA	168.90	2.48e4	1.03e4		1.000	2.04	28.7	114.7
2	2	PFPeA	218.90	1.94e4	1.18e4		1.000	3.19	22.5	89.8
3	3	PFBS	79.90	1.14e4	6.55e3		1.000	3.46	27.8	111.0
4	4	PFHxA	268.90	2.23e4	4.41e3		1.000	3.85	29.6	118.3
5	5	PFHpA	318.90	1.86e4	8.83e3		1.000	4.33	31.2	125.0
6	6	PFHxS	79.91	7.07e3	1.18e3		1.000	4.44	23.1	92.5
7	7	6:2 FTS	406.90	4.53e3	2.56e3		1.000	4.67	24.3	97.0
8	8	PFOA	368.90	1.62e4	7.16e3		1.000	4.71	22.5	90.2
9	9	PFNA	419.00	1.27e4	6.10e3		1.000	5.03	28.8	115.2
10	10	PFOS	79.92	4.58e3	2.00e3		1.000	5.09	22.7	90.9
11	11	PFDA	469.00	4.57e3	1.88e3		1.000	5.31	30.0	120.2
12	12	8:2 FTS	506.90	1.13e3	5.74e2		1.000	5.29	23.9	95.5
13	13	13C3-PFBA	172.00	1.03e4	1.15e4	0.894	1.000	2.04	12.6	100.4
14	14	13C3-PFPeA	221.90	1.18e4	1.22e4	0.945	1.000	3.19	12.9	102.8
15	15	13C3-PFBS	79.95	6.55e3	1.22e4	0.531	1.000	3.46	12.7	101.5
16	16	13C2-PFHxA	269.90	4.41e3	1.22e4	0.905	1.000	3.85	5.01	100.2
17	17	13C4-PFHpA	321.90	8.83e3	1.22e4	0.770	1.000	4.32	11.8	94.4
18	18	18O2-PFHxS	102.90	1.18e3	4.46e3	0.276	1.000	4.44	12.0	95.8
19	19	13C2-6:2 FTS	408.90	2.56e3	1.16e4	0.219	1.000	4.67	12.6	100.9
20	20	13C2-PFOA	369.90	7.16e3	1.16e4	0.663	1.000	4.71	11.6	93.1
21	21	13C5-PFNA	422.90	6.10e3	6.12e3	1.019	1.000	5.03	12.2	97.8
22	22	13C8-PFOS	79.93	2.00e3	2.16e3	0.921	1.000	5.09	12.6	100.7
23	23	13C2-PFDA	470.00	1.88e3	2.28e3	0.887	1.000	5.31	11.6	92.8
24	24	13C2-8:2 FTS	508.70	5.74e2	2.28e3	0.272	1.000	5.29	11.6	92.4
25	25	13C4-PFBA	171.90	1.15e4	1.15e4	1.000	1.000	2.04	12.5	100.0
26	26	13C5-PFHxA	273.00	1.22e4	1.22e4	1.000	1.000	3.84	12.5	100.0
27	27	13C3-PFHxS	80.01	4.46e3	4.46e3	1.000	1.000	4.44	12.5	100.0
28	28	13C8-PFOA	375.90	1.16e4	1.16e4	1.000	1.000	4.71	12.5	100.0
29	29	13C4-PFOS	79.94	2.16e3	2.16e3	1.000	1.000	5.09	12.5	100.0
30	30	13C9-PFNA	427.00	6.12e3	6.12e3	1.000	1.000	5.03	12.5	100.0
31	31	13C6-PFDA	474.00	2.28e3	2.28e3	1.000	1.000	5.30	12.5	100.0

Limits
75-125

114.1 A
114.2 A
115.4 A

PW
11/12/16

Dataset: U:\Q2.PRO\Results\161112J2\161111J2_13.qld

Last Altered: Saturday, November 12, 2016 10:56:35 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:57:30 Pacific Standard Time

Name: 161111J2_13.wiff, Date: 11-Nov-2016, Time: 18:54:07, ID: SS161111J2-1 PFC SSS 16J1810, Description: PFC SSS 16J1810 A

	# Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
32	32 Total PFBS	79.90		6.55e3		1.000		27.8	
33	33 Total PFHxS	79.91		1.18e3		1.000		28.0	
34	34 Total PFOA	368.90		7.16e3		1.000		26.5	
35	35 Total PFOS	79.92		2.00e3		1.000		32.1	

Vista Analytical Laboratory Q1

Dataset: U:\Q2.PRO\Results\161112J2\161111J2_13.qld

Last Altered: Saturday, November 12, 2016 10:56:35 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:57:30 Pacific Standard Time

Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 12 Nov 2016 10:51:05
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

Name: 161111J2_13.wiff, Date: 11-Nov-2016, Time: 18:54:07, ID: SS161111J2-1 PFC SSS 16J1810, Description: PFC SSS 16J1810 A

Total PFBS

	#	Name	Trace	RT	Area	IS Area	Conc.
1	3	PFBS	79.90	3.46	1.14e4	6.55e3	27.8

Total PFHxS

	#	Name	Trace	RT	Area	IS Area	Conc.
1	6	PFHxS	79.91	4.44	7.07e3	1.18e3	23.1
2	33	Total PFHxS	79.91	4.34	1.49e3	1.18e3	4.87

Total PFOA

	#	Name	Trace	RT	Area	IS Area	Conc.
1	8	PFOA	368.90	4.71	1.62e4	7.16e3	22.5
2	34	Total PFOA	368.90	4.62	2.98e3	7.16e3	3.96

Total PFOS

	#	Name	Trace	RT	Area	IS Area	Conc.
1	10	PFOS	79.92	5.09	4.58e3	2.00e3	22.7
2	35	Total PFOS	79.92	5.01	1.83e3	2.00e3	9.01
3	35	Total PFOS	79.92	4.89	8.54e1	2.00e3	0.328

Vista Analytical Laboratory Q2

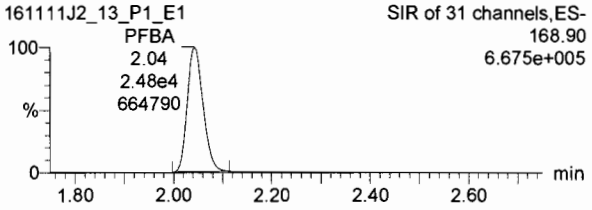
Dataset: U:\Q2.PRO\Results\161112J2\161111J2_13.qld

Last Altered: Saturday, November 12, 2016 10:56:35 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:57:42 Pacific Standard Time

Method: U:\Q2.PRO\MethDB\PFC List 18_A No4-2FTS_Mixed.mdb 12 Nov 2016 10:51:05
Calibration: U:\Q2.PRO\CurveDB\C18_VAL-PFC_Q2_11-11-16_L18_A.cdb 12 Nov 2016 10:16:40

Name: 161111J2_13.wiff, Date: 11-Nov-2016, Time: 18:54:07, ID: SS161111J2-1 PFC SSS 16J1810, Description: PFC SSS 16J1810 A

PFBA



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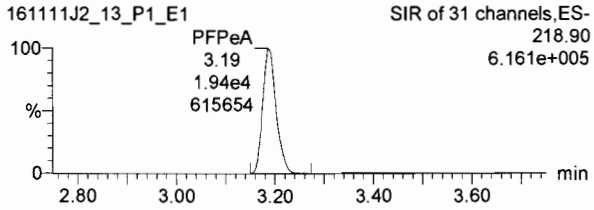
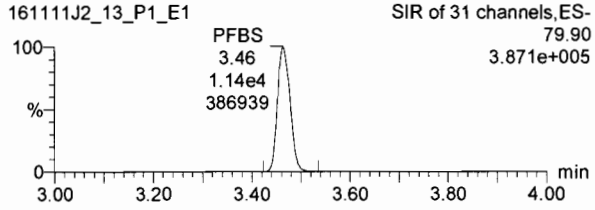
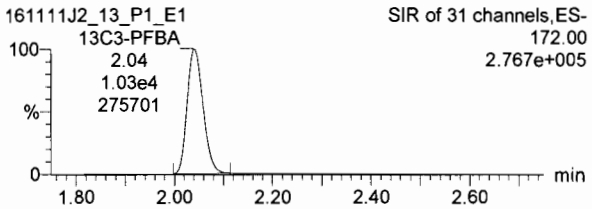


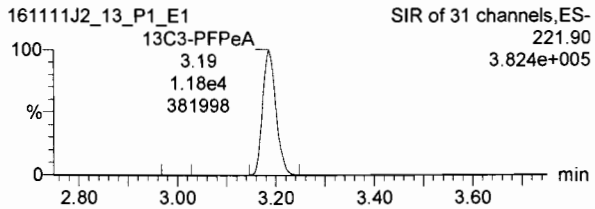
PFBS



13C3-PFBA



13C3-PFPeA



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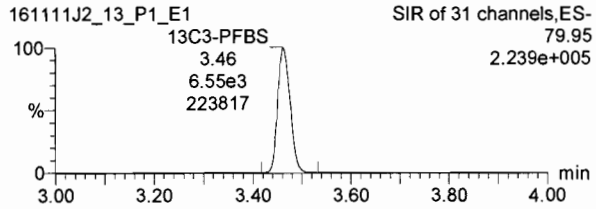
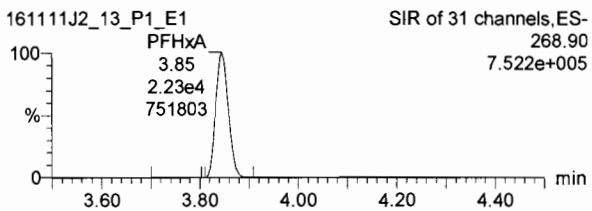
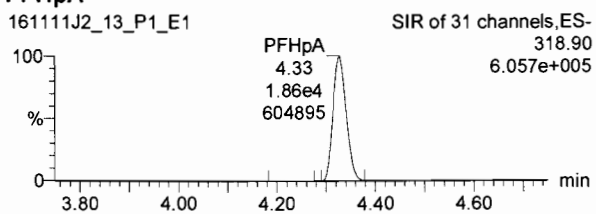


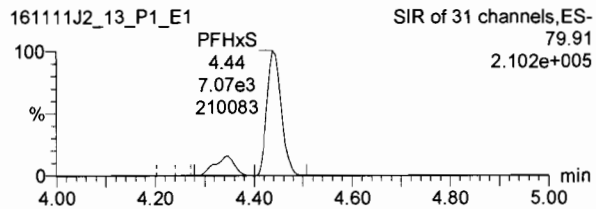
PFHxA



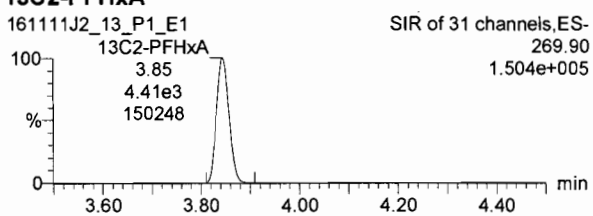
PFHpA



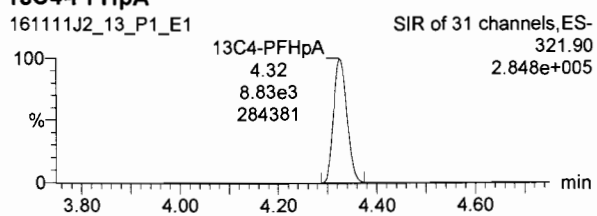
PFHxS



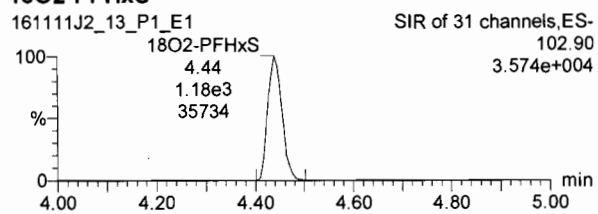
13C2-PFHxA



13C4-PFHpA



18O2-PFHxS

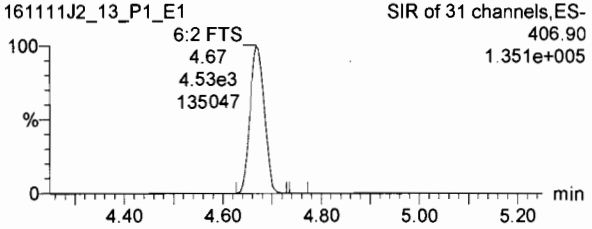


Dataset: U:\Q2.PRO\Results\161112J2\161111J2_13.qld

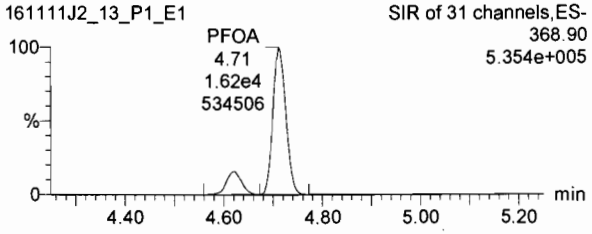
Last Altered: Saturday, November 12, 2016 10:56:35 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:57:42 Pacific Standard Time

Name: 161111J2_13.wiff, Date: 11-Nov-2016, Time: 18:54:07, ID: SS161111J2-1 PFC SSS 16J1810, Description: PFC SSS 16J1810 A

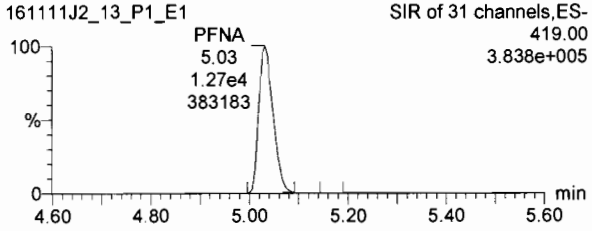
6:2 FTS



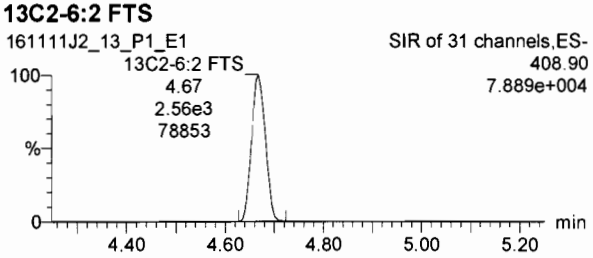
PFOA



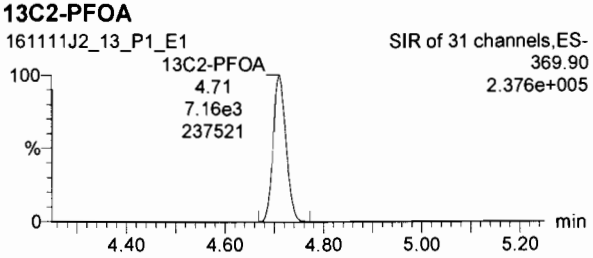
PFNA



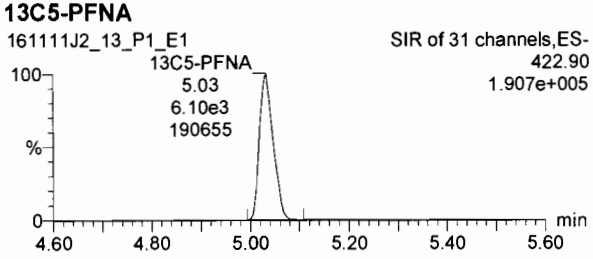
13C2-6:2 FTS



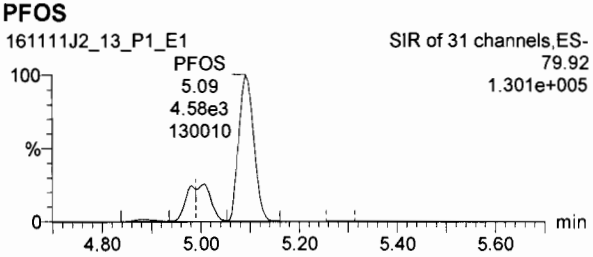
13C2-PFOA



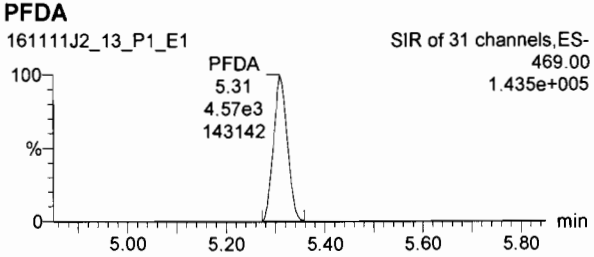
13C5-PFNA



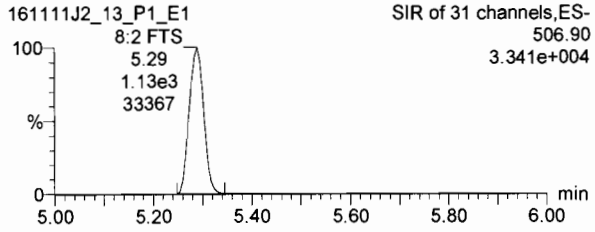
PFOS



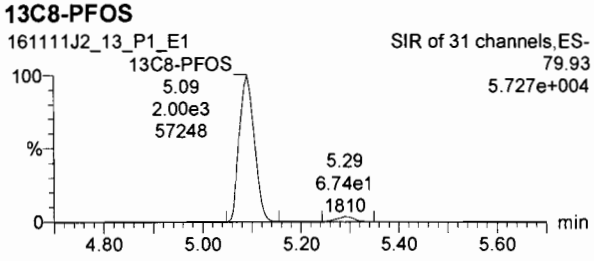
PFDA



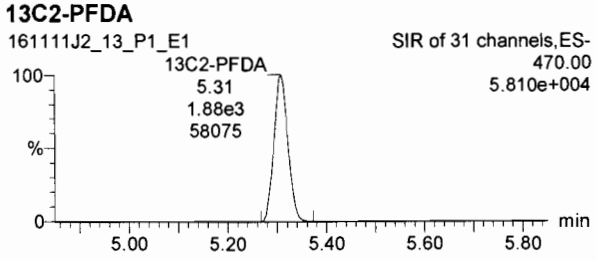
8:2 FTS



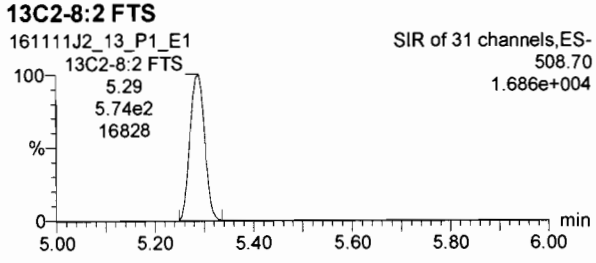
13C8-PFOS

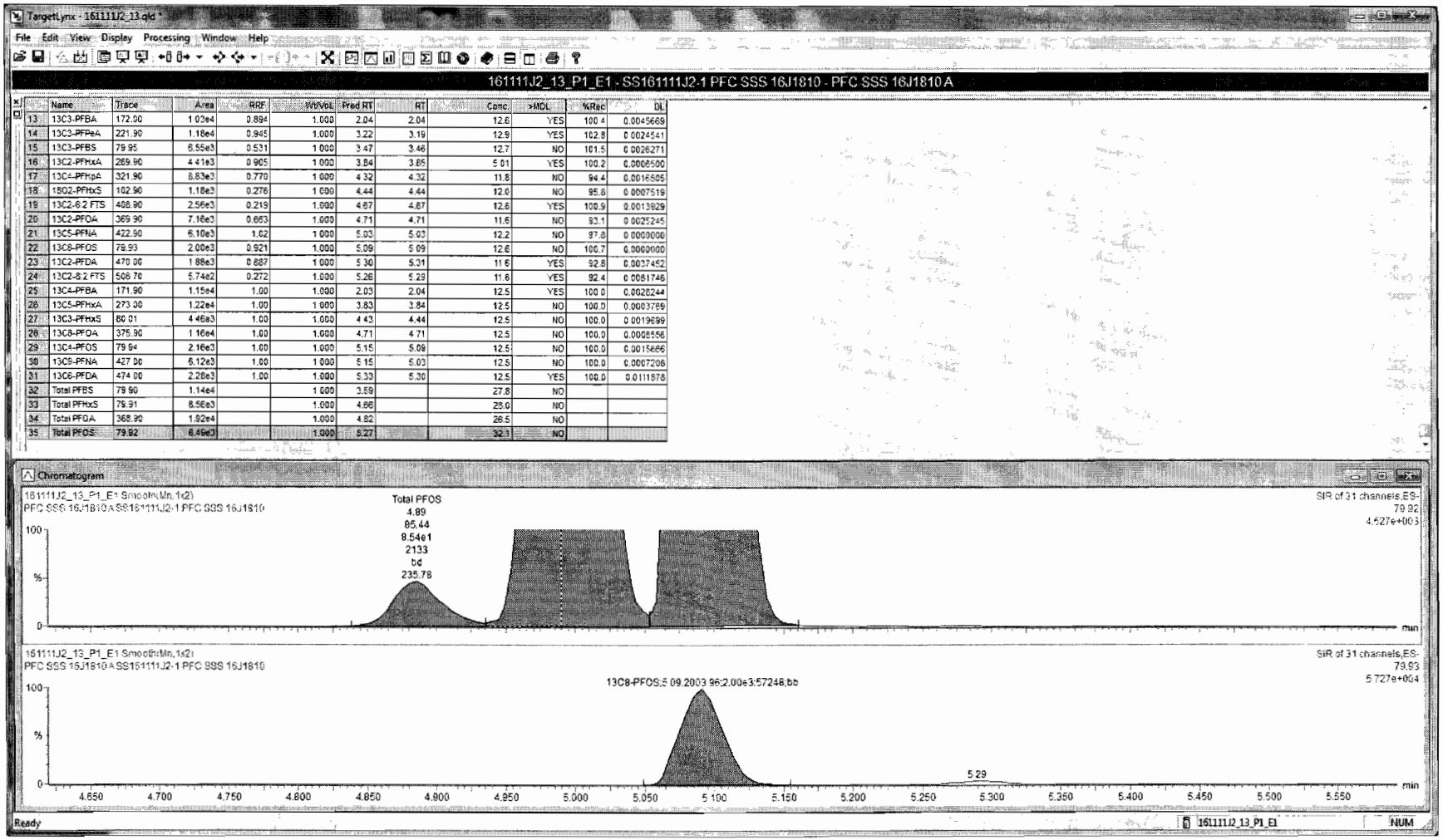


13C2-PFDA



13C2-8:2 FTS





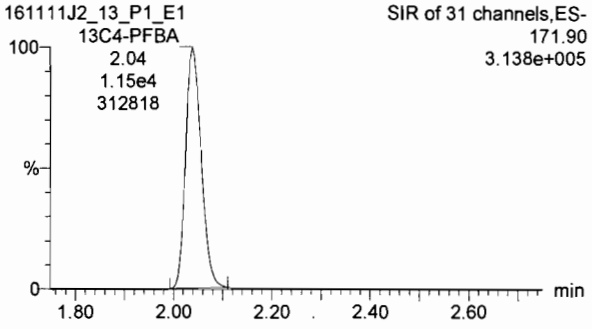
	Name	Trace	Area	RRF	%%Vol	Pred RT	RT	Conc.	>MDL	%Rec	DL
13	13C3-PFBA	172.00	1.03e4	0.894	1.000	2.04	2.04	12.6	YES	100.4	0.0045669
14	13C3-PFPeA	221.90	1.18e4	0.945	1.000	3.22	3.19	12.9	YES	102.8	0.0024541
15	13C3-PFBS	79.95	6.55e3	0.531	1.000	3.47	3.46	12.7	NO	101.5	0.0026271
16	13C2-PFHxA	269.90	4.41e3	0.905	1.000	3.84	3.85	5.01	YES	100.2	0.0006500
17	13C4-PFHpA	321.90	8.83e3	0.770	1.000	4.32	4.32	11.8	NO	94.4	0.0016505
18	18O2-PFHxS	102.90	1.18e3	0.276	1.000	4.44	4.44	12.6	NO	95.8	0.0007519
19	13C2-6:2 FTS	408.90	2.56e3	0.219	1.000	4.67	4.67	12.6	YES	100.9	0.0013929
20	13C2-PFOA	369.90	7.16e3	0.663	1.000	4.71	4.71	11.6	NO	93.1	0.0025245
21	13C5-PFNA	422.90	6.10e3	1.02	1.000	5.03	5.03	12.2	NO	97.8	0.0000000
22	13C8-PFOS	79.93	2.00e3	0.921	1.000	5.09	5.09	12.6	NO	100.7	0.0000000
23	13C2-PFDA	470.00	1.88e3	0.887	1.000	5.30	5.31	11.6	YES	92.8	0.0027452
24	13C2-8:2 FTS	508.70	5.74e2	0.272	1.000	5.26	5.29	11.6	YES	92.4	0.0081746
25	13C4-PFBA	171.90	1.15e4	1.00	1.000	2.03	2.04	12.5	YES	100.0	0.0028244
26	13C5-PFHxA	273.00	1.22e4	1.00	1.000	3.83	3.84	12.5	NO	100.0	0.0003789
27	13C3-PFHxS	80.01	4.46e3	1.00	1.000	4.43	4.44	12.5	NO	100.0	0.0019699
28	13C8-PFOA	375.90	1.16e4	1.00	1.000	4.71	4.71	12.5	NO	100.0	0.0008556
29	13C9-PFNA	427.00	6.12e3	1.00	1.000	5.15	5.03	12.5	NO	100.0	0.0015666
30	13C6-PFDA	474.00	2.28e3	1.00	1.000	5.33	5.30	12.5	YES	100.0	0.0067206
31	13C6-PFDA	474.00	2.28e3	1.00	1.000	5.33	5.30	12.5	YES	100.0	0.0111878
32	Total PFBS	79.90	1.14e4		1.000	3.59		27.8	NO		
33	Total PFHxS	79.91	8.56e3		1.000	4.66		25.0	NO		
34	Total PFOA	368.90	1.92e4		1.000	4.82		26.5	NO		
35	Total PFOS	79.92	6.46e3		1.000	5.27		32.1	NO		

Dataset: U:\Q2.PRO\Results\161112J2\161111J2_13.qld

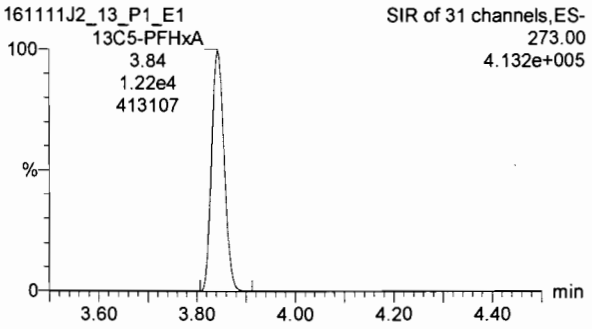
Last Altered: Saturday, November 12, 2016 10:56:35 Pacific Standard Time
Printed: Saturday, November 12, 2016 10:57:42 Pacific Standard Time

Name: 161111J2_13.wiff, Date: 11-Nov-2016, Time: 18:54:07, ID: SS161111J2-1 PFC SSS 16J1810, Description: PFC SSS 16J1810 A

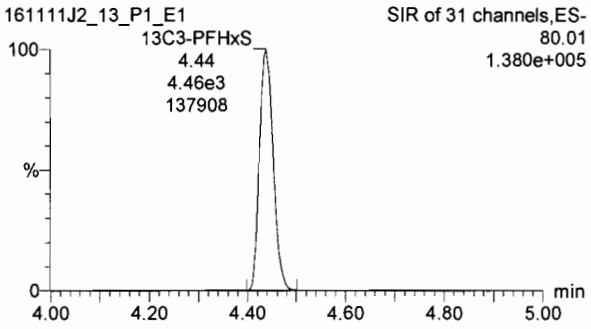
13C4-PFBA



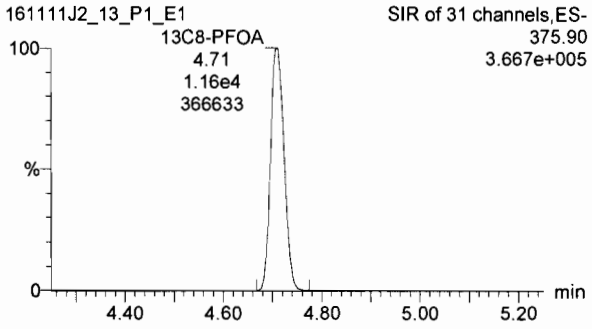
13C5-PFHxA



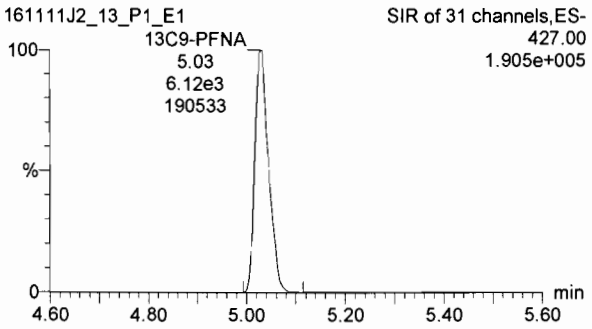
13C3-PFHxS



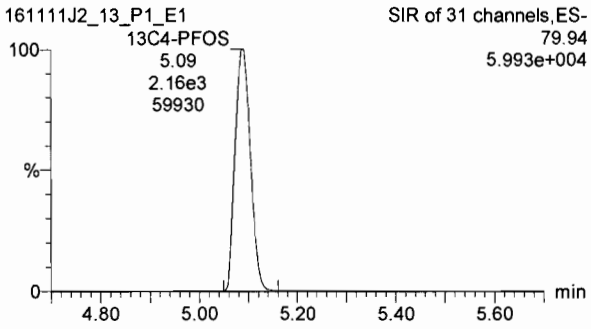
13C8-PFOA



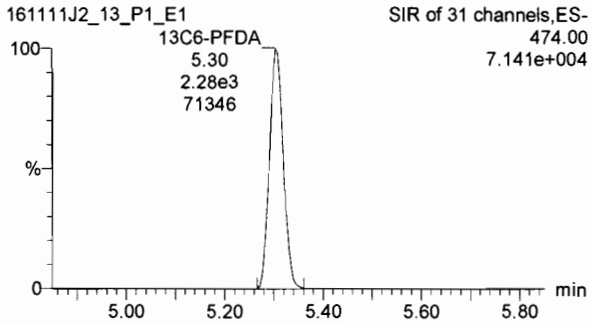
13C9-PFNA



13C4-PFOS



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:26:39 Pacific Standard Time

Scanned KC 11-14-16

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Compound name: PFBS
Correlation coefficient: r = 0.993420, r^2 = 0.986884
Calibration curve: 1.36557 * x + 0.119712
Response type: Internal Std (Ref 9), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	0.500	3.25	5.89e2	8.09e3	0.578	1.82	15.6
2	2 161113G1_4	1.00	3.25	1.12e3	9.40e3	1.00	1.48	-0.0
3	3 161113G1_5	2.00	3.25	1.80e3	9.15e3	1.72	1.23	-14.2
4	4 161113G1_6	5.00	3.25	3.80e3	8.99e3	3.78	1.06	-24.4
5	5 161113G1_7	10.0	3.25	1.05e4	8.47e3	11.3	1.55	12.6
6	6 161113G1_8	25.0	3.25	2.26e4	6.85e3	30.1	1.65	20.2
7	7 161113G1_9	50.0	3.25	4.08e4	8.27e3	45.1	1.23	-9.9
8	8 161113G1_10	75.0	3.25	5.89e4	7.17e3	75.1	1.37	0.1

AC 11/14/16

PW 11/14/16

Compound name: PFHxA
Correlation coefficient: r = 0.992075, r^2 = 0.984213
Calibration curve: 0.533409 * x + 0.0903449
Response type: Internal Std (Ref 10), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	0.500	3.64	7.85e2	9.91e3	0.573	0.792	14.6
2	2 161113G1_4	1.00	3.64	1.18e3	1.02e4	0.914	0.578	-8.6
3	3 161113G1_5	2.00	3.64	2.03e3	1.06e4	1.63	0.480	-18.5
4	4 161113G1_6	5.00	3.64	4.71e3	1.06e4	4.01	0.445	-19.9
5	5 161113G1_7	10.0	3.64	1.22e4	9.51e3	11.8	0.641	18.4
6	6 161113G1_8	25.0	3.65	2.79e4	8.36e3	31.1	0.666	24.3
7	7 161113G1_9	50.0	3.65	5.23e4	1.03e4	47.5	0.509	-4.9
8	8 161113G1_10	75.0	3.64	7.02e4	9.25e3	70.9	0.506	-5.4

PFDA excluded from CS(-1).

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

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Compound name: PFHpA
Correlation coefficient: r = 0.993436, r^2 = 0.986915
Calibration curve: 1.19442 * x + 0.171662
Response type: Internal Std (Ref 11), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	0.500	4.14	1.77e3	2.62e4	0.564	1.69	12.8
2	2 161113G1_4	1.00	4.14	3.12e3	2.87e4	0.995	1.36	-0.5
3	3 161113G1_5	2.00	4.14	4.34e3	2.54e4	1.65	1.07	-17.7
4	4 161113G1_6	5.00	4.14	1.15e4	2.79e4	4.16	1.03	-16.9
5	5 161113G1_7	10.0	4.14	2.94e4	2.82e4	10.8	1.30	7.8
6	6 161113G1_8	25.0	4.14	6.90e4	2.32e4	31.0	1.49	24.1
7	7 161113G1_9	50.0	4.14	1.21e5	2.69e4	46.8	1.12	-6.3
8	8 161113G1_10	75.0	4.14	1.81e5	2.60e4	72.5	1.16	-3.3

Compound name: PFHxS
Correlation coefficient: r = 0.992500, r^2 = 0.985056
Calibration curve: 1.30086 * x + 0.139374
Response type: Internal Std (Ref 12), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	0.500	4.25	5.42e2	7.72e3	0.568	1.76	13.5
2	2 161113G1_4	1.00	4.25	9.58e2	8.16e3	1.02	1.47	2.1
3	3 161113G1_5	2.00	4.25	1.31e3	7.55e3	1.56	1.09	-21.8
4	4 161113G1_6	5.00	4.25	3.64e3	8.23e3	4.14	1.11	-17.2
5	5 161113G1_7	10.0	4.25	8.85e3	7.97e3	10.6	1.39	5.7
6	6 161113G1_8	25.0	4.25	2.06e4	6.31e3	31.2	1.63	25.0
7	7 161113G1_9	50.0	4.25	4.08e4	7.78e3	50.3	1.31	0.5
8	8 161113G1_10	75.0	4.25	5.67e4	7.87e3	69.1	1.20	-7.8

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:26:39 Pacific Standard Time

Compound name: PFOA
Correlation coefficient: r = 0.995660, r^2 = 0.991339
Calibration curve: 0.800305 * x + 0.222058
Response type: Internal Std (Ref 13), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	0.500	4.52	2.17e3	3.88e4	0.597	1.40	19.4
2	2 161113G1_4	1.00	4.52	3.09e3	4.05e4	0.913	0.953	-8.7
3	3 161113G1_5	2.00	4.52	4.41e3	3.73e4	1.57	0.739	-21.6
4	4 161113G1_6	5.00	4.52	1.16e4	3.92e4	4.34	0.739	-13.3
5	5 161113G1_7	10.0	4.52	3.02e4	4.06e4	11.3	0.930	13.5
6	6 161113G1_8	25.0	4.53	6.61e4	3.49e4	29.3	0.946	17.1
7	7 161113G1_9	50.0	4.53	1.28e5	4.02e4	49.3	0.793	-1.4
8	8 161113G1_10	75.0	4.52	1.76e5	3.84e4	71.2	0.762	-5.1

Compound name: PFOS
Correlation coefficient: r = 0.997531, r^2 = 0.995068
Calibration curve: 0.727385 * x + -0.0835443
Response type: Internal Std (Ref 14), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	0.500	4.90	1.13e2	4.68e3	0.530	0.604	6.0
2	2 161113G1_4	1.00	4.90	3.80e2	6.90e3	1.06	0.688	6.1
3	3 161113G1_5	2.00	4.90	4.73e2	5.54e3	1.58	0.533	-20.9
4	4 161113G1_6	5.00	4.90	1.88e3	7.02e3	4.72	0.670	-5.6
5	5 161113G1_7	10.0	4.90	4.12e3	6.81e3	10.5	0.757	5.2
6	6 161113G1_8	25.0	4.90	8.64e3	5.23e3	28.5	0.826	14.0
7	7 161113G1_9	50.0	4.90	2.19e4	7.58e3	49.7	0.721	-0.6
8	8 161113G1_10	75.0	4.90	3.43e4	8.21e3	71.9	0.696	-4.1

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:26:39 Pacific Standard Time

Compound name: PFNA
Correlation coefficient: r = 0.991334, r^2 = 0.982742
Calibration curve: 1.58768 * x + 0.131445
Response type: Internal Std (Ref 15), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	0.500	4.85	1.03e3	1.32e4	0.531	1.95	6.3
2	2 161113G1_4	1.00	4.85	2.07e3	1.46e4	1.03	1.77	3.3
3	3 161113G1_5	2.00	4.85	3.03e3	1.48e4	1.53	1.28	-23.7
4	4 161113G1_6	5.00	4.85	8.54e3	1.56e4	4.23	1.37	-15.3
5	5 161113G1_7	10.0	4.85	2.13e4	1.40e4	11.9	1.90	18.8
6	6 161113G1_8	25.0	4.85	4.61e4	1.18e4	30.8	1.96	23.3
7	7 161113G1_9	50.0	4.85	9.20e4	1.64e4	44.0	1.40	-12.0
8	8 161113G1_10	75.0	4.85	1.43e5	1.51e4	74.5	1.58	-0.7

(A) excluded

Compound name: PFDA
Correlation coefficient: r = 0.993024, r^2 = 0.986097
Calibration curve: 0.548079 * x + 0.0475241
Response type: Internal Std (Ref 16), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	0.500	5.13	2.19e2	7.36e3	0.591	0.743	18.2 (A)
2	2 161113G1_4	1.00	5.13	6.97e2	1.15e4	1.30	0.760	30.0
3	3 161113G1_5	2.00	5.13	8.00e2	9.53e3	1.83	0.525	-8.6
4	4 161113G1_6	5.00	5.13	1.91e3	1.13e4	3.78	0.424	-24.4
5	5 161113G1_7	10.0	5.13	5.15e3	1.12e4	10.4	0.575	4.0
6	6 161113G1_8	25.0	5.13	9.45e3	6.91e3	31.1	0.684	24.5
7	7 161113G1_9	50.0	5.13	2.99e4	1.40e4	48.6	0.534	-2.7
8	8 161113G1_10	75.0	5.13	4.77e4	1.53e4	70.9	0.519	-5.4

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
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Compound name: 13C3-PFBS
Response Factor: 0.249812
RRF SD: 0.0343471, Relative SD: 13.7492
Response type: Internal Std (Ref 17), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	3.25	8.09e3	3.80e4	10.7	0.213	-14.8
2	2 161113G1_4	12.5	3.25	9.40e3	3.52e4	13.4	0.267	7.0
3	3 161113G1_5	12.5	3.25	9.15e3	3.20e4	14.3	0.286	14.6
4	4 161113G1_6	12.5	3.25	8.99e3	3.27e4	13.7	0.275	10.0
5	5 161113G1_7	12.5	3.25	8.47e3	3.23e4	13.1	0.263	5.2
6	6 161113G1_8	12.5	3.25	6.85e3	3.74e4	9.18	0.183	-26.6
7	7 161113G1_9	12.5	3.25	8.27e3	3.22e4	12.9	0.257	2.9
8	8 161113G1_10	12.5	3.25	7.17e3	2.82e4	12.7	0.254	1.7

Compound name: 13C2-PFHxA
Response Factor: 0.74126
RRF SD: 0.0946175, Relative SD: 12.7644
Response type: Internal Std (Ref 17), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	5.00	3.64	9.91e3	3.80e4	4.40	0.652	-12.1
2	2 161113G1_4	5.00	3.64	1.02e4	3.52e4	4.91	0.728	-1.8
3	3 161113G1_5	5.00	3.64	1.06e4	3.20e4	5.59	0.828	11.7
4	4 161113G1_6	5.00	3.64	1.06e4	3.27e4	5.45	0.808	9.0
5	5 161113G1_7	5.00	3.64	9.51e3	3.23e4	4.97	0.737	-0.6
6	6 161113G1_8	5.00	3.64	8.36e3	3.74e4	3.77	0.559	-24.5
7	7 161113G1_9	5.00	3.64	1.03e4	3.22e4	5.39	0.799	7.7
8	8 161113G1_10	5.00	3.64	9.25e3	2.82e4	5.53	0.819	10.5

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
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Compound name: 13C4-PFHpA
Response Factor: 2.07704
RRF SD: 0.223378, Relative SD: 10.7547
Response type: Internal Std (Ref 18), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	4.14	2.62e4	1.44e4	10.9	1.82	-12.5
2	2 161113G1_4	12.5	4.14	2.87e4	1.33e4	13.0	2.15	3.7
3	3 161113G1_5	12.5	4.14	2.54e4	1.22e4	12.5	2.08	0.4
4	4 161113G1_6	12.5	4.14	2.79e4	1.23e4	13.6	2.27	9.2
5	5 161113G1_7	12.5	4.14	2.82e4	1.32e4	12.8	2.13	2.7
6	6 161113G1_8	12.5	4.14	2.32e4	1.40e4	9.98	1.66	-20.2
7	7 161113G1_9	12.5	4.14	2.69e4	1.21e4	13.4	2.23	7.5
8	8 161113G1_10	12.5	4.14	2.60e4	1.15e4	13.6	2.27	9.2

Compound name: 18O2-PFHxS
Response Factor: 0.602831
RRF SD: 0.0762623, Relative SD: 12.6507
Response type: Internal Std (Ref 18), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	4.24	7.72e3	1.44e4	11.1	0.536	-11.1
2	2 161113G1_4	12.5	4.24	8.16e3	1.33e4	12.7	0.613	1.7
3	3 161113G1_5	12.5	4.24	7.55e3	1.22e4	12.9	0.620	2.9
4	4 161113G1_6	12.5	4.24	8.23e3	1.23e4	13.8	0.668	10.8
5	5 161113G1_7	12.5	4.24	7.97e3	1.32e4	12.5	0.603	0.1
6	6 161113G1_8	12.5	4.25	6.31e3	1.40e4	9.36	0.451	-25.1
7	7 161113G1_9	12.5	4.25	7.78e3	1.21e4	13.4	0.645	7.0
8	8 161113G1_10	12.5	4.25	7.87e3	1.15e4	14.2	0.686	13.8

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

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Compound name: 13C2-PFOA
Response Factor: 2.43832
RRF SD: 0.272715, Relative SD: 11.1845
Response type: Internal Std (Ref 19), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	4.52	3.88e4	1.72e4	11.6	2.25	-7.6
2	2 161113G1_4	12.5	4.52	4.05e4	1.60e4	12.9	2.52	3.5
3	3 161113G1_5	12.5	4.52	3.73e4	1.33e4	14.4	2.81	15.0
4	4 161113G1_6	12.5	4.52	3.92e4	1.56e4	12.9	2.51	2.9
5	5 161113G1_7	12.5	4.52	4.06e4	1.65e4	12.6	2.47	1.1
6	6 161113G1_8	12.5	4.53	3.49e4	1.86e4	9.64	1.88	-22.9
7	7 161113G1_9	12.5	4.53	4.02e4	1.63e4	12.7	2.47	1.3
8	8 161113G1_10	12.5	4.52	3.84e4	1.48e4	13.3	2.60	6.6

Compound name: 13C8-PFOS
Response Factor: 1.05531
RRF SD: 0.151169, Relative SD: 14.3247
Response type: Internal Std (Ref 20), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	4.90	4.68e3	5.56e3	9.97	0.842	-20.2
2	2 161113G1_4	12.5	4.90	6.90e3	5.89e3	13.9	1.17	10.9
3	3 161113G1_5	12.5	4.90	5.54e3	4.99e3	13.2	1.11	5.3
4	4 161113G1_6	12.5	4.90	7.02e3	6.24e3	13.3	1.12	6.5
5	5 161113G1_7	12.5	4.90	6.81e3	5.41e3	14.9	1.26	19.3
6	6 161113G1_8	12.5	4.90	5.23e3	6.09e3	10.2	0.859	-18.6
7	7 161113G1_9	12.5	4.90	7.58e3	7.91e3	11.4	0.959	-9.2
8	8 161113G1_10	12.5	4.90	8.21e3	7.34e3	13.2	1.12	6.0

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

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Compound name: 13C5-PFNA
Response Factor: 1.15772
RRF SD: 0.162288, Relative SD: 14.0179
Response type: Internal Std (Ref 21), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	4.85	1.32e4	1.33e4	10.8	0.996	-14.0
2	2 161113G1_4	12.5	4.85	1.46e4	1.31e4	12.1	1.12	-3.4
3	3 161113G1_5	12.5	4.85	1.48e4	1.14e4	14.0	1.30	12.0
4	4 161113G1_6	12.5	4.85	1.56e4	1.21e4	13.9	1.28	10.8
5	5 161113G1_7	12.5	4.85	1.40e4	1.18e4	12.8	1.19	2.4
6	6 161113G1_8	12.5	4.85	1.18e4	1.38e4	9.23	0.855	-26.2
7	7 161113G1_9	12.5	4.85	1.64e4	1.25e4	14.3	1.32	14.0
8	8 161113G1_10	12.5	4.85	1.51e4	1.25e4	13.0	1.21	4.3

Compound name: 13C2-PFDA
Response Factor: 1.16403
RRF SD: 0.192878, Relative SD: 16.5699
Response type: Internal Std (Ref 22), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	5.13	7.36e3	7.75e3	10.2	0.950	-18.4
2	2 161113G1_4	12.5	5.13	1.15e4	1.02e4	12.1	1.13	-3.3
3	3 161113G1_5	12.5	5.13	9.53e3	7.68e3	13.3	1.24	6.6
4	4 161113G1_6	12.5	5.13	1.13e4	9.51e3	12.7	1.18	1.8
5	5 161113G1_7	12.5	5.13	1.12e4	8.53e3	14.1	1.31	12.8
6	6 161113G1_8	12.5	5.13	6.91e3	8.46e3	8.77	0.817	-29.8
7	7 161113G1_9	12.5	5.13	1.40e4	1.06e4	14.1	1.32	13.2
8	8 161113G1_10	12.5	5.13	1.53e4	1.12e4	14.7	1.37	17.3

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

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Compound name: 13C5-PFHxA
Response Factor: 1
RRF SD: 8.3925e-017, Relative SD: 8.3925e-015
Response type: Internal Std (Ref 17), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	3.64	3.80e4	3.80e4	12.5	1.00	0.0
2	2 161113G1_4	12.5	3.64	3.52e4	3.52e4	12.5	1.00	0.0
3	3 161113G1_5	12.5	3.64	3.20e4	3.20e4	12.5	1.00	0.0
4	4 161113G1_6	12.5	3.64	3.27e4	3.27e4	12.5	1.00	0.0
5	5 161113G1_7	12.5	3.64	3.23e4	3.23e4	12.5	1.00	0.0
6	6 161113G1_8	12.5	3.64	3.74e4	3.74e4	12.5	1.00	0.0
7	7 161113G1_9	12.5	3.64	3.22e4	3.22e4	12.5	1.00	0.0
8	8 161113G1_10	12.5	3.64	2.82e4	2.82e4	12.5	1.00	0.0

Compound name: 13C3-PFHxS
Response Factor: 1
RRF SD: 4.19625e-017, Relative SD: 4.19625e-015
Response type: Internal Std (Ref 18), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	4.24	1.44e4	1.44e4	12.5	1.00	0.0
2	2 161113G1_4	12.5	4.24	1.33e4	1.33e4	12.5	1.00	0.0
3	3 161113G1_5	12.5	4.24	1.22e4	1.22e4	12.5	1.00	0.0
4	4 161113G1_6	12.5	4.25	1.23e4	1.23e4	12.5	1.00	0.0
5	5 161113G1_7	12.5	4.25	1.32e4	1.32e4	12.5	1.00	-0.0
6	6 161113G1_8	12.5	4.25	1.40e4	1.40e4	12.5	1.00	0.0
7	7 161113G1_9	12.5	4.25	1.21e4	1.21e4	12.5	1.00	0.0
8	8 161113G1_10	12.5	4.25	1.15e4	1.15e4	12.5	1.00	0.0

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
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Compound name: 13C8-PFOA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 19), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	4.52	1.72e4	1.72e4	12.5	1.00	0.0
2	2 161113G1_4	12.5	4.52	1.60e4	1.60e4	12.5	1.00	0.0
3	3 161113G1_5	12.5	4.52	1.33e4	1.33e4	12.5	1.00	0.0
4	4 161113G1_6	12.5	4.52	1.56e4	1.56e4	12.5	1.00	0.0
5	5 161113G1_7	12.5	4.52	1.65e4	1.65e4	12.5	1.00	0.0
6	6 161113G1_8	12.5	4.52	1.86e4	1.86e4	12.5	1.00	0.0
7	7 161113G1_9	12.5	4.53	1.63e4	1.63e4	12.5	1.00	0.0
8	8 161113G1_10	12.5	4.52	1.48e4	1.48e4	12.5	1.00	0.0

Compound name: 13C4-PFOS
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 20), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	4.90	5.56e3	5.56e3	12.5	1.00	0.0
2	2 161113G1_4	12.5	4.90	5.89e3	5.89e3	12.5	1.00	0.0
3	3 161113G1_5	12.5	4.90	4.99e3	4.99e3	12.5	1.00	0.0
4	4 161113G1_6	12.5	4.90	6.24e3	6.24e3	12.5	1.00	0.0
5	5 161113G1_7	12.5	4.90	5.41e3	5.41e3	12.5	1.00	0.0
6	6 161113G1_8	12.5	4.90	6.09e3	6.09e3	12.5	1.00	0.0
7	7 161113G1_9	12.5	4.90	7.91e3	7.91e3	12.5	1.00	0.0
8	8 161113G1_10	12.5	4.90	7.34e3	7.34e3	12.5	1.00	0.0

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Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

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Compound name: 13C9-PFNA
Response Factor: 1
RRF SD: 8.3925e-017, Relative SD: 8.3925e-015
Response type: Internal Std (Ref 21), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	4.85	1.33e4	1.33e4	12.5	1.00	0.0
2	2 161113G1_4	12.5	4.85	1.31e4	1.31e4	12.5	1.00	0.0
3	3 161113G1_5	12.5	4.85	1.14e4	1.14e4	12.5	1.00	0.0
4	4 161113G1_6	12.5	4.85	1.21e4	1.21e4	12.5	1.00	0.0
5	5 161113G1_7	12.5	4.85	1.18e4	1.18e4	12.5	1.00	0.0
6	6 161113G1_8	12.5	4.85	1.38e4	1.38e4	12.5	1.00	0.0
7	7 161113G1_9	12.5	4.85	1.25e4	1.25e4	12.5	1.00	0.0
8	8 161113G1_10	12.5	4.85	1.25e4	1.25e4	12.5	1.00	0.0

Compound name: 13C6-PFDA
Response Factor: 1
RRF SD: 9.3831e-017, Relative SD: 9.3831e-015
Response type: Internal Std (Ref 22), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161113G1_3	12.5	5.13	7.75e3	7.75e3	12.5	1.00	0.0
2	2 161113G1_4	12.5	5.13	1.02e4	1.02e4	12.5	1.00	0.0
3	3 161113G1_5	12.5	5.13	7.68e3	7.68e3	12.5	1.00	0.0
4	4 161113G1_6	12.5	5.13	9.51e3	9.51e3	12.5	1.00	0.0
5	5 161113G1_7	12.5	5.13	8.53e3	8.53e3	12.5	1.00	-0.0
6	6 161113G1_8	12.5	5.13	8.46e3	8.46e3	12.5	1.00	0.0
7	7 161113G1_9	12.5	5.13	1.06e4	1.06e4	12.5	1.00	0.0
8	8 161113G1_10	12.5	5.13	1.12e4	1.12e4	12.5	1.00	0.0

Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Monday, November 14, 2016 09:28:19 Pacific Standard Time
Printed: Monday, November 14, 2016 09:28:35 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Compound name: PFBS

	Name	ID	Acq.Date	Acq.Time
1	161113G1_1	IPA	13-Nov-16	11:09:29
2	161113G1_2	ST161113G1-1 PFC CS-2 16K1124	13-Nov-16	11:22:09
3	161113G1_3	ST161113G1-2 PFC CS-1 16K1125	13-Nov-16	11:34:46
4	161113G1_4	ST161113G1-3 PFC CS0 16K1126	13-Nov-16	11:47:22
5	161113G1_5	ST161113G1-4 PFC CS1 16K1127	13-Nov-16	12:00:00
6	161113G1_6	ST161113G1-5 PFC CS2 16K1128	13-Nov-16	12:12:39
7	161113G1_7	ST161113G1-6 PFC CS3 16K1129	13-Nov-16	12:25:17
8	161113G1_8	ST161113G1-7 PFC CS3.5 16K0923	13-Nov-16	12:37:58
9	161113G1_9	ST161113G1-8 PFC CS4 16K1130	13-Nov-16	12:50:37
10	161113G1_10	ST161113G1-9 PFC CS4.5 16K1131	13-Nov-16	13:03:18
11	161113G1_11	ST161113G1-10 PFC CS5 16K1132	13-Nov-16	13:15:55
12	161113G1_12	IPA	13-Nov-16	13:28:31
13	161113G1_13	SS161113G1-1 PFC SSS 16J1810	13-Nov-16	13:41:09
14	161113G1_14	B6K0053-BS1 OPR 0.125	13-Nov-16	13:53:48
15	161113G1_15	B6K0054-BS1 OPR 0.125	13-Nov-16	14:06:24
16	161113G1_16	B6K0054-BSD1 LCS Dup 0.125	13-Nov-16	14:19:01
17	161113G1_17	B6K0055-BS1 OPR 1	13-Nov-16	14:31:39
18	161113G1_18	IPA	13-Nov-16	14:44:17
19	161113G1_19	B6K0053-BLK1 Method Blank 0.125	13-Nov-16	14:56:54
20	161113G1_20	B6K0054-BLK1 Method Blank 0.125	13-Nov-16	15:09:33
21	161113G1_21	B6K0055-BLK1 Method Blank 1	13-Nov-16	15:22:08
22	161113G1_22	1601388-01 MW-BG07-1016 0.12618	13-Nov-16	15:34:43
23	161113G1_23	1601388-02 MW-BG06-1016 0.12354	13-Nov-16	15:47:19
24	161113G1_24	1601388-03 MW-BG05-1016 0.12746	13-Nov-16	15:59:55
25	161113G1_25	1601388-04 MW-BG05P-1016 0.1237	13-Nov-16	16:12:32
26	161113G1_26	1601388-05 MW-BG04-1016 0.13102	13-Nov-16	16:25:10
27	161113G1_27	1601388-06 OC-FB-102816 0.12776	13-Nov-16	16:37:48
28	161113G1_28	1601388-07 MW-BG01-1016 0.12279	13-Nov-16	16:50:26
29	161113G1_29	1601388-08 MW-BG09-1016 0.12536	13-Nov-16	17:03:01
30	161113G1_30	B6K0053-MS1 Matrix Spike 0.13008	13-Nov-16	17:15:36
31	161113G1_31	B6K0053-MSD1 Matrix Spike Dup 0.12486	13-Nov-16	17:28:12

Dataset: Untitled

Last Altered: Monday, November 14, 2016 09:28:19 Pacific Standard Time
Printed: Monday, November 14, 2016 09:28:35 Pacific Standard Time

Compound name: PFBS

	Name	ID	Acq.Date	Acq.Time
32	161113G1_32	1601388-09 OC-MW04-1016 0.12595	13-Nov-16	17:40:48
33	161113G1_33	IPA	13-Nov-16	17:53:25
34	161113G1_34	ST161113G1-11 PFC CS3.5 16K0923	13-Nov-16	18:06:14
35	161113G1_35	IPA	13-Nov-16	18:18:52
36	161113G1_36	1601388-10 MW-BG11-1016 0.12196	13-Nov-16	18:31:31
37	161113G1_37	1601390-01 SP 4 0.12354	13-Nov-16	18:44:09
38	161113G1_38	1601390-02 SP 5 0.12756	13-Nov-16	18:56:47
39	161113G1_39	1601390-03 SP 6 0.12523	13-Nov-16	19:09:26
40	161113G1_40	1601390-04 102916-DUP 0.12766	13-Nov-16	19:22:01
41	161113G1_41	1601398-01 SW-NRES020-110116 0.12224	13-Nov-16	19:34:35
42	161113G1_42	1601399-01 860 SOUTH RD 0.12506	13-Nov-16	19:47:11
43	161113G1_43	1601382-02 AT028-SB15-102816-01-02 1	13-Nov-16	19:59:49
44	161113G1_44	1601382-03 AT028-SB15-102816-04-05 1	13-Nov-16	20:12:27
45	161113G1_45	1601382-04 AT028-SB16-102816-02-03 1	13-Nov-16	20:25:06
46	161113G1_46	IPA	13-Nov-16	20:37:46
47	161113G1_47	ST161113G1-12 PFC CS3.5 16K0923	13-Nov-16	20:50:25
48	161113G1_48	IPA	13-Nov-16	21:03:11

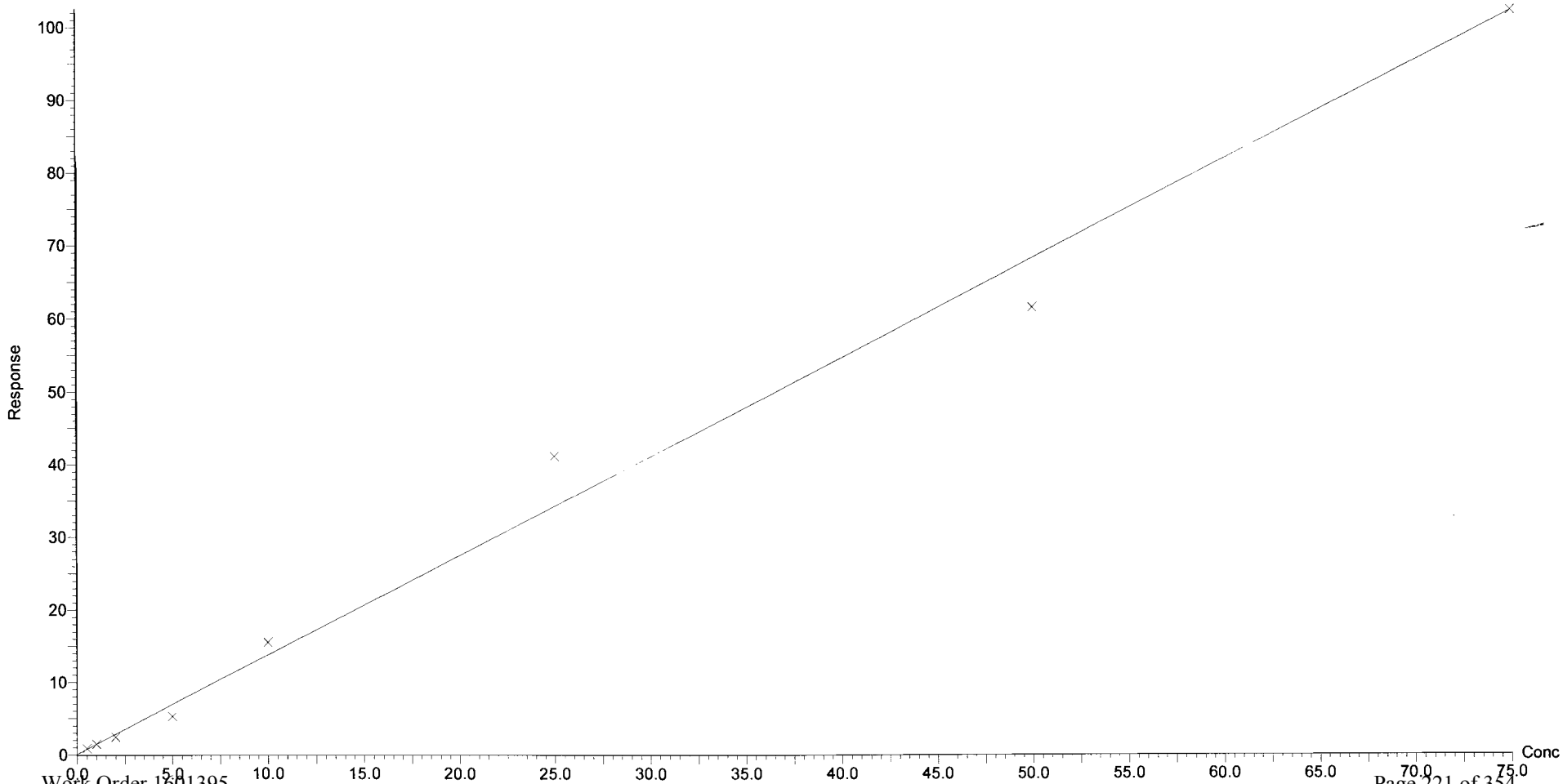
Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:25:20 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

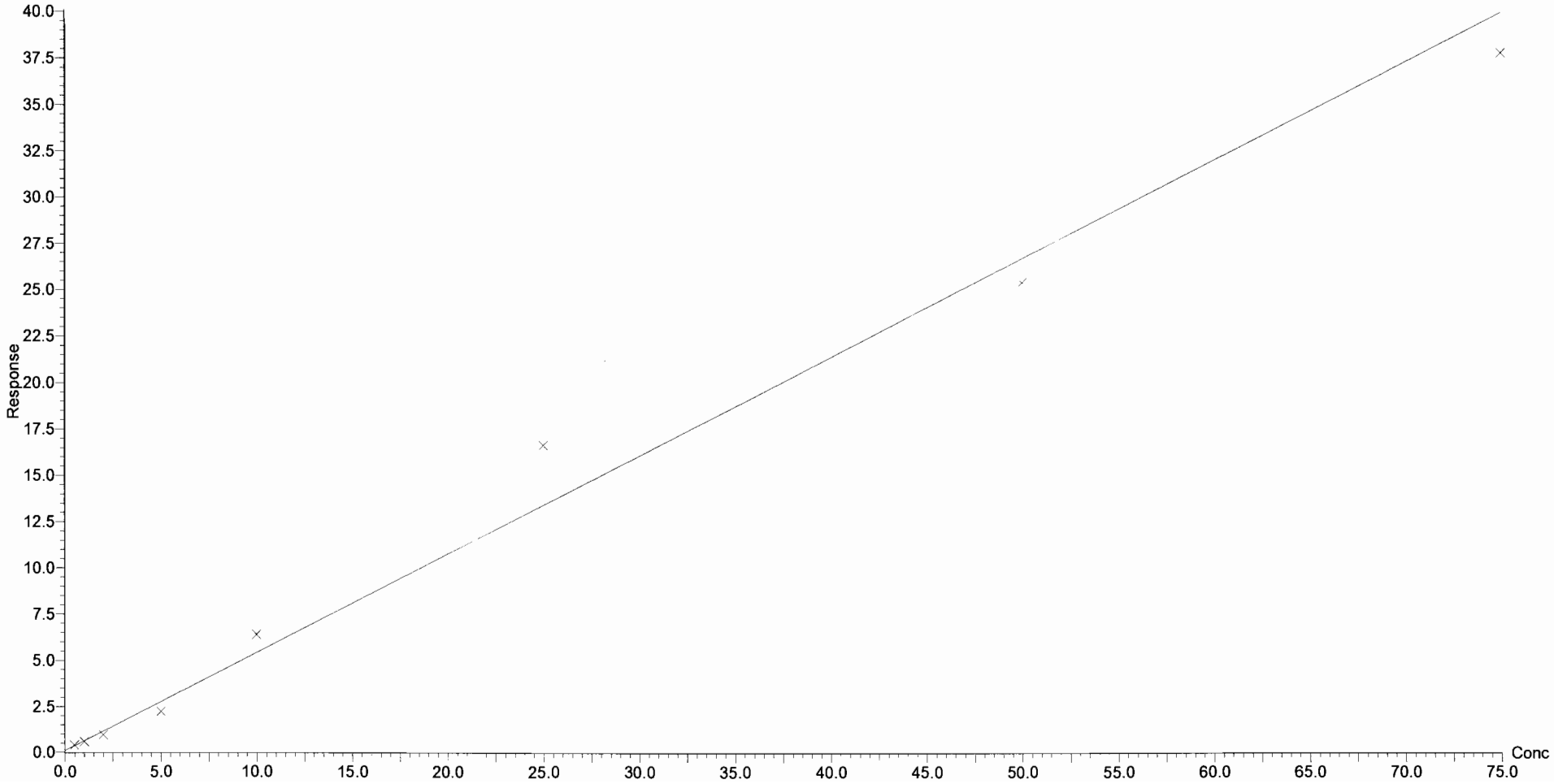
Compound name: PFBS
Correlation coefficient: r = 0.993420, r^2 = 0.986884
Calibration curve: 1.36557 * x + 0.119712
Response type: Internal Std (Ref 9), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:25:20 Pacific Standard Time

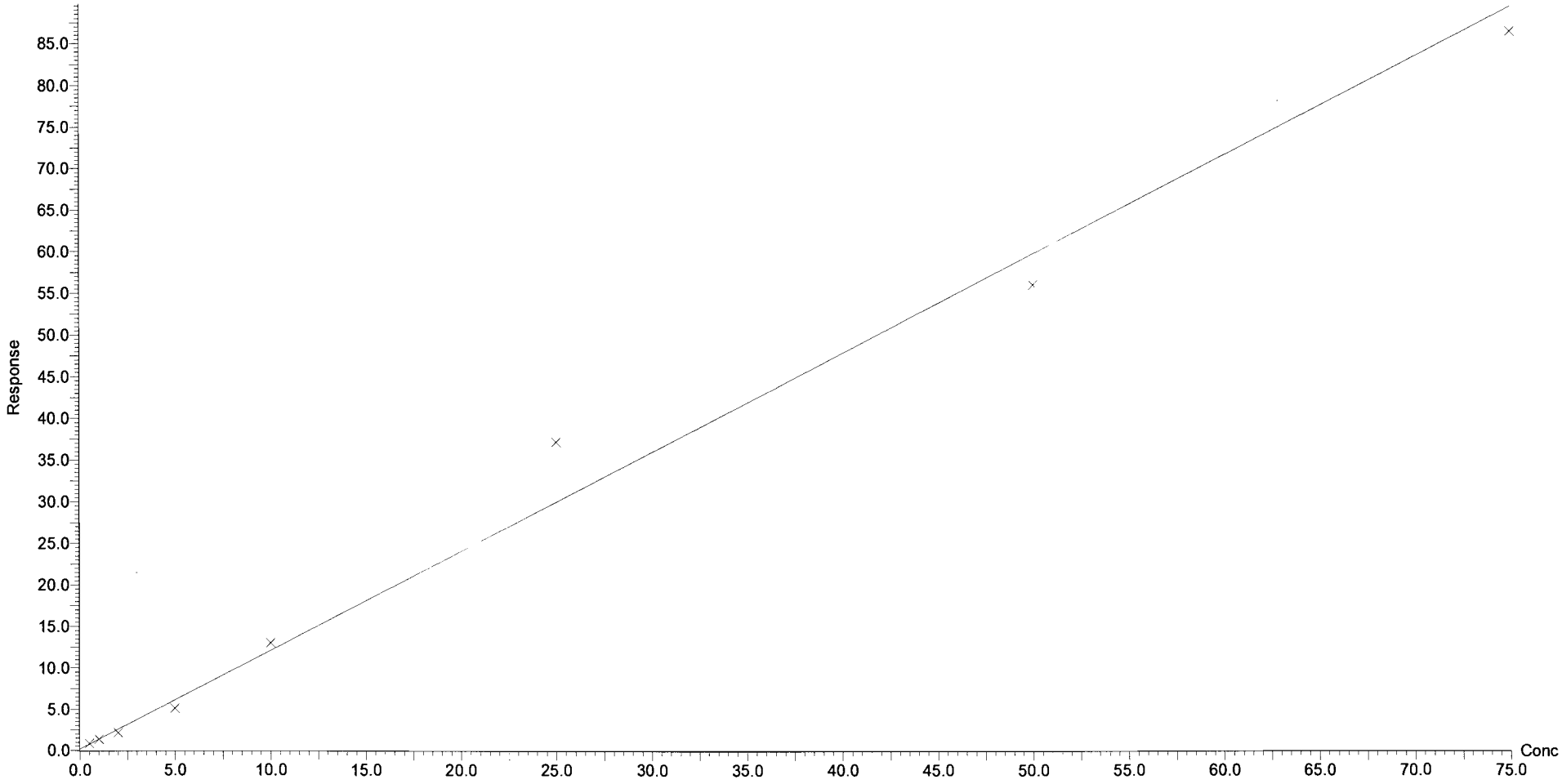
Compound name: PFHxA
Correlation coefficient: r = 0.992075, r^2 = 0.984213
Calibration curve: 0.533409 * x + 0.0903449
Response type: Internal Std (Ref 10), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:25:20 Pacific Standard Time

Compound name: PFHpA
Correlation coefficient: r = 0.993436, r^2 = 0.986915
Calibration curve: 1.19442 * x + 0.171662
Response type: Internal Std (Ref 11), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

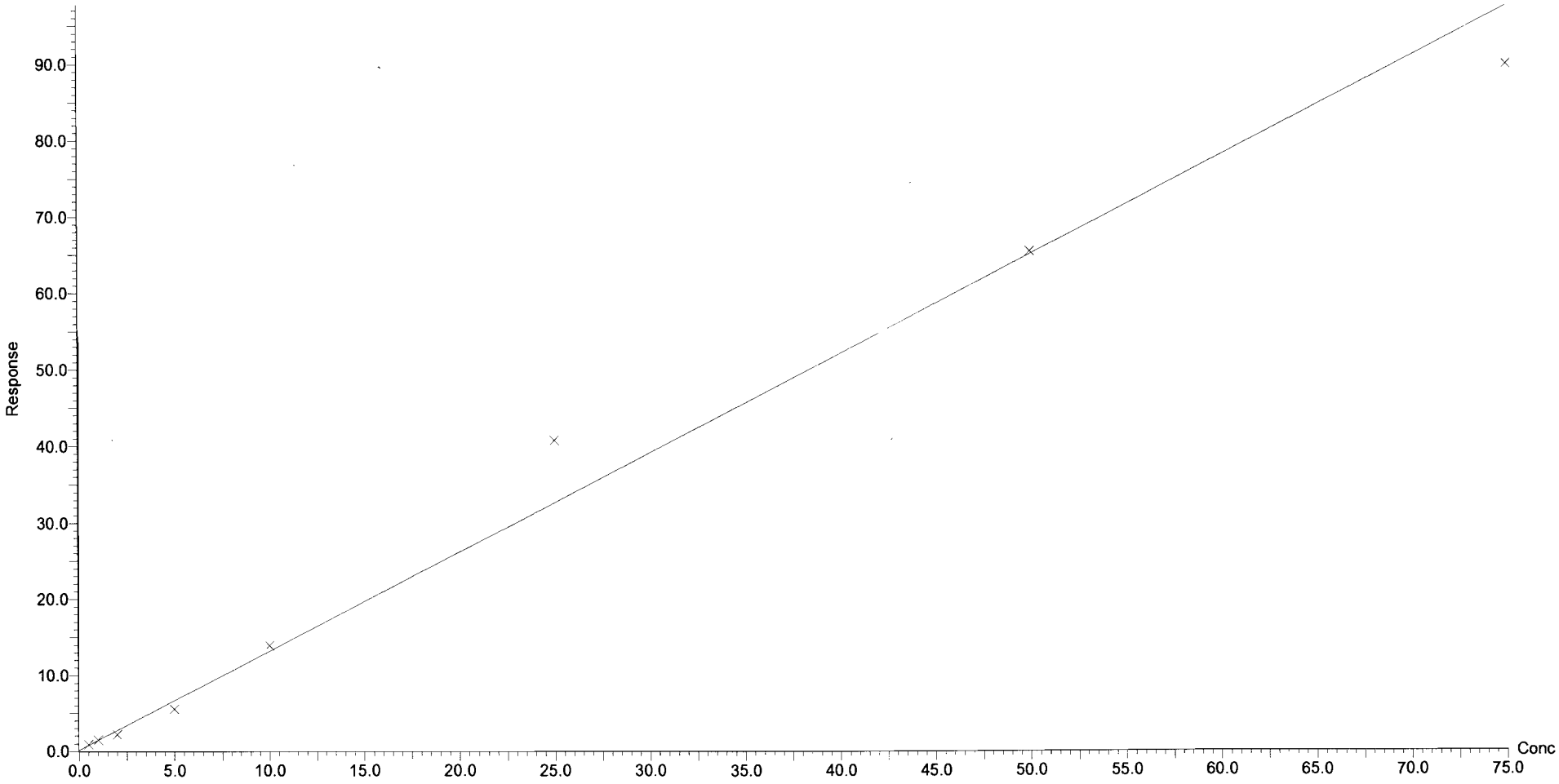


Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:25:20 Pacific Standard Time

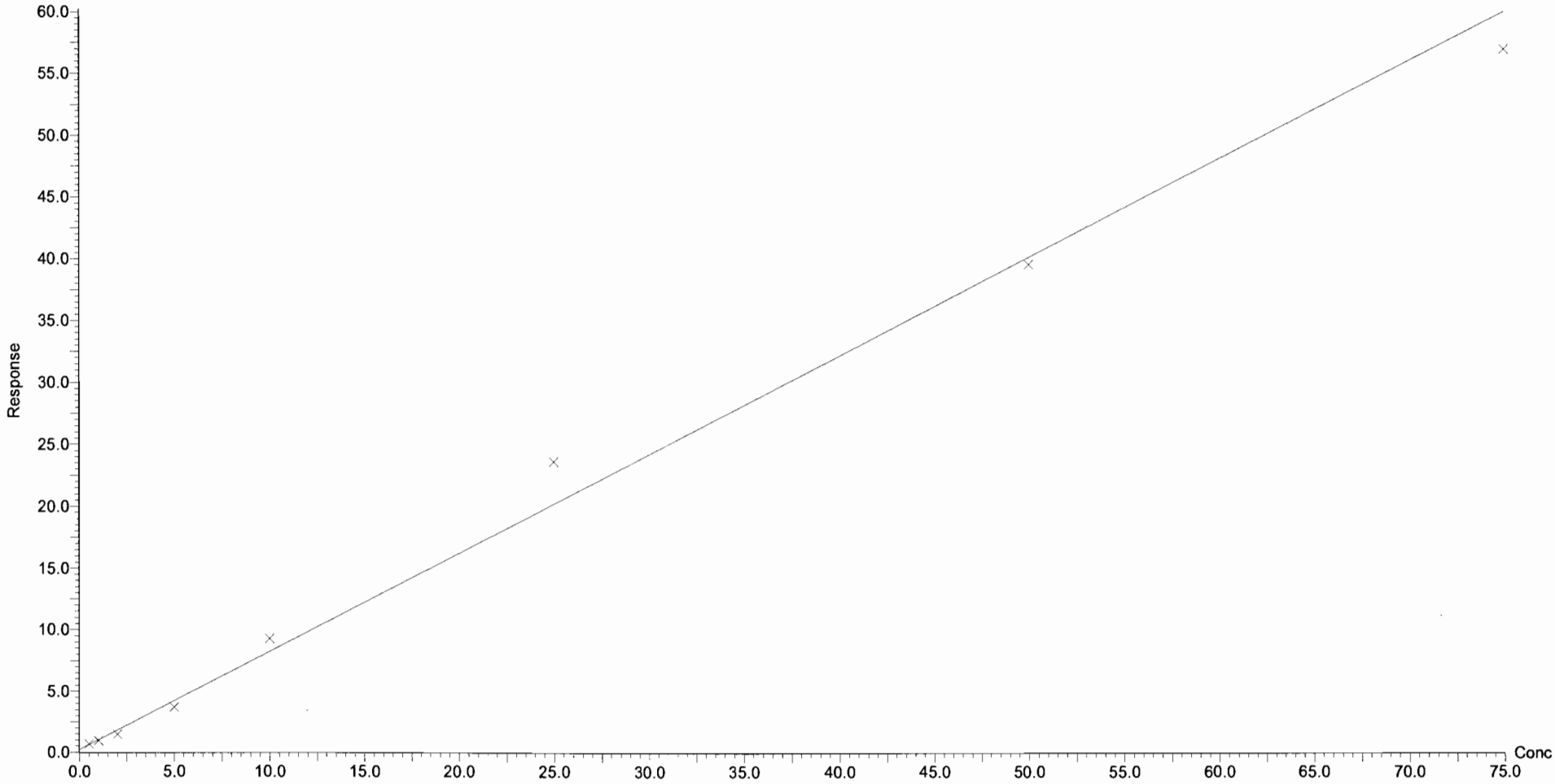
Compound name: PFHxS
Correlation coefficient: r = 0.992500, r^2 = 0.985056
Calibration curve: 1.30086 * x + 0.139374
Response type: Internal Std (Ref 12), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:25:20 Pacific Standard Time

Compound name: PFOA
Correlation coefficient: r = 0.995660, r^2 = 0.991339
Calibration curve: 0.800305 * x + 0.222058
Response type: Internal Std (Ref 13), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

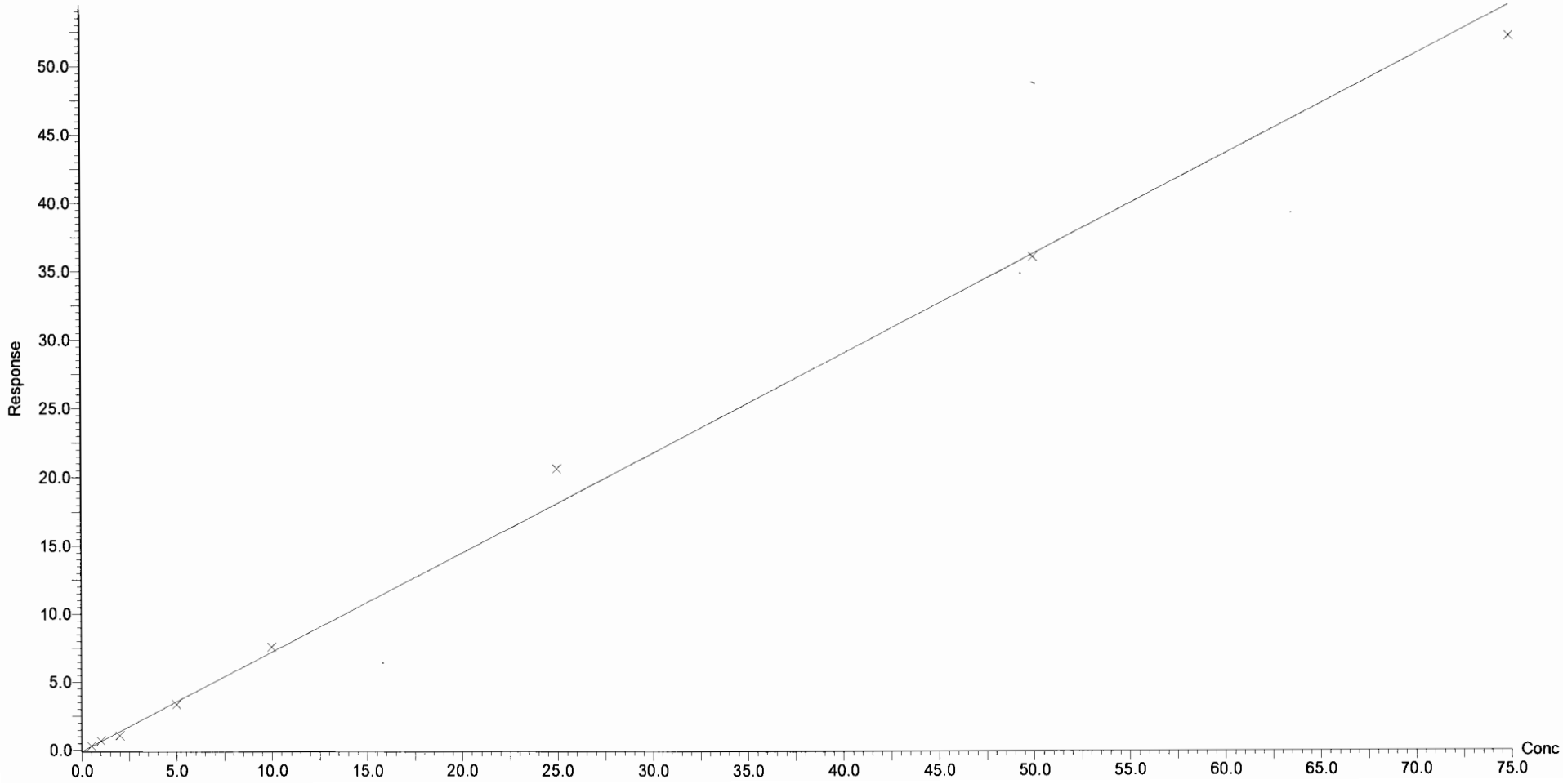


Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:25:20 Pacific Standard Time

Compound name: PFOS
Correlation coefficient: r = 0.997531, r^2 = 0.995068
Calibration curve: 0.727385 * x + -0.0835443
Response type: Internal Std (Ref 14), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

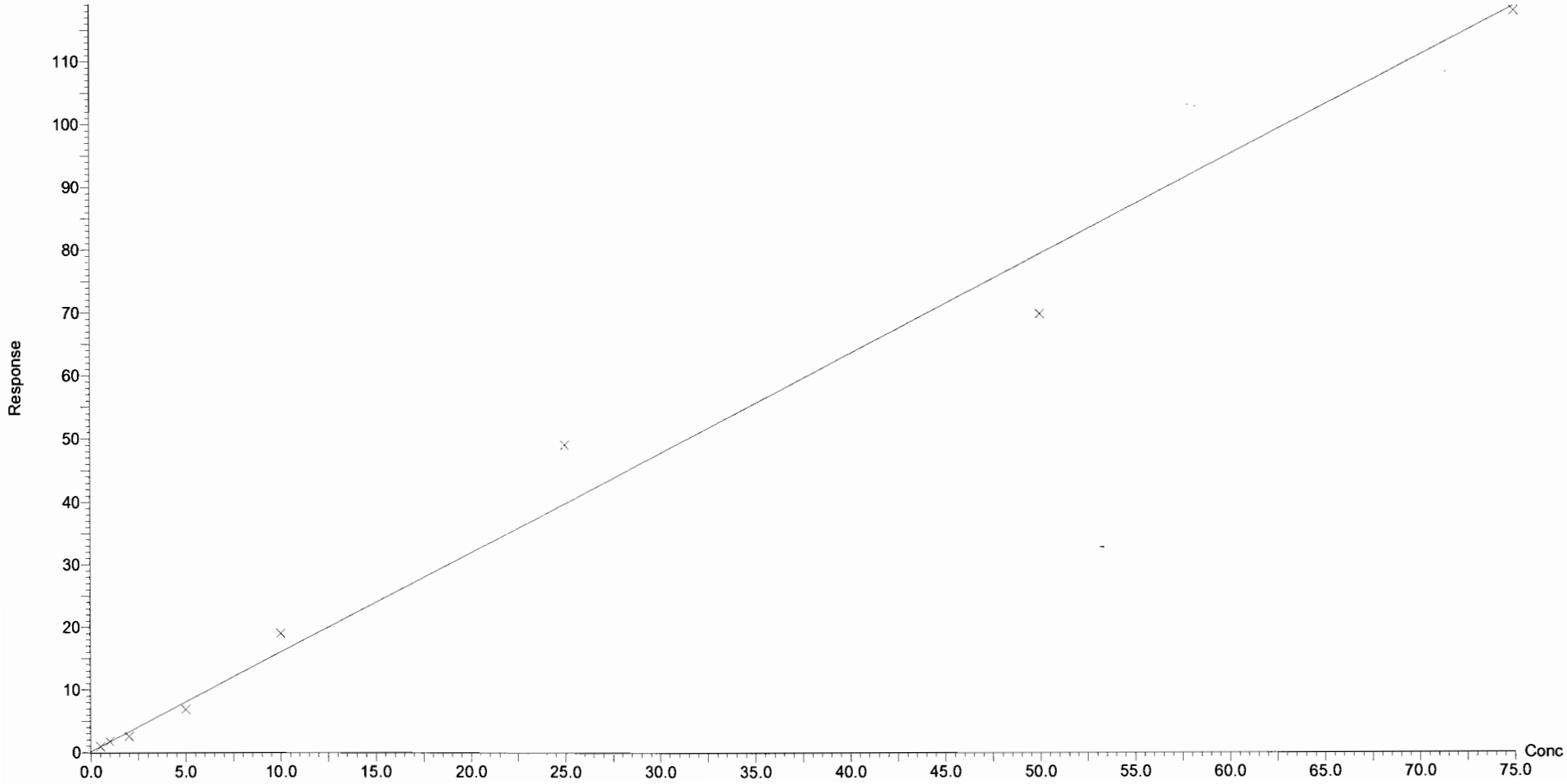


Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:25:20 Pacific Standard Time

Compound name: PFNA
Correlation coefficient: r = 0.991334, r^2 = 0.982742
Calibration curve: 1.58768 * x + 0.131445
Response type: Internal Std (Ref 15), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

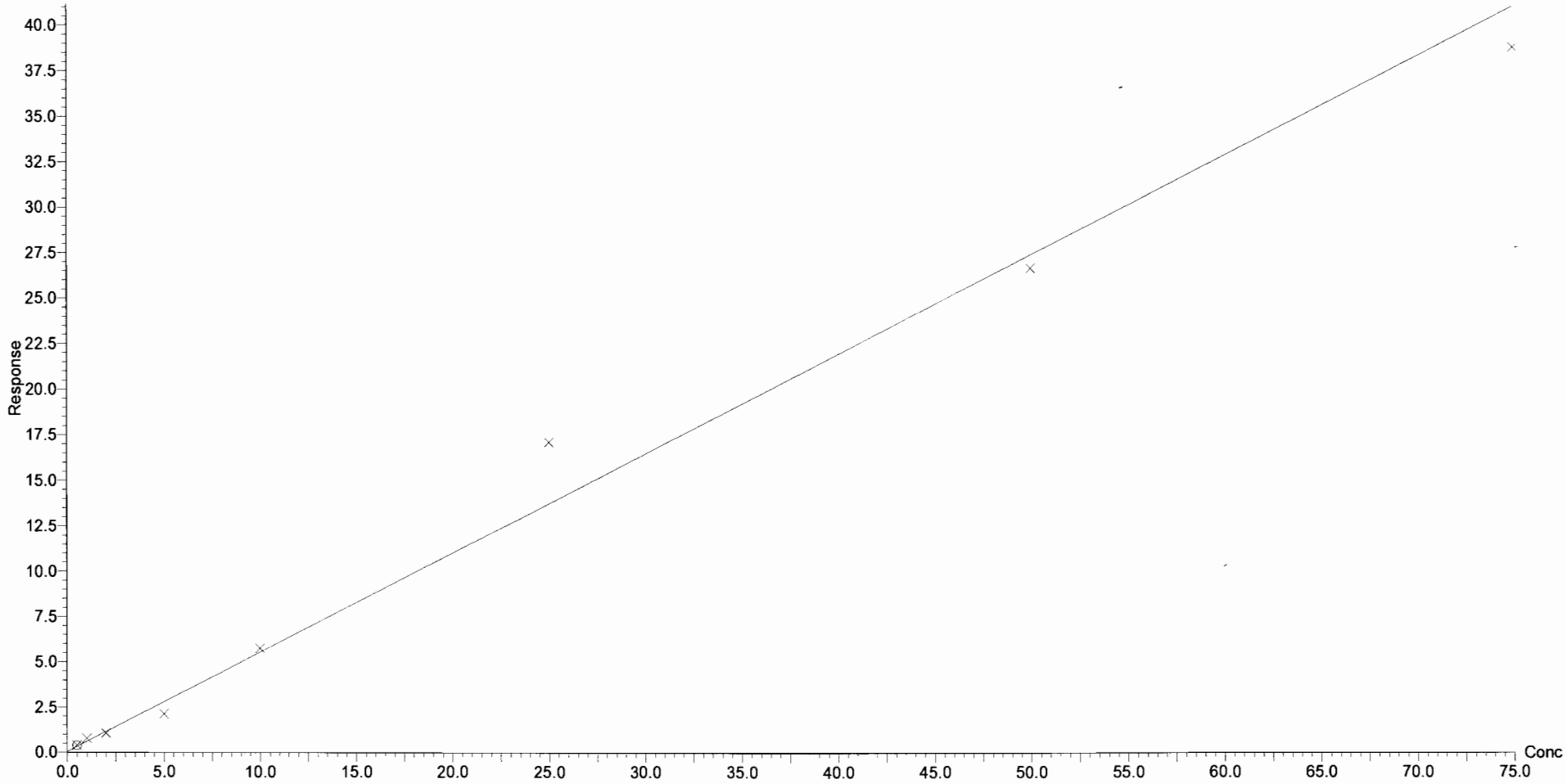


Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-CRV.qld

Last Altered: Monday, November 14, 2016 09:22:23 Pacific Standard Time
Printed: Monday, November 14, 2016 09:25:20 Pacific Standard Time

Compound name: PFDA
Correlation coefficient: r = 0.993024, r^2 = 0.986097
Calibration curve: 0.548079 * x + 0.0475241
Response type: Internal Std (Ref 16), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Include, Weighting: 1/x, Axis trans: None



Vista Analytical Laboratory Q1

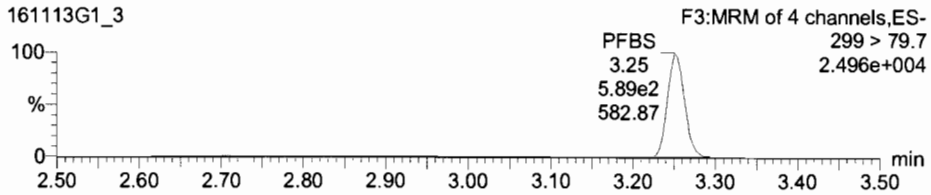
Dataset: Untitled

Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

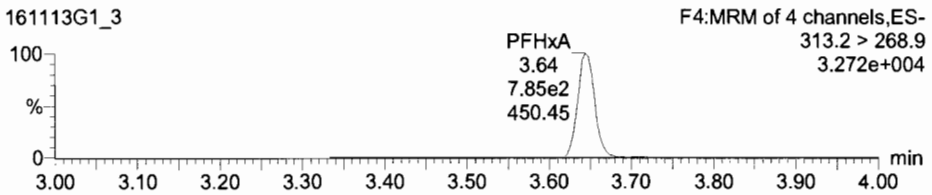
Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: 14 Nov 2016 09:09:17

Name: 161113G1_3, Date: 13-Nov-2016, Time: 11:34:46, ID: ST161113G1-2 PFC CS-1 16K1125, Description: PFC CS-1 16K1125 A

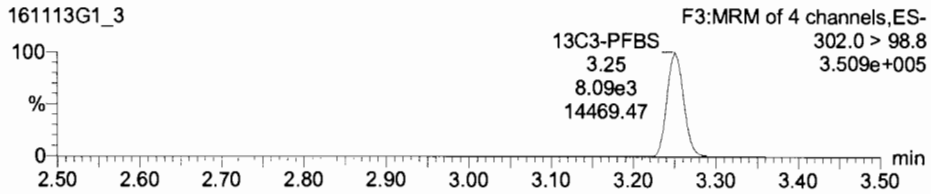
Total PFBS



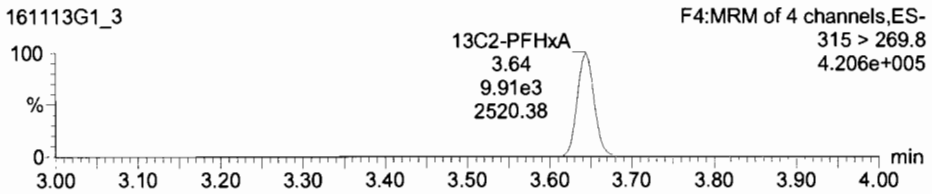
PFHxA



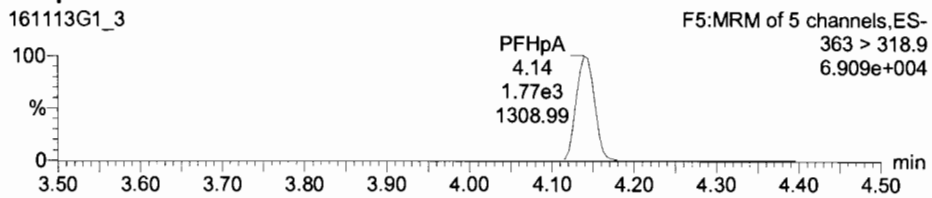
13C3-PFBS



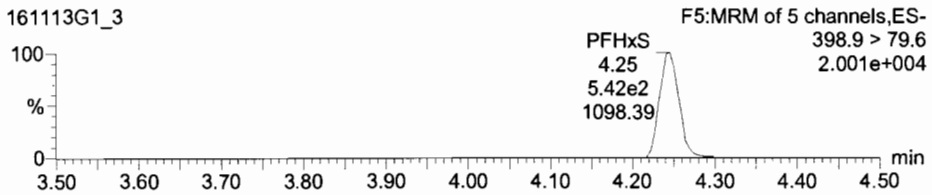
13C2-PFHxA



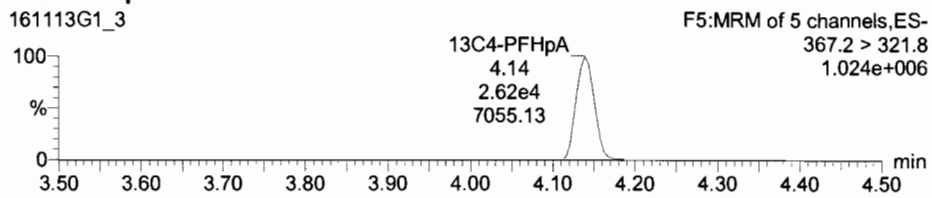
PFHpA



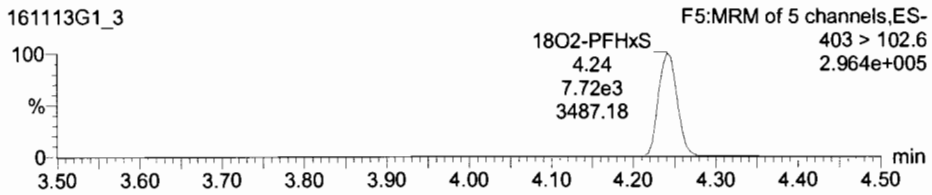
Total PFHxS



13C4-PFHpA



18O2-PFHxS

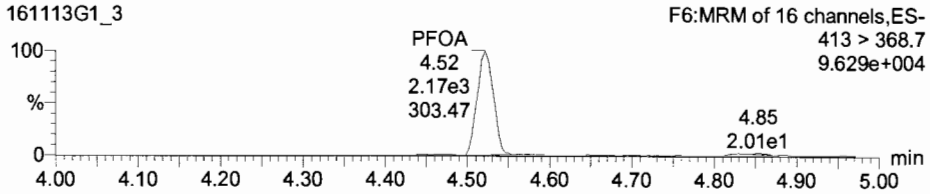


Dataset: Untitled

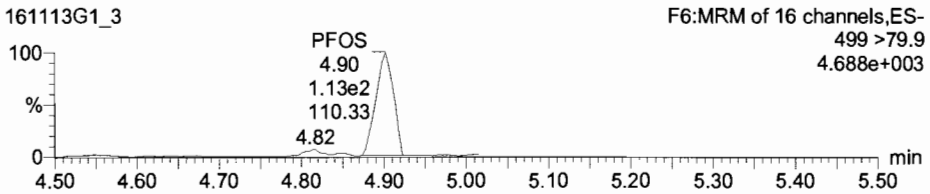
Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_3, Date: 13-Nov-2016, Time: 11:34:46, ID: ST161113G1-2 PFC CS-1 16K1125, Description: PFC CS-1 16K1125 A

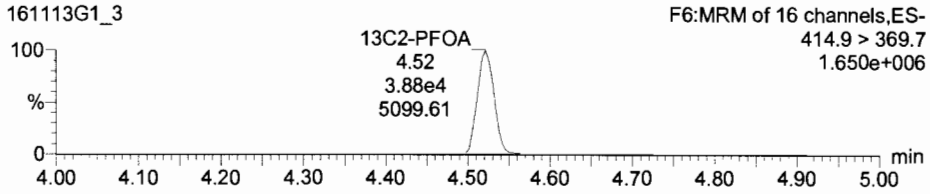
Total PFOA



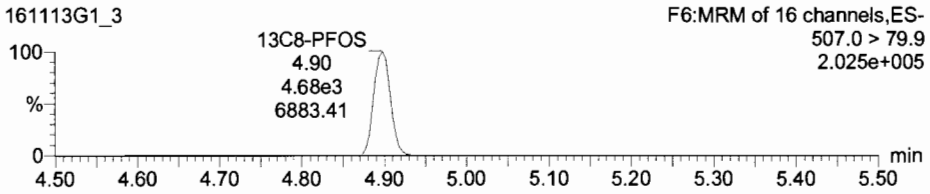
Total PFOS



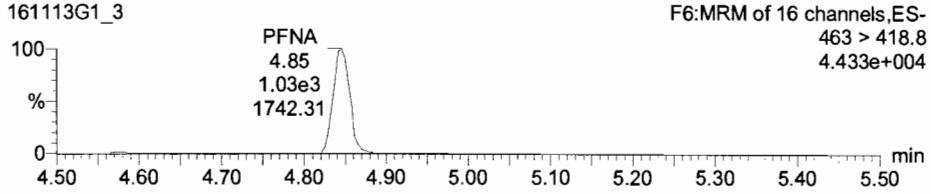
13C2-PFOA



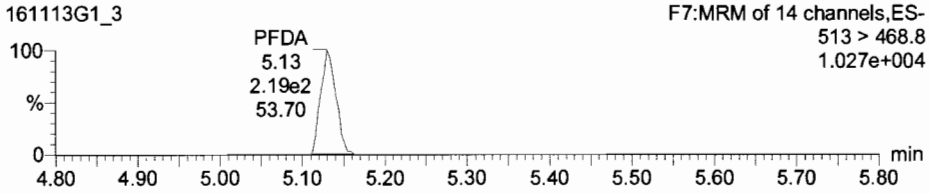
13C8-PFOS



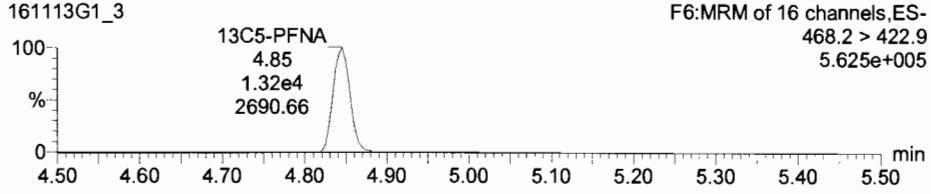
PFNA



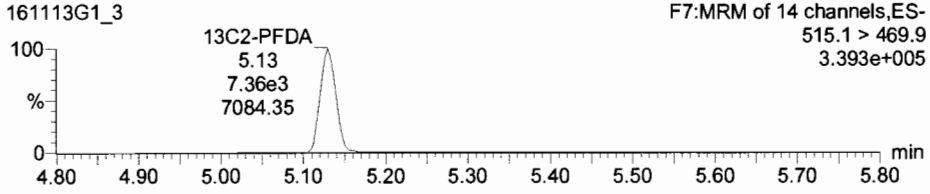
PFDA



13C5-PFNA



13C2-PFDA



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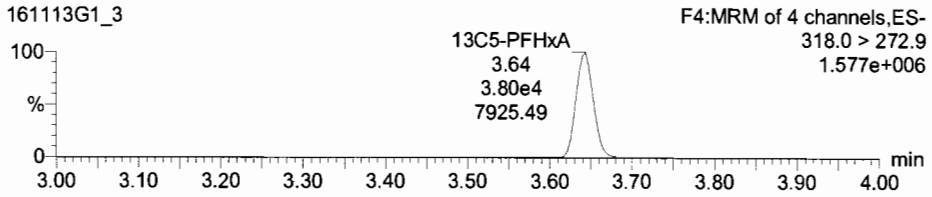
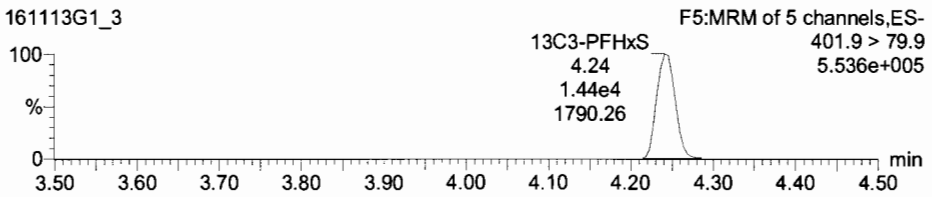
Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_3, Date: 13-Nov-2016, Time: 11:34:46, ID: ST161113G1-2 PFC CS-1 16K1125, Description: PFC CS-1 16K1125 A

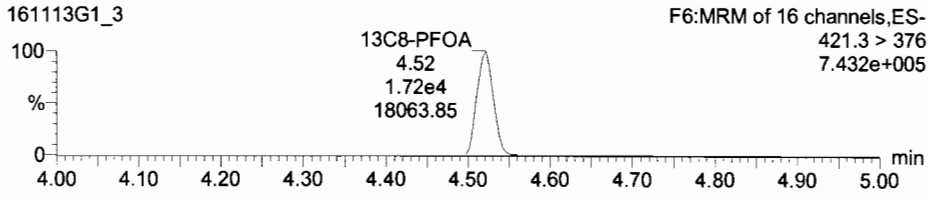
13C5-PFHxA



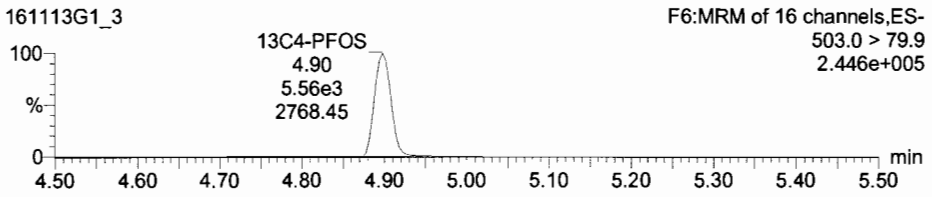
13C3-PFHxS



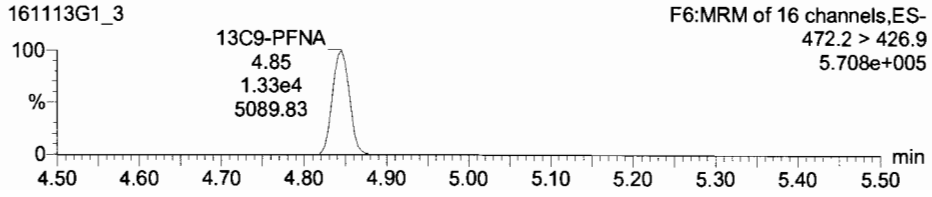
13C8-PFOA



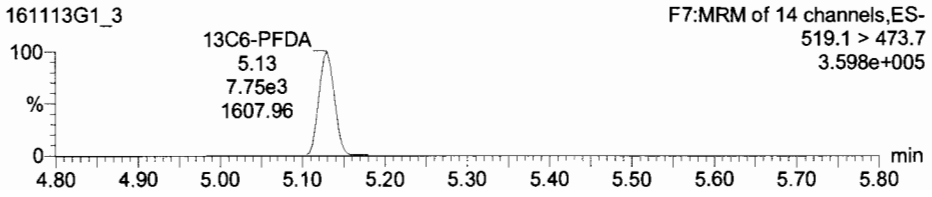
13C4-PFOS



13C9-PFNA



13C6-PFDA

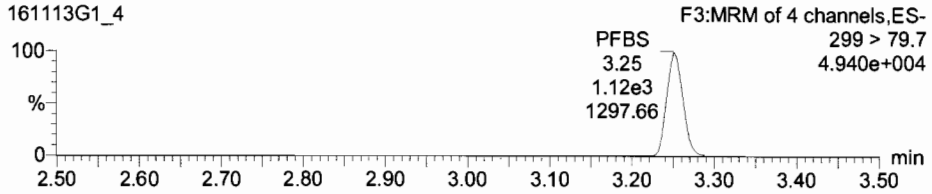


Dataset: Untitled

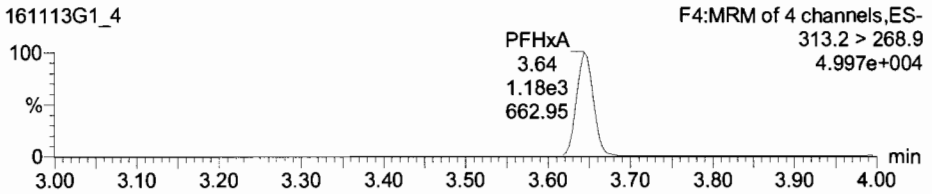
Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_4, Date: 13-Nov-2016, Time: 11:47:22, ID: ST161113G1-3 PFC CS0 16K1126, Description: PFC CS0 16K1126 A

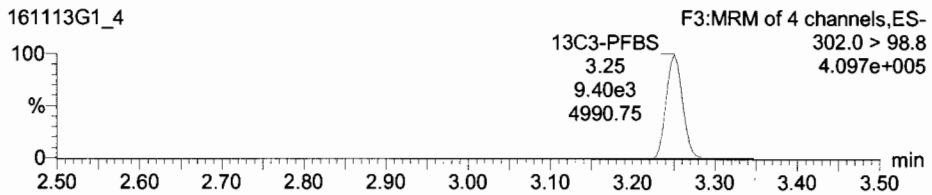
Total PFBS



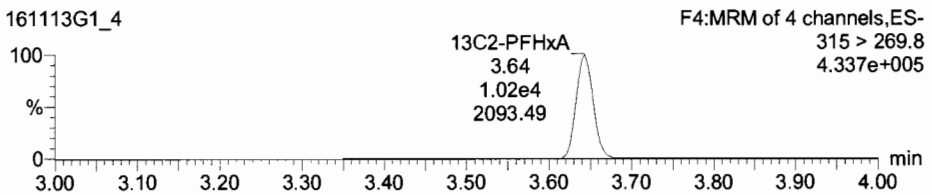
PFHxA



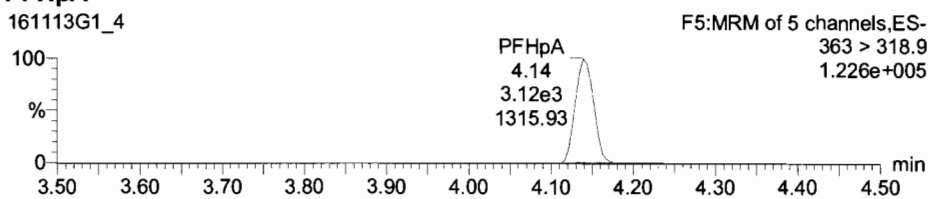
13C3-PFBS



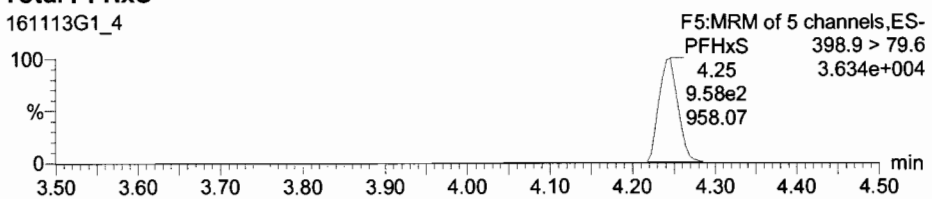
13C2-PFHxA



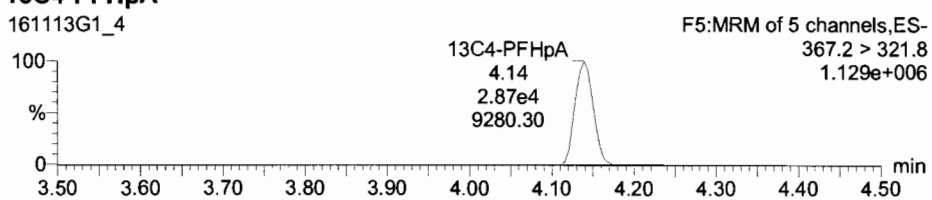
PFHpA



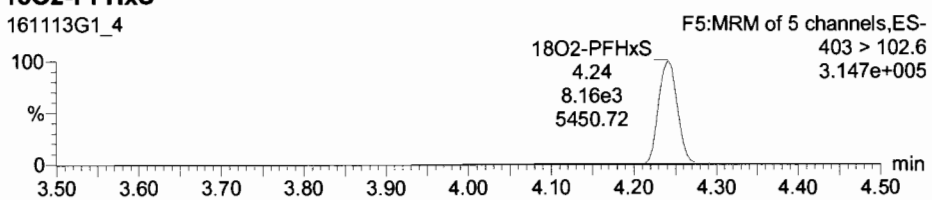
Total PFHxS



13C4-PFHpA



18O2-PFHxS



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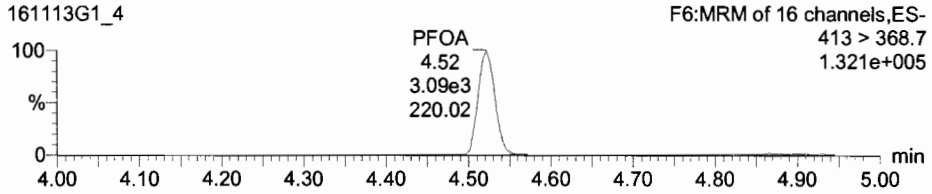
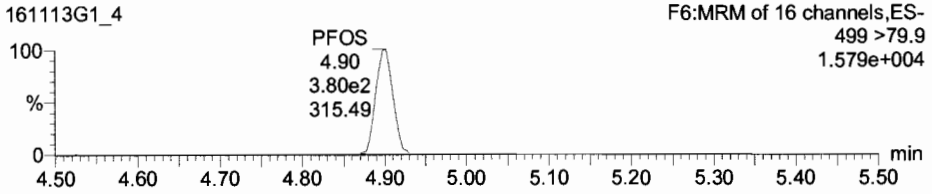
Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_4, Date: 13-Nov-2016, Time: 11:47:22, ID: ST161113G1-3 PFC CS0 16K1126, Description: PFC CS0 16K1126 A

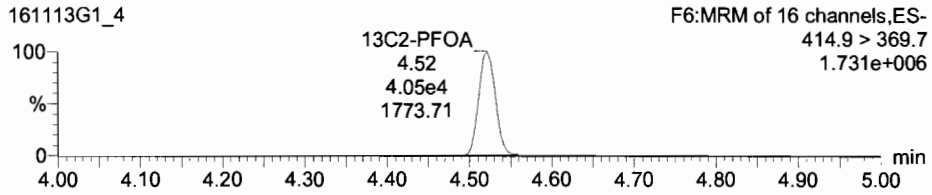
Total PFOA



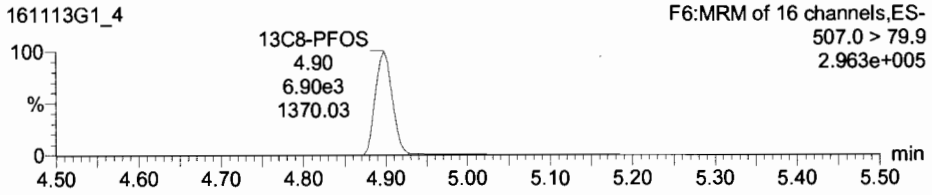
Total PFOS



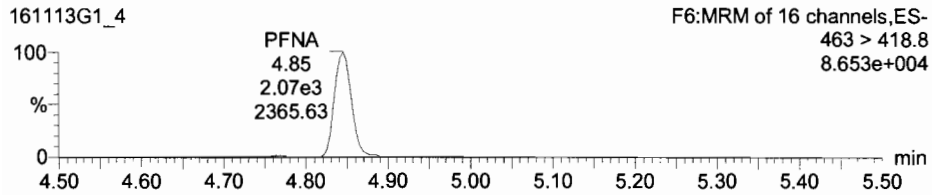
13C2-PFOA



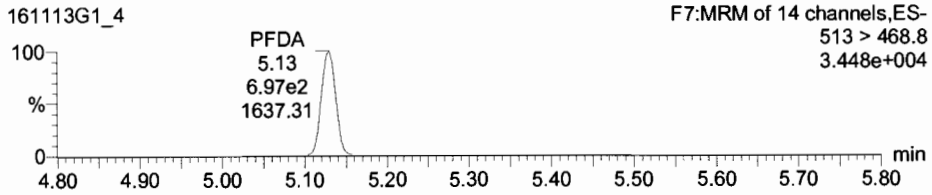
13C8-PFOS



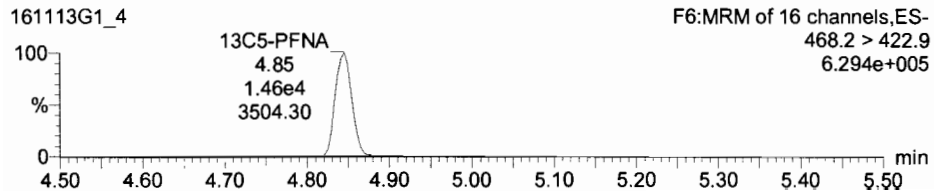
PFNA



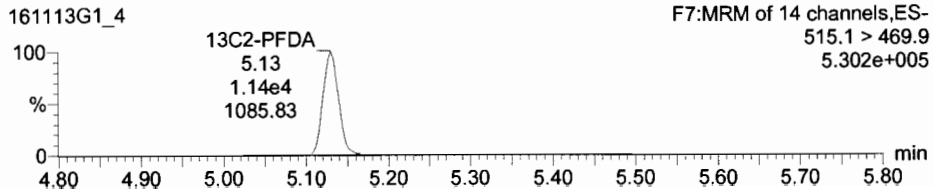
PFDA



13C5-PFNA



13C2-PFDA



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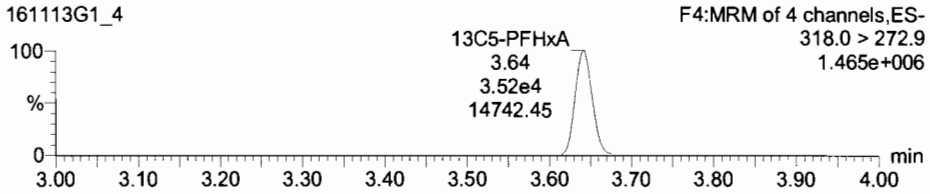
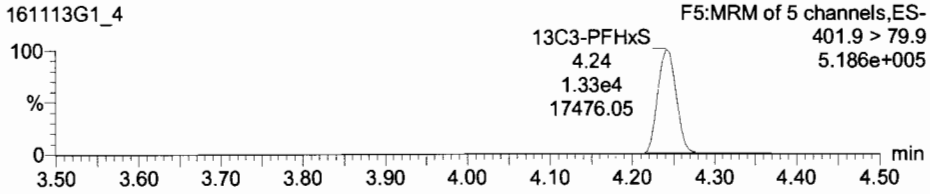
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_4, Date: 13-Nov-2016, Time: 11:47:22, ID: ST161113G1-3 PFC CS0 16K1126, Description: PFC CS0 16K1126 A

13C5-PFHxA



13C3-PFHxS



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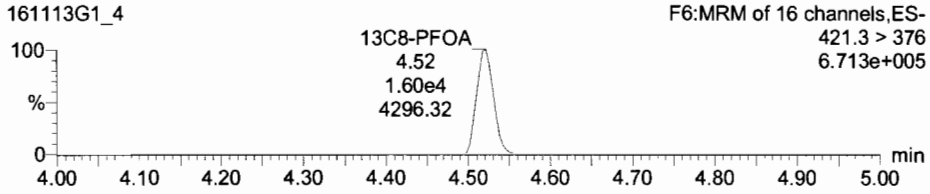
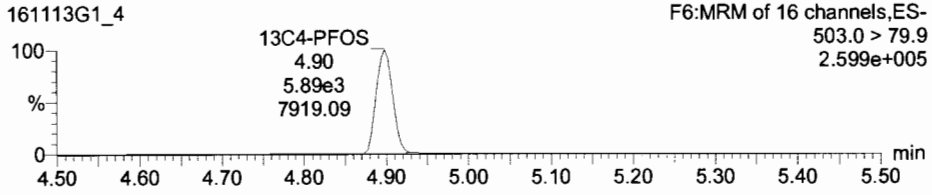
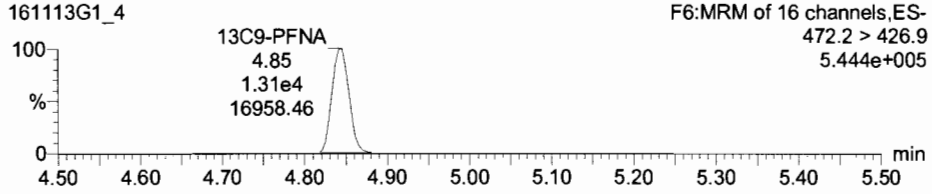


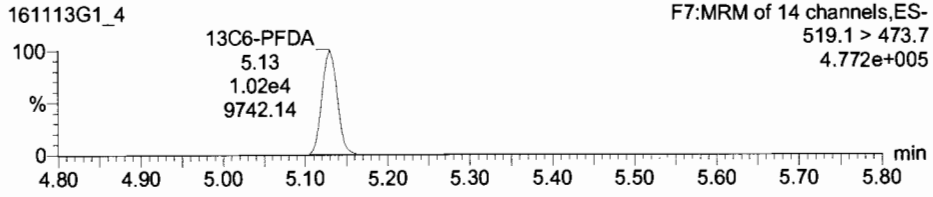
13C4-PFOS



13C9-PFNA



13C6-PFDA



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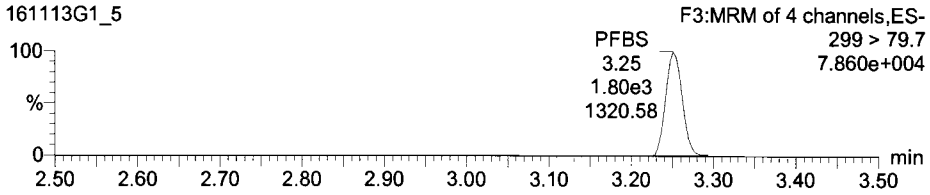
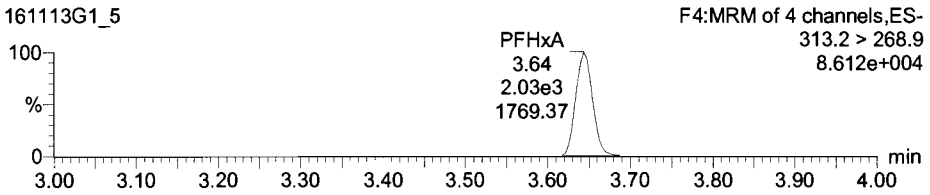
Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_5, Date: 13-Nov-2016, Time: 12:00:00, ID: ST161113G1-4 PFC CS1 16K1127, Description: PFC CS1 16K1127 A

Total PFBS



PFHxA



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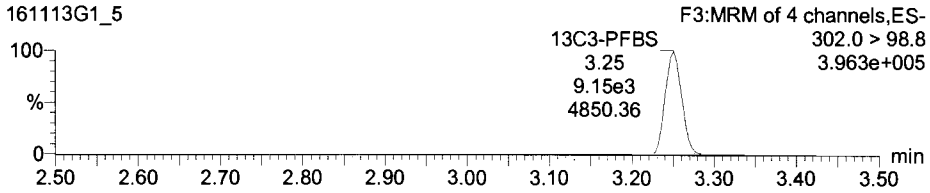
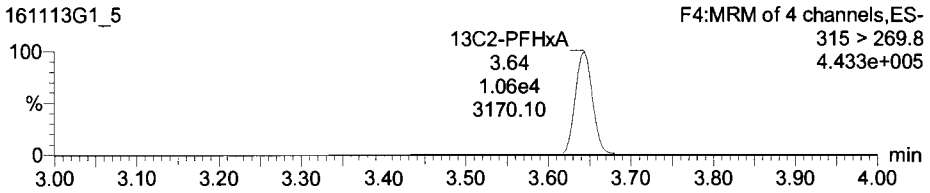
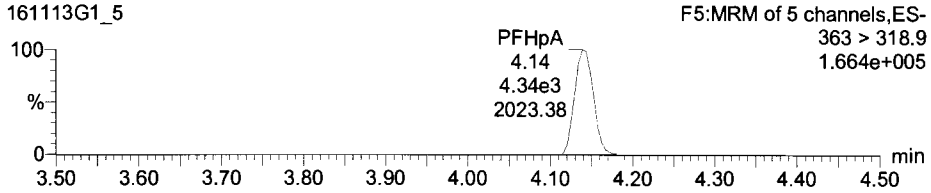


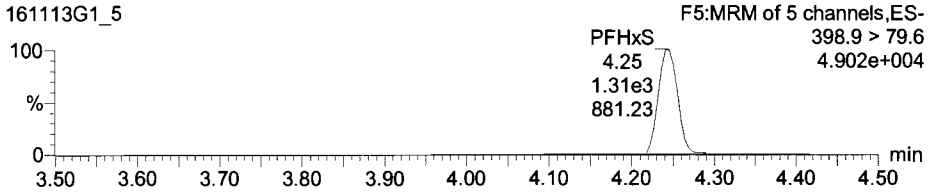
13C2-PFHxA



PFHpA



Total PFHxS



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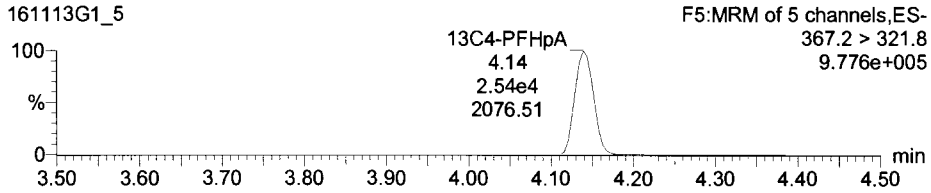
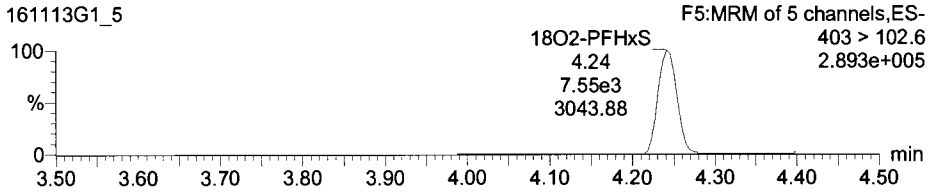


18O2-PFHxS



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Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
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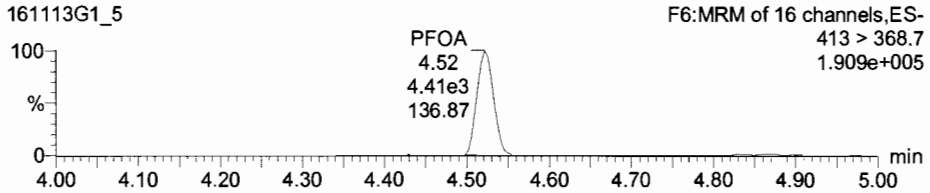
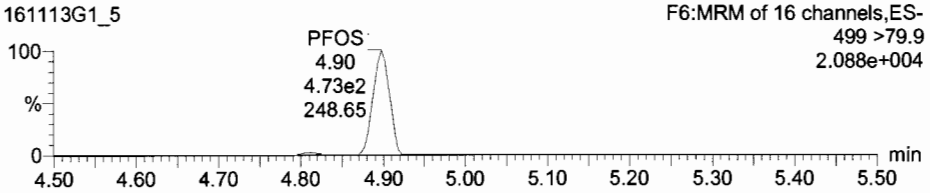
Name: 161113G1_5, Date: 13-Nov-2016, Time: 12:00:00, ID: ST161113G1-4 PFC CS1 16K1127, Description: PFC CS1 16K1127 A

Total PFOA



Total PFOS



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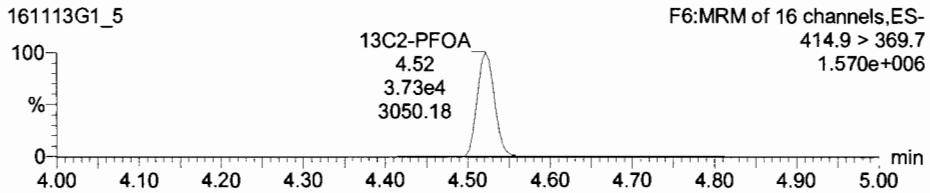

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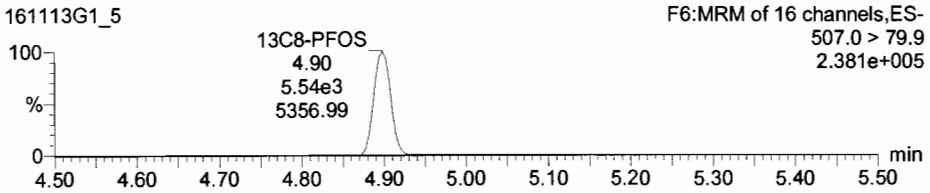
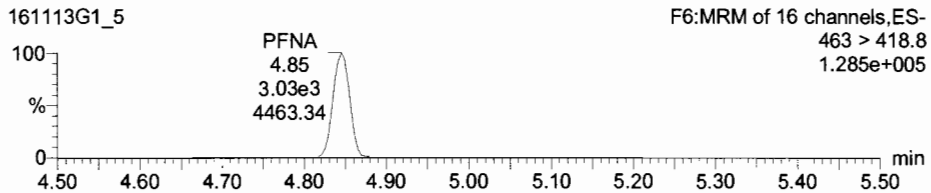
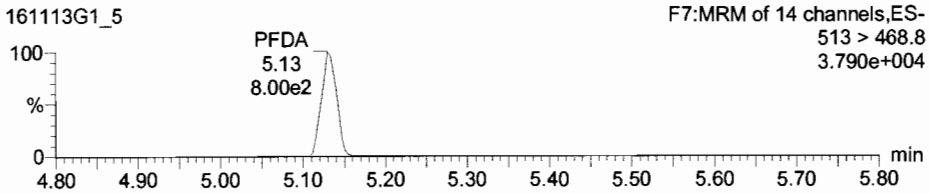


PFNA



PFDA



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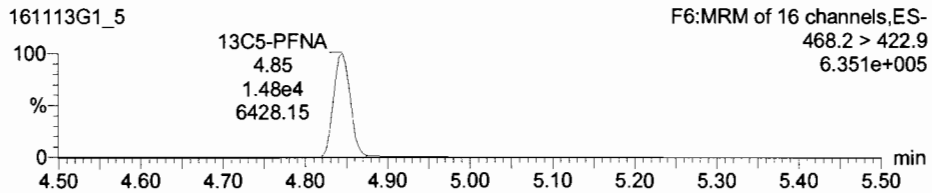
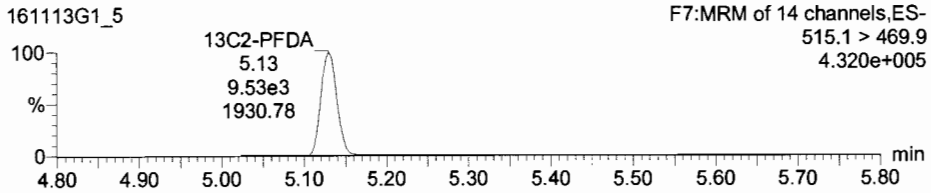


13C2-PFDA



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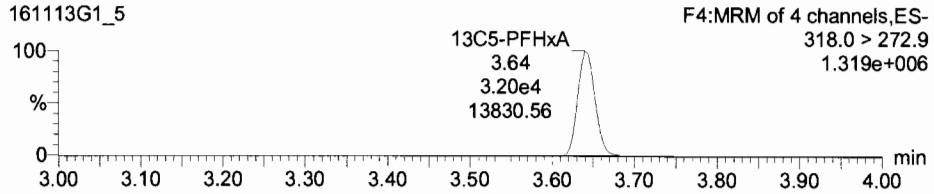
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_5, Date: 13-Nov-2016, Time: 12:00:00, ID: ST161113G1-4 PFC CS1 16K1127, Description: PFC CS1 16K1127 A

13C5-PFHxA



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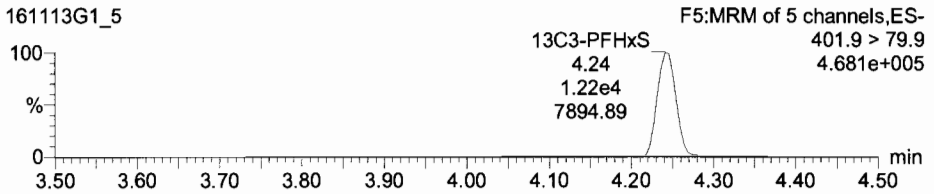

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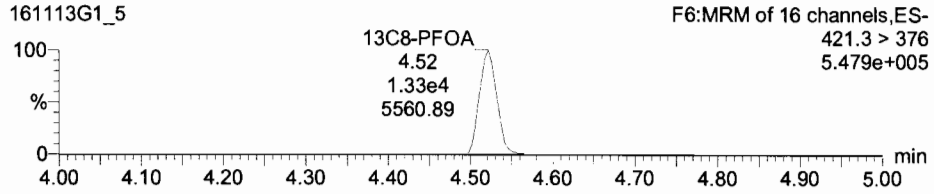

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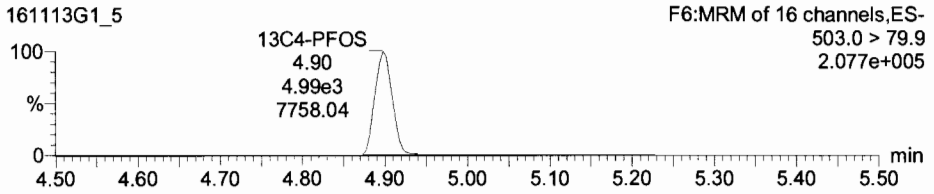
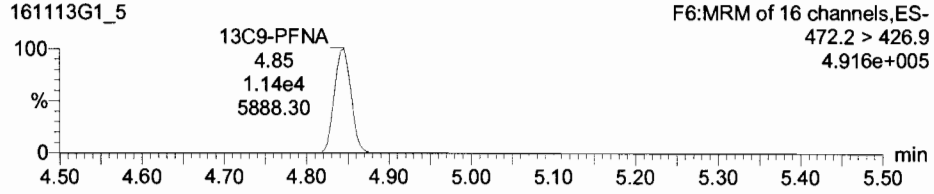


13C9-PFNA



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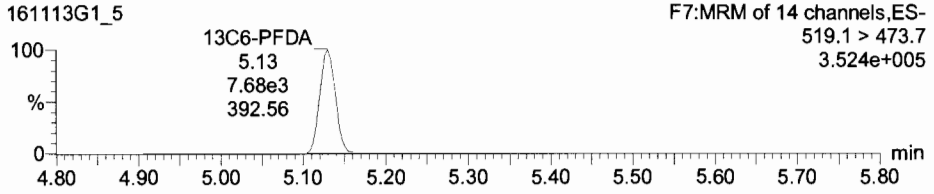

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Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
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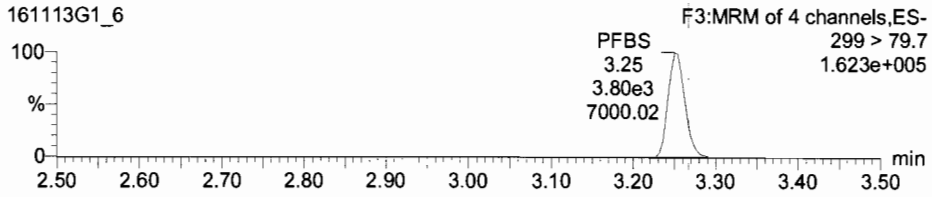
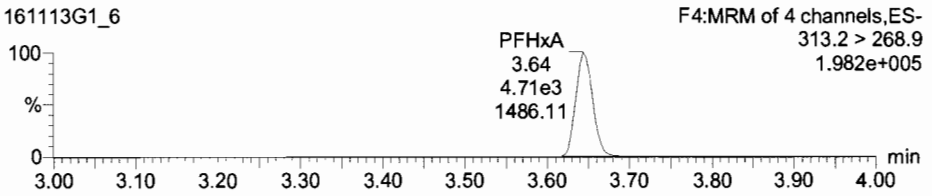
Name: 161113G1_6, Date: 13-Nov-2016, Time: 12:12:39, ID: ST161113G1-5 PFC CS2 16K1128, Description: PFC CS2 16K1128 A

Total PFBS



PFHxA



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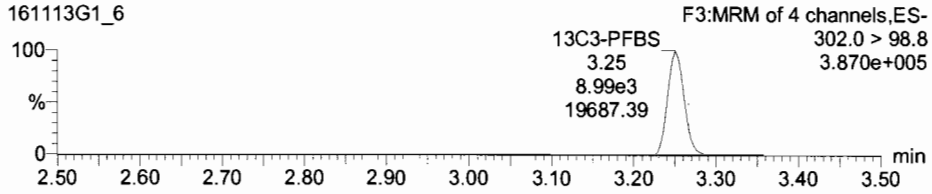
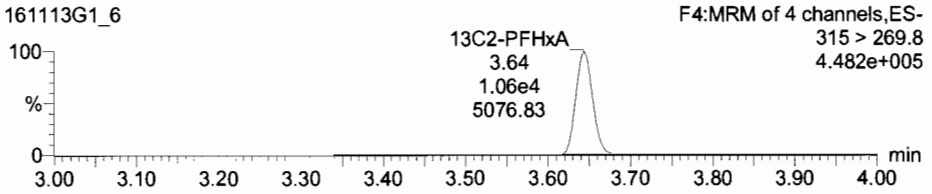
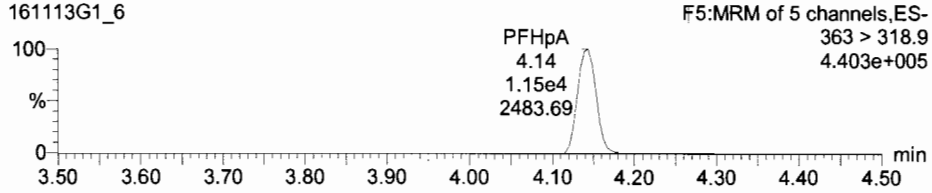


13C2-PFHxA



PFHpA



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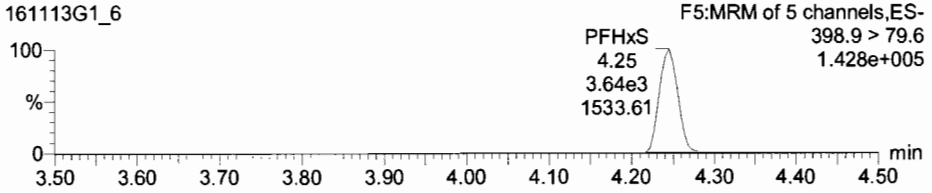

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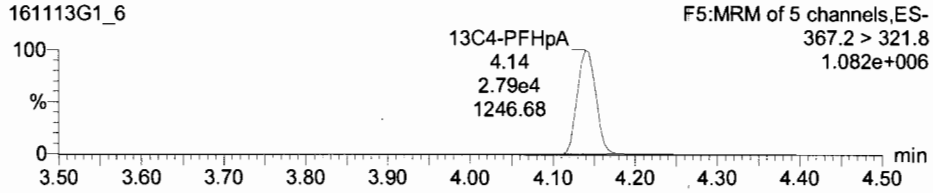
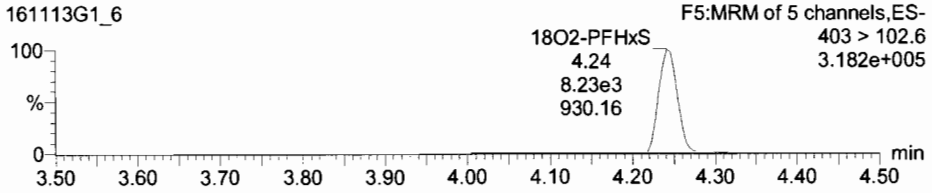


18O2-PFHxS



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Name: 161113G1_6, Date: 13-Nov-2016, Time: 12:12:39, ID: ST161113G1-5 PFC CS2 16K1128, Description: PFC CS2 16K1128 A

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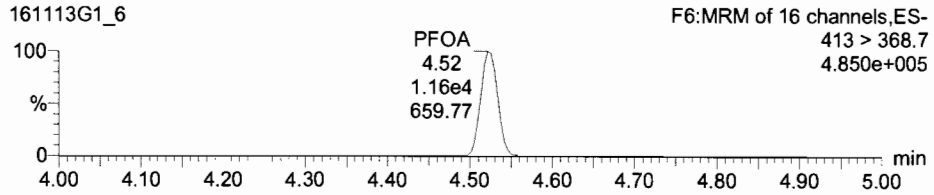

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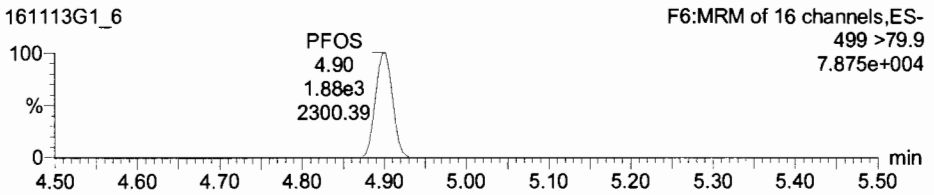

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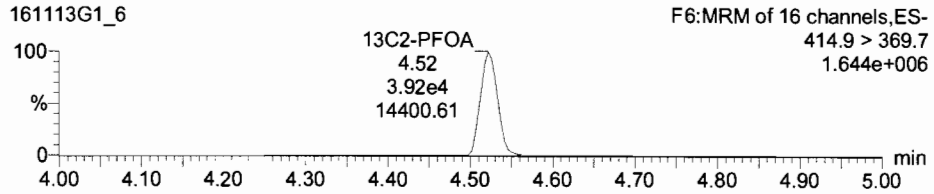

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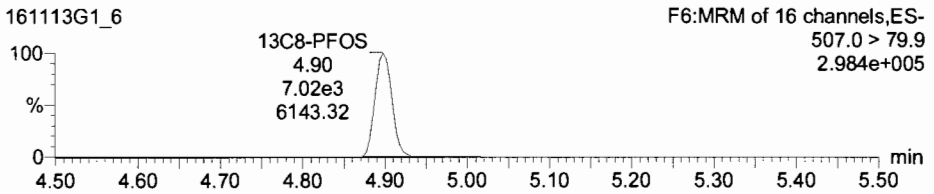

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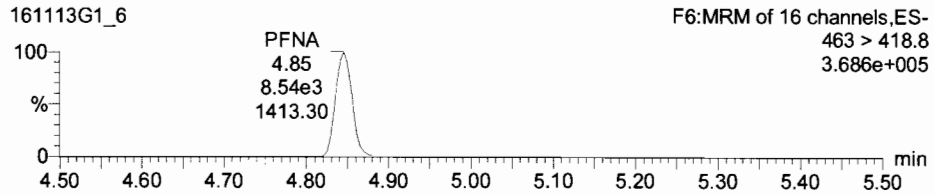
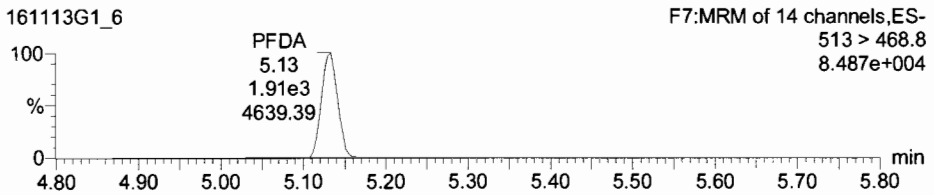
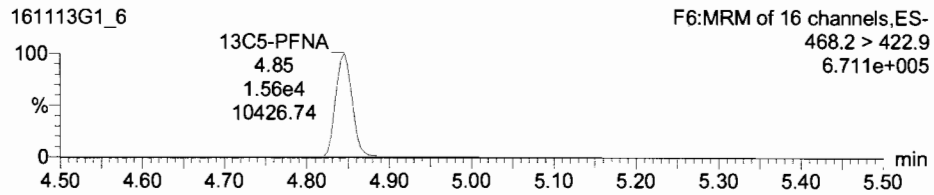


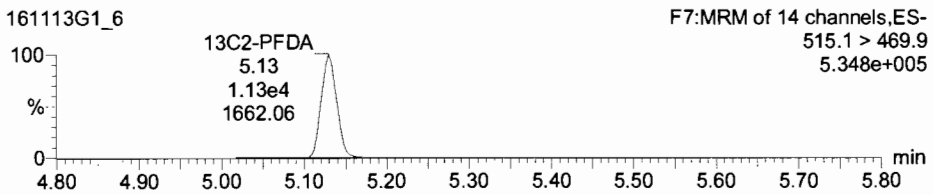
PFDA



13C5-PFNA



13C2-PFDA

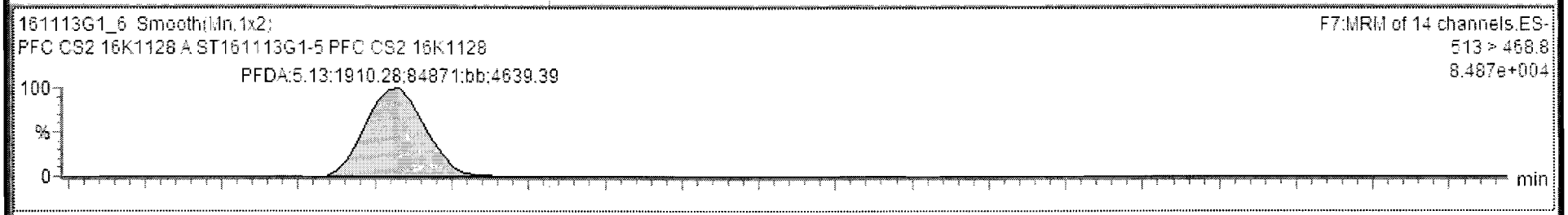


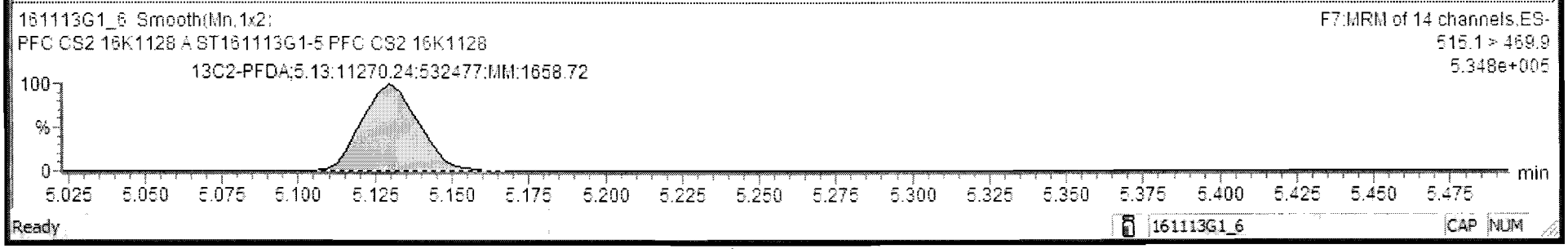
TargetLynx - 161113G1-CRV.qld - [Chromatogram]

File Edit View Display Processing Window Help

161113G1_6 - ST161113G1-5 PFC CS2 16K1128 - PFC CS2 16K1128 A

	Name	Trace	Area	Response	RRF	Wt/VoL	RT	Conc.	%Rec	DL	%RSD	Coeff. Of D...
1	PFBS	299 > 79.7	3.80e3	5.284	1.057	1.000	3.25	3.78	75.6	0.0000000		0.9869
2	PFHxA	313.2 > 268.9	4.71e3	2.227	0.445	1.000	3.64	4.01	80.1	0.0000000		0.9842
3	PFHpA	363 > 318.9	1.15e4	5.135	1.027	1.000	4.14	4.16	83.1	0.0000000		0.9869
4	PFHxS	398.9 > 79.6	3.64e3	5.528	1.106	1.000	4.25	4.14	82.8	0.0000000		0.9851
5	PFOA	413 > 368.7	1.16e4	3.693	0.739	1.000	4.52	4.34	86.7	0.0000000		0.9913
6	PFOS	499 >79.9	1.88e3	3.348	0.670	1.000	4.90	4.72	94.4	0.1197636		0.9951
7	PFNA	463 > 418.8	8.54e3	6.854	1.371	1.000	4.85	4.23	84.7	0.0000000		0.9827
8	PFDA	513 > 468.8	1.91e3	2.119	0.424	1.000	5.13	3.75	75.0	0.0000000		0.9862
9	13C3-PFBS	302.0 > 98.8	8.99e3	3.434	0.275	1.000	3.25	13.7	110.0	0.0017850	13.7	
10	13C2-PFHxA	315 > 269.8	1.06e4	4.040	0.808	1.000	3.64	5.45	109.0	0.0026978	12.8	
11	13C4-PFHpA	367.2 > 321.8	2.79e4	28.342	2.267	1.000	4.14	13.6	109.2	0.0273797	10.8	
12	18O2-PFHxS	403 > 102.6	8.23e3	8.347	0.668	1.000	4.24	13.8	110.8	0.0372324	12.7	
13	13C2-PFOA	414.9 > 369.7	3.92e4	31.375	2.510	1.000	4.52	12.9	102.9	0.0022195	11.2	
14	13C8-PFOS	507.0 > 79.9	7.02e3	14.052	1.124	1.000	4.90	13.3	106.5	0.0053721	14.3	
15	13C5-PFNA	468.2 > 422.9	1.56e4	16.036	1.283	1.000	4.85	13.9	110.8	0.0033300	14.0	
16	13C2-PFDA	515.1 > 469.9	1.13e4	14.806	1.185	1.000	5.13	12.7	101.8	0.0196539	16.6	
17	13C5-PFHxA	318.0 > 272.9	3.27e4	12.500	1.000	1.000	3.64	12.5	100.0	0.0023257	0.000000...	





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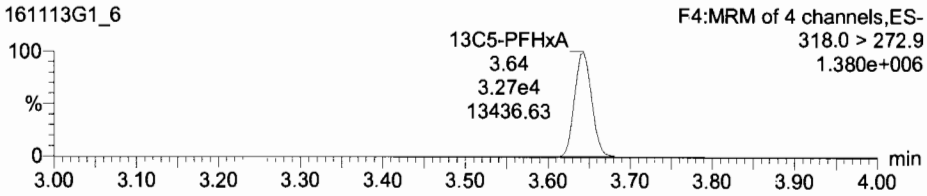
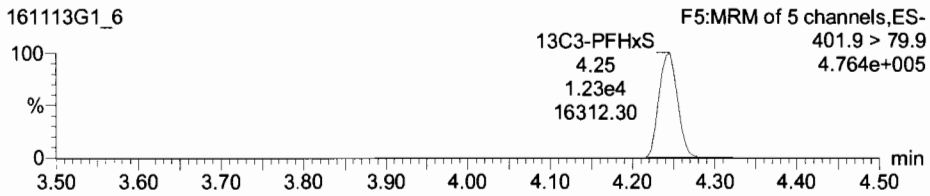
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_6, Date: 13-Nov-2016, Time: 12:12:39, ID: ST161113G1-5 PFC CS2 16K1128, Description: PFC CS2 16K1128 A

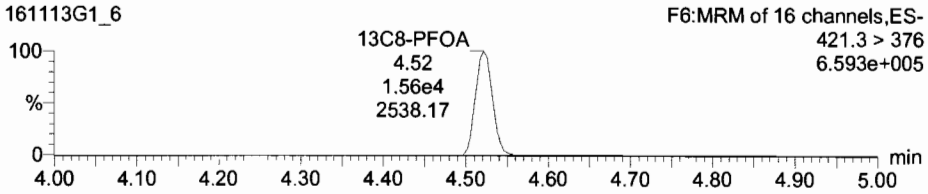
13C5-PFHxA



13C3-PFHxS



13C8-PFOA



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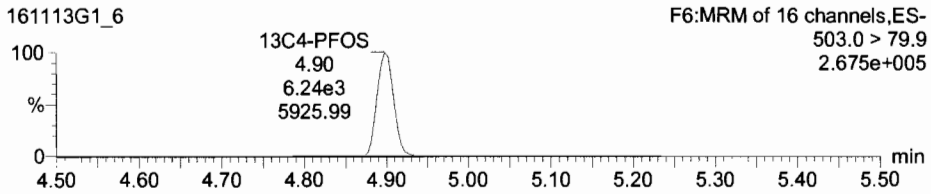

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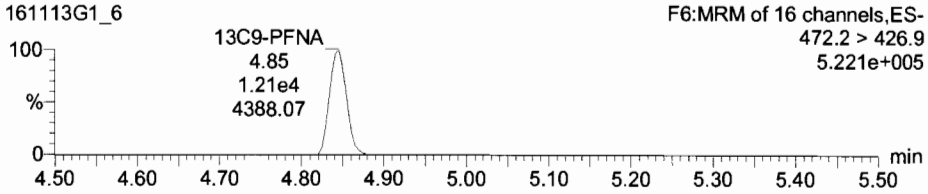
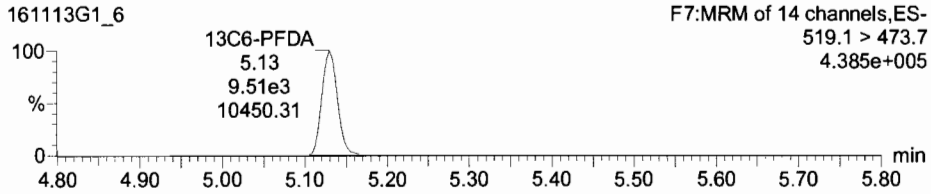


13C6-PFDA



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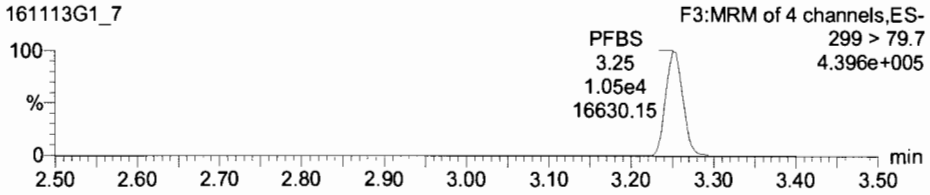
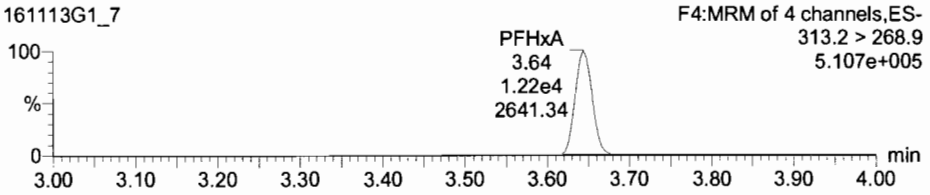
Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_7, Date: 13-Nov-2016, Time: 12:25:17, ID: ST161113G1-6 PFC CS3 16K1129, Description: PFC CS3 16K1129 A

Total PFBS



PFHxA



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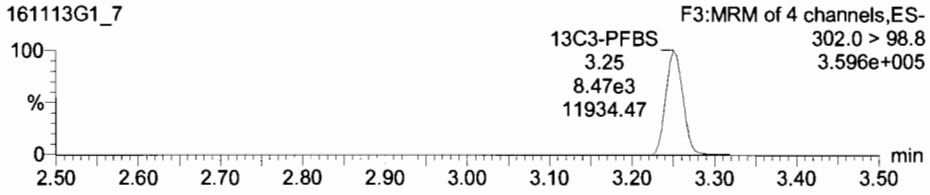
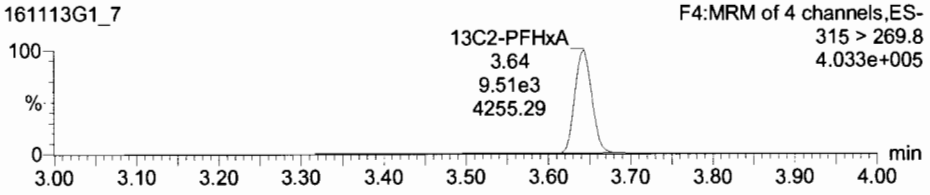
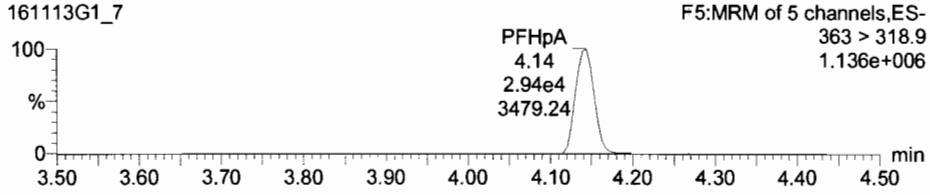


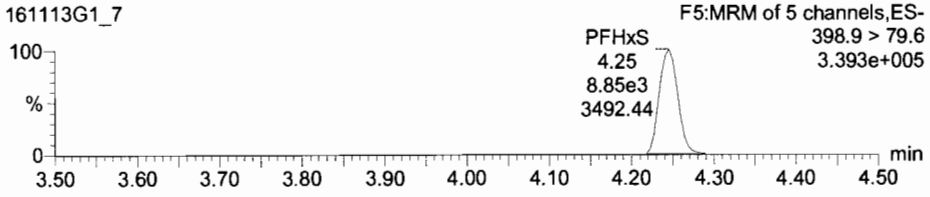
13C2-PFHxA



PFHpA



Total PFHxS



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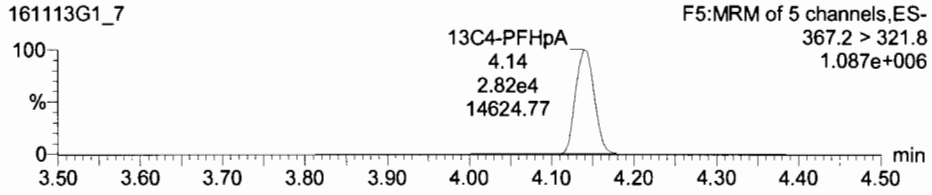
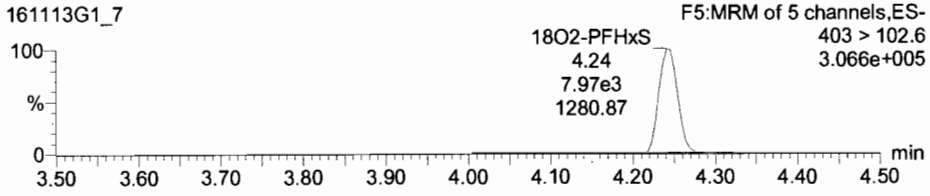


18O2-PFHxS



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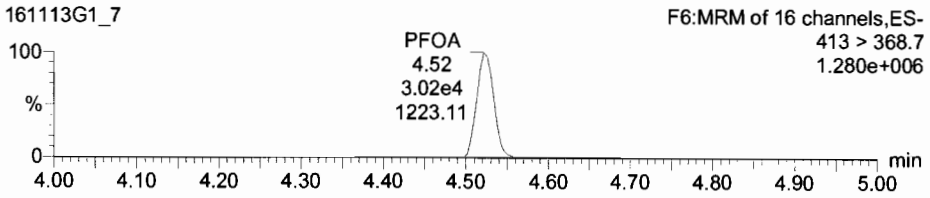
Name: 161113G1_7, Date: 13-Nov-2016, Time: 12:25:17, ID: ST161113G1-6 PFC CS3 16K1129, Description: PFC CS3 16K1129 A

Total PFOA



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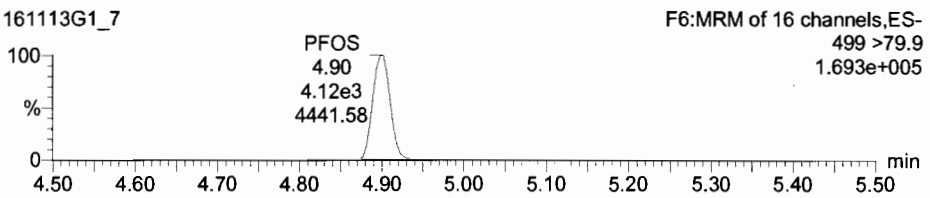

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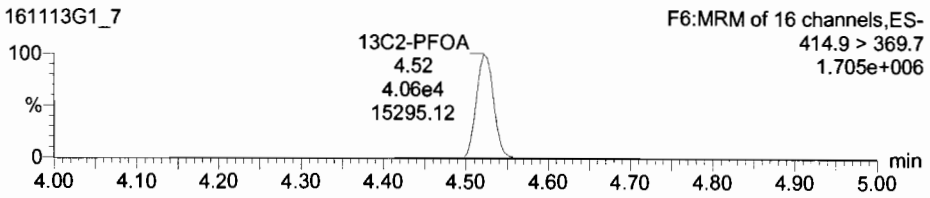
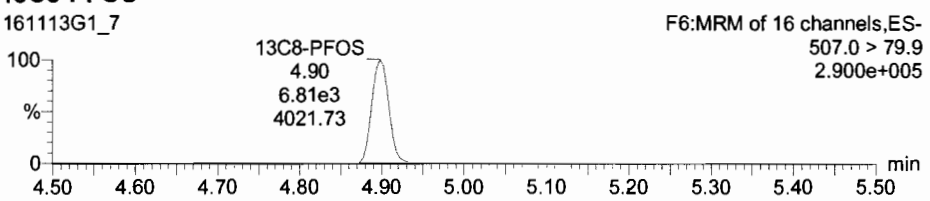


13C8-PFOS



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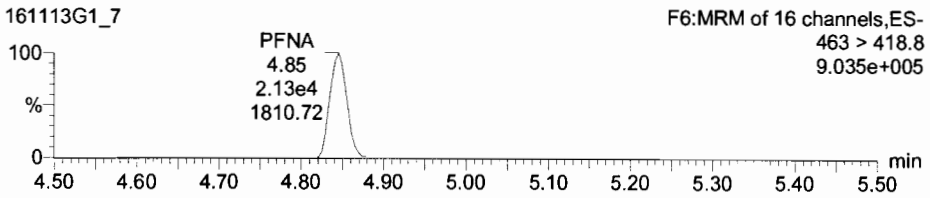

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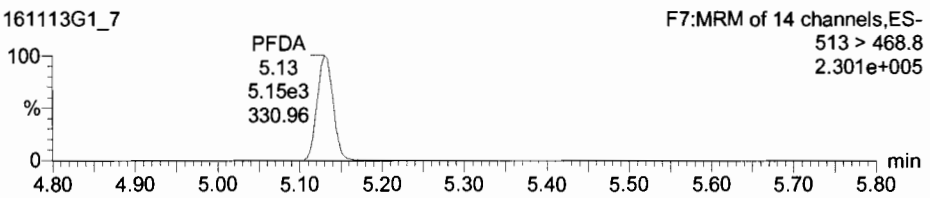

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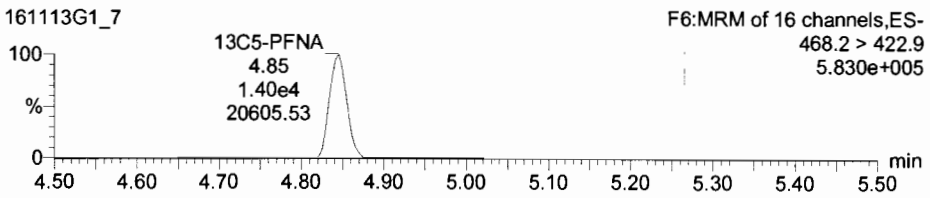
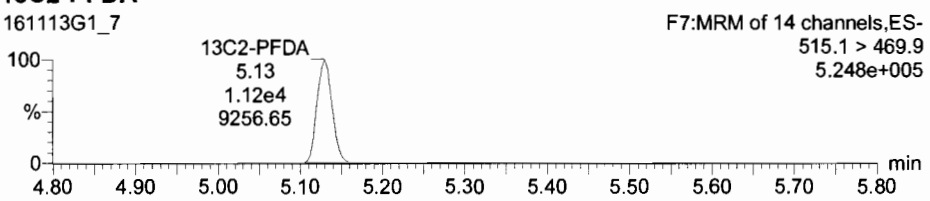


13C2-PFDA



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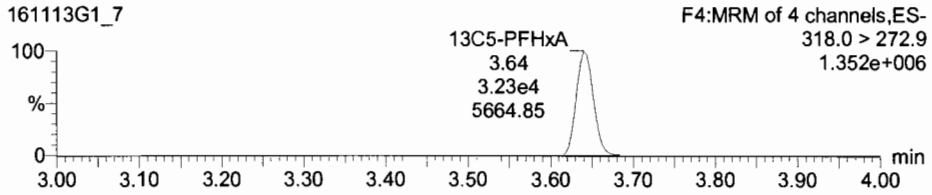
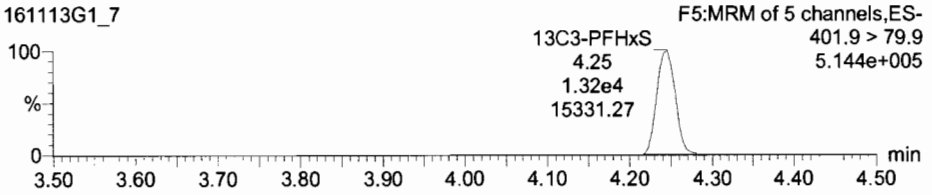
13C5-PFHxA



13C3-PFHxS



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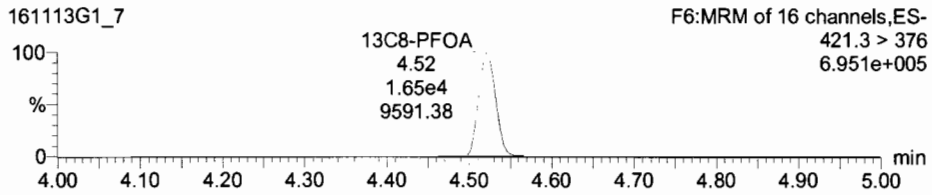

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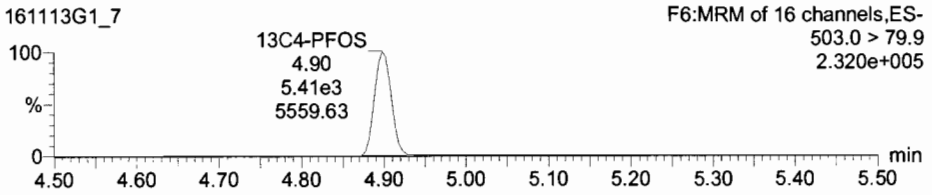

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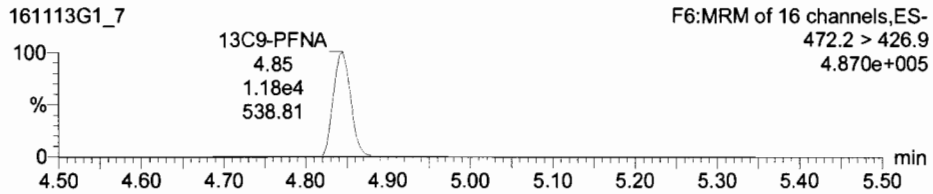
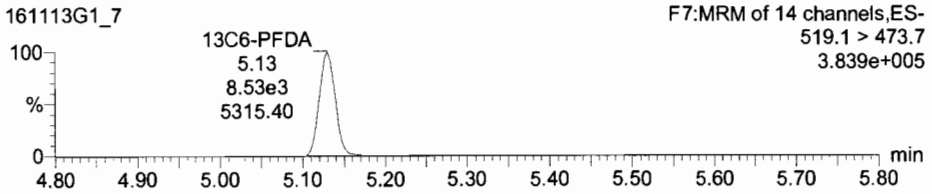


13C6-PFDA



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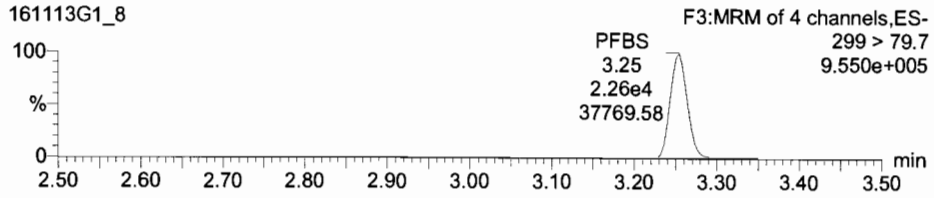
Total PFBS



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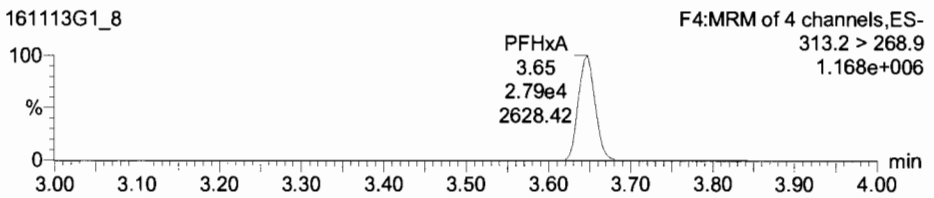

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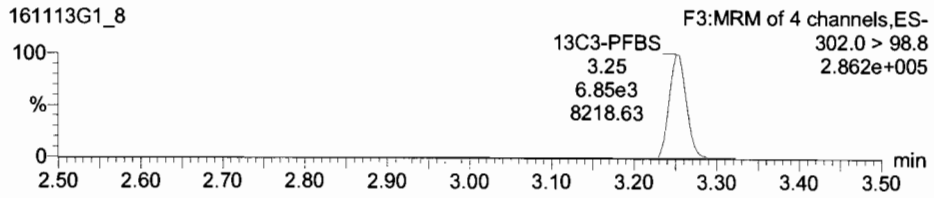

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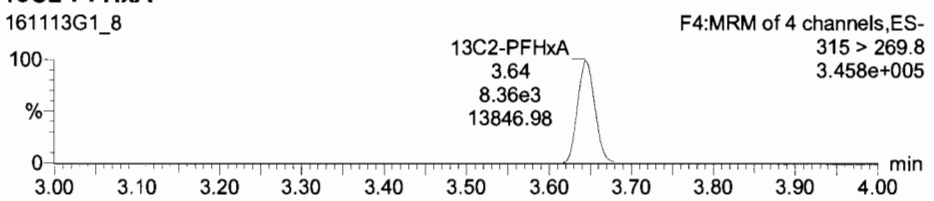
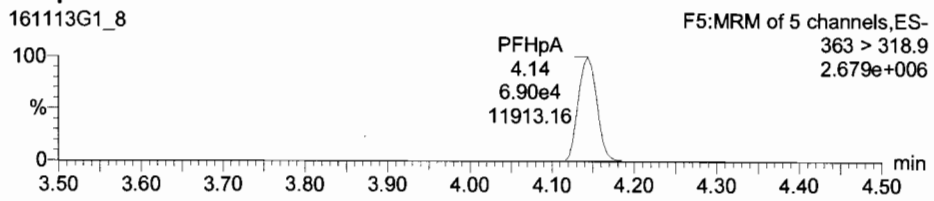


PFHpA



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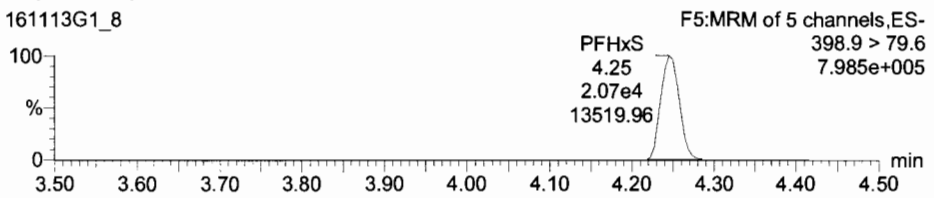

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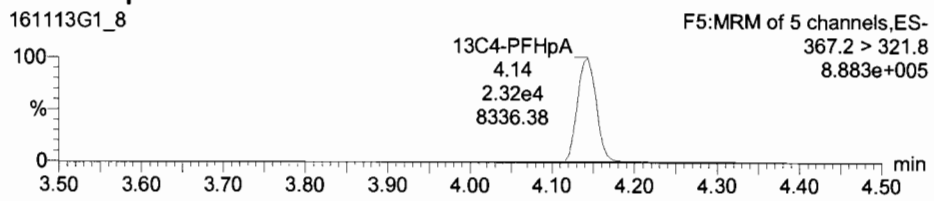
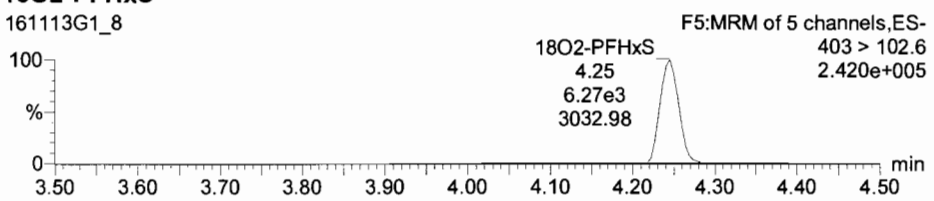


18O2-PFHxS

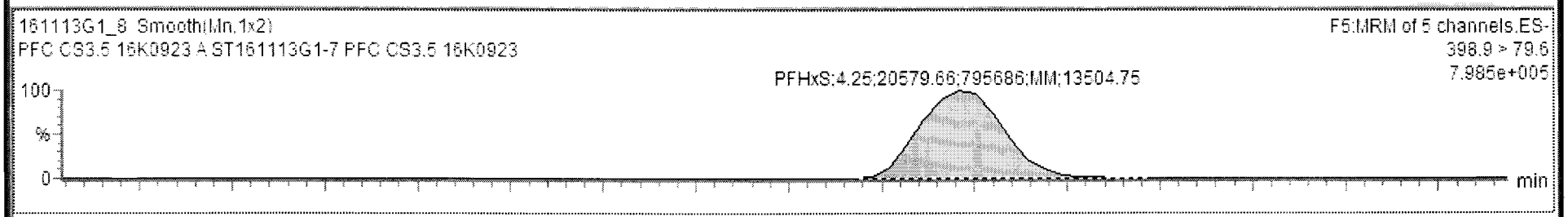


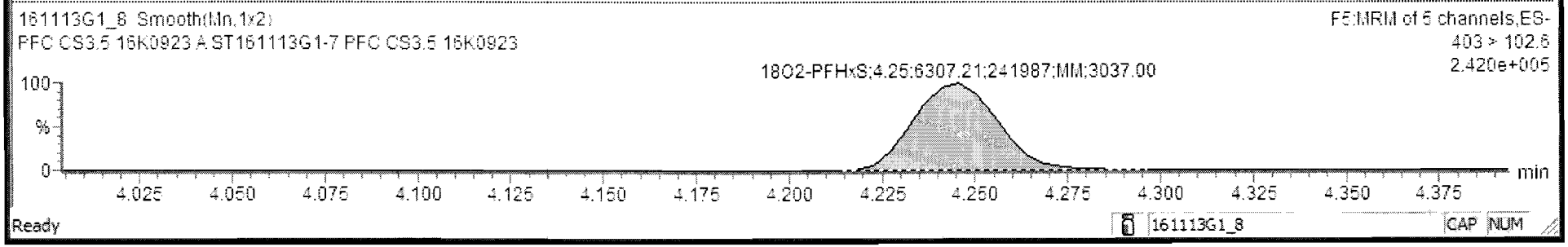
TargetLynx - 161113G1-CRV.qld - [Chromatogram]

File Edit View Display Processing Window Help

161113G1_8 - ST161113G1-7 PFC CS3.5 16K0923 - PFC CS3.5 16K0923 A

	Name	Trace	Area	Response	RRF	Wt/VoL	RT	Conc.	%Rec	DL	%RSD	Coeff. Of D...
1	PFBS	299 > 79.7	2.26e4	41.168	1.647	1.000	3.25	30.1	120.2	0.0000000		0.9869
2	PFHxA	313.2 > 268.9	2.79e4	16.662	0.666	1.000	3.65	31.1	124.3	0.0000000		0.9842
3	PFHpA	363 > 318.9	6.90e4	37.241	1.490	1.000	4.14	31.0	124.1	0.0000000		0.9869
4	PFHxS	398.9 > 79.6	2.06e4	40.786	1.631	1.000	4.25	31.2	125.0	0.0000000		0.9851
5	PFOA	413 > 368.7	6.61e4	23.657	0.946	1.000	4.53	29.3	117.1	0.0000000		0.9913
6	PFOS	499 >79.9	8.64e3	20.638	0.826	1.000	4.90	28.5	114.0	0.1352703		0.9951
7	PFNA	463 > 418.8	4.61e4	49.063	1.963	1.000	4.85	30.8	123.3	0.0000000		0.9827
8	PFDA	513 > 468.8	9.45e3	17.105	0.684	1.000	5.13	31.1	124.5	0.0000000		0.9862
9	13C3-PFBS	302.0 > 98.8	6.85e3	2.292	0.183	1.000	3.25	9.18	73.4	0.0028420	13.7	
10	13C2-PFHxA	315 > 269.8	8.36e3	2.797	0.559	1.000	3.64	3.77	75.5	0.0006873	12.8	
11	13C4-PFHpA	367.2 > 321.8	2.32e4	20.720	1.658	1.000	4.14	9.98	79.8	0.0030063	10.8	
12	18O2-PFHxS	403 > 102.6	6.31e3	5.643	0.451	1.000	4.25	9.36	74.9	0.0077578	12.7	
13	13C2-PFOA	414.9 > 369.7	3.49e4	23.496	1.880	1.000	4.53	9.64	77.1	0.0222173	11.2	
14	13C8-PFOS	507.0 > 79.9	5.23e3	10.741	0.859	1.000	4.90	10.2	81.4	0.0294796	14.3	
15	13C5-PFNA	468.2 > 422.9	1.18e4	10.882	0.855	1.000	4.85	9.23	73.8	0.0014979	14.0	
16	13C2-PFDA	515.1 > 469.9	6.91e3	10.208	0.817	1.000	5.13	8.77	70.2	0.0019706	16.6	
17	13C5-PFHxA	318.0 > 272.9	3.74e4	12.500	1.000	1.000	3.64	12.5	100.0	0.0028158	0.000000...	





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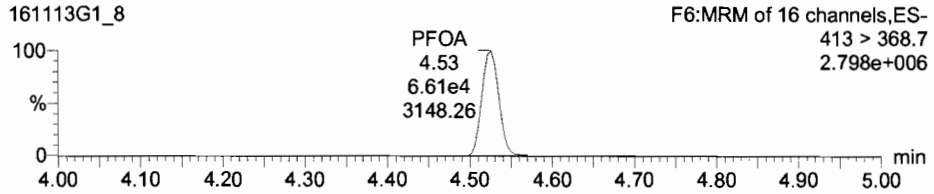
Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_8, Date: 13-Nov-2016, Time: 12:37:58, ID: ST161113G1-7 PFC CS3.5 16K0923, Description: PFC CS3.5 16K0923 A

Total PFOA



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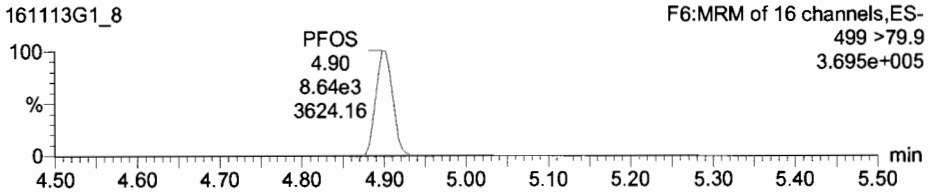
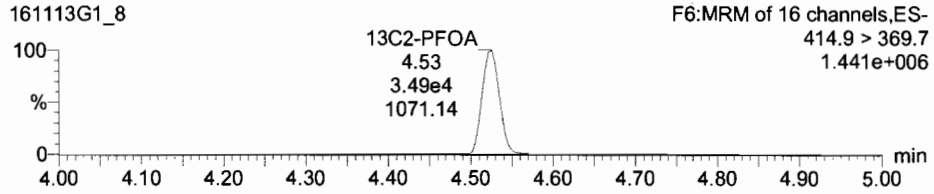
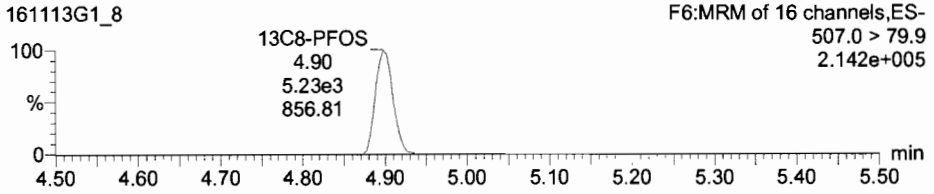


13C2-PFOA



13C8-PFOS



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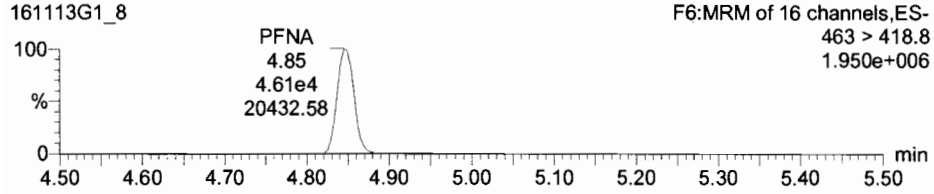

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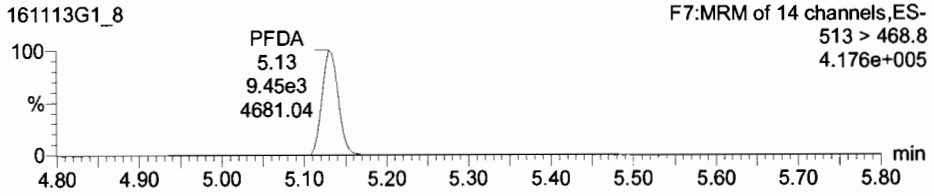
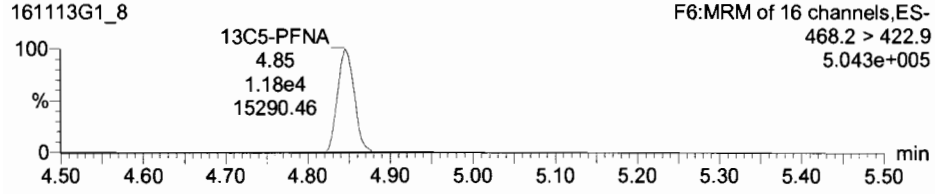


13C5-PFNA



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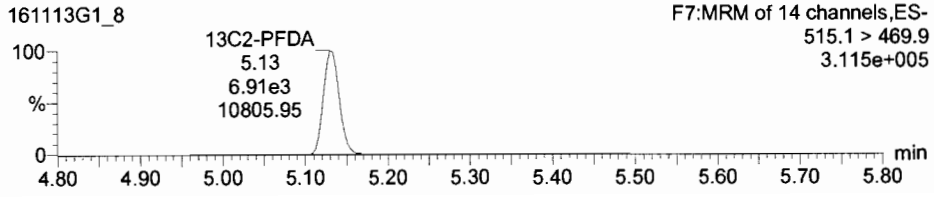

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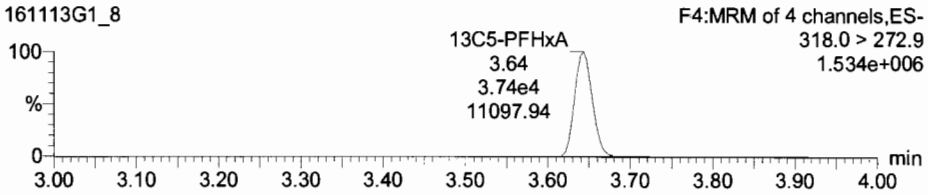
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_8, Date: 13-Nov-2016, Time: 12:37:58, ID: ST161113G1-7 PFC CS3.5 16K0923, Description: PFC CS3.5 16K0923 A

13C5-PFHxA



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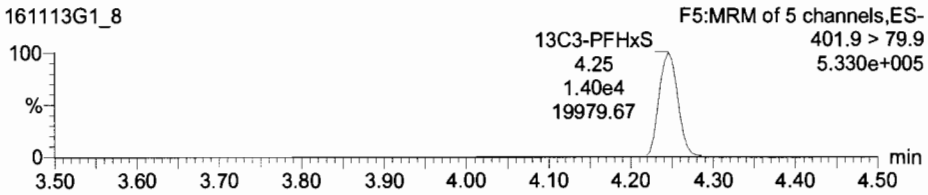

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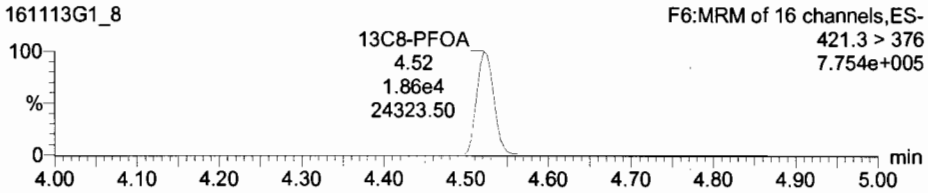

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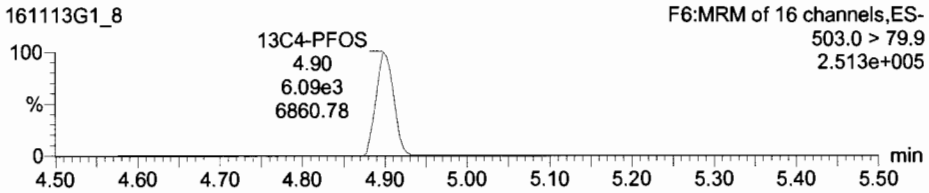

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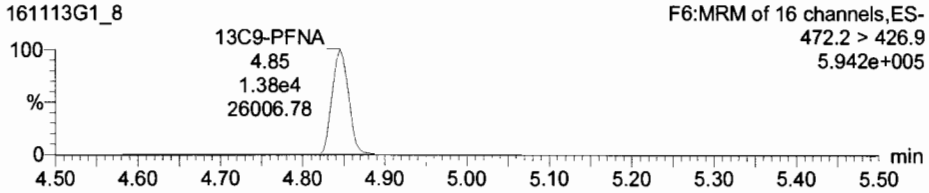

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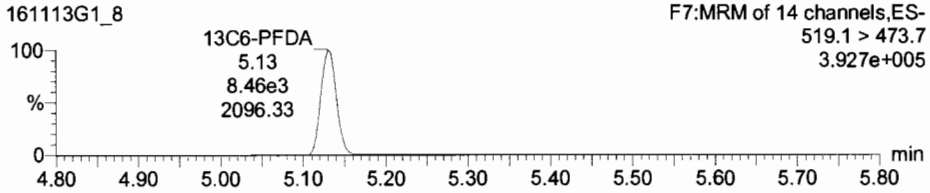

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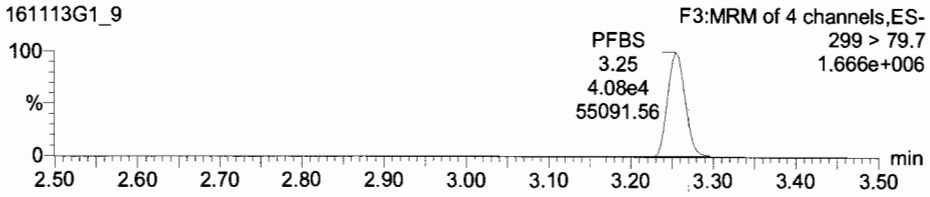
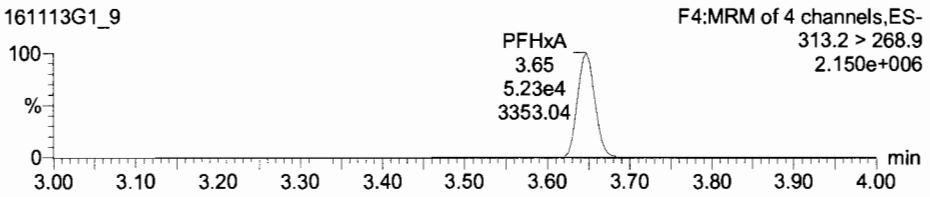
Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_9, Date: 13-Nov-2016, Time: 12:50:37, ID: ST161113G1-8 PFC CS4 16K1130, Description: PFC CS4 16K1130 A

Total PFBS



PFHxA



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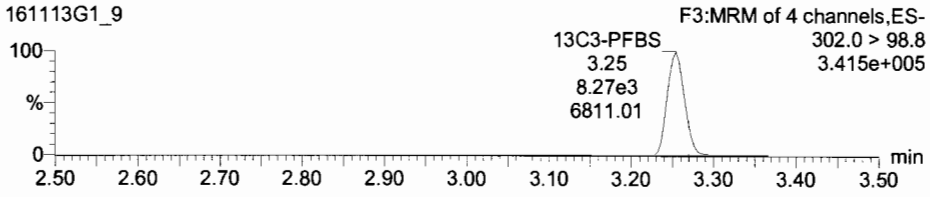

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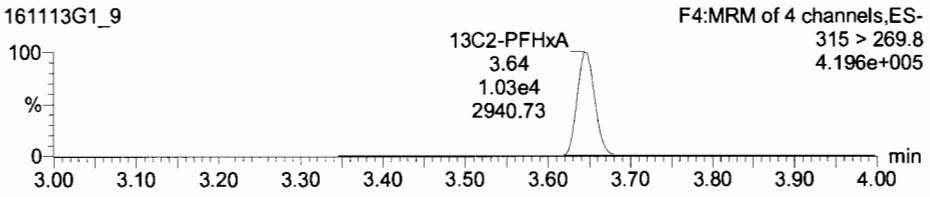
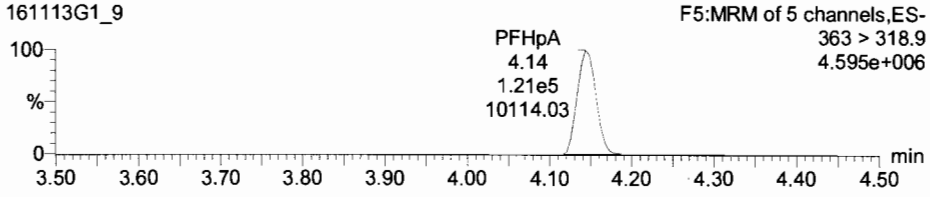


PFHpA



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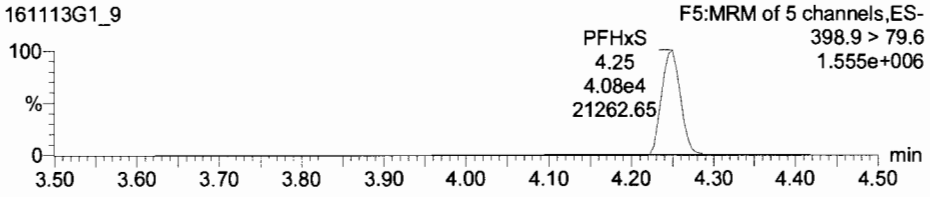

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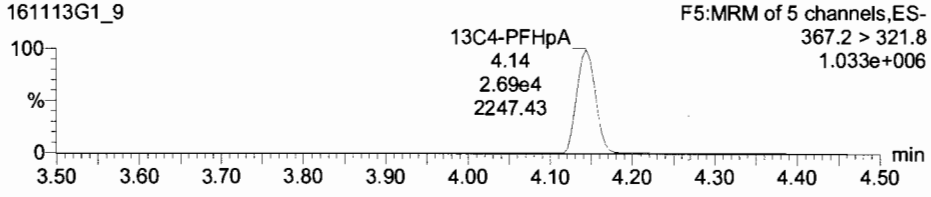
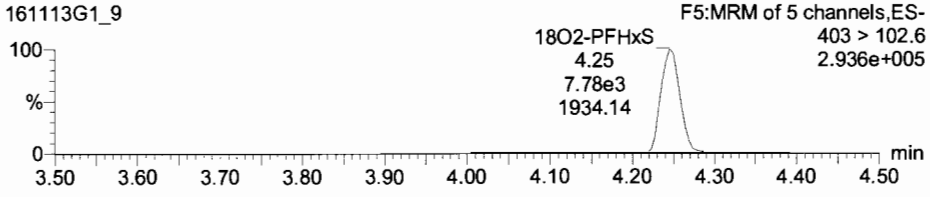


18O2-PFHxS



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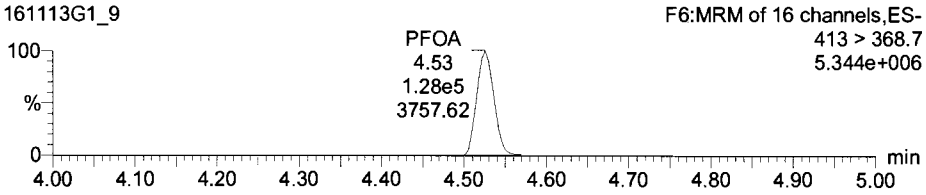
Name: 161113G1_9, Date: 13-Nov-2016, Time: 12:50:37, ID: ST161113G1-8 PFC CS4 16K1130, Description: PFC CS4 16K1130 A

Total PFOA



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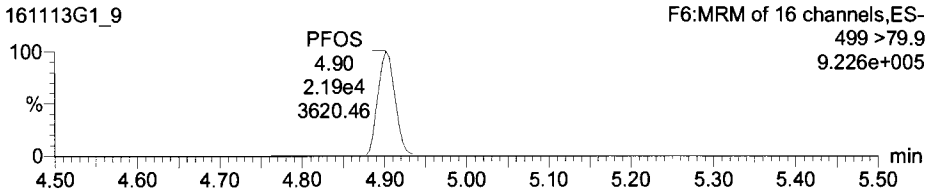

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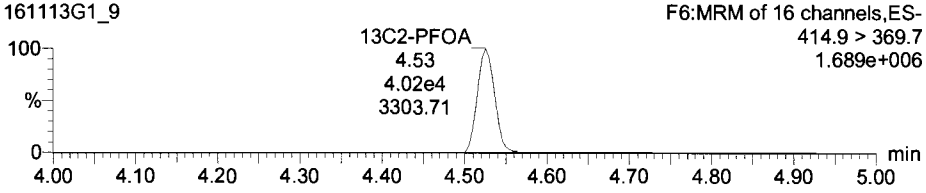

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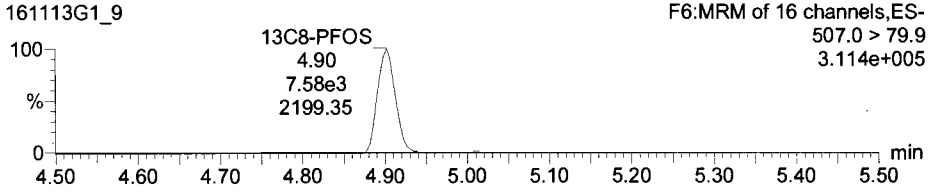

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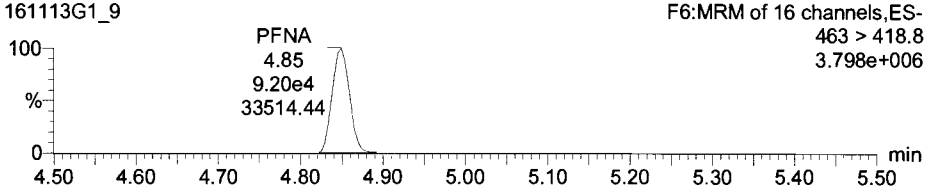

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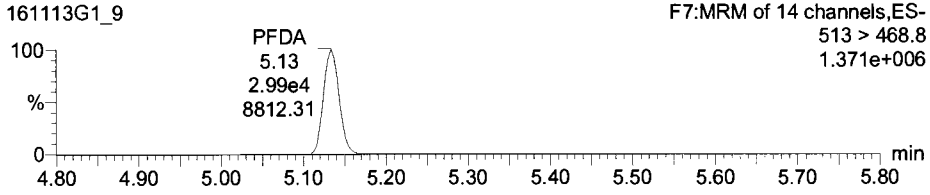

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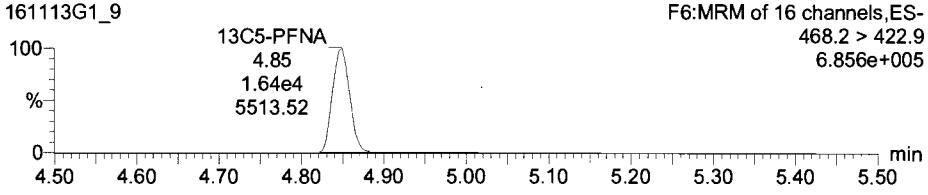

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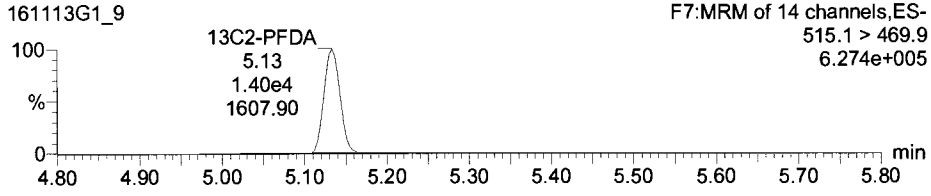

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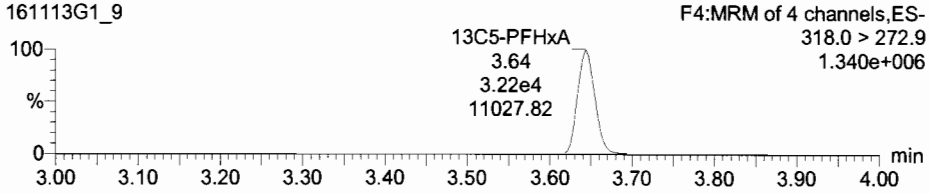
Name: 161113G1_9, Date: 13-Nov-2016, Time: 12:50:37, ID: ST161113G1-8 PFC CS4 16K1130, Description: PFC CS4 16K1130 A

13C5-PFHxA



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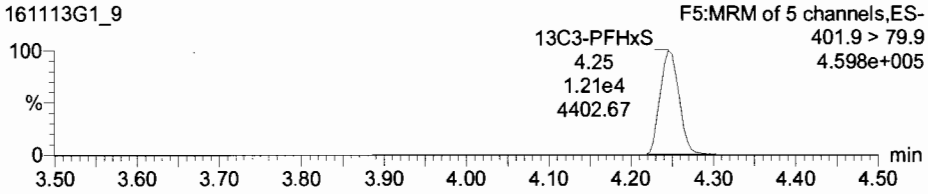

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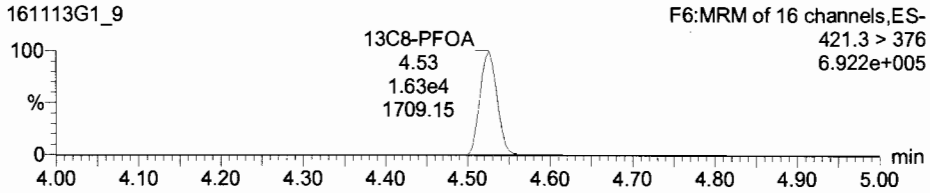

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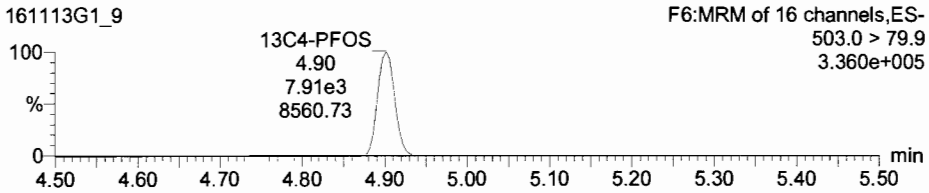

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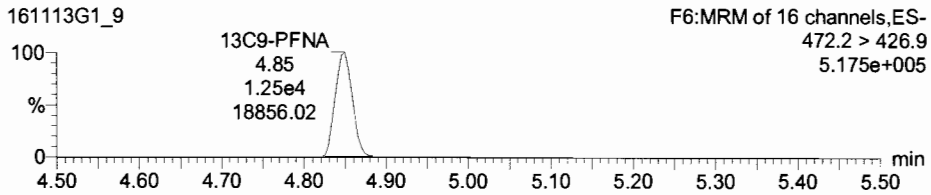

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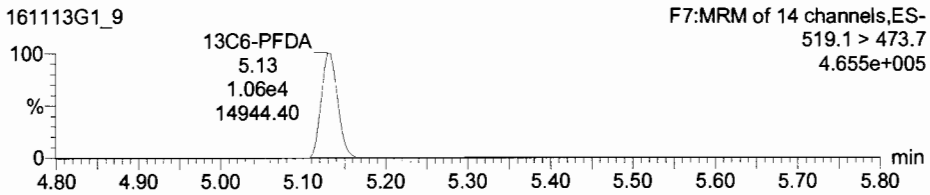

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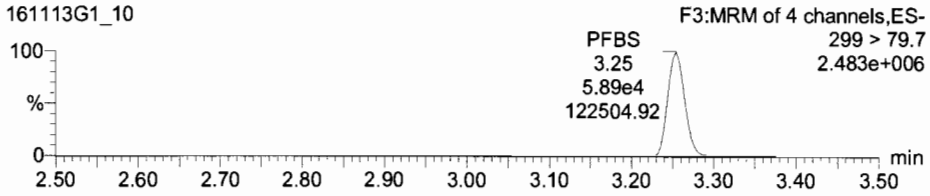
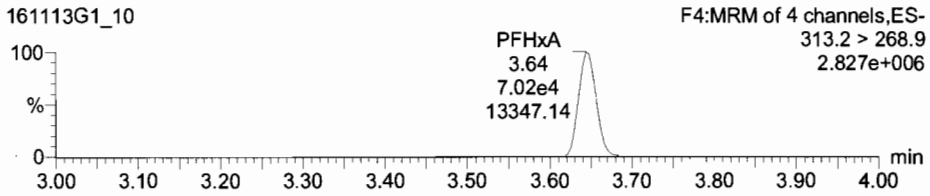
Name: 161113G1_10, Date: 13-Nov-2016, Time: 13:03:18, ID: ST161113G1-9 PFC CS4.5 16K1131, Description: PFC CS4.5 16K1131 A

Total PFBS



PFHxA



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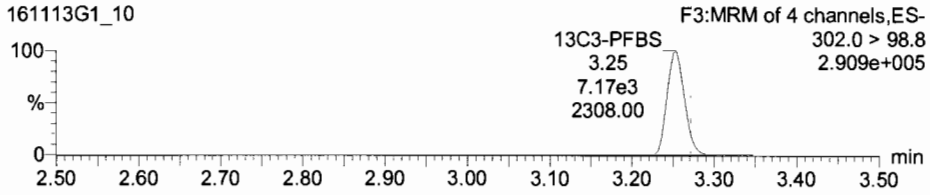

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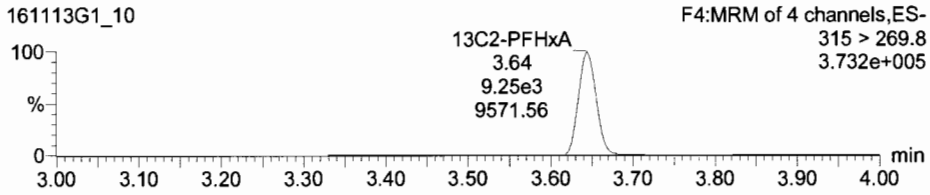
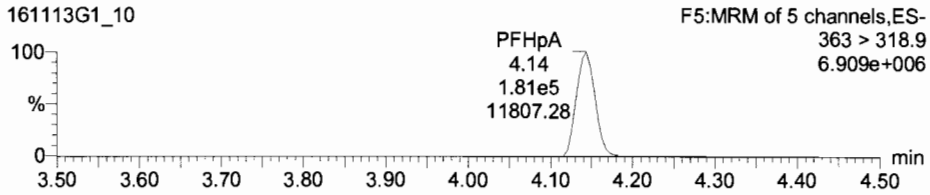
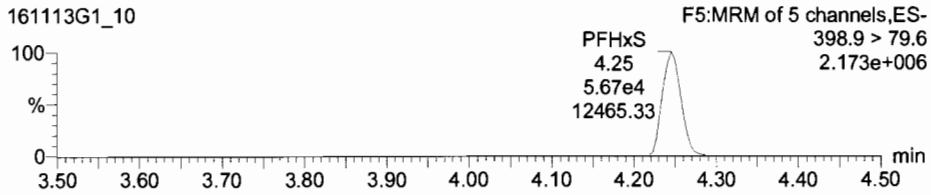


PFHpA



Total PFHxS



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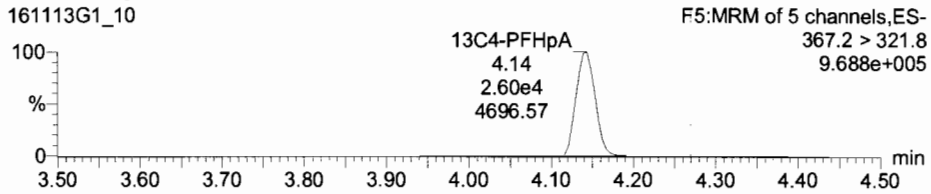
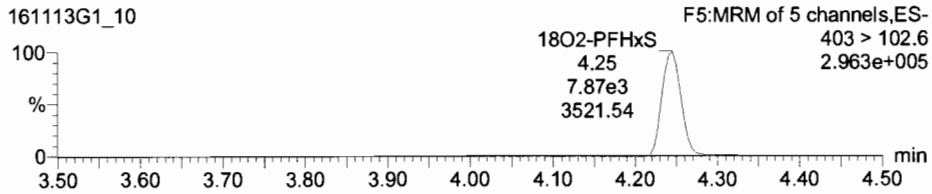


18O2-PFHxS



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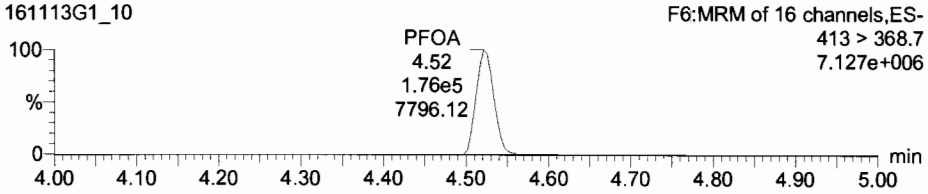
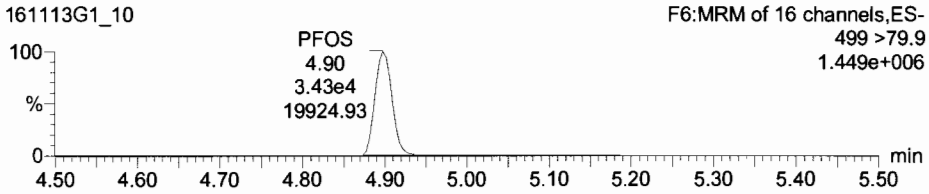
Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_10, Date: 13-Nov-2016, Time: 13:03:18, ID: ST161113G1-9 PFC CS4.5 16K1131, Description: PFC CS4.5 16K1131 A

Total PFOA



Total PFOS



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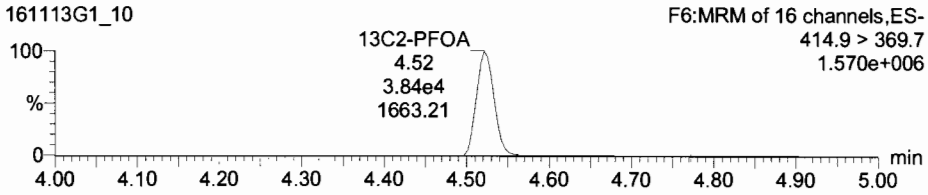

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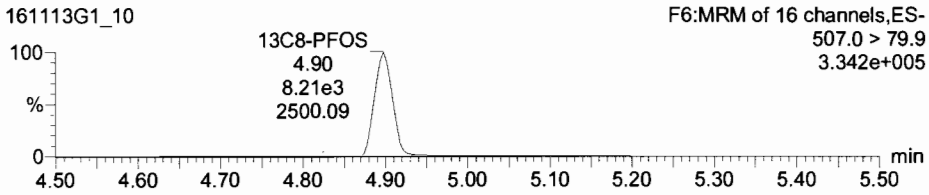

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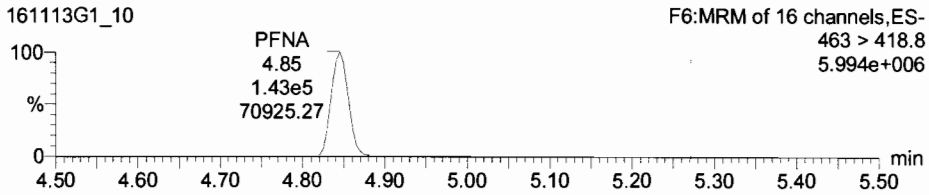

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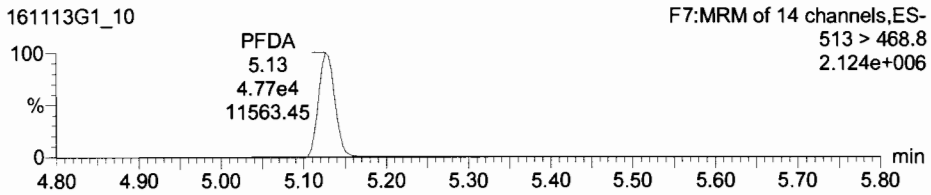
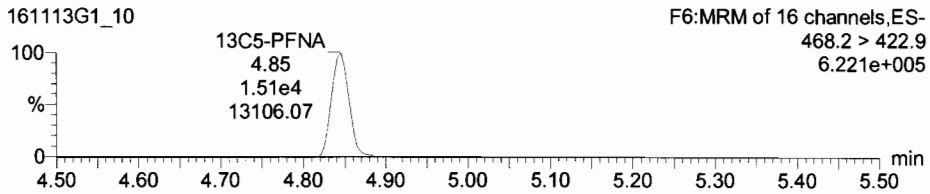
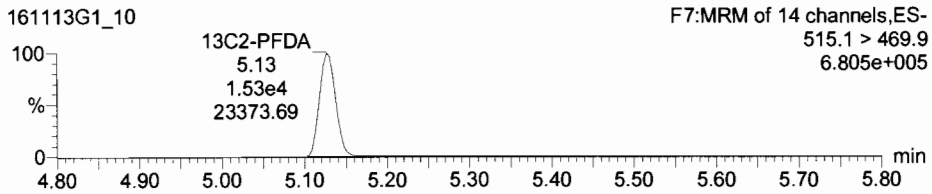


13C5-PFNA



13C2-PFDA



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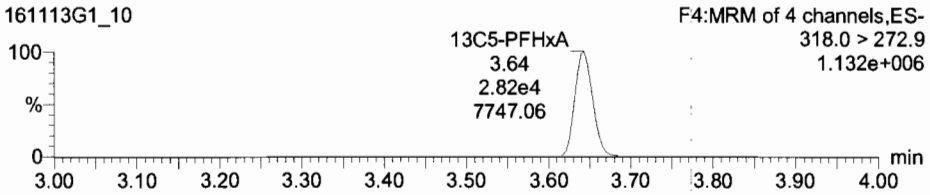
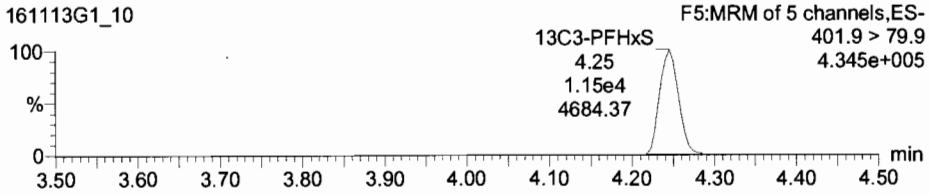
Last Altered: Monday, November 14, 2016 09:09:18 Pacific Standard Time
Printed: Monday, November 14, 2016 09:10:33 Pacific Standard Time

Name: 161113G1_10, Date: 13-Nov-2016, Time: 13:03:18, ID: ST161113G1-9 PFC CS4.5 16K1131, Description: PFC CS4.5 16K1131 A

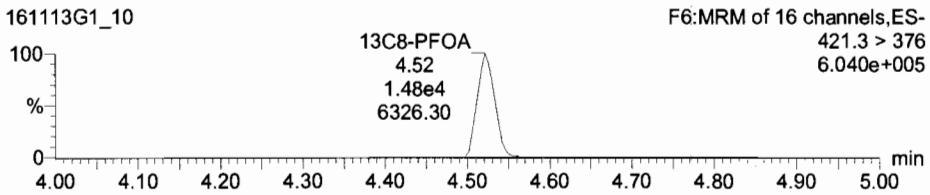
13C5-PFHxA



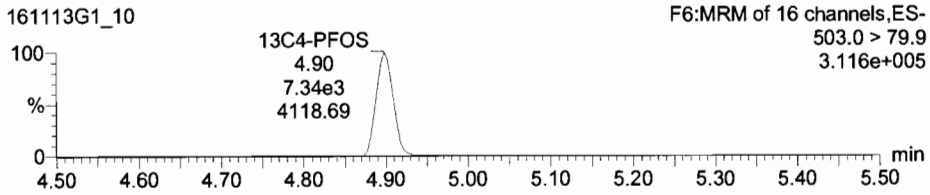
13C3-PFHxS



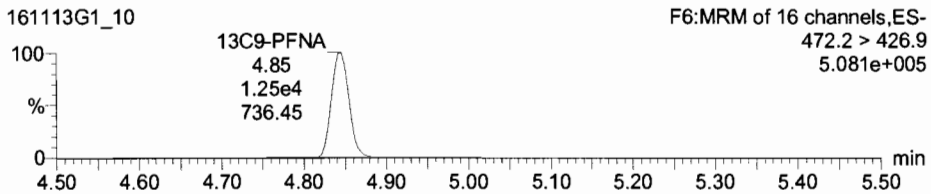
13C8-PFOA



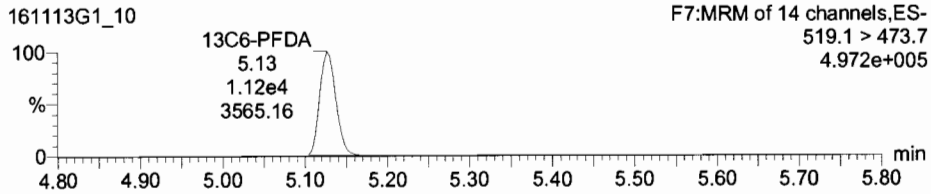
13C4-PFOS



13C9-PFNA



13C6-PFDA



Dataset: U:\G1.PRO\Results\2016\161113G1\161113G1-13.qld

Last Altered: Monday, November 14, 2016 09:38:30 Pacific Standard Time
Printed: Monday, November 14, 2016 09:39:42 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161113G1_13, Date: 13-Nov-2016, Time: 13:41:09, ID: SS161113G1-1 PFC SSS 16J1810, Description: PFC SSS 16J1810 A

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
1	1	PFBS	299 > 79.7	2.28e4	7.22e3		1.000	3.15	28.8	115.0
2	2	PFHxA	313.2 > 268.9	3.08e4	9.35e3		1.000	3.52	30.7	122.7
3	3	PFHpA	363 > 318.9	6.83e4	2.31e4		1.000	4.05	30.8	123.0
4	4	PFHxS	398.9 > 79.6	1.75e4	6.71e3		1.000	4.16	24.9	123 ~~99.6~~
5	5	PFOA	413 > 368.7	5.12e4	3.20e4		1.000	4.44	24.8	125 ~~99.0~~
6	6	PFOS	499 >79.9	5.76e3	4.36e3		1.000	4.83	22.8	116 ~~91.3~~
7	7	PFNA	463 > 418.8	4.47e4	1.12e4		1.000	4.77	31.2	124.9
8	8	PFDA	513 > 468.8	7.90e3	5.76e3		1.000	5.06	31.2	124.7
9	9	13C3-PFBS	302.0 > 98.8	7.22e3	3.14e4	0.250	1.000	3.15	11.5	92.0
10	10	13C2-PFHxA	315 > 269.8	9.35e3	3.14e4	0.741	1.000	3.52	5.02	100.4
11	11	13C4-PFHpA	367.2 > 321.8	2.31e4	1.21e4	2.077	1.000	4.05	11.5	92.3
12	12	18O2-PFHxS	403 > 102.6	6.71e3	1.21e4	0.603	1.000	4.16	11.5	92.3
13	13	13C2-PFOA	414.9 > 369.7	3.20e4	1.43e4	2.438	1.000	4.44	11.5	92.0
14	14	13C8-PFOS	507.0 > 79.9	4.36e3	4.59e3	1.055	1.000	4.83	11.2	90.0
15	15	13C5-PFNA	468.2 > 422.9	1.12e4	1.04e4	1.158	1.000	4.77	11.6	93.1
16	16	13C2-PFDA	515.1 > 469.9	5.76e3	4.97e3	1.164	1.000	5.06	12.5	99.6
17	17	13C5-PFHxA	318.0 > 272.9	3.14e4	3.14e4	1.000	1.000	3.52	12.5	100.0
18	18	13C3-PFHxS	401.9 > 79.9	1.21e4	1.21e4	1.000	1.000	4.16	12.5	100.0
19	19	13C8-PFOA	421.3 > 376	1.43e4	1.43e4	1.000	1.000	4.44	12.5	100.0
20	20	13C4-PFOS	503.0 > 79.9	4.59e3	4.59e3	1.000	1.000	4.83	12.5	100.0
21	21	13C9-PFNA	472.2 > 426.9	1.04e4	1.04e4	1.000	1.000	4.77	12.5	100.0
22	22	13C6-PFDA	519.1 > 473.7	4.97e3	4.97e3	1.000	1.000	5.06	12.5	100.0

75-125

AC
11/14/16

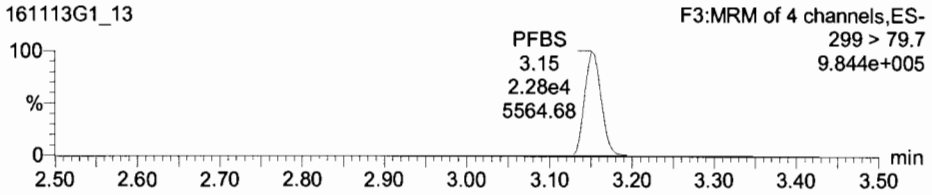
Dataset: Untitled

Last Altered: Monday, November 14, 2016 09:29:44 Pacific Standard Time
Printed: Monday, November 14, 2016 09:30:01 Pacific Standard Time

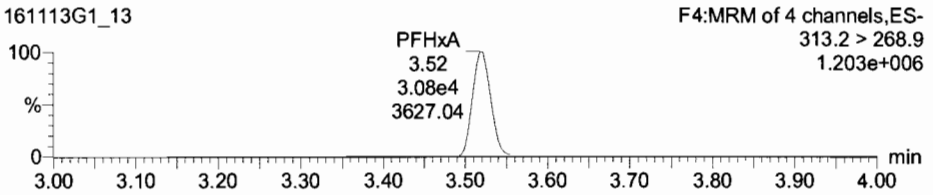
Method: U:\G1.PRO\MethDB\PFAS_14_A_LINEAR.mdb 11 Nov 2016 08:55:34
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-13-16_L14_A.cdb 14 Nov 2016 09:22:23

Name: 161113G1_13, Date: 13-Nov-2016, Time: 13:41:09, ID: SS161113G1-1 PFC SSS 16J1810, Description: PFC SSS 16J1810 A

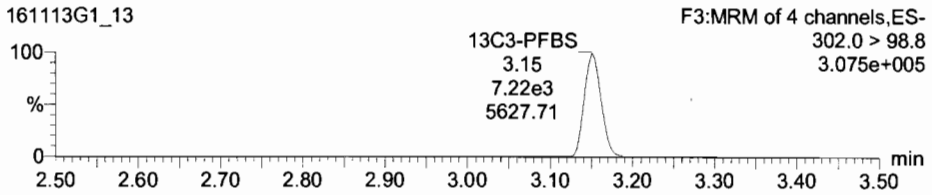
Total PFBS



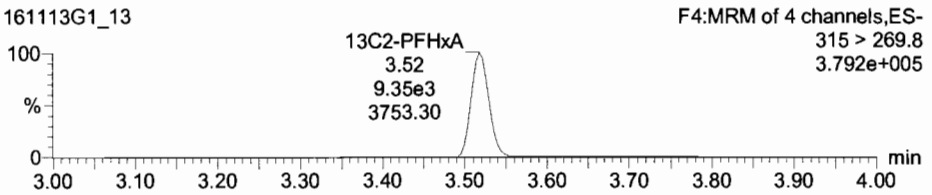
PFHxA



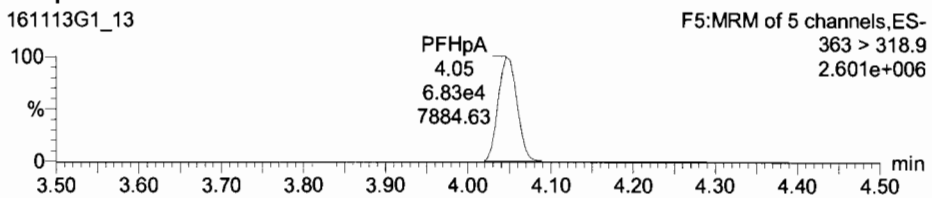
13C3-PFBS



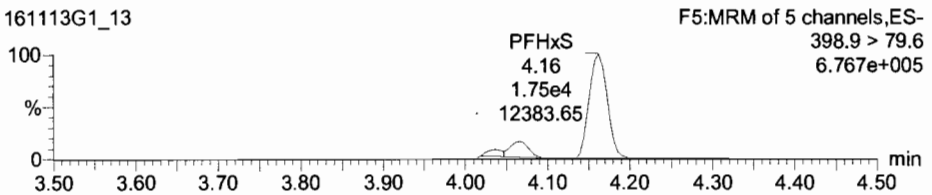
13C2-PFHxA



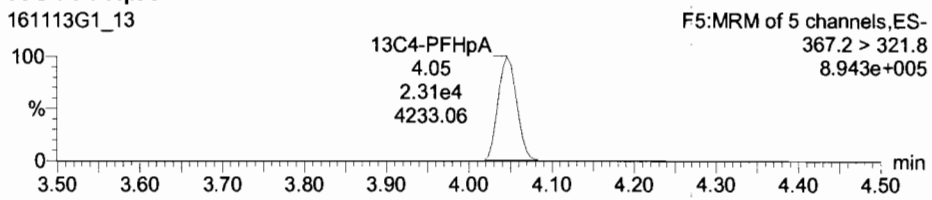
PFHpA



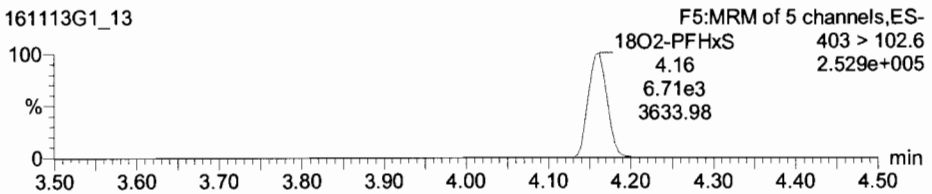
Total PFHxS



13C4-PFHpA



18O2-PFHxS



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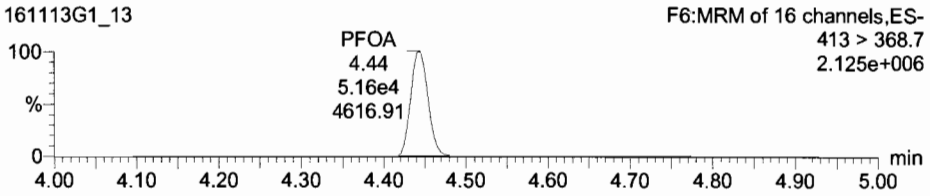
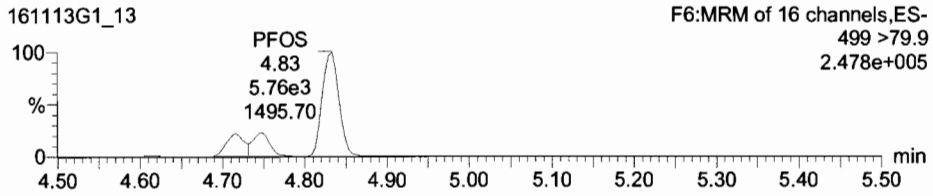
Last Altered: Monday, November 14, 2016 09:29:44 Pacific Standard Time
Printed: Monday, November 14, 2016 09:30:01 Pacific Standard Time

Name: 161113G1_13, Date: 13-Nov-2016, Time: 13:41:09, ID: SS161113G1-1 PFC SSS 16J1810, Description: PFC SSS 16J1810 A

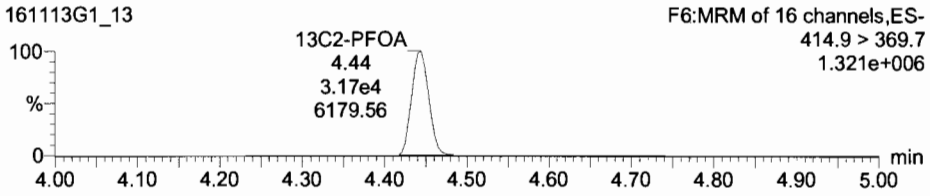
Total PFOA



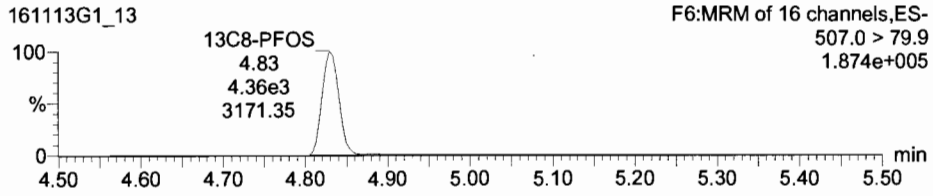
Total PFOS



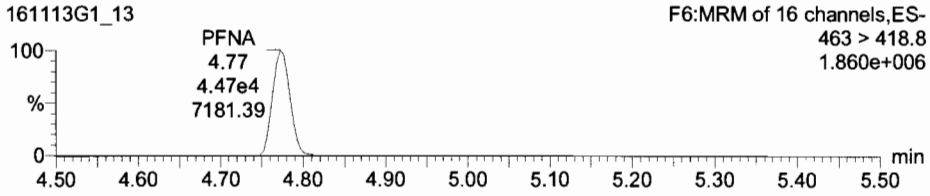
13C2-PFOA



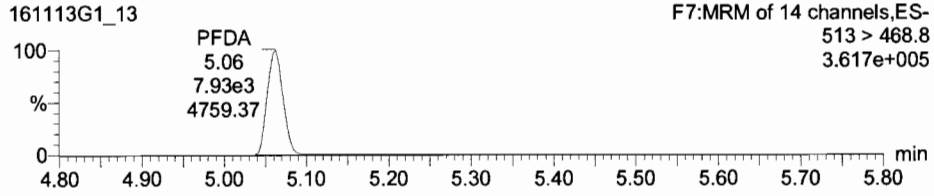
13C8-PFOS



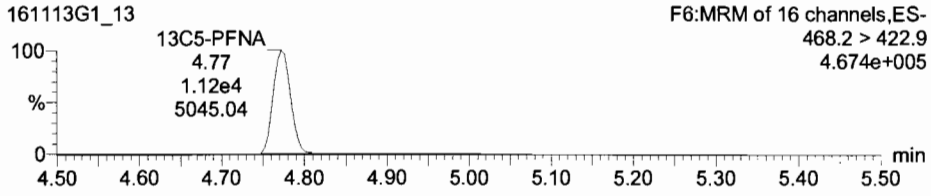
PFNA



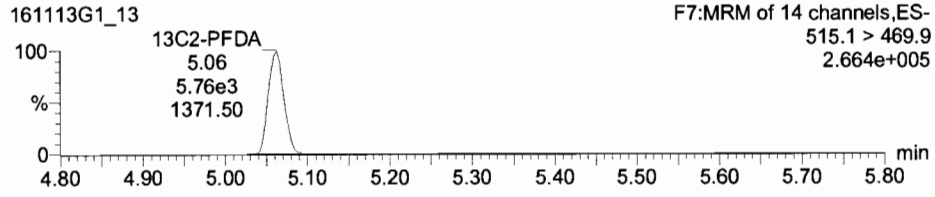
PFDA



13C5-PFNA



13C2-PFDA

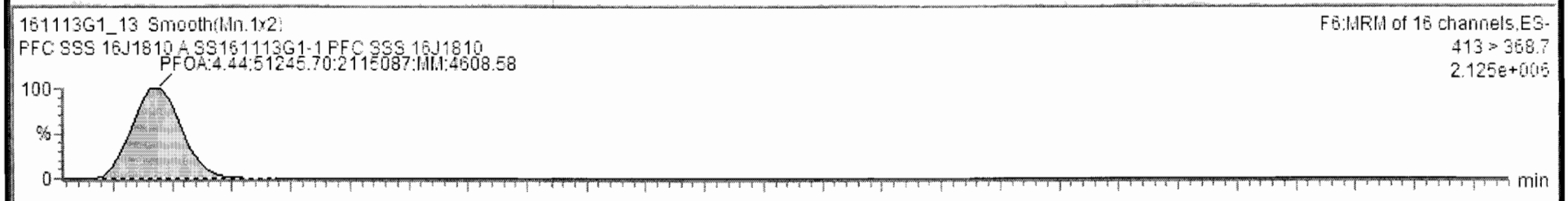


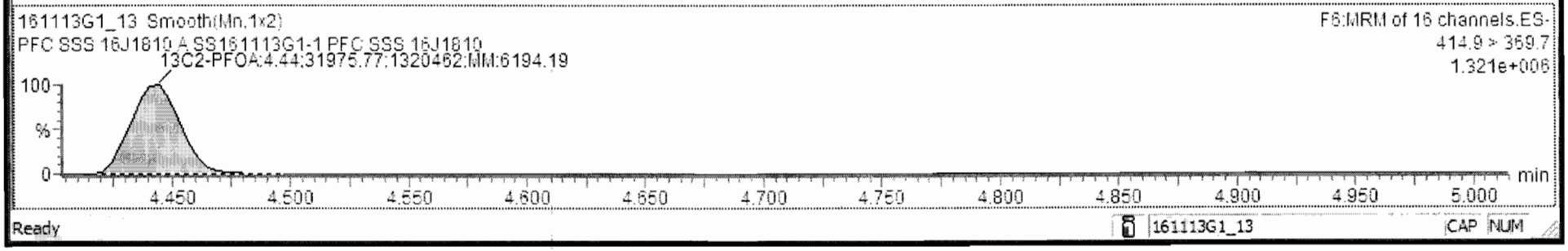
TargetLynx - 161113G1-13.qld - [Chromatogram]

File Edit View Display Processing Window Help

161113G1_13 - SS161113G1-1 PFC SSS 16J1810 - PFC SSS 16J1810 A

	Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
1	PFBS	299 > 79.7	2.28e4		1.000	3.15	3.15	28.8	YES	115.0	0.0000000
2	PFHxA	313.2 > 268.9	3.08e4		1.000	3.52	3.52	30.7	YES	122.7	0.0000000
3	PFHpA	363 > 318.9	6.83e4		1.000	4.05	4.05	30.8	YES	123.0	0.0000000
4	PFHxS	398.9 > 79.6	1.75e4		1.000	4.16	4.16	24.9	YES	99.8	0.0000000
5	PFOA	413 > 368.7	5.12e4		1.000	4.44	4.44	24.8	YES	99.0	0.0000000
6	PFOS	499 >79.9	5.76e3		1.000	4.83	4.83	22.8	YES	91.3	0.1526328
7	PFNA	463 > 418.8	4.47e4		1.000	4.77	4.77	31.2	YES	124.9	0.0000000
8	PFDA	513 > 468.8	7.80e3		1.000	5.06	5.06	31.2	NO	124.7	0.0000000
9	13C3-PFBS	302.0 > 98.8	7.22e3	0.250	1.000	3.14	3.15	11.5	NO	92.0	0.0053520
10	13C2-PFHxA	315 > 269.8	9.35e3	0.741	1.000	3.52	3.52	5.02	NO	100.4	0.0033329
11	13C4-PFHpA	367.2 > 321.8	2.31e4	2.08	1.000	4.04	4.05	11.5	NO	92.3	0.0069201
12	18O2-PFHxS	403 > 102.6	6.71e3	0.603	1.000	4.16	4.16	11.5	NO	92.3	0.0078731
13	13C2-PFOA	414.9 > 369.7	3.20e4	2.44	1.000	4.44	4.44	11.5	NO	92.0	0.0045674
14	13C8-PFOS	507.0 > 79.9	4.36e3	1.06	1.000	4.83	4.83	11.2	NO	90.0	0.0090422
15	13C5-PFNA	468.2 > 422.9	1.12e4	1.16	1.000	4.77	4.77	11.6	NO	93.1	0.0059095
16	13C2-PFDA	515.1 > 469.9	5.76e3	1.16	1.000	5.06	5.06	12.5	NO	99.6	0.0228154
17	13C5-PFHxA	318.0 > 272.9	3.14e4	1.00	1.000	3.52	3.52	12.5	NO	100.0	0.0038206





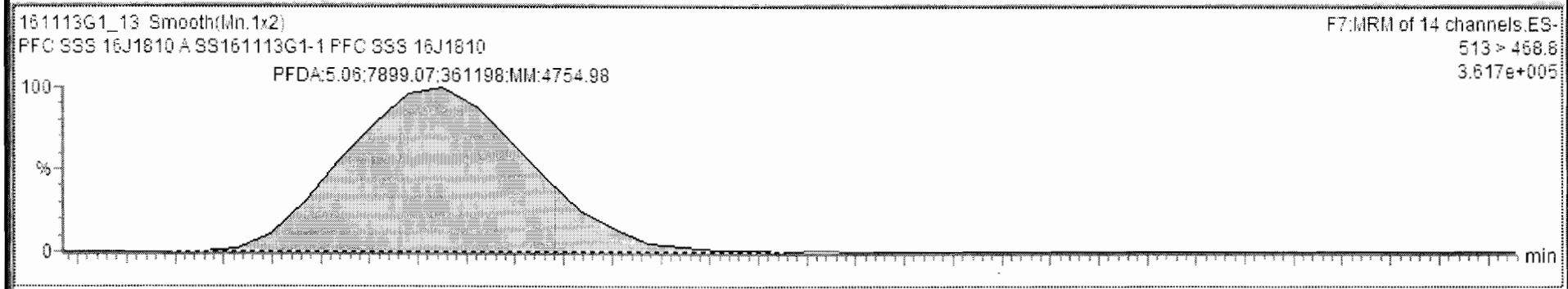
Ready 161113G1_13 CAP NUM

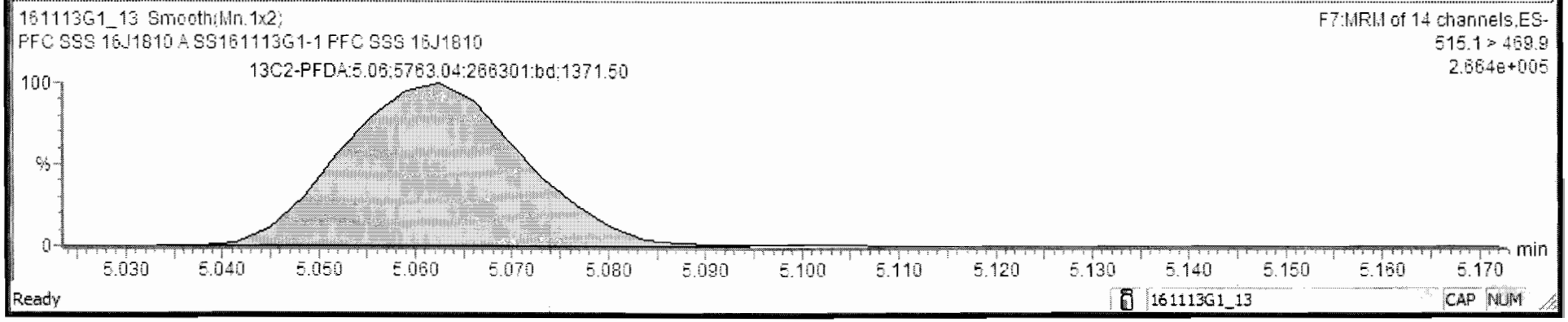
TargetLynx - untitled * - [Chromatogram]

File Edit View Display Processing Window Help

161113G1_13 - SS161113G1-1 PFC SSS 16J1810 - PFC SSS 16J1810 A

	Name	Trace	Area	Response	RRF	Wt/Vol	RT	Conc.	%Rec	DL	%RSD	Coeff. Of D...
1	PFBS	299 > 79.7	2.28e4	39.391	1.576	1.000	3.15	26.8	115.0	0.0000000		0.9869
2	PFHxA	313.2 > 268.9	3.08e4	16.448	0.658	1.000	3.52	30.7	122.7	0.0000000		0.9842
3	PFHpA	363 > 318.9	6.83e4	36.914	1.477	1.000	4.05	30.8	123.0	0.0000000		0.9869
4	PFHxS	398.9 > 79.8	1.75e4	32.580	1.303	1.000	4.16	24.9	99.8	0.0000000		0.9851
5	PFOA	413 > 368.7	5.16e4	20.317	0.813	1.000	4.44	25.1	100.4	0.0000000		0.9913
6	PFOS	499 >79.9	5.76e3	16.514	0.661	1.000	4.83	22.8	91.3	0.1528328		0.9951
7	PFNA	463 > 418.8	4.47e4	49.719	1.989	1.000	4.77	31.2	124.9	0.0000000		0.9827
8	PFDA	513 > 468.8	7.90e3	17.133	0.685	1.000	5.06	31.2	124.7	0.0000000		0.9861
9	13C3-PFBS	302.0 > 98.8	7.22e3	2.873	0.230	1.000	3.15	11.5	92.0	0.0053520	13.7	
10	13C2-PFHxA	315 > 269.8	9.35e3	3.720	0.744	1.000	3.52	5.02	100.4	0.0033329	12.8	
11	13C4-PFHpA	367.2 > 321.8	2.31e4	23.958	1.917	1.000	4.05	11.5	92.3	0.0069201	10.8	





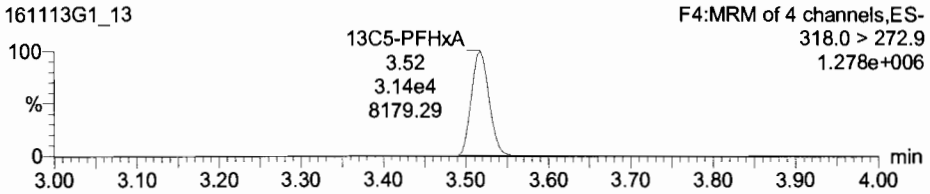
Ready 161113G1_13 CAP NUM

Dataset: Untitled

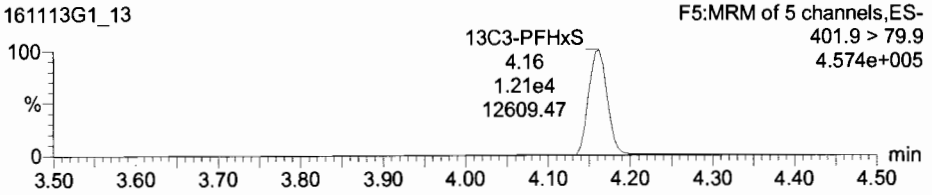
Last Altered: Monday, November 14, 2016 09:29:44 Pacific Standard Time
Printed: Monday, November 14, 2016 09:30:01 Pacific Standard Time

Name: 161113G1_13, Date: 13-Nov-2016, Time: 13:41:09, ID: SS161113G1-1 PFC SSS 16J1810, Description: PFC SSS 16J1810 A

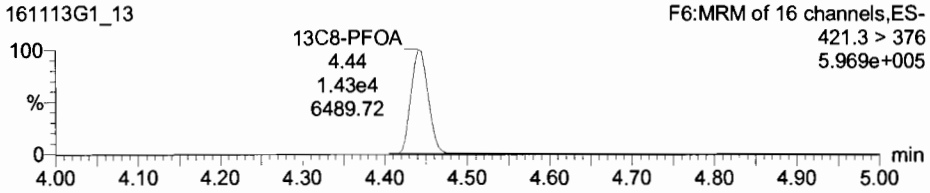
13C5-PFHxA



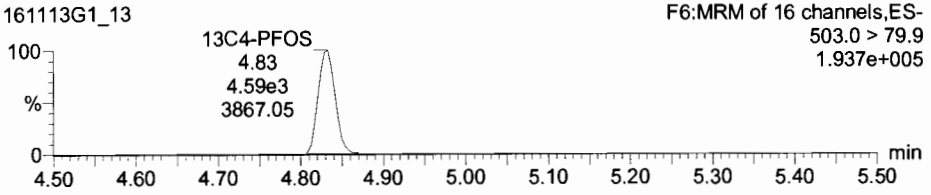
13C3-PFHxS



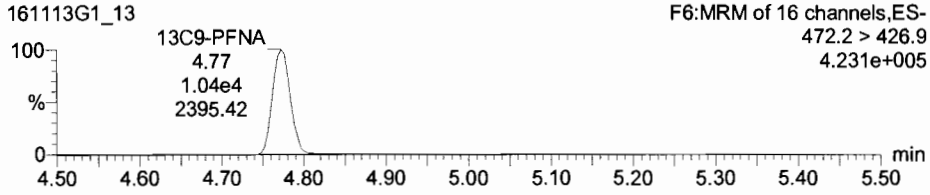
13C8-PFOA



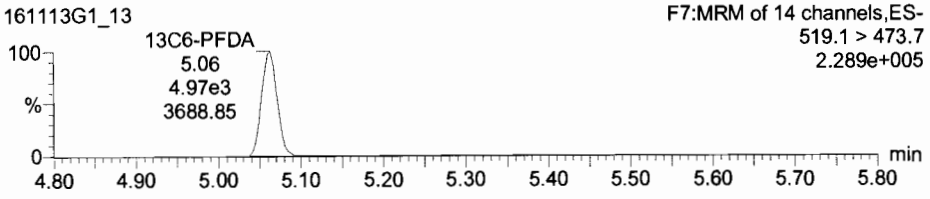
13C4-PFOS



13C9-PFNA



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
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Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 22 Nov 2016 14:48:05
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

Compound name: PFBA
Correlation coefficient: r = 0.999216, r^2 = 0.998432
Calibration curve: 0.492927 * x + -0.0410615
Response type: Internal Std (Ref 14), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	1.93	4.29e2	2.07e4	0.608	0.518	21.7
2	2 161122G2_3	1.00	1.93	7.79e2	2.25e4	0.959	0.432	-4.1
3	3 161122G2_4	2.00	1.93	1.63e3	2.32e4	1.86	0.439	-6.8
4	4 161122G2_5	5.00	1.93	3.55e3	2.31e4	3.97	0.383	-20.6
5	5 161122G2_6	10.0	1.93	8.96e3	2.17e4	10.6	0.516	5.6
6	6 161122G2_7	25.0	1.93	1.94e4	1.87e4	26.4	0.519	5.5
7	7 161122G2_8	50.0	1.93	3.75e4	1.90e4	50.0	0.492	0.0
8	8 161122G2_9	75.0	1.93	5.74e4	1.98e4	73.5	0.482	-2.0
9	9 161122G2_10	100	1.93	7.24e4	1.83e4	101	0.496	0.7

AC
11/22/16

CS 4.5 & 5 excluded from 6:2FTS regression.

Compound name: PFPeA
Correlation coefficient: r = 0.999341, r^2 = 0.998683
Calibration curve: 1.00273 * x + -0.119981
Response type: Internal Std (Ref 15), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	2.85	3.66e2	9.28e3	0.611	0.986	22.2
2	2 161122G2_3	1.00	2.85	6.80e2	9.67e3	0.996	0.879	-0.4
3	3 161122G2_4	2.00	2.86	1.32e3	9.90e3	1.79	0.836	-10.6
4	4 161122G2_5	5.00	2.85	3.20e3	1.02e4	4.02	0.782	-19.6
5	5 161122G2_6	10.0	2.85	8.05e3	9.55e3	10.6	1.05	6.4
6	6 161122G2_7	25.0	2.85	1.68e4	8.18e3	25.7	1.03	2.7
7	7 161122G2_8	50.0	2.85	3.26e4	8.27e3	49.3	0.986	-1.5
8	8 161122G2_9	75.0	2.85	4.96e4	8.14e3	76.0	1.01	1.4
9	9 161122G2_10	100	2.85	5.76e4	7.23e3	99.5	0.996	-0.5

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

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Compound name: PFBS
Correlation coefficient: r = 0.999283, r^2 = 0.998566
Calibration curve: 1.79216 * x + -0.145672
Response type: Internal Std (Ref 16), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	3.10	4.84e2	6.26e3	0.620	1.93	24.1
2	2 161122G2_3	1.00	3.10	8.53e2	6.27e3	1.03	1.70	3.1
3	3 161122G2_4	2.00	3.10	1.59e3	6.78e3	1.72	1.47	-14.0
4	4 161122G2_5	5.00	3.10	4.15e3	7.36e3	4.01	1.41	-19.7
5	5 161122G2_6	10.0	3.10	9.73e3	6.40e3	10.7	1.90	7.0
6	6 161122G2_7	25.0	3.10	2.06e4	5.76e3	25.0	1.79	-0.1
7	7 161122G2_8	50.0	3.10	3.75e4	5.35e3	48.9	1.75	-2.2
8	8 161122G2_9	75.0	3.10	5.77e4	5.29e3	76.2	1.82	1.6
9	9 161122G2_10	100	3.10	7.03e4	4.89e3	100	1.80	0.4

Compound name: PFHxA
Correlation coefficient: r = 0.999245, r^2 = 0.998491
Calibration curve: 0.598427 * x + 0.0095449
Response type: Internal Std (Ref 17), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	3.47	3.91e2	5.21e3	0.612	0.751	22.3
2	2 161122G2_3	1.00	3.47	6.55e2	5.44e3	0.989	0.602	-1.1
3	3 161122G2_4	2.00	3.47	1.13e3	5.54e3	1.69	0.512	-15.3
4	4 161122G2_5	5.00	3.47	2.82e3	5.55e3	4.23	0.508	-15.5
5	5 161122G2_6	10.0	3.47	6.63e3	5.30e3	10.4	0.625	4.3
6	6 161122G2_7	25.0	3.47	1.40e4	4.52e3	25.9	0.621	3.6
7	7 161122G2_8	50.0	3.47	2.69e4	4.31e3	52.1	0.624	4.2
8	8 161122G2_9	75.0	3.47	4.00e4	4.48e3	74.5	0.594	-0.7
9	9 161122G2_10	100	3.47	4.95e4	4.22e3	98.0	0.587	-2.0

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

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Compound name: PFHpA
Correlation coefficient: r = 0.999639, r^2 = 0.999279
Calibration curve: 1.55279 * x + -0.138431
Response type: Internal Std (Ref 18), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	3.98	9.73e2	1.51e4	0.608	1.61	21.5
2	2 161122G2_3	1.00	3.98	1.74e3	1.58e4	0.979	1.38	-2.1
3	3 161122G2_4	2.00	3.98	3.68e3	1.71e4	1.82	1.34	-9.2
4	4 161122G2_5	5.00	3.98	8.49e3	1.63e4	4.28	1.30	-14.3
5	5 161122G2_6	10.0	3.98	2.03e4	1.60e4	10.3	1.58	3.0
6	6 161122G2_7	25.0	3.98	4.48e4	1.42e4	25.4	1.57	1.7
7	7 161122G2_8	50.0	3.98	8.30e4	1.36e4	49.2	1.52	-1.7
8	8 161122G2_9	75.0	3.98	1.27e5	1.35e4	75.5	1.56	0.7
9	9 161122G2_10	100	3.98	1.54e5	1.23e4	100	1.56	0.4

Compound name: PFHxS
Correlation coefficient: r = 0.998761, r^2 = 0.997524
Calibration curve: 1.72095 * x + -0.0266266
Response type: Internal Std (Ref 19), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.09	4.64e2	6.01e3	0.576	1.93	15.3
2	2 161122G2_3	1.00	4.09	8.63e2	6.30e3	1.01	1.71	1.1
3	3 161122G2_4	2.00	4.09	1.70e3	7.02e3	1.78	1.51	-11.2
4	4 161122G2_5	5.00	4.09	3.79e3	6.33e3	4.36	1.49	-12.8
5	5 161122G2_6	10.0	4.09	8.81e3	6.15e3	10.4	1.79	4.1
6	6 161122G2_7	25.0	4.09	2.00e4	5.33e3	27.2	1.87	8.9
7	7 161122G2_8	50.0	4.09	3.53e4	5.46e3	47.1	1.62	-5.9
8	8 161122G2_9	75.0	4.09	5.41e4	5.36e3	73.4	1.68	-2.2
9	9 161122G2_10	100	4.09	7.00e4	4.95e3	103	1.77	2.7

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

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Compound name: 6:2 FTS
Coefficient of Determination: R^2 = 0.978941
Calibration curve: 0.00135992 * x^2 + 0.414129 * x + -0.114975
Response type: Internal Std (Ref 20), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x^2, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.33	4.92e1	6.03e3	0.523	0.204	4.6
2	2 161122G2_3	1.00	4.33	1.34e2	6.29e3	0.919	0.267	-8.1
3	3 161122G2_4	2.00	4.33	3.55e2	6.05e3	2.03	0.366	1.7
4	4 161122G2_5	5.00	4.32	9.08e2	6.94e3	4.17	0.327	-16.6
5	5 161122G2_6	10.0	4.32	1.95e3	5.43e3	10.7	0.449	7.3
6	6 161122G2_7	25.0	4.32	5.91e3	5.54e3	29.6	0.534	18.5
7	7 161122G2_8	50.0	4.32	9.32e3	5.35e3	45.9	0.436	-8.1
8	8 161122G2_9	75.0	4.32	1.61e4	7.05e3	58.2	0.381	-22.5
9	9 161122G2_10	100	4.32	2.02e4	6.58e3	74.5	0.383	-25.5

Compound name: PFOA
Correlation coefficient: r = 0.999524, r^2 = 0.999048
Calibration curve: 0.899906 * x + 0.0917344
Response type: Internal Std (Ref 21), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.37	1.09e3	2.40e4	0.527	1.13	5.5
2	2 161122G2_3	1.00	4.37	2.24e3	2.87e4	0.983	0.976	-1.7
3	3 161122G2_4	2.00	4.37	4.08e3	2.79e4	1.93	0.915	-3.4
4	4 161122G2_5	5.00	4.37	9.24e3	2.85e4	4.40	0.811	-11.9
5	5 161122G2_6	10.0	4.37	2.04e4	2.60e4	10.8	0.982	8.1
6	6 161122G2_7	25.0	4.37	4.59e4	2.44e4	26.0	0.941	4.2
7	7 161122G2_8	50.0	4.37	8.53e4	2.35e4	50.3	0.908	0.7
8	8 161122G2_9	75.0	4.37	1.30e5	2.38e4	75.6	0.908	0.8
9	9 161122G2_10	100	4.37	1.53e5	2.17e4	97.9	0.882	-2.1

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Compound name: PFHpS
Correlation coefficient: r = 0.997800, r^2 = 0.995604
Calibration curve: 0.0921515 * x + -0.0228444
Response type: Internal Std (Ref 21), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.45	5.82e1	2.40e4	0.577	0.0606	15.3
2	2 161122G2_3	1.00	4.45	1.24e2	2.87e4	0.834	0.0540	-16.6
3	3 161122G2_4	2.00	4.45	3.98e2	2.79e4	2.18	0.0892	9.2
4	4 161122G2_5	5.00	4.45	9.47e2	2.85e4	4.76	0.0832	-4.8
5	5 161122G2_6	10.0	4.45	1.65e3	2.60e4	8.86	0.0794	-11.4
6	6 161122G2_7	25.0	4.45	5.10e3	2.44e4	28.6	0.105	14.5
7	7 161122G2_8	50.0	4.45	8.06e3	2.35e4	46.8	0.0858	-6.4
8	8 161122G2_9	75.0	4.45	1.27e4	2.38e4	72.8	0.0891	-3.0
9	9 161122G2_10	100	4.45	1.64e4	2.17e4	103	0.0948	3.1

Compound name: PFOS
Correlation coefficient: r = 0.996761, r^2 = 0.993532
Calibration curve: 0.83439 * x + -0.165838
Response type: Internal Std (Ref 22), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.78	1.21e2	5.26e3	0.543	0.574	8.5
2	2 161122G2_3	1.00	4.77	3.67e2	7.35e3	0.947	0.624	-5.3
3	3 161122G2_4	2.00	4.77	8.56e2	8.95e3	1.63	0.598	-18.4
4	4 161122G2_5	5.00	4.77	2.17e3	6.87e3	4.93	0.790	-1.4
5	5 161122G2_6	10.0	4.77	4.69e3	7.23e3	9.90	0.810	-1.0
6	6 161122G2_7	25.0	4.77	1.42e4	6.95e3	30.8	1.02	23.3
7	7 161122G2_8	50.0	4.78	1.92e4	5.80e3	49.9	0.830	-0.1
8	8 161122G2_9	75.0	4.77	3.52e4	7.19e3	73.6	0.817	-1.8
9	9 161122G2_10	100	4.77	4.44e4	6.93e3	96.1	0.800	-3.9

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Compound name: PFNA
Correlation coefficient: r = 0.997674, r^2 = 0.995354
Calibration curve: 1.64181 * x + -0.17063
Response type: Internal Std (Ref 23), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.72	5.63e2	1.06e4	0.509	1.33	1.7
2	2 161122G2_3	1.00	4.71	1.61e3	1.33e4	1.02	1.51	2.5
3	3 161122G2_4	2.00	4.71	3.31e3	1.23e4	2.16	1.68	7.8
4	4 161122G2_5	5.00	4.71	7.19e3	1.28e4	4.37	1.40	-12.5
5	5 161122G2_6	10.0	4.71	1.72e4	1.33e4	10.0	1.63	0.1
6	6 161122G2_7	25.0	4.71	4.06e4	1.21e4	25.6	1.67	2.3
7	7 161122G2_8	50.0	4.71	6.88e4	1.04e4	50.5	1.65	1.0
8	8 161122G2_9	75.0	4.71	1.10e5	1.23e4	68.0	1.49	-9.3
9	9 161122G2_10	100	4.71	1.49e5	1.07e4	106	1.74	6.3

Compound name: PFDA
Correlation coefficient: r = 0.998669, r^2 = 0.997340
Calibration curve: 0.596457 * x + -0.0200723
Response type: Internal Std (Ref 24), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	5.01	1.30e2	6.01e3	0.486	0.540	-2.7
2	2 161122G2_3	1.00	5.01	3.72e2	8.51e3	0.949	0.546	-5.1
3	3 161122G2_4	2.00	5.01	8.65e2	8.73e3	2.11	0.620	5.6
4	4 161122G2_5	5.00	5.01	1.70e3	8.07e3	4.44	0.526	-11.1
5	5 161122G2_6	10.0	5.01	3.83e3	7.02e3	11.5	0.683	14.8
6	6 161122G2_7	25.0	5.01	1.25e4	1.01e4	26.1	0.622	4.4
7	7 161122G2_8	50.0	5.01	1.45e4	6.60e3	46.1	0.550	-7.7
8	8 161122G2_9	75.0	5.01	3.19e4	8.88e3	75.4	0.599	0.5
9	9 161122G2_10	100	5.01	4.34e4	8.96e3	101	0.605	1.5

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

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Compound name: 8:2 FTS
Coefficient of Determination: R^2 = 0.984052
Calibration curve: -0.000479329 * x^2 + 0.502189 * x + 0.00235356
Response type: Internal Std (Ref 25), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	0.500	4.99	4.13e1	2.12e3	0.479	0.486	-4.1
2	2 161122G2_3	1.00	4.99	1.45e2	3.66e3	0.984	0.496	-1.6
3	3 161122G2_4	2.00	4.99	2.64e2	2.69e3	2.44	0.613	22.1
4	4 161122G2_5	5.00	4.99	4.56e2	2.74e3	4.16	0.416	-16.8
5	5 161122G2_6	10.0	4.99	1.14e3	3.15e3	9.07	0.452	-9.3
6	6 161122G2_7	25.0	4.99	4.23e3	3.62e3	29.9	0.584	19.7
7	7 161122G2_8	50.0	4.99	4.24e3	2.69e3	40.8	0.394	-18.4
8	8 161122G2_9	75.0	4.99	1.23e4	3.97e3	84.1	0.518	12.1
9	9 161122G2_10	100	4.99	1.62e4	4.58e3	96.8	0.441	-3.2

Compound name: 13C3-PFBA
Response Factor: 1.20506
RRF SD: 0.0553973, Relative SD: 4.59706
Response type: Internal Std (Ref 26), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	1.93	2.07e4	1.76e4	12.2	1.18	-2.2
2	2 161122G2_3	12.5	1.93	2.25e4	1.85e4	12.6	1.22	1.0
3	3 161122G2_4	12.5	1.93	2.32e4	1.80e4	13.4	1.29	7.0
4	4 161122G2_5	12.5	1.93	2.31e4	1.91e4	12.6	1.21	0.8
5	5 161122G2_6	12.5	1.93	2.17e4	1.69e4	13.3	1.29	6.8
6	6 161122G2_7	12.5	1.93	1.87e4	1.58e4	12.3	1.18	-2.0
7	7 161122G2_8	12.5	1.93	1.90e4	1.64e4	12.1	1.16	-3.6
8	8 161122G2_9	12.5	1.93	1.98e4	1.66e4	12.4	1.20	-0.7
9	9 161122G2_10	12.5	1.93	1.83e4	1.63e4	11.6	1.12	-7.1

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Compound name: 13C3-PFPeA
Response Factor: 0.447597
RRF SD: 0.0175301, Relative SD: 3.9165
Response type: Internal Std (Ref 28), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	2.85	9.28e3	2.07e4	12.5	0.448	0.1
2	2 161122G2_3	12.5	2.85	9.67e3	2.17e4	12.4	0.445	-0.6
3	3 161122G2_4	12.5	2.85	9.90e3	2.11e4	13.1	0.469	4.8
4	4 161122G2_5	12.5	2.85	1.02e4	2.20e4	13.0	0.466	4.1
5	5 161122G2_6	12.5	2.85	9.55e3	2.15e4	12.4	0.445	-0.6
6	6 161122G2_7	12.5	2.85	8.18e3	1.89e4	12.1	0.434	-3.1
7	7 161122G2_8	12.5	2.85	8.27e3	1.78e4	13.0	0.465	3.9
8	8 161122G2_9	12.5	2.85	8.14e3	1.84e4	12.4	0.443	-1.0
9	9 161122G2_10	12.5	2.85	7.23e3	1.75e4	11.6	0.414	-7.5

Compound name: 13C3-PFBS
Response Factor: 0.302055
RRF SD: 0.0171236, Relative SD: 5.66905
Response type: Internal Std (Ref 28), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	3.10	6.26e3	2.07e4	12.5	0.302	0.1
2	2 161122G2_3	12.5	3.10	6.27e3	2.17e4	11.9	0.288	-4.6
3	3 161122G2_4	12.5	3.10	6.78e3	2.11e4	13.3	0.321	6.4
4	4 161122G2_5	12.5	3.10	7.36e3	2.20e4	13.8	0.335	10.8
5	5 161122G2_6	12.5	3.10	6.40e3	2.15e4	12.3	0.298	-1.4
6	6 161122G2_7	12.5	3.10	5.76e3	1.89e4	12.6	0.306	1.1
7	7 161122G2_8	12.5	3.10	5.35e3	1.78e4	12.5	0.301	-0.4
8	8 161122G2_9	12.5	3.10	5.29e3	1.84e4	11.9	0.288	-4.7
9	9 161122G2_10	12.5	3.10	4.89e3	1.75e4	11.6	0.280	-7.3

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Compound name: 13C2-PFHxA
Response Factor: 0.619528
RRF SD: 0.0178176, Relative SD: 2.876
Response type: Internal Std (Ref 28), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	5.00	3.47	5.21e3	2.07e4	5.07	0.628	1.4
2	2 161122G2_3	5.00	3.47	5.44e3	2.17e4	5.05	0.626	1.0
3	3 161122G2_4	5.00	3.47	5.54e3	2.11e4	5.29	0.656	5.9
4	4 161122G2_5	5.00	3.47	5.55e3	2.20e4	5.09	0.631	1.8
5	5 161122G2_6	5.00	3.47	5.30e3	2.15e4	4.98	0.617	-0.4
6	6 161122G2_7	5.00	3.47	4.52e3	1.89e4	4.83	0.598	-3.4
7	7 161122G2_8	5.00	3.47	4.31e3	1.78e4	4.89	0.606	-2.2
8	8 161122G2_9	5.00	3.47	4.48e3	1.84e4	4.92	0.610	-1.5
9	9 161122G2_10	5.00	3.47	4.22e3	1.75e4	4.87	0.603	-2.6

Compound name: 13C4-PFHpA
Response Factor: 1.13869
RRF SD: 0.046436, Relative SD: 4.078
Response type: Internal Std (Ref 29), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	3.98	1.51e4	1.32e4	12.6	1.14	0.5
2	2 161122G2_3	12.5	3.97	1.58e4	1.36e4	12.7	1.16	1.9
3	3 161122G2_4	12.5	3.98	1.71e4	1.42e4	13.2	1.21	5.8
4	4 161122G2_5	12.5	3.97	1.63e4	1.48e4	12.1	1.10	-3.3
5	5 161122G2_6	12.5	3.97	1.60e4	1.44e4	12.2	1.11	-2.4
6	6 161122G2_7	12.5	3.97	1.42e4	1.23e4	12.7	1.16	1.7
7	7 161122G2_8	12.5	3.97	1.36e4	1.16e4	12.8	1.17	2.7
8	8 161122G2_9	12.5	3.97	1.35e4	1.17e4	12.7	1.15	1.3
9	9 161122G2_10	12.5	3.97	1.23e4	1.18e4	11.5	1.05	-8.2

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Compound name: 18O2-PFHxS
Response Factor: 0.449434
RRF SD: 0.0241405, Relative SD: 5.37132
Response type: Internal Std (Ref 29), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.09	6.01e3	1.32e4	12.6	0.455	1.1
2	2 161122G2_3	12.5	4.09	6.30e3	1.36e4	12.9	0.463	3.1
3	3 161122G2_4	12.5	4.09	7.02e3	1.42e4	13.7	0.494	9.8
4	4 161122G2_5	12.5	4.09	6.33e3	1.48e4	11.9	0.428	-4.8
5	5 161122G2_6	12.5	4.09	6.15e3	1.44e4	11.9	0.427	-5.0
6	6 161122G2_7	12.5	4.09	5.33e3	1.23e4	12.1	0.434	-3.4
7	7 161122G2_8	12.5	4.08	5.46e3	1.16e4	13.0	0.468	4.2
8	8 161122G2_9	12.5	4.09	5.36e3	1.17e4	12.7	0.456	1.5
9	9 161122G2_10	12.5	4.09	4.95e3	1.18e4	11.7	0.420	-6.6

Compound name: 13C2-6:2 FTS
Response Factor: 1.07309
RRF SD: 0.0967215, Relative SD: 9.01333
Response type: Internal Std (Ref 27), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.33	6.03e3	5.89e3	11.9	1.02	-4.5
2	2 161122G2_3	12.5	4.33	6.29e3	5.82e3	12.6	1.08	0.7
3	3 161122G2_4	12.5	4.33	6.05e3	5.56e3	12.7	1.09	1.3
4	4 161122G2_5	12.5	4.32	6.94e3	5.84e3	13.8	1.19	10.8
5	5 161122G2_6	12.5	4.32	5.43e3	5.76e3	11.0	0.942	-12.2
6	6 161122G2_7	12.5	4.32	5.54e3	4.77e3	13.5	1.16	8.2
7	7 161122G2_8	12.5	4.32	5.35e3	5.78e3	10.8	0.925	-13.8
8	8 161122G2_9	12.5	4.32	7.05e3	5.95e3	13.8	1.18	10.3
9	9 161122G2_10	12.5	4.32	6.58e3	6.18e3	12.4	1.06	-0.8

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Compound name: 13C2-PFOA
Response Factor: 2.26193
RRF SD: 0.103705, Relative SD: 4.58481
Response type: Internal Std (Ref 30), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.37	2.40e4	1.14e4	11.7	2.12	-6.4
2	2 161122G2_3	12.5	4.37	2.87e4	1.22e4	13.0	2.36	4.4
3	3 161122G2_4	12.5	4.37	2.79e4	1.22e4	12.6	2.28	0.8
4	4 161122G2_5	12.5	4.37	2.85e4	1.19e4	13.3	2.40	6.0
5	5 161122G2_6	12.5	4.37	2.60e4	1.12e4	12.9	2.33	3.0
6	6 161122G2_7	12.5	4.37	2.44e4	1.17e4	11.5	2.09	-7.7
7	7 161122G2_8	12.5	4.37	2.35e4	1.03e4	12.6	2.28	0.9
8	8 161122G2_9	12.5	4.37	2.38e4	1.06e4	12.4	2.24	-1.2
9	9 161122G2_10	12.5	4.37	2.17e4	9.56e3	12.5	2.27	0.2

Compound name: 13C8-PFOS
Response Factor: 0.943547
RRF SD: 0.0953243, Relative SD: 10.1028
Response type: Internal Std (Ref 31), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.77	5.26e3	6.09e3	11.4	0.863	-8.5
2	2 161122G2_3	12.5	4.77	7.35e3	8.00e3	12.2	0.918	-2.7
3	3 161122G2_4	12.5	4.77	8.95e3	7.63e3	15.5	1.17	24.2
4	4 161122G2_5	12.5	4.77	6.87e3	7.71e3	11.8	0.892	-5.5
5	5 161122G2_6	12.5	4.77	7.23e3	7.12e3	13.5	1.02	7.6
6	6 161122G2_7	12.5	4.77	6.95e3	7.59e3	12.1	0.917	-2.9
7	7 161122G2_8	12.5	4.77	5.80e3	6.40e3	12.0	0.906	-4.0
8	8 161122G2_9	12.5	4.77	7.19e3	7.90e3	12.1	0.910	-3.5
9	9 161122G2_10	12.5	4.77	6.93e3	7.73e3	11.9	0.898	-4.9

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Compound name: 13C5-PFNA
Response Factor: 1.08198
RRF SD: 0.109173, Relative SD: 10.0901
Response type: Internal Std (Ref 32), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.71	1.06e4	9.86e3	12.4	1.07	-0.7
2	2 161122G2_3	12.5	4.71	1.33e4	1.10e4	14.0	1.21	11.8
3	3 161122G2_4	12.5	4.71	1.23e4	1.19e4	12.0	1.04	-4.3
4	4 161122G2_5	12.5	4.71	1.28e4	1.06e4	14.0	1.21	12.3
5	5 161122G2_6	12.5	4.71	1.33e4	1.18e4	13.0	1.13	4.1
6	6 161122G2_7	12.5	4.71	1.21e4	1.04e4	13.4	1.16	7.4
7	7 161122G2_8	12.5	4.71	1.04e4	1.14e4	10.5	0.909	-16.0
8	8 161122G2_9	12.5	4.71	1.23e4	1.16e4	12.3	1.07	-1.4
9	9 161122G2_10	12.5	4.71	1.07e4	1.14e4	10.8	0.938	-13.3

Compound name: 13C2-PFDA
Response Factor: 1.01921
RRF SD: 0.0876435, Relative SD: 8.59913
Response type: Internal Std (Ref 33), Area * (IS Conc. / IS Area)
Curve type: RF

	# Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	5.01	6.01e3	6.35e3	11.6	0.947	-7.1
2	2 161122G2_3	12.5	5.01	8.51e3	9.85e3	10.6	0.864	-15.2
3	3 161122G2_4	12.5	5.01	8.73e3	8.39e3	12.8	1.04	2.1
4	4 161122G2_5	12.5	5.01	8.07e3	7.46e3	13.3	1.08	6.1
5	5 161122G2_6	12.5	5.01	7.02e3	6.59e3	13.1	1.07	4.5
6	6 161122G2_7	12.5	5.01	1.01e4	9.85e3	12.5	1.02	0.3
7	7 161122G2_8	12.5	5.01	6.60e3	5.70e3	14.2	1.16	13.6
8	8 161122G2_9	12.5	5.01	8.88e3	8.46e3	12.9	1.05	2.9
9	9 161122G2_10	12.5	5.01	8.96e3	9.48e3	11.6	0.945	-7.3

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Compound name: 13C2-8:2 FTS
Response Factor: 0.568768
RRF SD: 0.137212, Relative SD: 24.1245
Response type: Internal Std (Ref 27), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.99	2.12e3	5.89e3	7.93	0.361	-36.6
2	2 161122G2_3	12.5	4.99	3.66e3	5.82e3	13.8	0.629	10.6
3	3 161122G2_4	12.5	4.99	2.69e3	5.56e3	10.6	0.483	-15.1
4	4 161122G2_5	12.5	4.99	2.74e3	5.84e3	10.3	0.468	-17.7
5	5 161122G2_6	12.5	4.99	3.15e3	5.76e3	12.0	0.546	-4.1
6	6 161122G2_7	12.5	4.99	3.62e3	4.77e3	16.7	0.759	33.4
7	7 161122G2_8	12.5	4.99	2.69e3	5.78e3	10.2	0.466	-18.0
8	8 161122G2_9	12.5	4.99	3.97e3	5.95e3	14.7	0.667	17.3
9	9 161122G2_10	12.5	4.99	4.58e3	6.18e3	16.3	0.740	30.1

Compound name: 13C4-PFBA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 26), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	1.93	1.76e4	1.76e4	12.5	1.00	0.0
2	2 161122G2_3	12.5	1.92	1.85e4	1.85e4	12.5	1.00	0.0
3	3 161122G2_4	12.5	1.93	1.80e4	1.80e4	12.5	1.00	0.0
4	4 161122G2_5	12.5	1.93	1.91e4	1.91e4	12.5	1.00	0.0
5	5 161122G2_6	12.5	1.93	1.69e4	1.69e4	12.5	1.00	0.0
6	6 161122G2_7	12.5	1.93	1.58e4	1.58e4	12.5	1.00	0.0
7	7 161122G2_8	12.5	1.93	1.64e4	1.64e4	12.5	1.00	0.0
8	8 161122G2_9	12.5	1.93	1.66e4	1.66e4	12.5	1.00	0.0
9	9 161122G2_10	12.5	1.92	1.63e4	1.63e4	12.5	1.00	0.0

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Compound name: 13C2-4:2 FTS
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 27), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	3.37	5.89e3	5.89e3	12.5	1.00	0.0
2	2 161122G2_3	12.5	3.37	5.82e3	5.82e3	12.5	1.00	0.0
3	3 161122G2_4	12.5	3.37	5.56e3	5.56e3	12.5	1.00	0.0
4	4 161122G2_5	12.5	3.38	5.84e3	5.84e3	12.5	1.00	0.0
5	5 161122G2_6	12.5	3.38	5.76e3	5.76e3	12.5	1.00	0.0
6	6 161122G2_7	12.5	3.38	4.77e3	4.77e3	12.5	1.00	0.0
7	7 161122G2_8	12.5	3.38	5.78e3	5.78e3	12.5	1.00	0.0
8	8 161122G2_9	12.5	3.38	5.95e3	5.95e3	12.5	1.00	0.0
9	9 161122G2_10	12.5	3.38	6.18e3	6.18e3	12.5	1.00	0.0

Compound name: 13C5-PFHxA
Response Factor: 1
RRF SD: 3.92523e-017, Relative SD: 3.92523e-015
Response type: Internal Std (Ref 28), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	3.47	2.07e4	2.07e4	12.5	1.00	0.0
2	2 161122G2_3	12.5	3.46	2.17e4	2.17e4	12.5	1.00	0.0
3	3 161122G2_4	12.5	3.47	2.11e4	2.11e4	12.5	1.00	0.0
4	4 161122G2_5	12.5	3.47	2.20e4	2.20e4	12.5	1.00	0.0
5	5 161122G2_6	12.5	3.47	2.15e4	2.15e4	12.5	1.00	0.0
6	6 161122G2_7	12.5	3.47	1.89e4	1.89e4	12.5	1.00	0.0
7	7 161122G2_8	12.5	3.47	1.78e4	1.78e4	12.5	1.00	0.0
8	8 161122G2_9	12.5	3.47	1.84e4	1.84e4	12.5	1.00	-0.0
9	9 161122G2_10	12.5	3.47	1.75e4	1.75e4	12.5	1.00	0.0

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Compound name: 13C3-PFHxS
Response Factor: 1
RRF SD: 7.85046e-017, Relative SD: 7.85046e-015
Response type: Internal Std (Ref 29), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.09	1.32e4	1.32e4	12.5	1.00	0.0
2	2 161122G2_3	12.5	4.09	1.36e4	1.36e4	12.5	1.00	0.0
3	3 161122G2_4	12.5	4.09	1.42e4	1.42e4	12.5	1.00	0.0
4	4 161122G2_5	12.5	4.09	1.48e4	1.48e4	12.5	1.00	0.0
5	5 161122G2_6	12.5	4.09	1.44e4	1.44e4	12.5	1.00	0.0
6	6 161122G2_7	12.5	4.09	1.23e4	1.23e4	12.5	1.00	0.0
7	7 161122G2_8	12.5	4.09	1.16e4	1.16e4	12.5	1.00	0.0
8	8 161122G2_9	12.5	4.09	1.17e4	1.17e4	12.5	1.00	0.0
9	9 161122G2_10	12.5	4.09	1.18e4	1.18e4	12.5	1.00	0.0

Compound name: 13C8-PFOA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 30), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.37	1.14e4	1.14e4	12.5	1.00	0.0
2	2 161122G2_3	12.5	4.37	1.22e4	1.22e4	12.5	1.00	0.0
3	3 161122G2_4	12.5	4.37	1.22e4	1.22e4	12.5	1.00	0.0
4	4 161122G2_5	12.5	4.37	1.19e4	1.19e4	12.5	1.00	0.0
5	5 161122G2_6	12.5	4.37	1.12e4	1.12e4	12.5	1.00	0.0
6	6 161122G2_7	12.5	4.37	1.17e4	1.17e4	12.5	1.00	0.0
7	7 161122G2_8	12.5	4.37	1.03e4	1.03e4	12.5	1.00	0.0
8	8 161122G2_9	12.5	4.37	1.06e4	1.06e4	12.5	1.00	0.0
9	9 161122G2_10	12.5	4.37	9.56e3	9.56e3	12.5	1.00	0.0

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:27:47 Pacific Standard Time

Compound name: 13C4-PFOS
Response Factor: 1
RRF SD: 7.85046e-017, Relative SD: 7.85046e-015
Response type: Internal Std (Ref 31), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.78	6.09e3	6.09e3	12.5	1.00	0.0
2	2 161122G2_3	12.5	4.77	8.00e3	8.00e3	12.5	1.00	0.0
3	3 161122G2_4	12.5	4.78	7.63e3	7.63e3	12.5	1.00	0.0
4	4 161122G2_5	12.5	4.77	7.71e3	7.71e3	12.5	1.00	0.0
5	5 161122G2_6	12.5	4.77	7.12e3	7.12e3	12.5	1.00	0.0
6	6 161122G2_7	12.5	4.77	7.59e3	7.59e3	12.5	1.00	0.0
7	7 161122G2_8	12.5	4.78	6.40e3	6.40e3	12.5	1.00	0.0
8	8 161122G2_9	12.5	4.77	7.90e3	7.90e3	12.5	1.00	0.0
9	9 161122G2_10	12.5	4.77	7.73e3	7.73e3	12.5	1.00	0.0

Compound name: 13C9-PFNA
Response Factor: 1
RRF SD: 0, Relative SD: 0
Response type: Internal Std (Ref 32), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	4.71	9.86e3	9.86e3	12.5	1.00	0.0
2	2 161122G2_3	12.5	4.71	1.10e4	1.10e4	12.5	1.00	0.0
3	3 161122G2_4	12.5	4.71	1.19e4	1.19e4	12.5	1.00	0.0
4	4 161122G2_5	12.5	4.71	1.06e4	1.06e4	12.5	1.00	0.0
5	5 161122G2_6	12.5	4.71	1.18e4	1.18e4	12.5	1.00	0.0
6	6 161122G2_7	12.5	4.71	1.04e4	1.04e4	12.5	1.00	0.0
7	7 161122G2_8	12.5	4.71	1.14e4	1.14e4	12.5	1.00	0.0
8	8 161122G2_9	12.5	4.71	1.16e4	1.16e4	12.5	1.00	0.0
9	9 161122G2_10	12.5	4.71	1.14e4	1.14e4	12.5	1.00	0.0

Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:27:47 Pacific Standard Time

Compound name: 13C6-PFDA
Response Factor: 1
RRF SD: 3.92523e-017, Relative SD: 3.92523e-015
Response type: Internal Std (Ref 33), Area * (IS Conc. / IS Area)
Curve type: RF

	#-Name	Std. Conc	RT	Resp	IS Resp	Conc.	RRF	%Dev
1	1 161122G2_2	12.5	5.01	6.35e3	6.35e3	12.5	1.00	0.0
2	2 161122G2_3	12.5	5.01	9.85e3	9.85e3	12.5	1.00	0.0
3	3 161122G2_4	12.5	5.01	8.39e3	8.39e3	12.5	1.00	0.0
4	4 161122G2_5	12.5	5.01	7.46e3	7.46e3	12.5	1.00	0.0
5	5 161122G2_6	12.5	5.01	6.59e3	6.59e3	12.5	1.00	0.0
6	6 161122G2_7	12.5	5.01	9.85e3	9.85e3	12.5	1.00	0.0
7	7 161122G2_8	12.5	5.01	5.70e3	5.70e3	12.5	1.00	0.0
8	8 161122G2_9	12.5	5.01	8.46e3	8.46e3	12.5	1.00	-0.0
9	9 161122G2_10	12.5	5.01	9.48e3	9.48e3	12.5	1.00	0.0

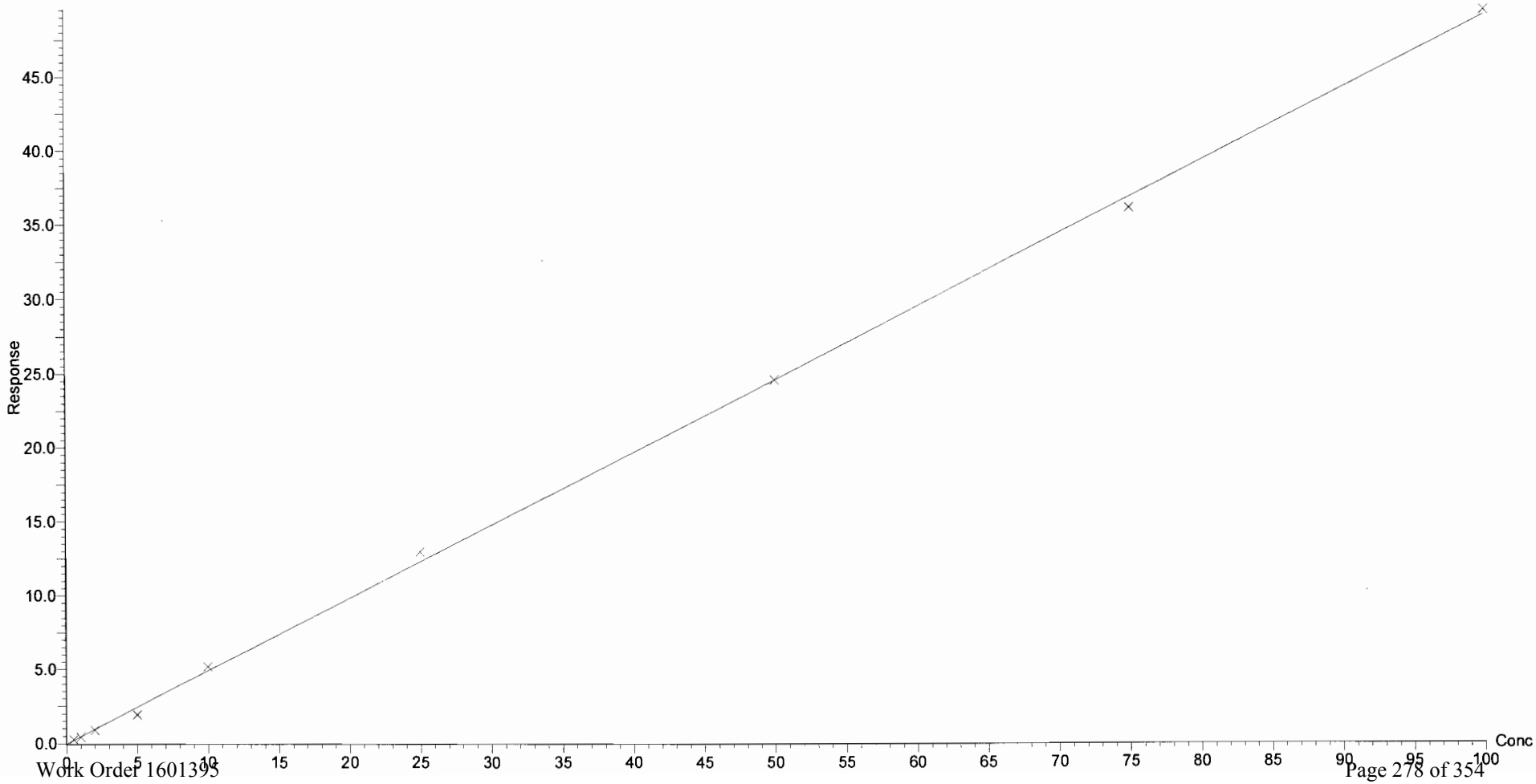
Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 22 Nov 2016 14:48:05
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

Compound name: PFBA
Correlation coefficient: r = 0.999216, r^2 = 0.998432
Calibration curve: 0.492927 * x + -0.0410615
Response type: Internal Std (Ref 14), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

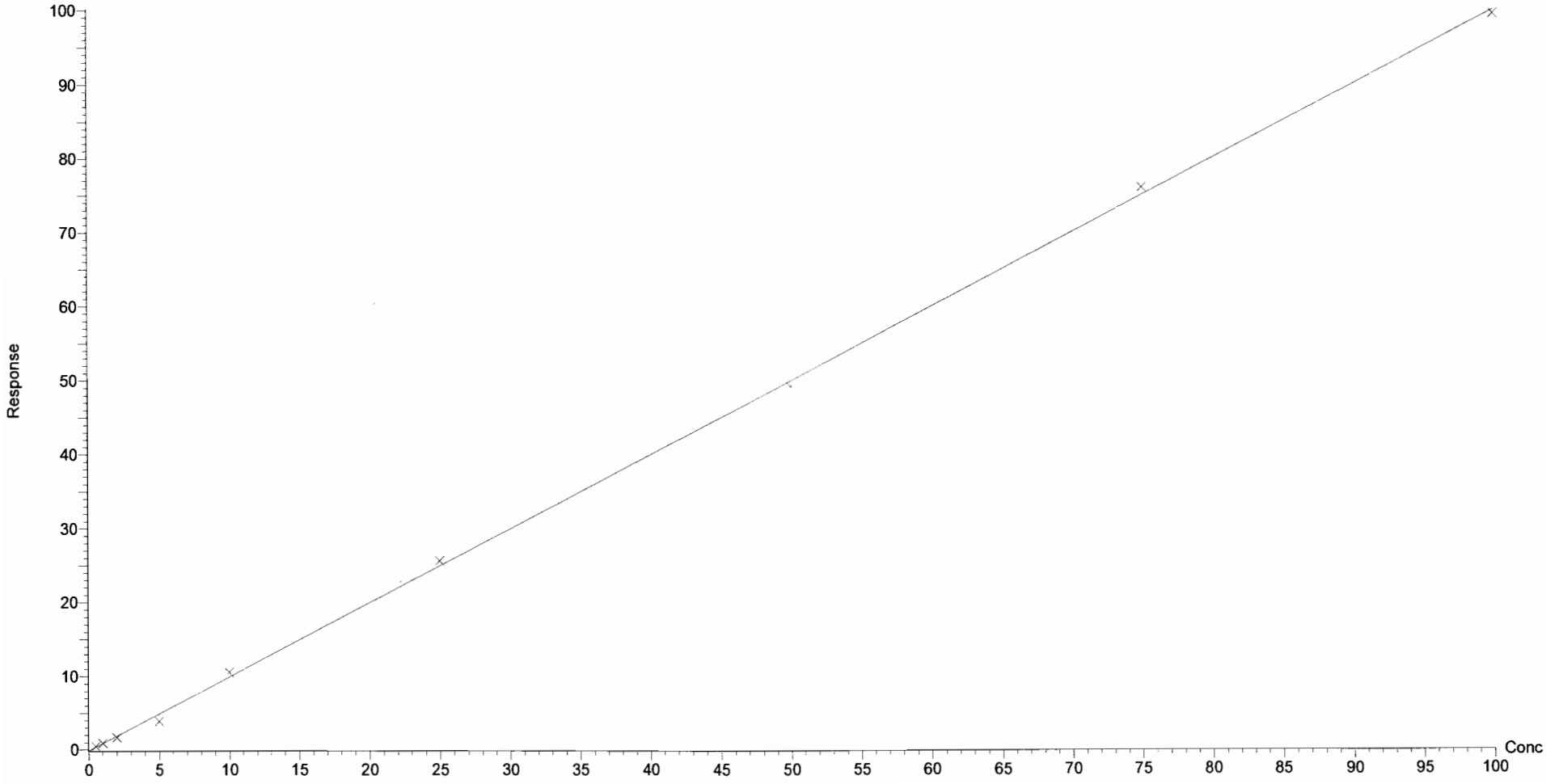


Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

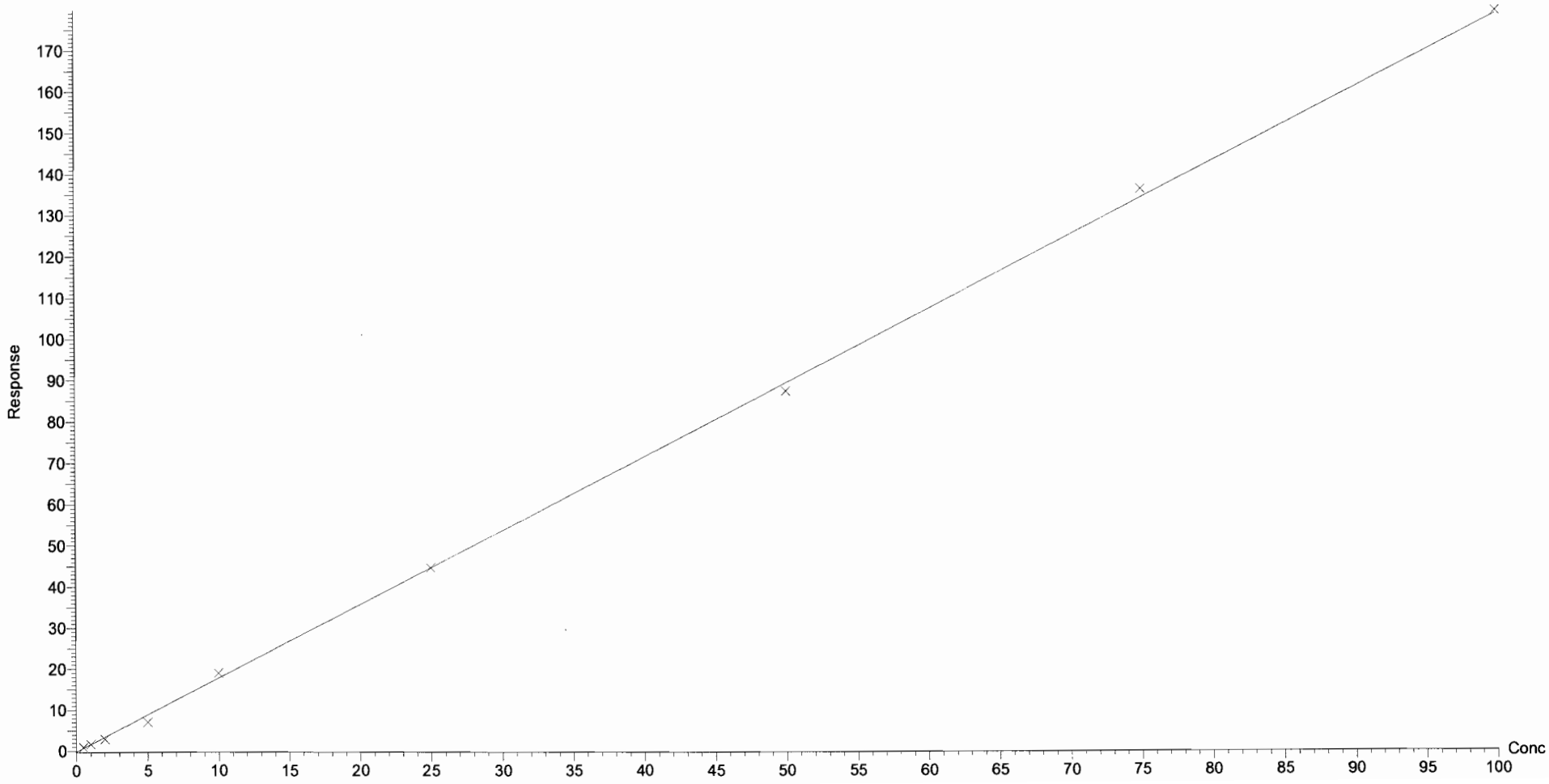
Compound name: PFPeA
Correlation coefficient: r = 0.999341, r^2 = 0.998683
Calibration curve: 1.00273 * x + -0.119981
Response type: Internal Std (Ref 15), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

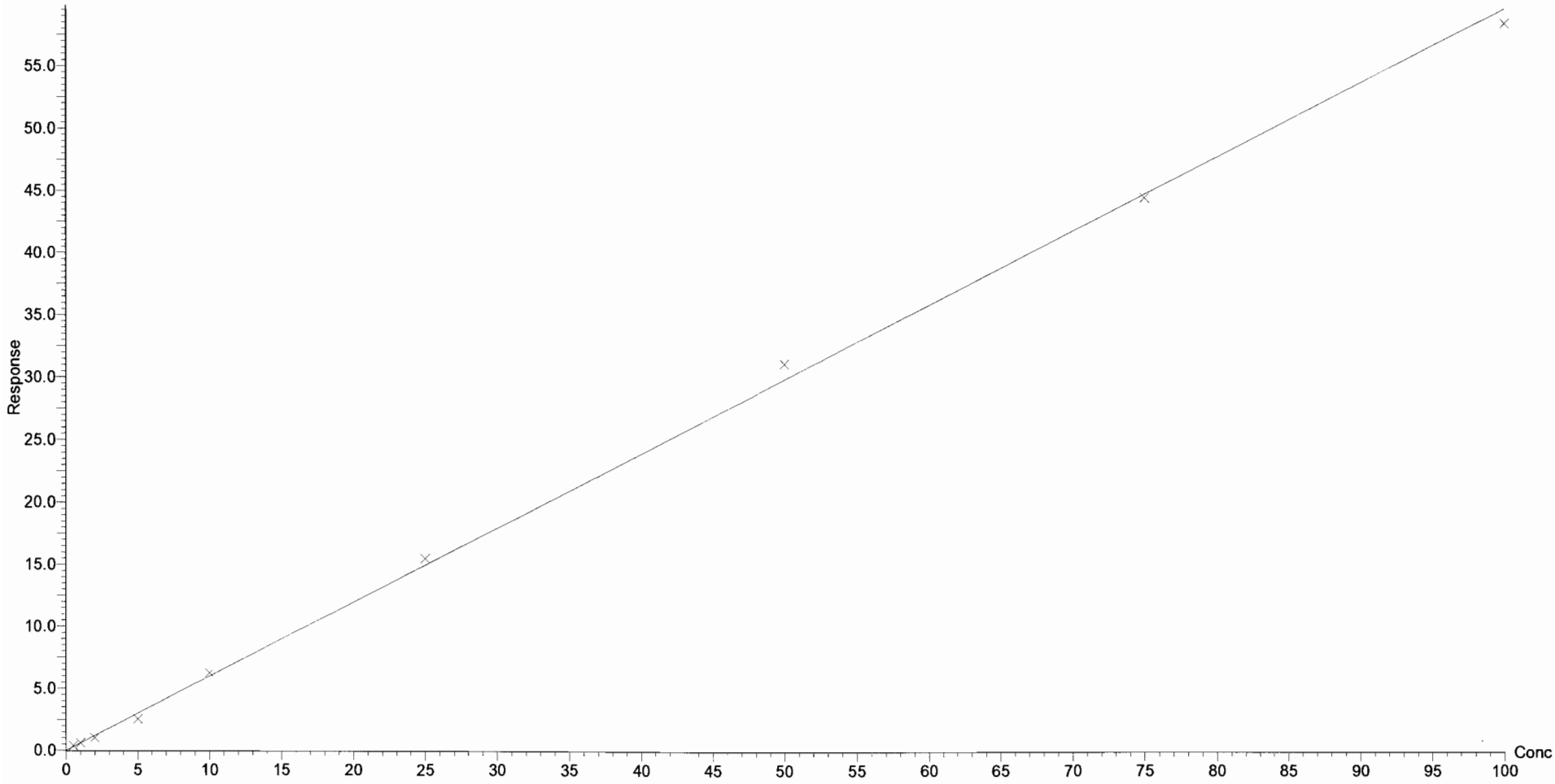
Compound name: PFBS
Correlation coefficient: r = 0.999283, r^2 = 0.998566
Calibration curve: 1.79216 * x + -0.145672
Response type: Internal Std (Ref 16), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

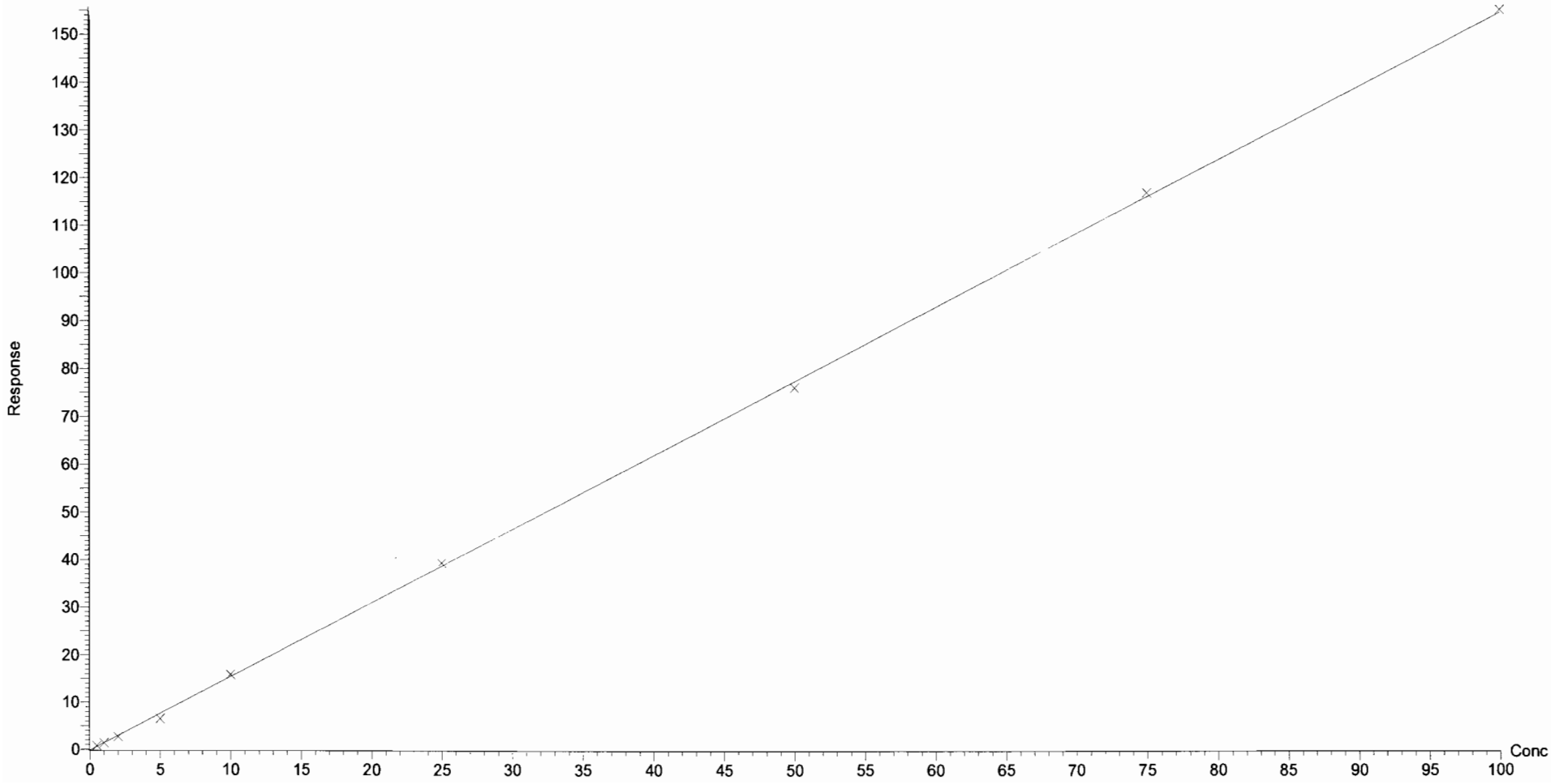
Compound name: PFHxA
Correlation coefficient: r = 0.999245, r^2 = 0.998491
Calibration curve: 0.598427 * x + 0.0095449
Response type: Internal Std (Ref 17), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

Compound name: PFHpA
Correlation coefficient: r = 0.999639, r^2 = 0.999279
Calibration curve: 1.55279 * x + -0.138431
Response type: Internal Std (Ref 18), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

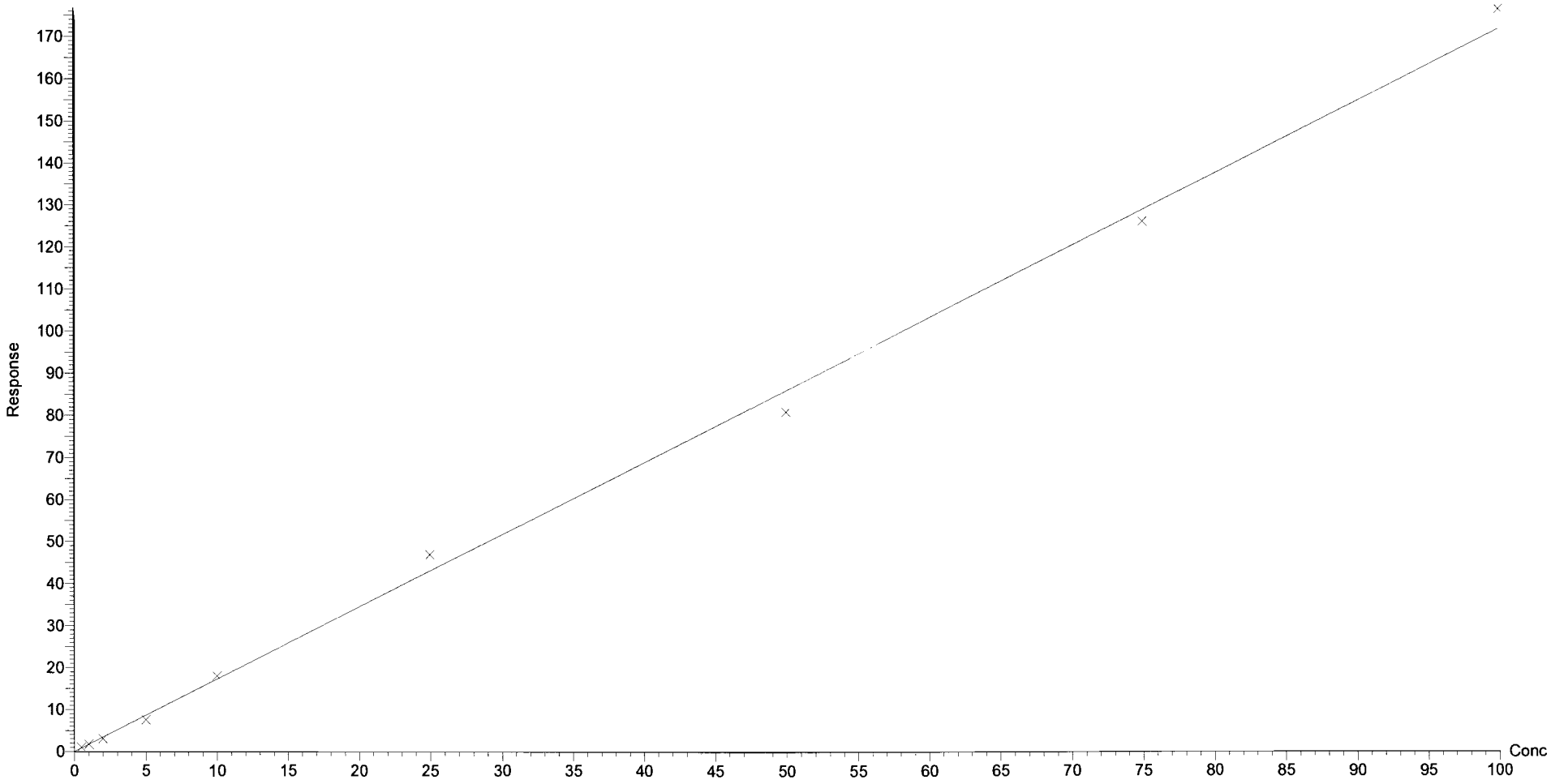


Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

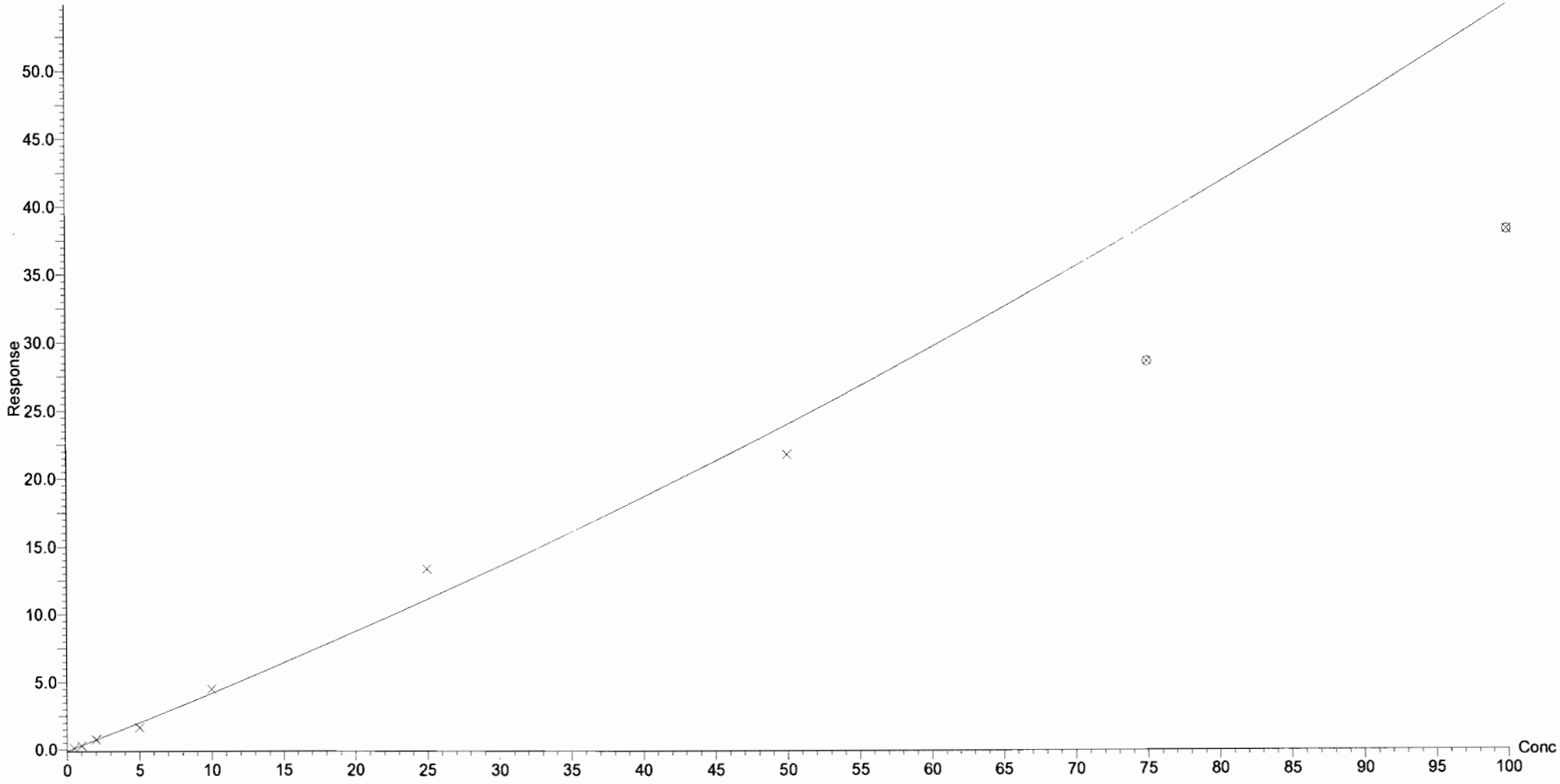
Compound name: PFHxS
Correlation coefficient: r = 0.998761, r^2 = 0.997524
Calibration curve: 1.72095 * x + -0.0266266
Response type: Internal Std (Ref 19), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

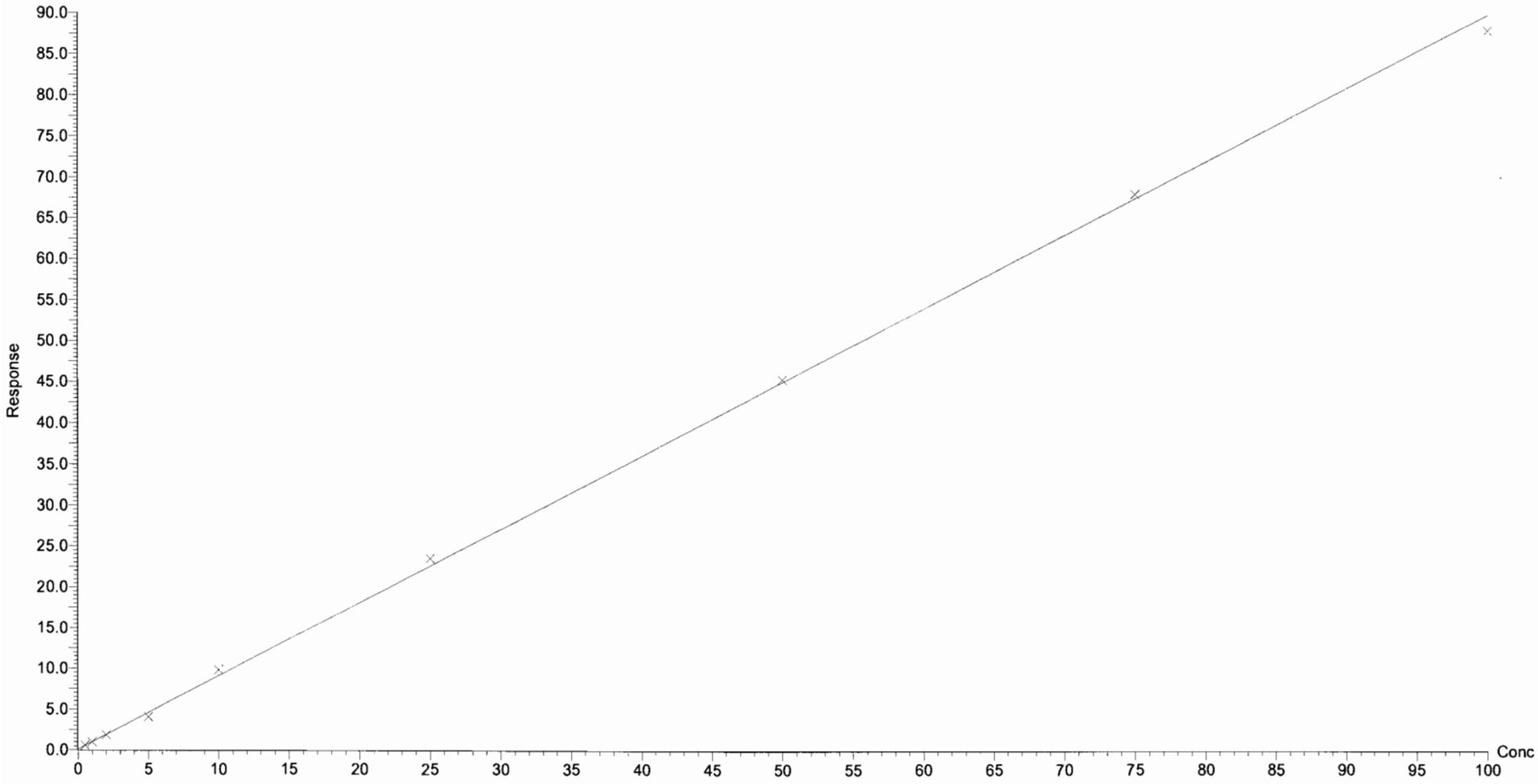
Compound name: 6:2 FTS
Coefficient of Determination: R^2 = 0.978941
Calibration curve: 0.00135992 * x^2 + 0.414129 * x + -0.114975
Response type: Internal Std (Ref 20), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x^2, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

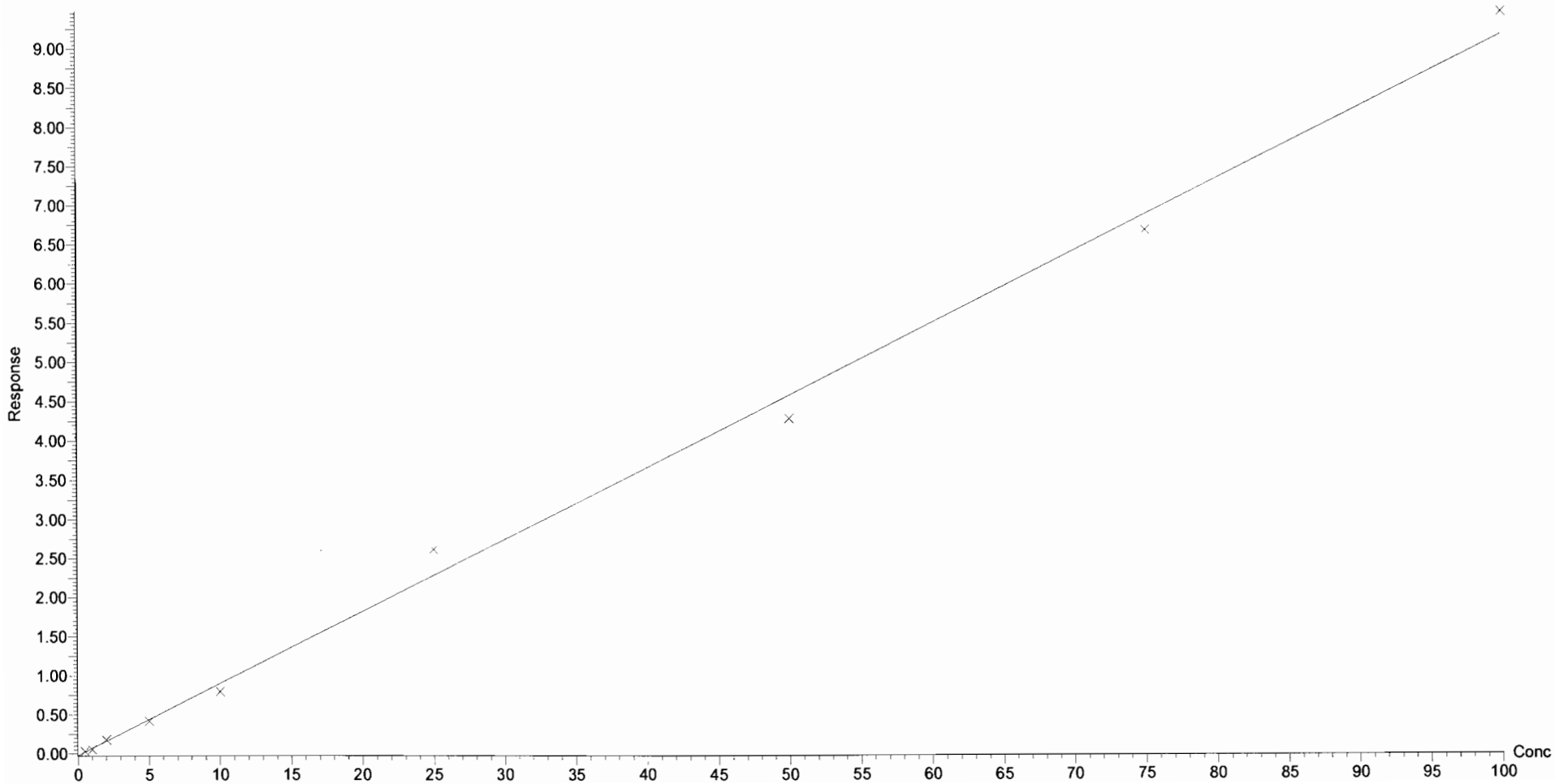
Compound name: PFOA
Correlation coefficient: r = 0.999524, r^2 = 0.999048
Calibration curve: 0.899906 * x + 0.0917344
Response type: Internal Std (Ref 21), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

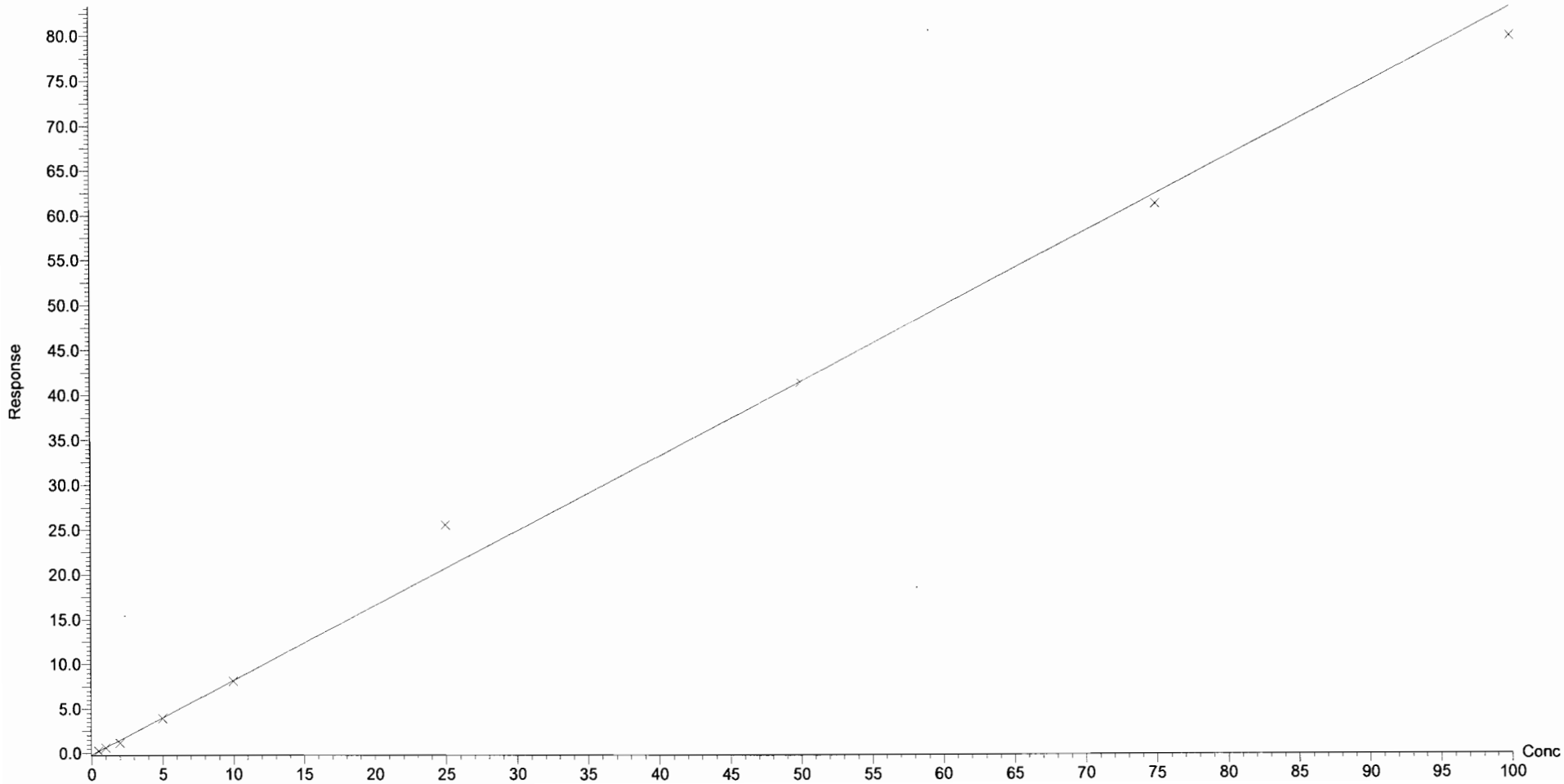
Compound name: PFHpS
Correlation coefficient: r = 0.997800, r^2 = 0.995604
Calibration curve: 0.0921515 * x + -0.0228444
Response type: Internal Std (Ref 21), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

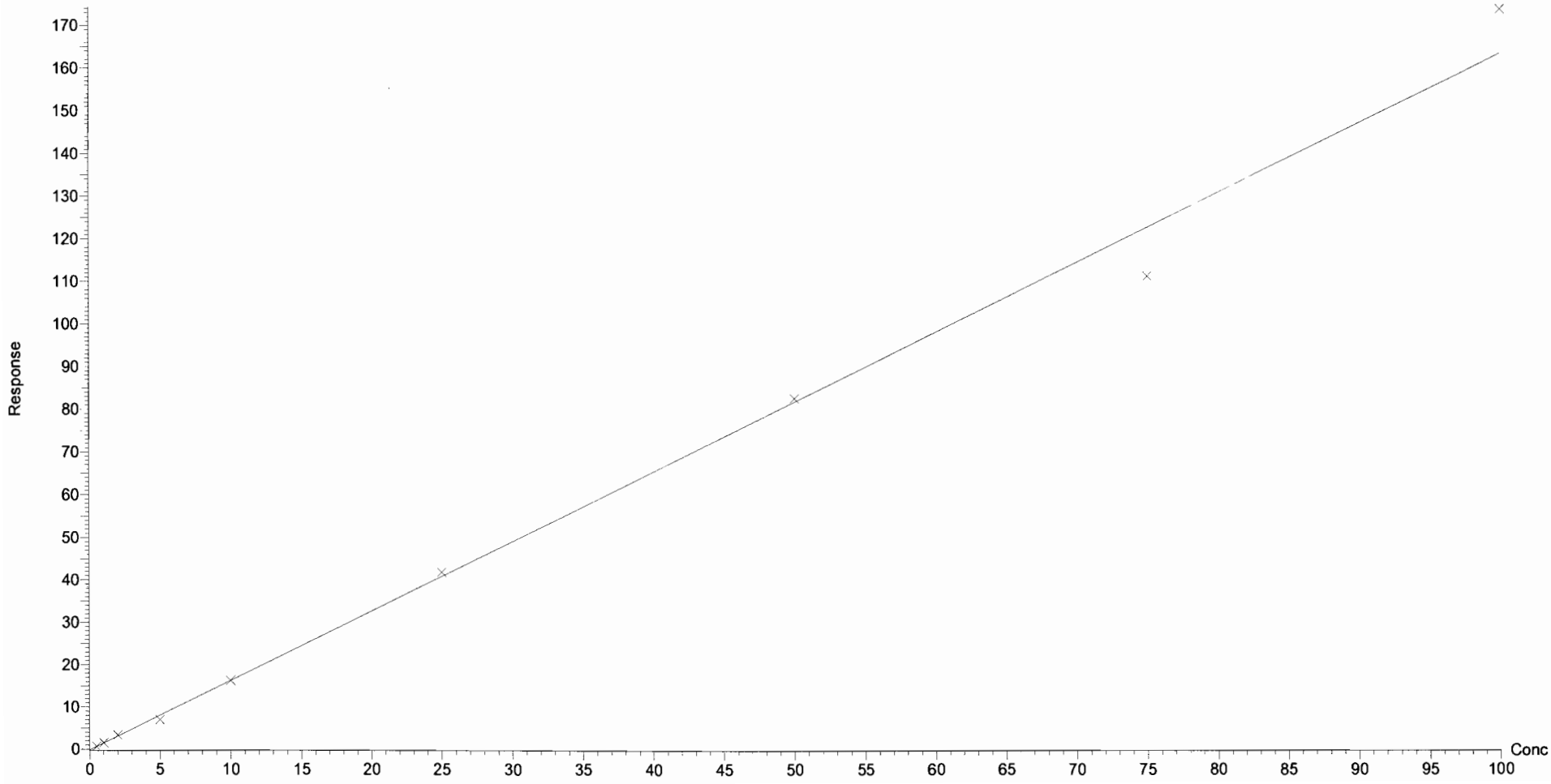
Compound name: PFOS
Correlation coefficient: r = 0.996761, r^2 = 0.993532
Calibration curve: 0.83439 * x + -0.165838
Response type: Internal Std (Ref 22), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None



Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

Compound name: PFNA
Correlation coefficient: r = 0.997674, r^2 = 0.995354
Calibration curve: 1.64181 * x + -0.17063
Response type: Internal Std (Ref 23), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

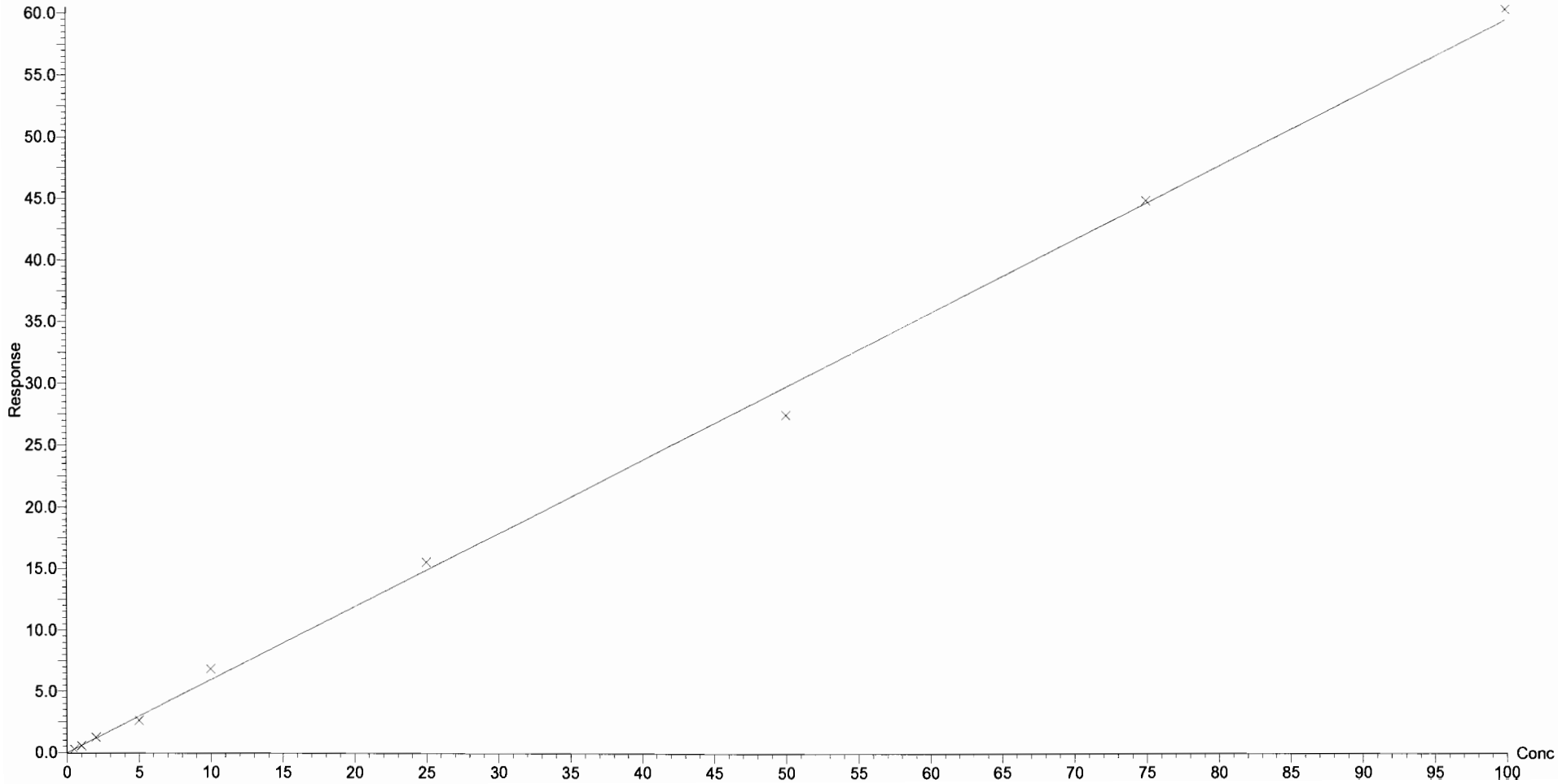


Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

Compound name: PFDA
Correlation coefficient: r = 0.998669, r^2 = 0.997340
Calibration curve: 0.596457 * x + -0.0200723
Response type: Internal Std (Ref 24), Area * (IS Conc. / IS Area)
Curve type: Linear, Origin: Exclude, Weighting: 1/x, Axis trans: None

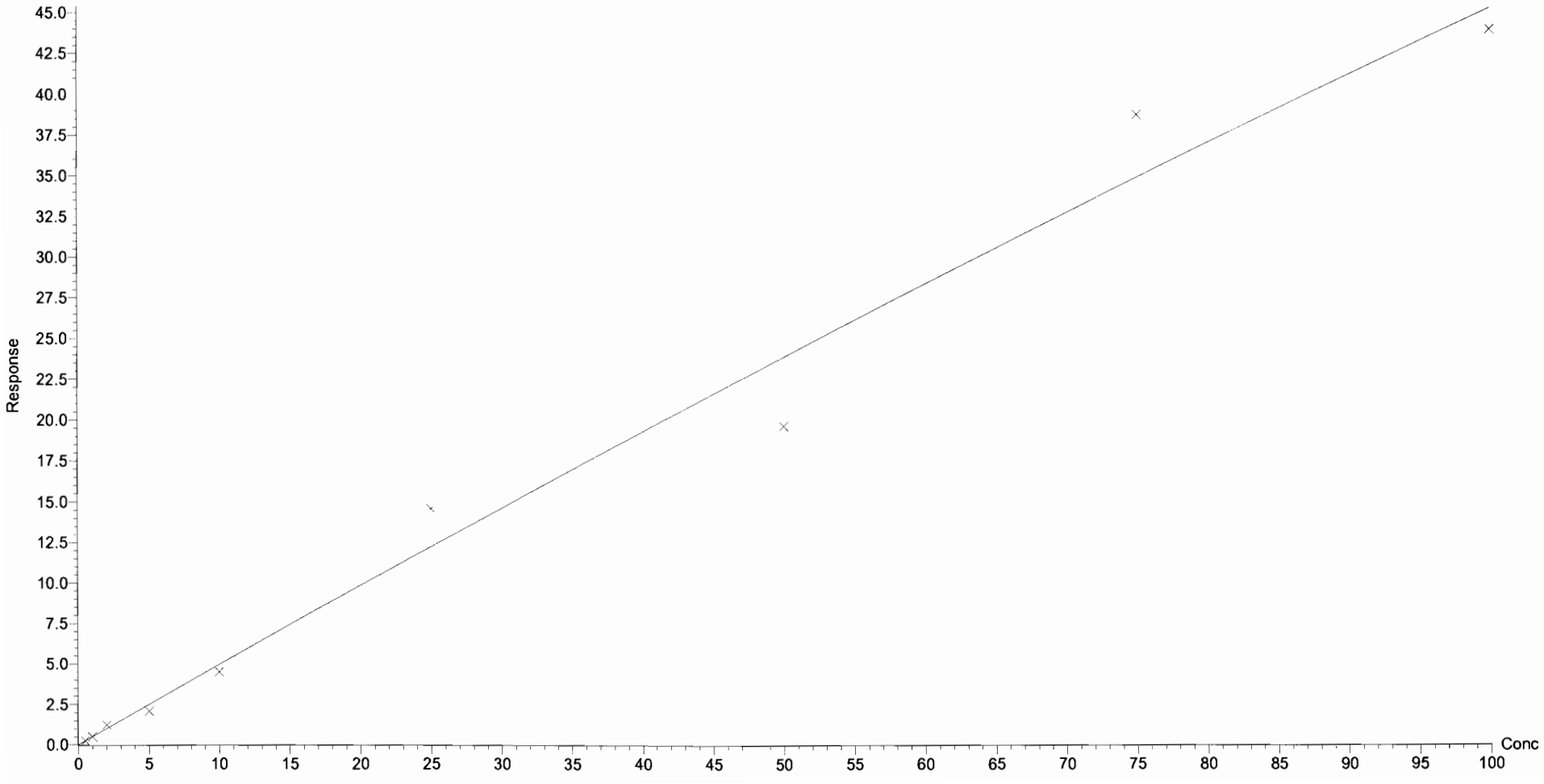


Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-CRV.qld

Last Altered: Tuesday, November 22, 2016 15:25:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:26:22 Pacific Standard Time

Compound name: 8:2 FTS
Coefficient of Determination: R^2 = 0.984052
Calibration curve: -0.000479329 * x^2 + 0.502189 * x + 0.00235356
Response type: Internal Std (Ref 25), Area * (IS Conc. / IS Area)
Curve type: 2nd Order, Origin: Exclude, Weighting: 1/x, Axis trans: None



Vista Analytical Laboratory VG-9

Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 15:08:21 Pacific Standard Time
Printed: Tuesday, November 22, 2016 15:09:10 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 22 Nov 2016 14:48:20
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 14:59:27

Compound name: PFBA

	Name	ID	Acq.Date	Acq.Time
1	161122G2_1	IPA	22-Nov-16	09:47:54
2	161122G2_2	ST161122G2-2 PFC CS-1 16K1705	22-Nov-16	10:00:32
3	161122G2_3	ST161122G2-3 PFC CS0 16K1706	22-Nov-16	10:13:07
4	161122G2_4	ST161122G2-4 PFC CS1 16K1707	22-Nov-16	10:25:42
5	161122G2_5	ST161122G2-5 PFC CS2 16K1708	22-Nov-16	10:38:18
6	161122G2_6	ST161122G2-6 PFC CS3 16K1709	22-Nov-16	10:50:54
7	161122G2_7	ST161122G2-7 PFC CS3.5 16K1710	22-Nov-16	11:03:32
8	161122G2_8	ST161122G2-8 PFC CS4 16K1711	22-Nov-16	11:16:11
9	161122G2_9	ST161122G2-9 PFC CS4.5 16K1712	22-Nov-16	11:28:50
10	161122G2_10	ST161122G2-10 PFC CS5 16K1713	22-Nov-16	11:41:28
11	161122G2_11	IPA	22-Nov-16	11:54:03
12	161122G2_12	SS161122G2-1 PFC SS 16K2201	22-Nov-16	12:06:50
13	161122G2_13	IPA	22-Nov-16	12:19:32

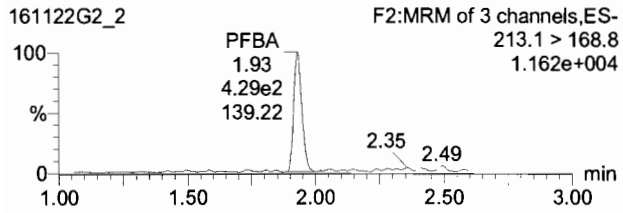
Dataset: Untitled

Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

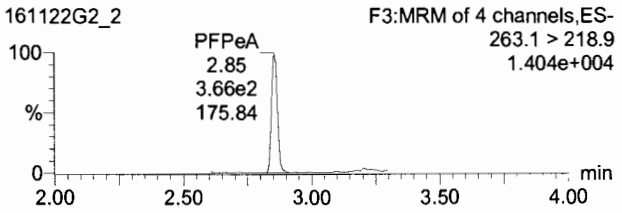
Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 22 Nov 2016 14:48:05
Calibration: 22 Nov 2016 14:43:00

Name: 161122G2_2, Date: 22-Nov-2016, Time: 10:00:32, ID: ST161122G2-2 PFC CS-1 16K1705, Description: PFC CS-1 16K1705 A

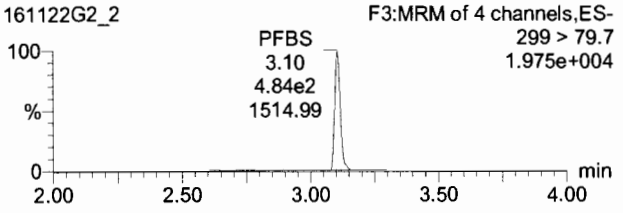
PFBA



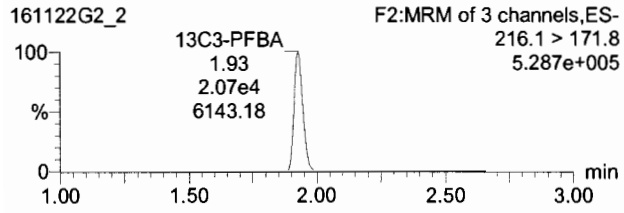
PFPeA



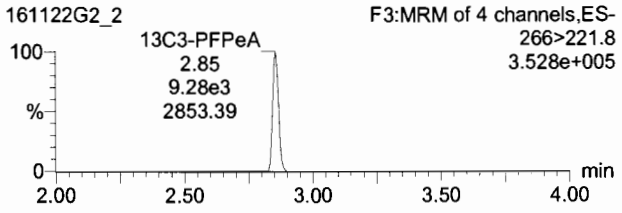
PFBS



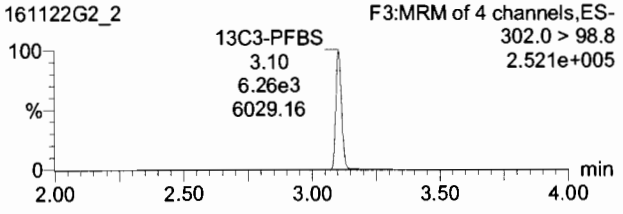
13C3-PFBA



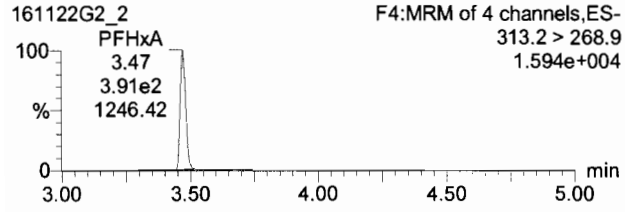
13C3-PFPeA



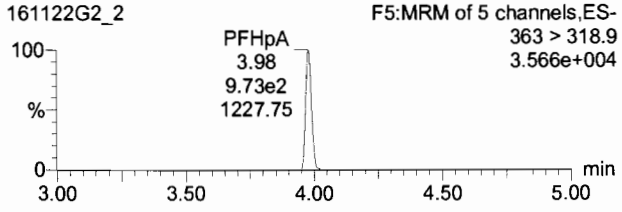
13C3-PFBS



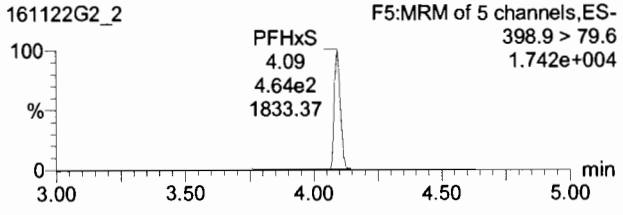
PFHxA



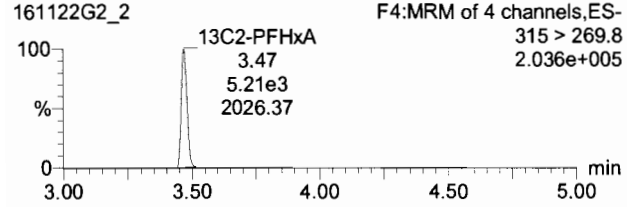
PFHpA



PFHxS



13C2-PFHxA



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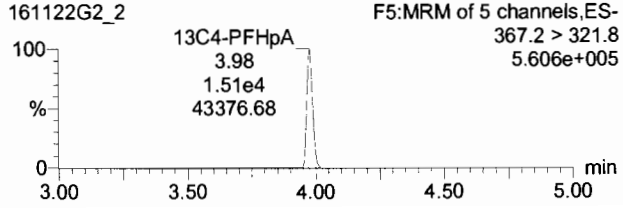
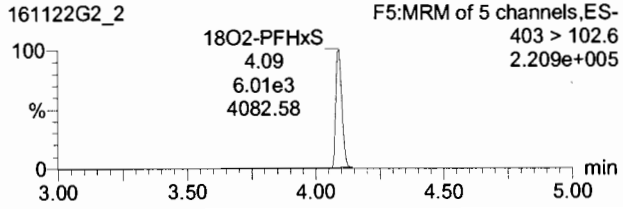


18O2-PFHxS



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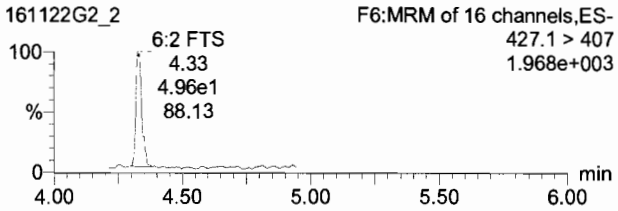
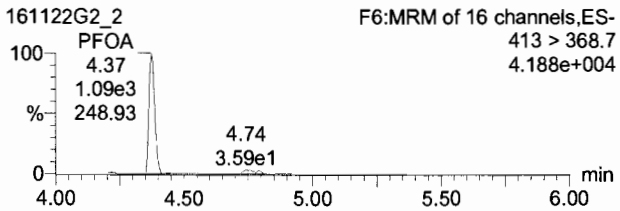
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_2, Date: 22-Nov-2016, Time: 10:00:32, ID: ST161122G2-2 PFC CS-1 16K1705, Description: PFC CS-1 16K1705 A

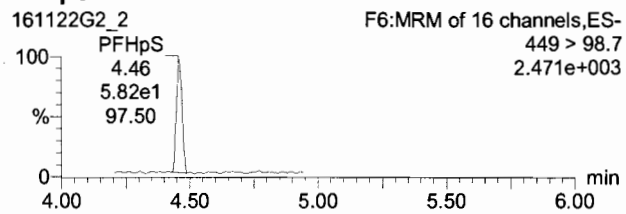
6:2 FTS



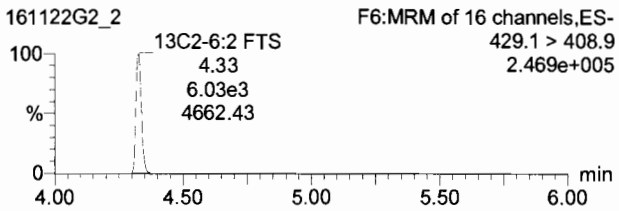
PFOA



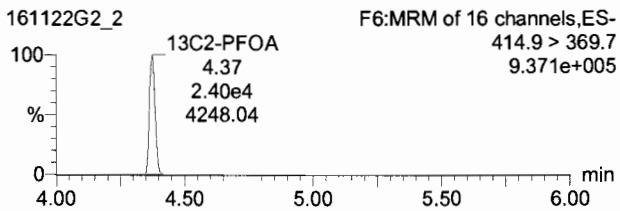
PFHpS



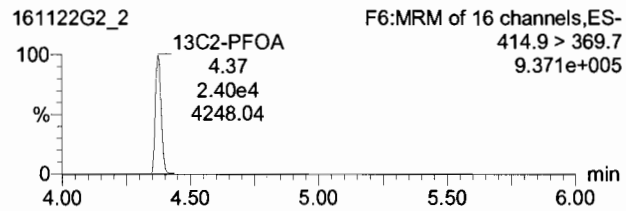
13C2-6:2 FTS



13C2-PFOA



13C2-PFOA

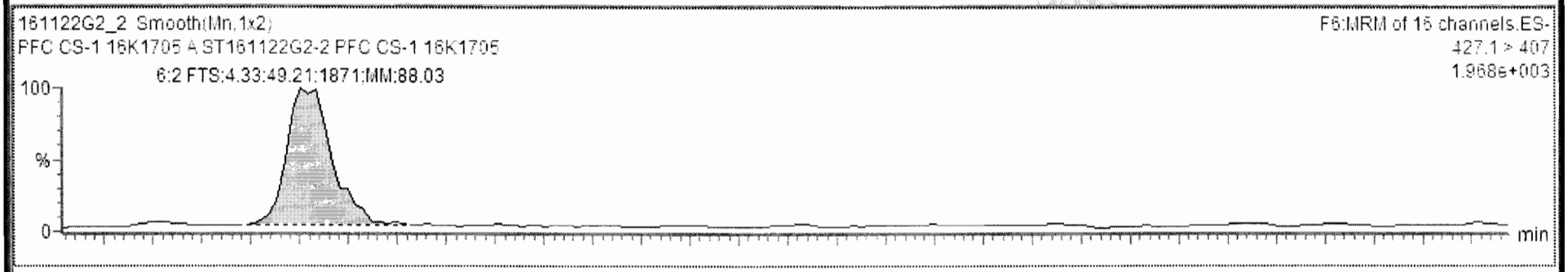


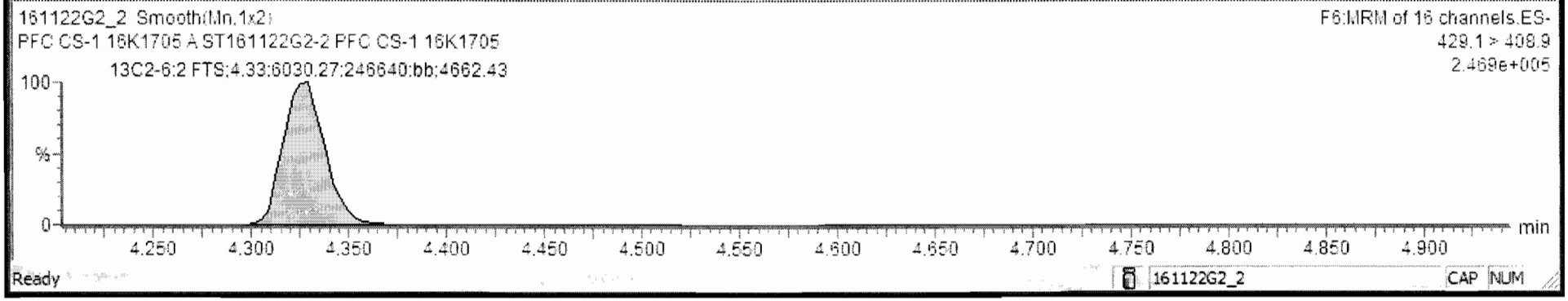
TargetLynx - 161122G2-CRV.qld - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_2 - ST161122G2-2 PFC CS-1 16K1705 - PFC CS-1 16K1705 A

	Name	Trace	Area	Response	RRF	Wt/VoL	RT	Conc.	%Rec	DL	%RSD	Coeff. Of D...
1	PFBA	213.1 > 168.8	4.29e2	0.259	0.518	1.000	1.93	0.608	121.7	0.0932282		0.9984
2	PFPeA	263.1 > 218.9	3.66e2	0.493	0.986	1.000	2.85	0.611	122.2	0.1266747		0.9987
3	PFBS	299 > 79.7	4.84e2	0.966	1.932	1.000	3.10	0.620	124.1	0.0821816		0.9986
4	PFHxA	313.2 > 268.9	3.91e2	0.376	0.751	1.000	3.47	0.612	122.3	0.0000000		0.9985
5	PFHpA	363 > 318.9	9.73e2	0.805	1.610	1.000	3.98	0.608	121.5	0.0901896		0.9993
6	PFHxS	398.9 > 79.8	4.64e2	0.965	1.931	1.000	4.09	0.576	115.3	0.0162512		0.9975
7	6:2 FTS	427.1 > 407	4.92e1	0.102	0.204	1.000	4.33	0.523	104.6	0.2838680		0.9769
8	PFOA	413 > 368.7	1.09e3	0.566	1.133	1.000	4.37	0.527	105.5	0.0000000		0.9990
9	PFHpS	449 > 98.7	5.82e1	0.030	0.061	1.000	4.46	0.577	115.3	0.2567614		0.9956
10	PFOS	499 >79.9	1.21e2	0.287	0.574	1.000	4.76	0.543	108.5	0.2386134		0.9935
11	PFNA	463 > 418.8	5.63e2	0.664	1.329	1.000	4.72	0.509	101.7	0.1047001		0.9954
12	PFDA	513 > 468.8	1.30e2	0.270	0.540	1.000	5.01	0.486	97.3	0.0368964		0.9973
13	8:2 FTS	527 > 506.9	4.13e1	0.243	0.486	1.000	4.99	0.485	97.0	0.0169968		0.9823





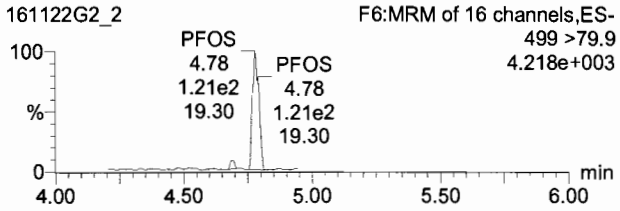
Ready 161122G2_2 CAP NUM

Dataset: Untitled

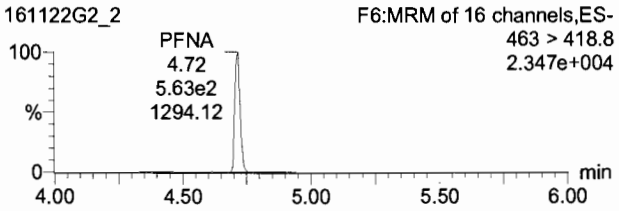
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_2, Date: 22-Nov-2016, Time: 10:00:32, ID: ST161122G2-2 PFC CS-1 16K1705, Description: PFC CS-1 16K1705 A

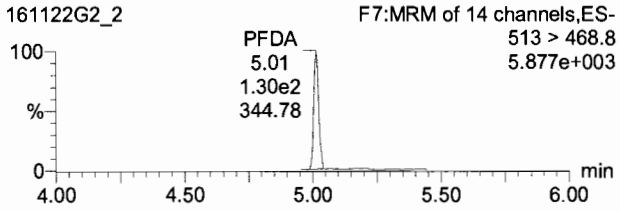
PFOS



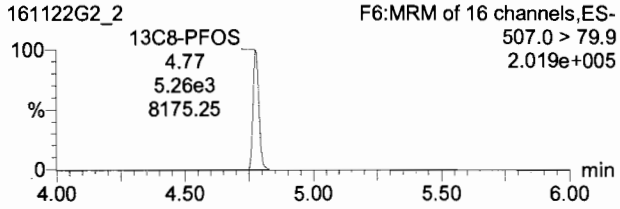
PFNA



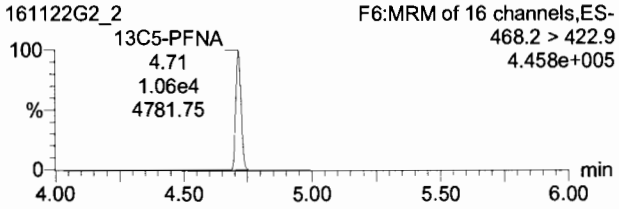
PFDA



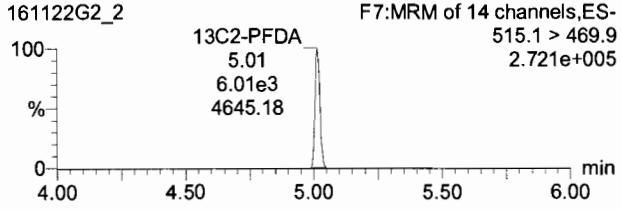
13C8-PFOS



13C5-PFNA



13C2-PFDA



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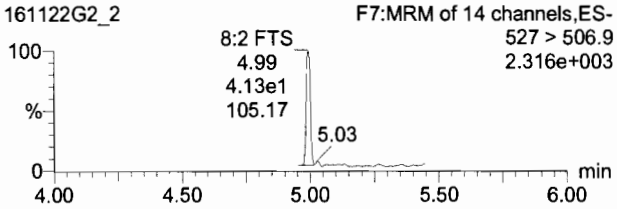
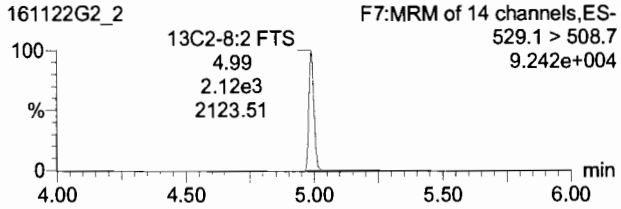
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_2, Date: 22-Nov-2016, Time: 10:00:32, ID: ST161122G2-2 PFC CS-1 16K1705, Description: PFC CS-1 16K1705 A

8:2 FTS



13C2-8:2 FTS

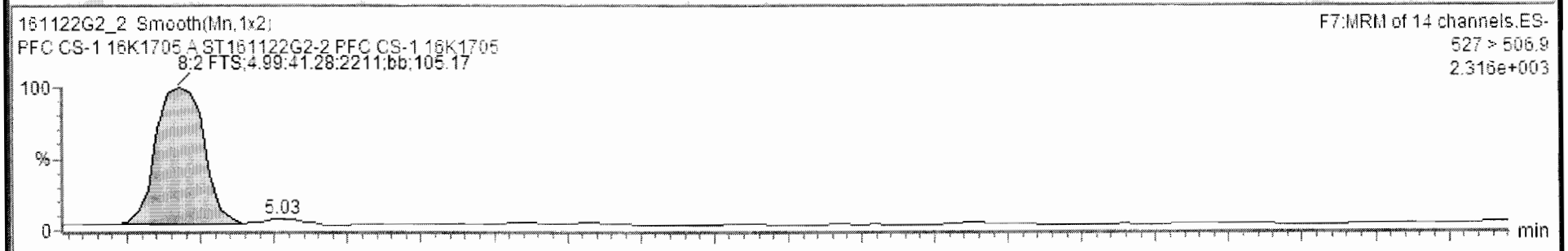


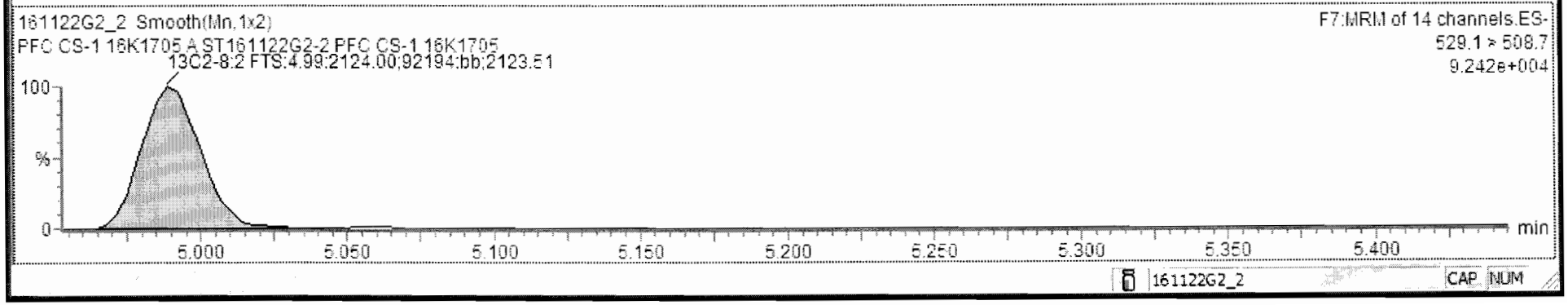
TargetLynx - 161122G2-CRV.qld * - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_2 - ST161122G2-2 PFC CS-1 16K1705 - PFC CS-1 16K1705 A

	Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	3.91e2		1.000	3.47	3.47	0.612	NO	122.3	0.0000000
5	PFHpA	363 > 318.9	9.73e2		1.000	3.98	3.98	0.608	NO	121.5	0.0903976
6	PFHxS	398.9 > 79.6	4.64e2		1.000	4.09	4.09	0.576	NO	115.3	0.0164070
7	6:2 FTS	427.1 > 407	4.92e1		1.000	4.33	4.33	0.645	NO	129.1	0.4501268
8	PFOA	413 > 368.7	1.09e3		1.000	4.37	4.37	0.527	NO	105.5	0.0000000
9	PFHpS	449 > 98.7	5.82e1		1.000	4.37	4.45	0.577	NO	115.3	0.2585335
10	PFOS	499 >79.9	1.21e2		1.000	4.78	4.78	0.543	NO	108.5	0.2465854
11	PFNA	463 > 418.8	5.63e2		1.000	4.71	4.72	0.509	NO	101.7	0.1048546
12	PFDA	513 > 468.8	1.30e2		1.000	5.01	5.01	0.486	NO	97.3	0.0375452
13	8:2 FTS	527 > 506.9	4.13e1		1.000	4.99	4.99	0.479	NO	95.9	0.0123962
14	13C3-PFBA	216.1 > 171.8	2.07e4	1.21	1.000	1.93	1.93	12.2	NO	97.8	0.0060004
15	13C3-PFPeA	266>221.8	9.28e3	0.448	1.000	2.83	2.85	12.5	NO	100.1	0.0125741
16	13C3-PFBS	302.0 > 98.8	6.26e3	0.302	1.000	3.09	3.10	12.5	NO	100.1	0.0062980





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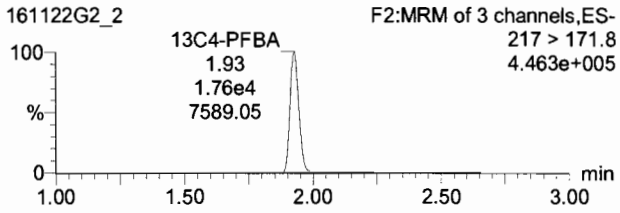
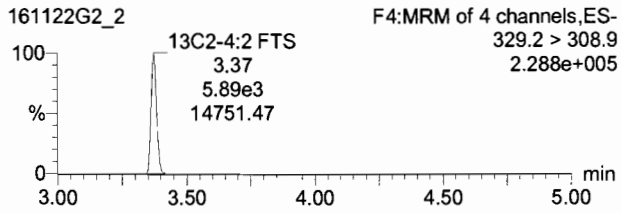
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_2, Date: 22-Nov-2016, Time: 10:00:32, ID: ST161122G2-2 PFC CS-1 16K1705, Description: PFC CS-1 16K1705 A

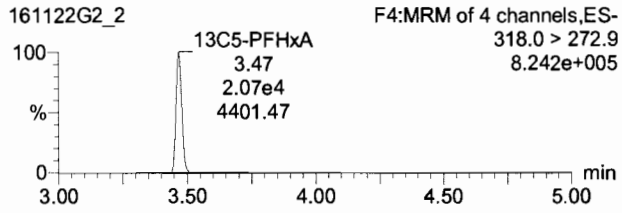
13C4-PFBA



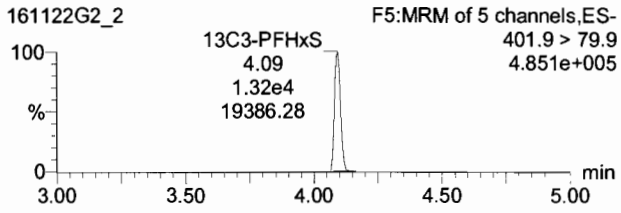
13C2-4:2 FTS



13C5-PFHxA



13C3-PFHxS



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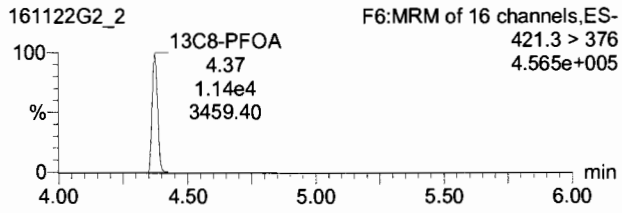
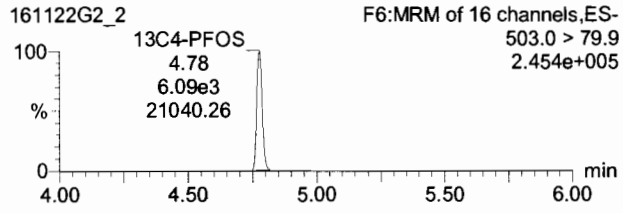
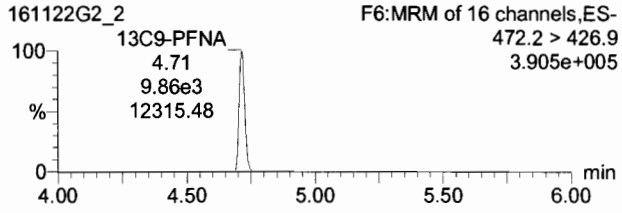


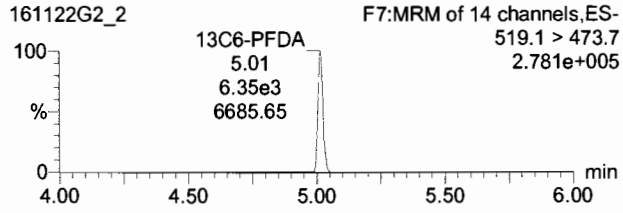
13C4-PFOS



13C9-PFNA



13C6-PFDA



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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

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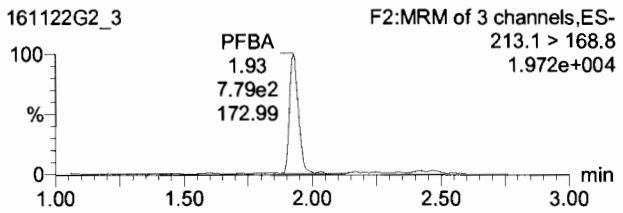
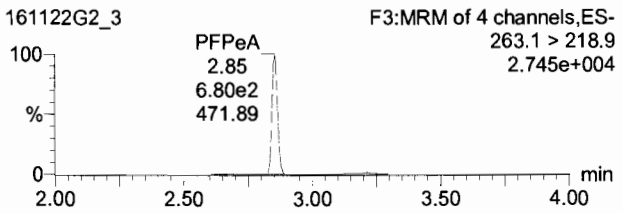
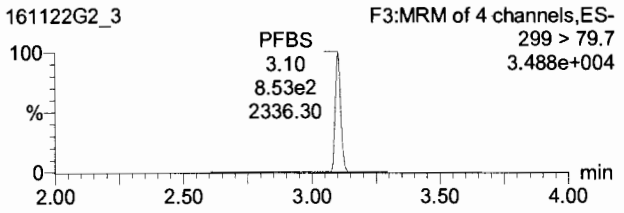
PFBA



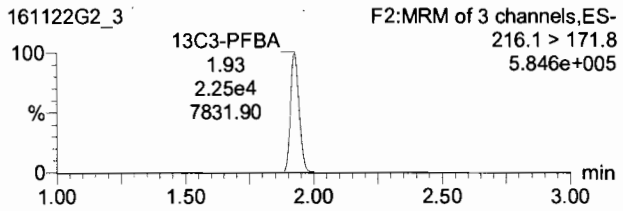
PFPeA



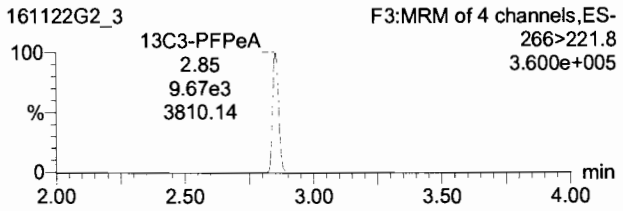
PFBS



13C3-PFBA



13C3-PFPeA



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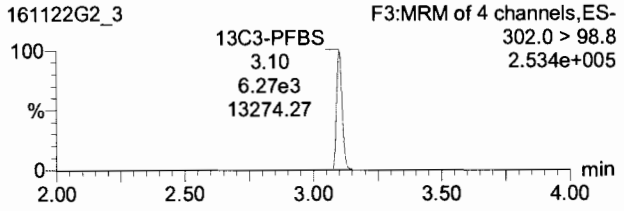
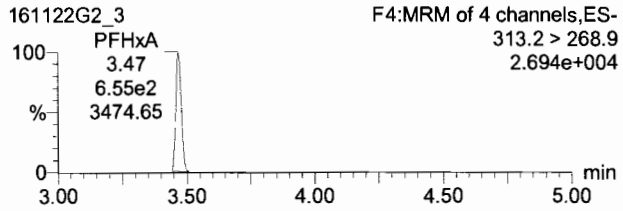


PFHxA



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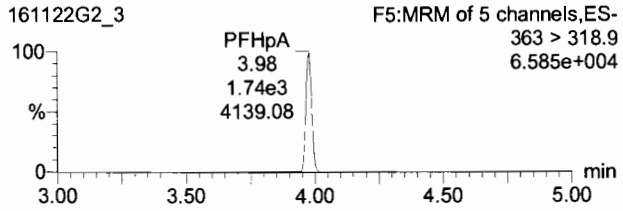

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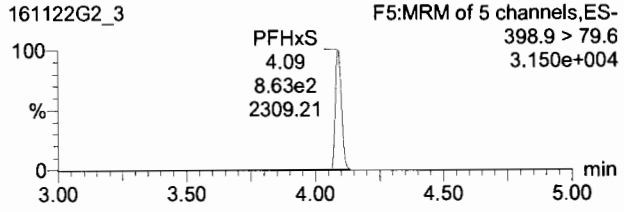
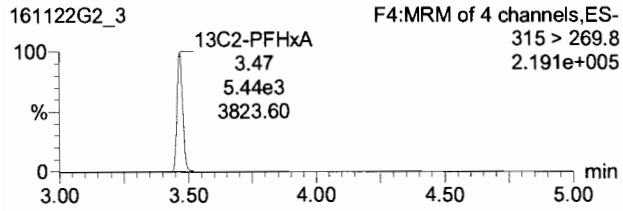


13C2-PFHxA



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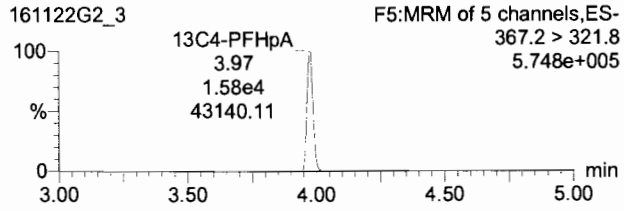

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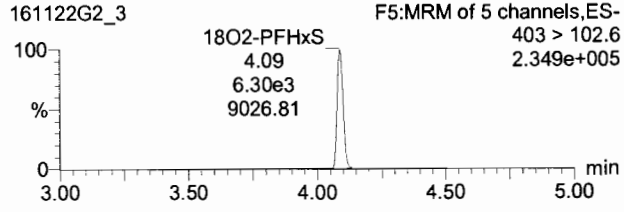

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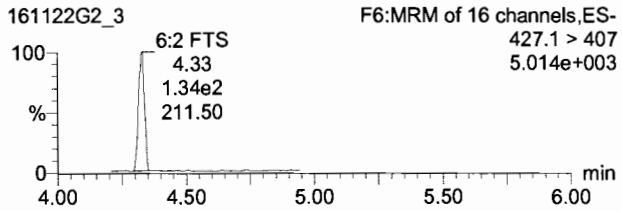
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_3, Date: 22-Nov-2016, Time: 10:13:07, ID: ST161122G2-3 PFC CS0 16K1706, Description: PFC CS0 16K1706 A

6:2 FTS



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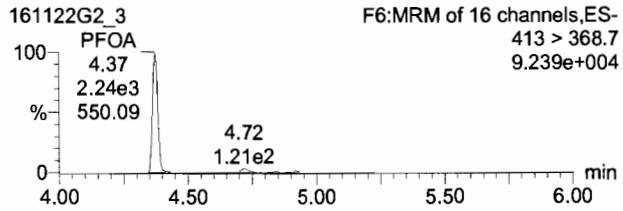

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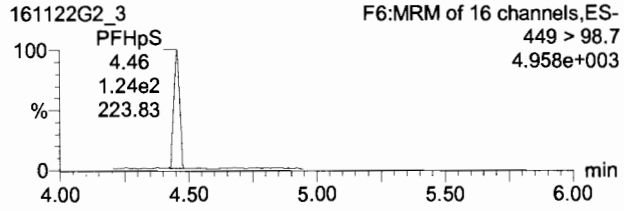

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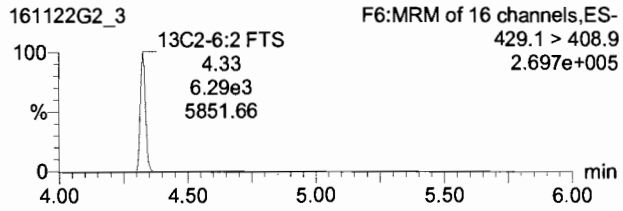

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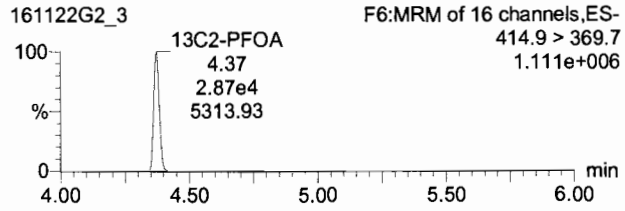

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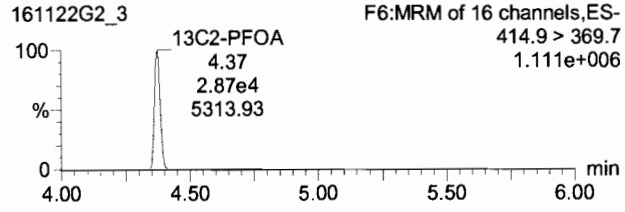

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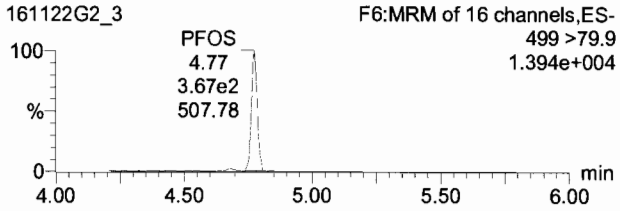
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_3, Date: 22-Nov-2016, Time: 10:13:07, ID: ST161122G2-3 PFC CS0 16K1706, Description: PFC CS0 16K1706 A

PFOS



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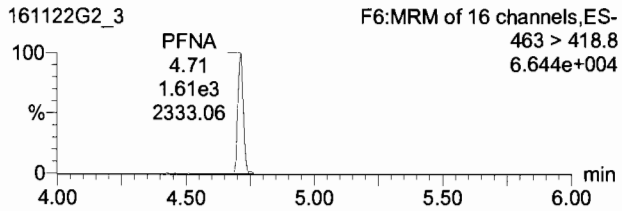

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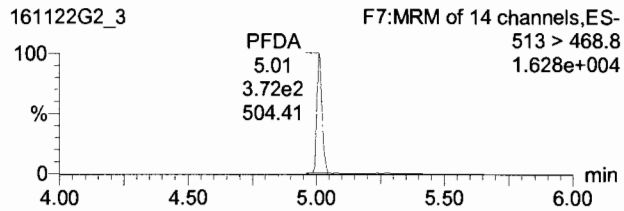
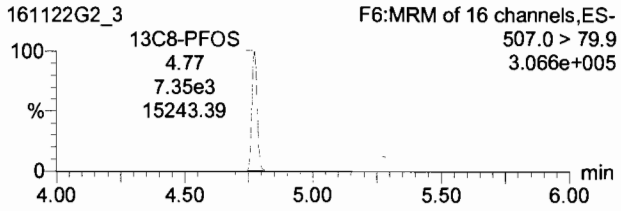


13C8-PFOS



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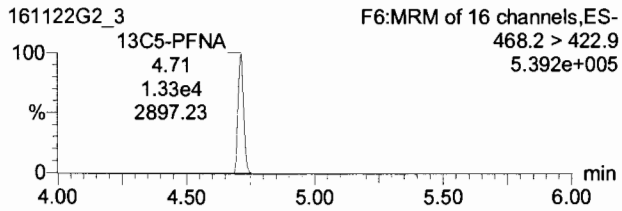

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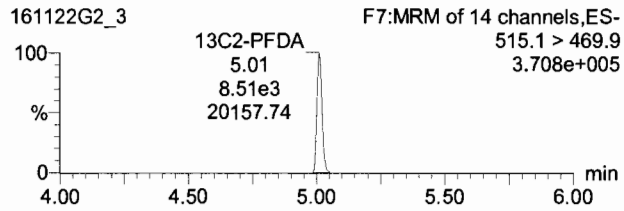

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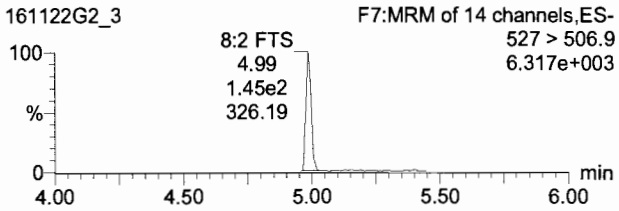
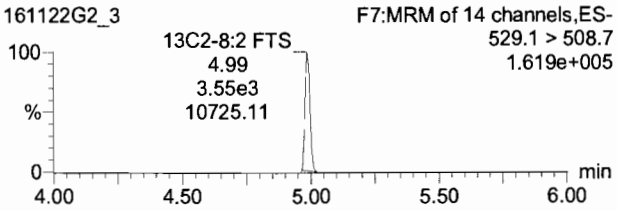
Name: 161122G2_3, Date: 22-Nov-2016, Time: 10:13:07, ID: ST161122G2-3 PFC CS0 16K1706, Description: PFC CS0 16K1706 A

8:2 FTS



13C2-8:2 FTS

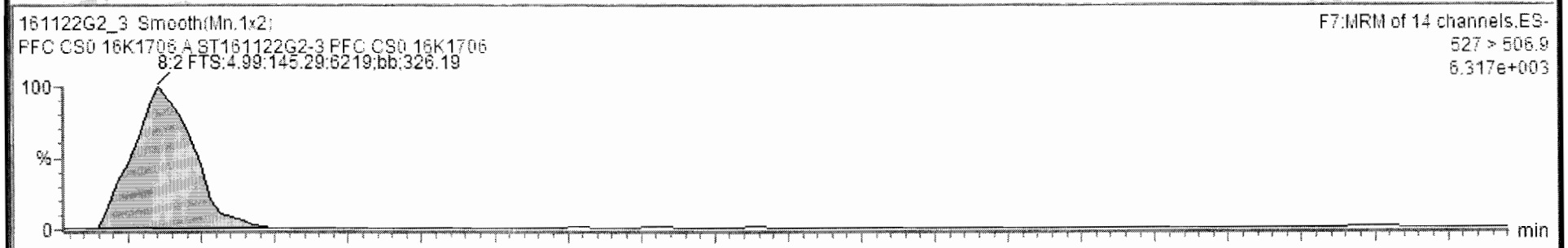


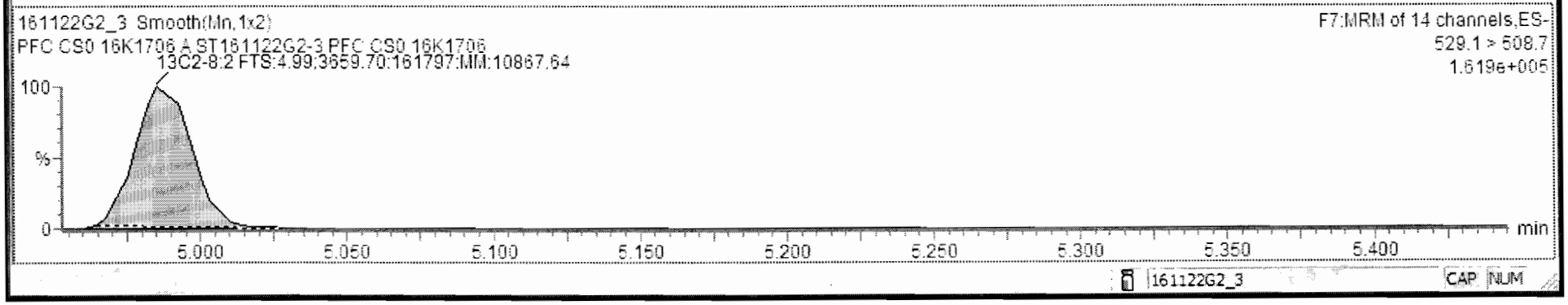
TargetLynx - 161122G2-CRV.qld * - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_3 - ST161122G2-3 PFC CS0 16K1706 - PFC CS0 16K1706 A

	Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	6.55e2		1.000	3.47	3.47	0.989	NO	98.9	0.0000000
5	PFHpA	363 > 318.9	1.74e3		1.000	3.97	3.98	0.979	NO	97.9	0.0897062
6	PFHxS	398.9 > 79.6	8.63e2		1.000	4.09	4.09	1.01	NO	101.1	0.0165248
7	6:2 FTS	427.1 > 407	1.34e2		1.000	4.33	4.33	0.971	NO	97.1	0.4490742
8	PFOA	413 > 368.7	2.24e3		1.000	4.37	4.37	0.983	NO	98.3	0.0000000
9	PFHpS	449 > 98.7	1.24e2		1.000	4.37	4.49	0.834	NO	83.4	0.2545461
10	PFOS	499 >79.9	3.67e2		1.000	4.78	4.77	0.947	NO	94.7	0.2020921
11	PFNA	463 > 418.8	1.61e3		1.000	4.71	4.71	1.02	NO	102.5	0.1049328
12	PFDA	513 > 468.8	3.72e2		1.000	5.01	5.01	0.949	NO	94.9	0.0381871
13	8:2 FTS	527 > 506.9	1.45e2		1.000	4.99	4.99	0.984	NO	98.4	0.0027010
14	13C3-PFBA	216.1 > 171.8	2.25e4	1.21	1.000	1.92	1.93	12.6	NO	101.0	0.0041450
15	13C3-PFPeA	266>221.8	9.67e3	0.448	1.000	2.83	2.85	12.4	NO	99.4	0.0077179
16	13C3-PFBS	302.0 > 98.8	6.27e3	0.302	1.000	3.09	3.10	11.9	NO	95.4	0.0023082





161122G2_3 CAP NUM

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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
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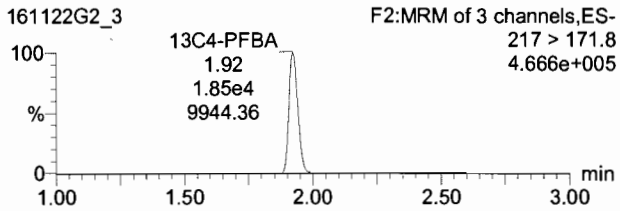
Name: 161122G2_3, Date: 22-Nov-2016, Time: 10:13:07, ID: ST161122G2-3 PFC CS0 16K1706, Description: PFC CS0 16K1706 A

13C4-PFBA



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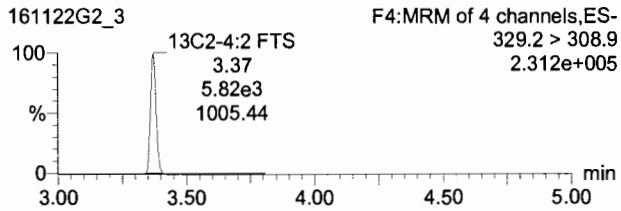

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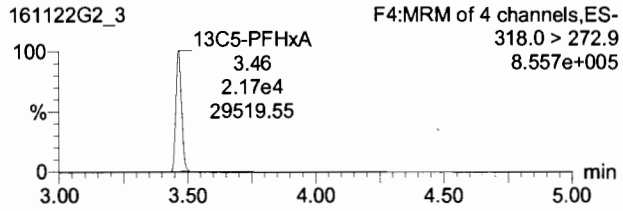

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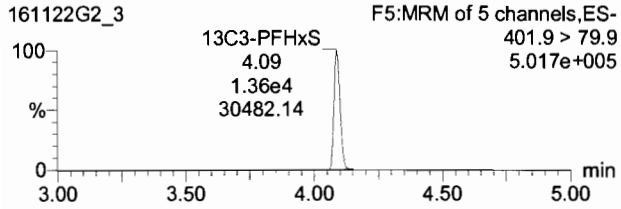

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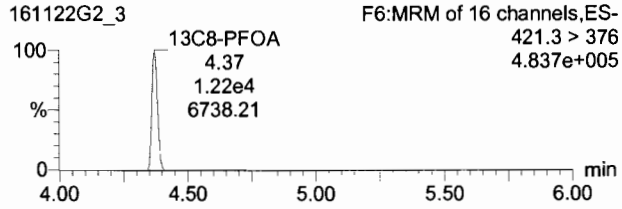

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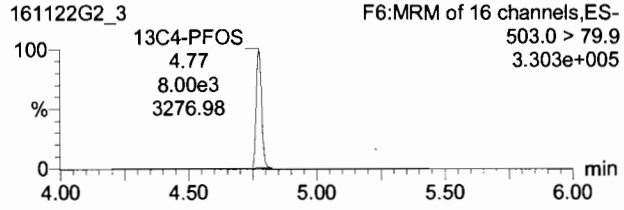

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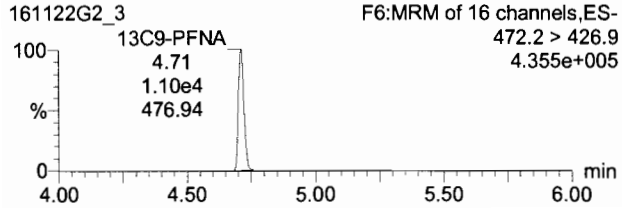

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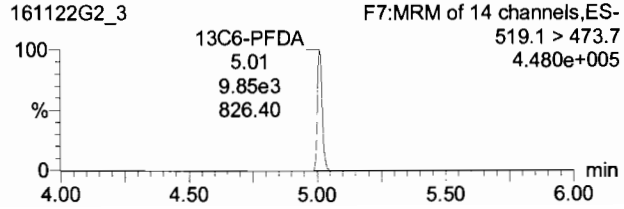

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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
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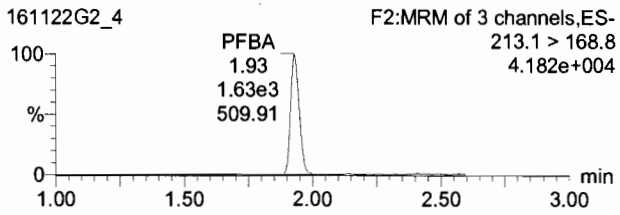

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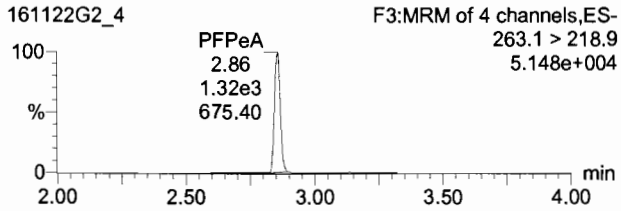

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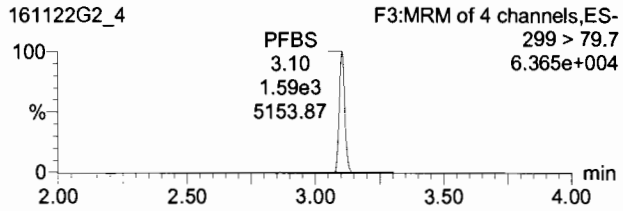

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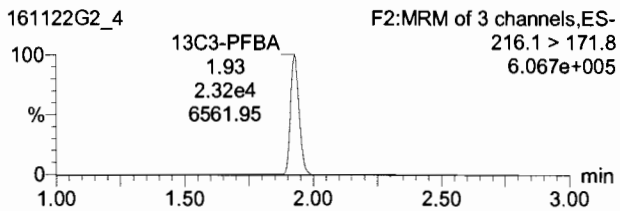

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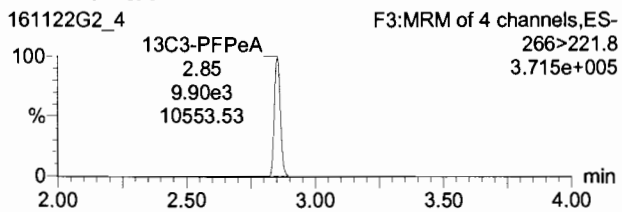

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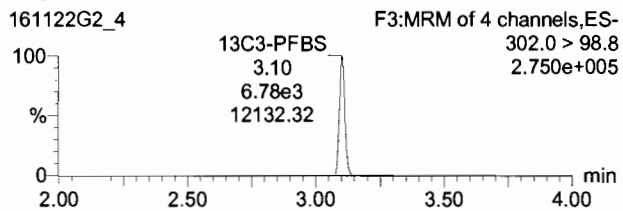

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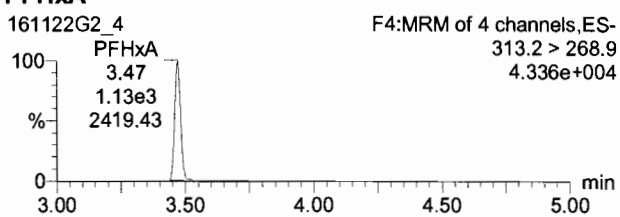

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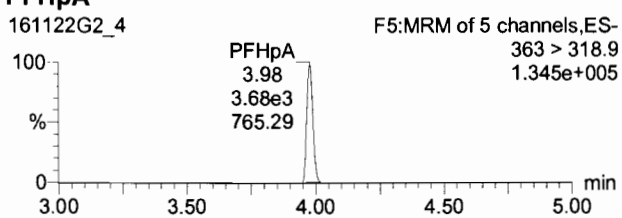

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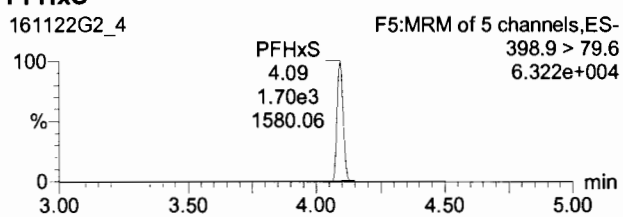

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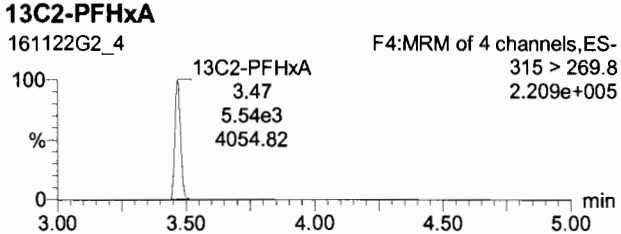

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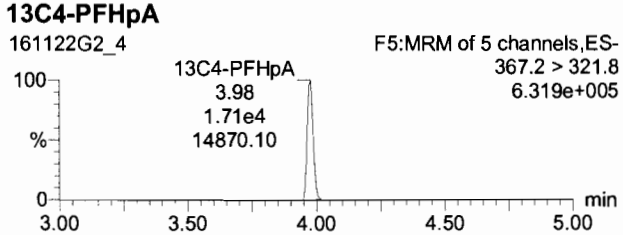

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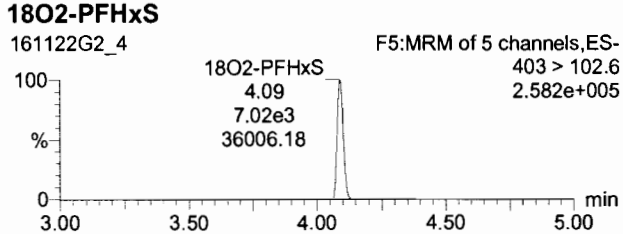

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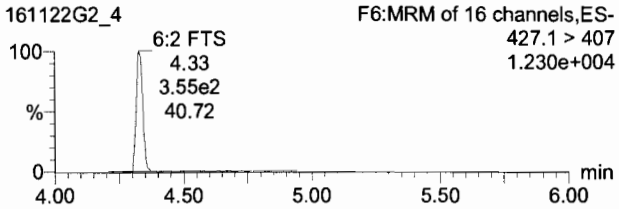
Name: 161122G2_4, Date: 22-Nov-2016, Time: 10:25:42, ID: ST161122G2-4 PFC CS1 16K1707, Description: PFC CS1 16K1707 A

6:2 FTS



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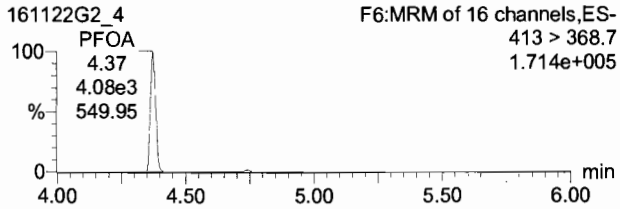

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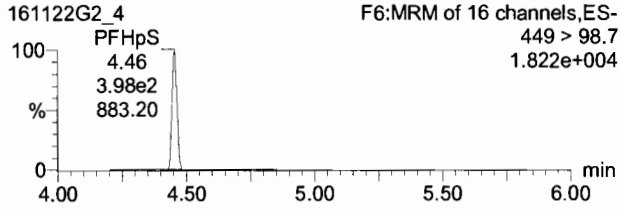
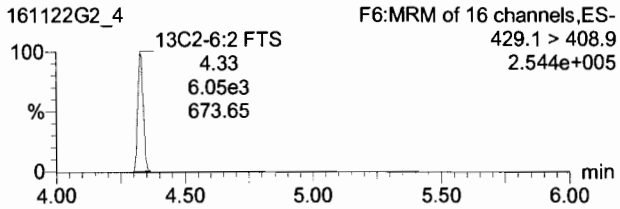
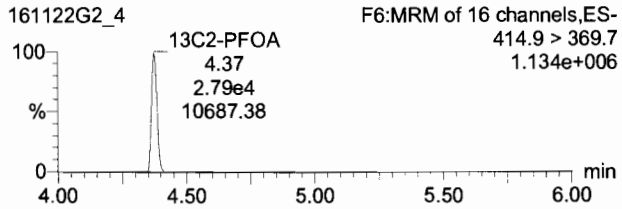


13C2-6:2 FTS



13C2-PFOA



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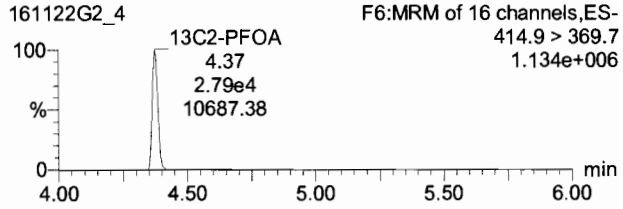

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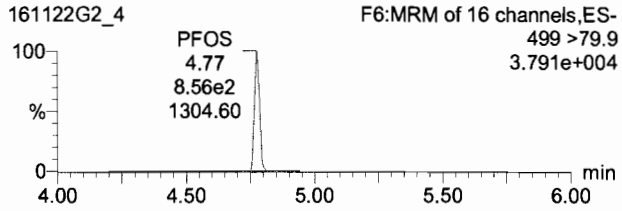
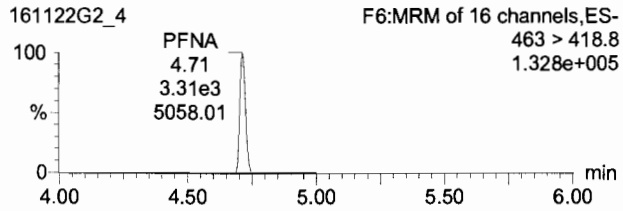
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_4, Date: 22-Nov-2016, Time: 10:25:42, ID: ST161122G2-4 PFC CS1 16K1707, Description: PFC CS1 16K1707 A

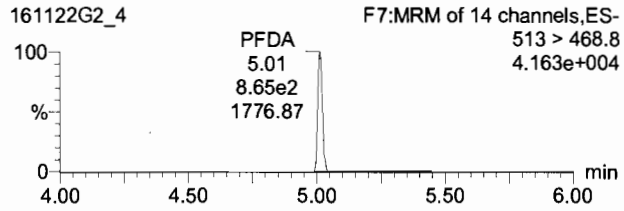
PFOS



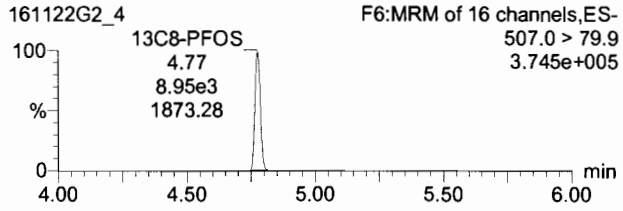
PFNA



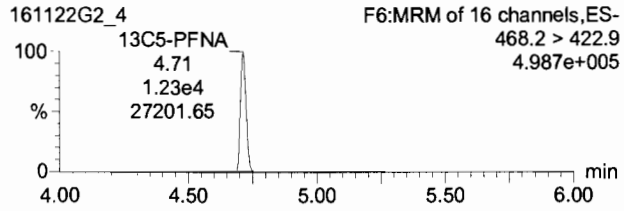
PFDA



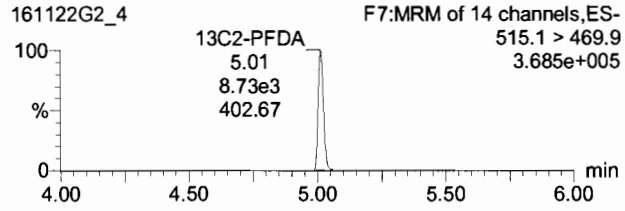
13C8-PFOS



13C5-PFNA



13C2-PFDA



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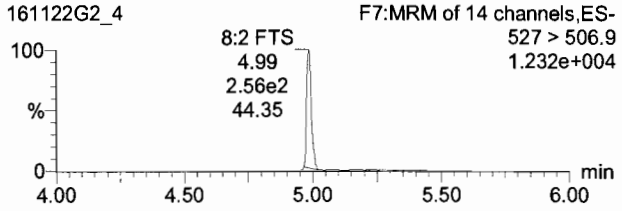
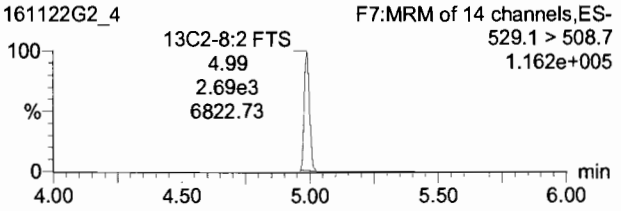
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_4, Date: 22-Nov-2016, Time: 10:25:42, ID: ST161122G2-4 PFC CS1 16K1707, Description: PFC CS1 16K1707 A

8:2 FTS



13C2-8:2 FTS

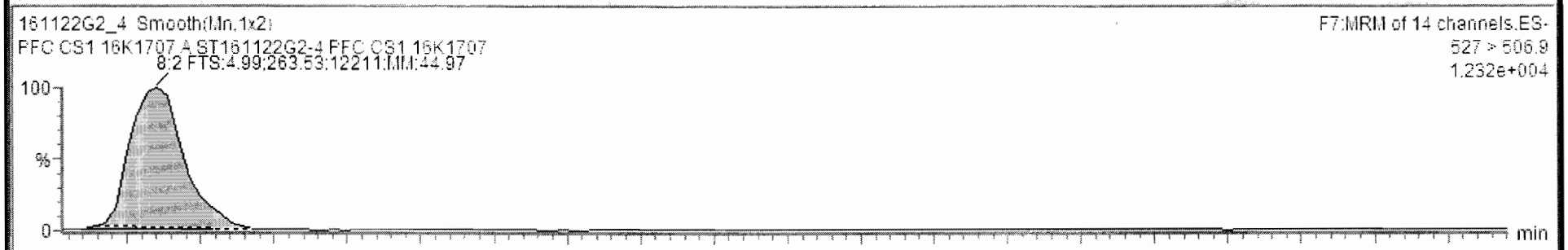


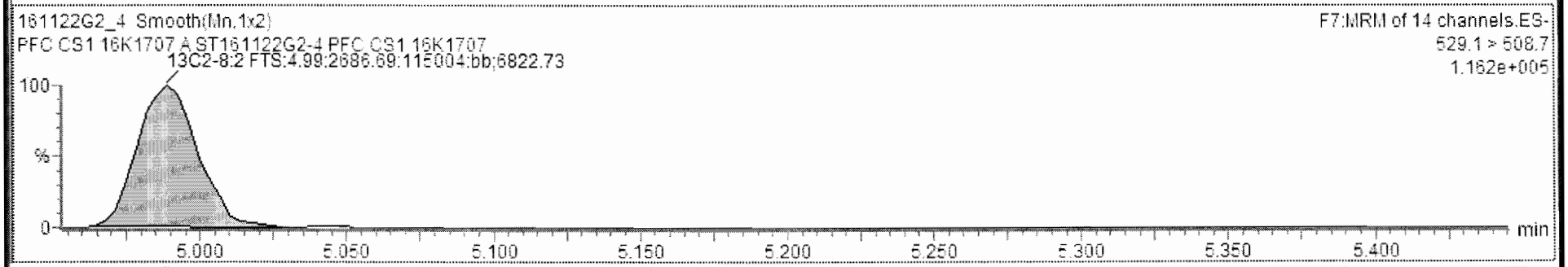
TargetLynx - 161122G2-CRV.qld * - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_4 - ST161122G2-4 PFC CS1 16K1707 - PFC CS1 16K1707 A

	Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	1.13e3		1.000	3.47	3.47	1.69	NO	84.7	0.0000000
5	PFHpA	363 > 318.9	3.68e3		1.000	3.98	3.98	1.82	NO	90.8	0.0947461
6	PFHxS	398.9 > 79.6	1.70e3		1.000	4.09	4.09	1.78	NO	88.8	0.0182811
7	6:2 FTS	427.1 > 407	3.55e2		1.000	4.33	4.33	1.90	NO	94.8	0.5167321
8	PFOA	413 > 368.7	4.08e3		1.000	4.37	4.37	1.93	NO	96.6	0.0000000
9	PFHpS	449 > 98.7	3.98e2		1.000	4.37	4.45	2.18	NO	109.2	0.2540463
10	PFOS	499 >79.9	8.56e2		1.000	4.78	4.77	1.63	NO	81.6	0.2016580
11	PFNA	463 > 418.8	3.31e3		1.000	4.71	4.71	2.16	NO	107.8	0.1049312
12	PFDA	513 > 468.8	8.65e2		1.000	5.01	5.01	2.11	NO	105.6	0.0369790
13	8:2 FTS	527 > 506.9	2.64e2		1.000	4.99	4.99	2.44	NO	122.1	0.1423108
14	13C3-PFBA	216.1 > 171.8	2.32e4	1.21	1.000	1.93	1.93	13.4	NO	107.0	0.0051901
15	13C3-PFPeA	266>221.8	9.90e3	0.448	1.000	2.83	2.85	13.1	NO	104.8	0.0029331
16	13C3-PFBS	302.0 > 98.8	6.78e3	0.302	1.000	3.09	3.10	13.3	NO	106.4	0.0028004





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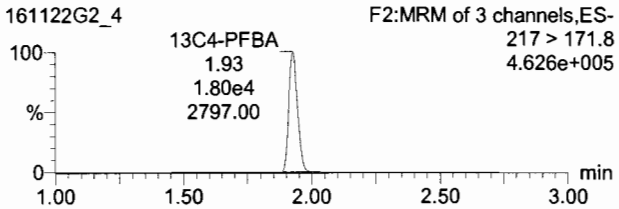
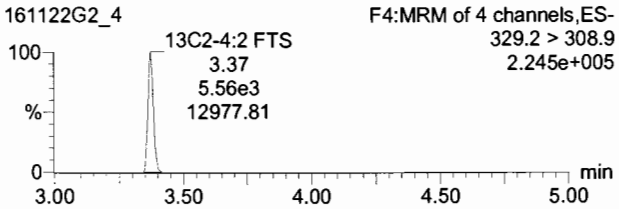
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_4, Date: 22-Nov-2016, Time: 10:25:42, ID: ST161122G2-4 PFC CS1 16K1707, Description: PFC CS1 16K1707 A

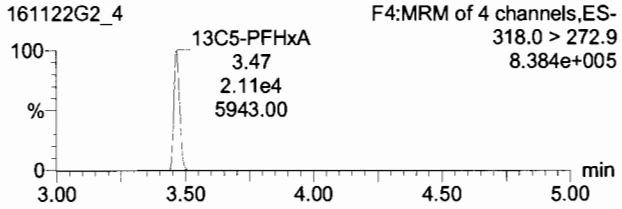
13C4-PFBA



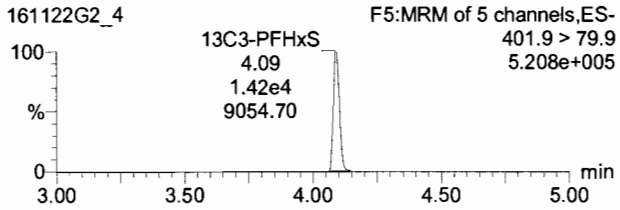
13C2-4:2 FTS



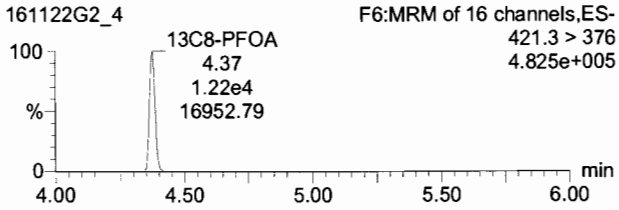
13C5-PFHxA



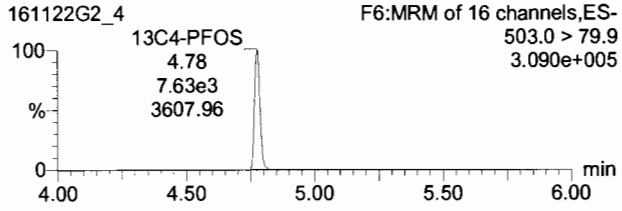
13C3-PFHxS



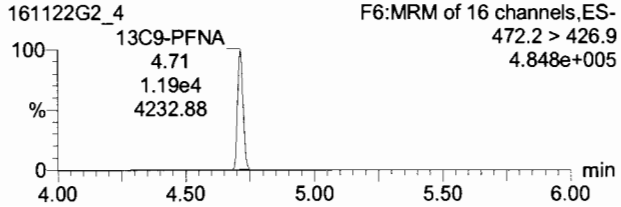
13C8-PFOA



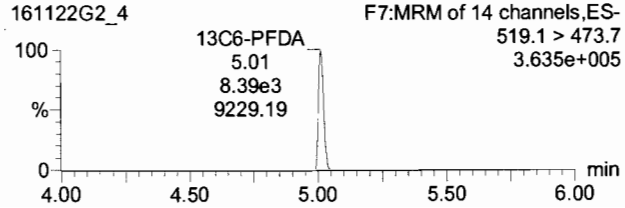
13C4-PFOS



13C9-PFNA



13C6-PFDA



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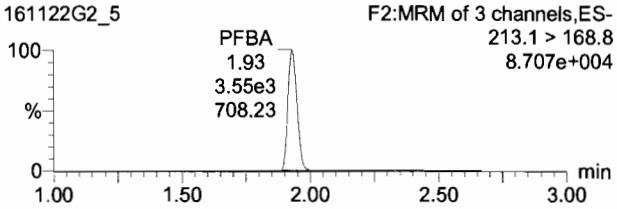
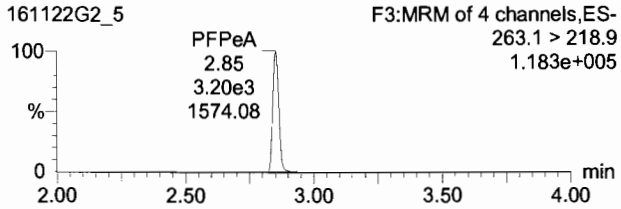
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_5, Date: 22-Nov-2016, Time: 10:38:18, ID: ST161122G2-5 PFC CS2 16K1708, Description: PFC CS2 16K1708 A

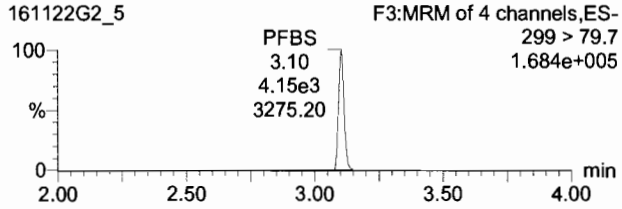
PFBA



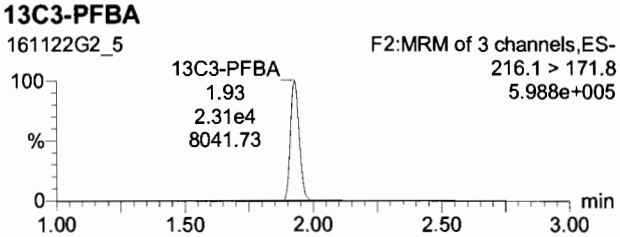
PFPeA



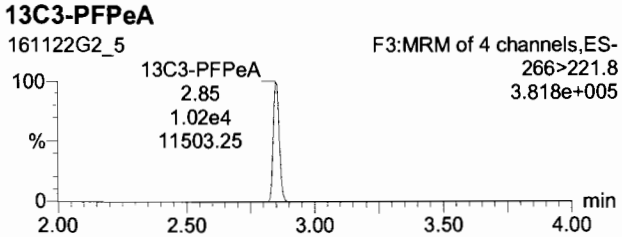
PFBS



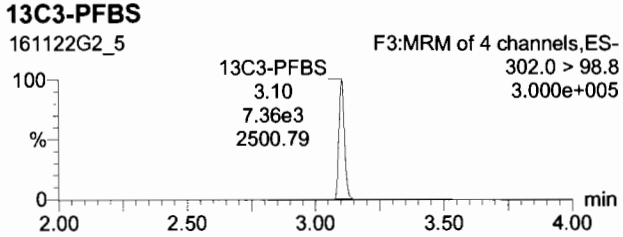
13C3-PFBA



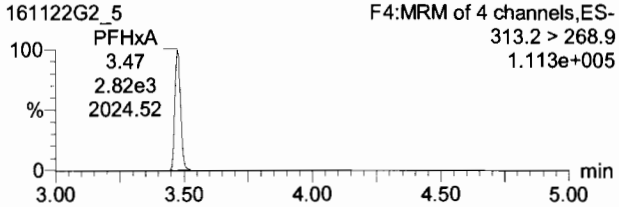
13C3-PFPeA



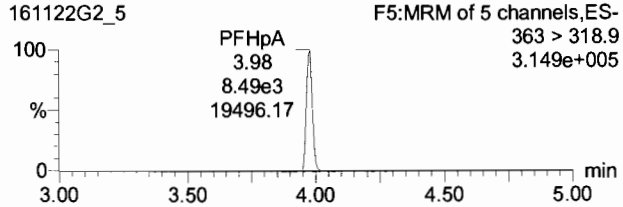
13C3-PFBS



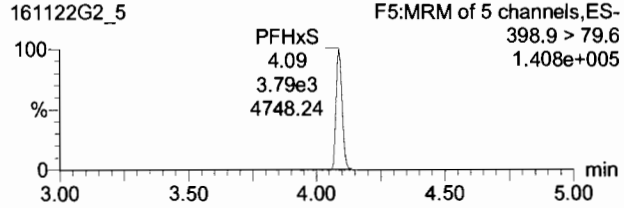
PFHxA



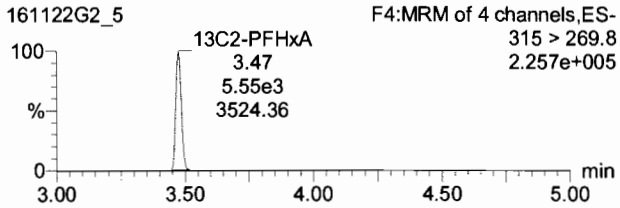
PFHpA



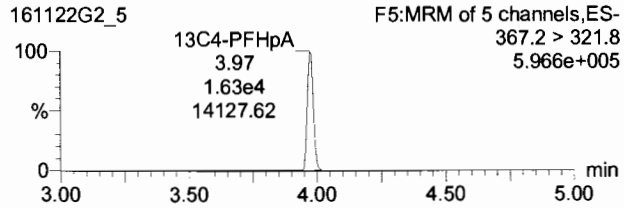
PFHxS



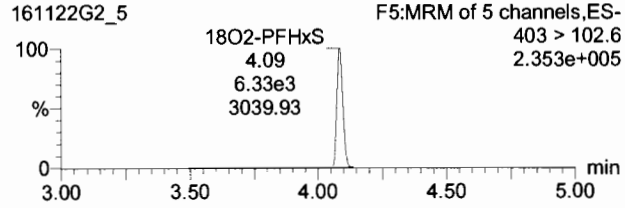
13C2-PFHxA



13C4-PFHpA



18O2-PFHxS



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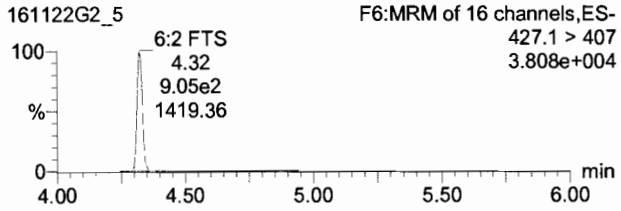
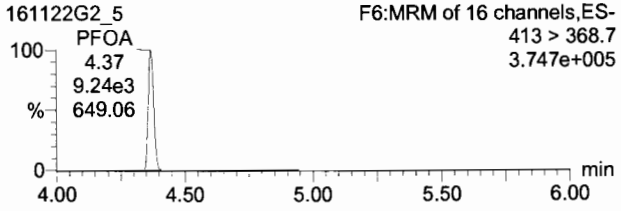
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_5, Date: 22-Nov-2016, Time: 10:38:18, ID: ST161122G2-5 PFC CS2 16K1708, Description: PFC CS2 16K1708 A

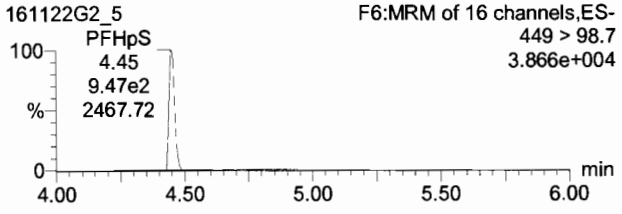
6:2 FTS



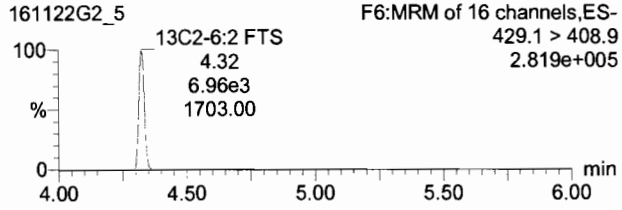
PFOA



PFHpS



13C2-6:2 FTS



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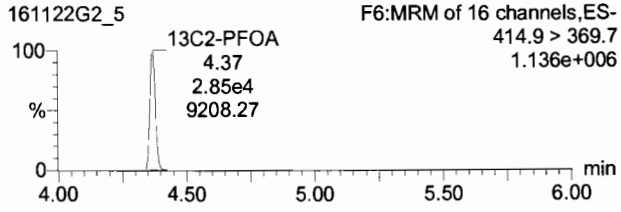
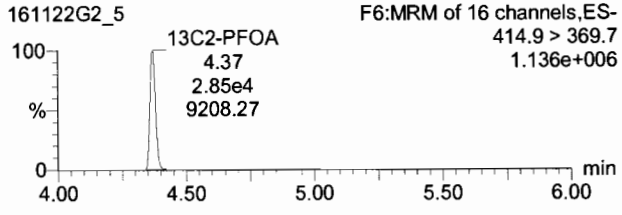


13C2-PFOA

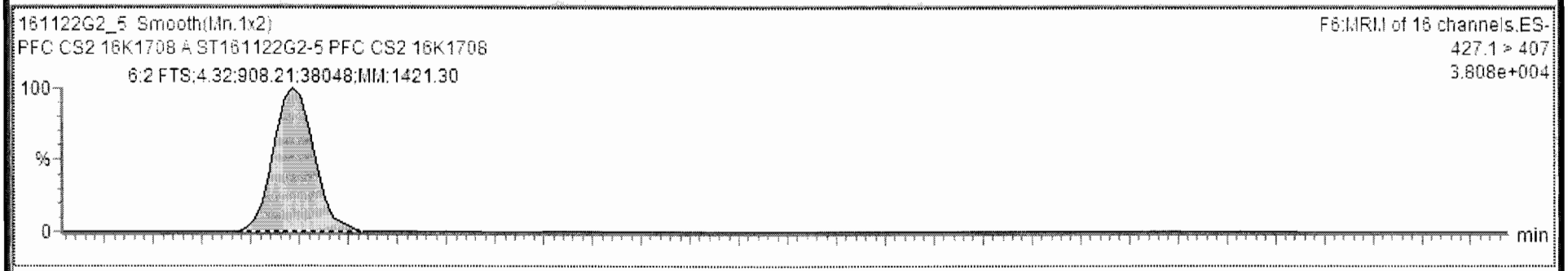


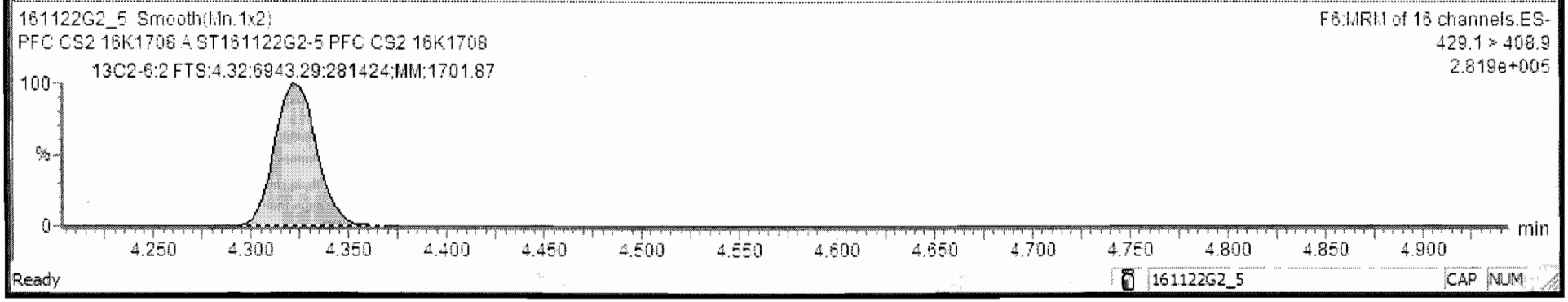
TargetLynx - untitled * - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_5 - ST161122G2-5 PFC CS2 16K1708 - PFC CS2 16K1708 A

	Name	Trace	Area	Response	RRF	Wt/Vol	RT	Conc.	%Rec	DL	%RSD	Coeff. Of D...
4	PFHxA	313.2 > 268.9	2.82e3	2.538	0.508	1.000	3.47	4.23	84.5	0.0000000		0.9985
5	PFHpA	363 > 318.9	8.49e3	8.514	1.303	1.000	3.98	4.28	85.7	0.0898946		0.9993
6	PFHxS	398.9 > 79.6	3.79e3	7.475	1.495	1.000	4.09	4.36	87.2	0.0177628		0.9975
7	6:2 FTS	427.1 > 407	9.08e2	1.635	0.327	1.000	4.32	4.17	83.4	0.2827957		0.9789
8	PFOA	413 > 368.7	9.24e3	4.054	0.811	1.000	4.37	4.40	88.1	0.0000000		0.9990
9	PFHpS	449 > 98.7	9.47e2	0.416	0.083	1.000	4.45	4.76	95.2	0.2525704		0.9956
10	PFOS	499 >79.9	2.17e3	3.949	0.790	1.000	4.77	4.93	98.6	0.2032607		0.9935
11	PFNA	463 > 418.8	7.19e3	7.012	1.402	1.000	4.71	4.37	87.5	0.1046439		0.9954
12	PFDA	513 > 468.8	1.70e3	2.630	0.526	1.000	5.01	4.44	88.9	0.0382137		0.9973
13	8:2 FTS	527 > 506.9	4.40e2	2.081	0.416	1.000	4.99	4.15	82.9	0.0148202		0.9823
14	13C3-PFBA	216.1 > 171.8	2.31e4	15.177	1.214	1.000	1.93	12.6	100.8	0.0039178	4.60	
15	13C3-PFPeA	266>221.8	1.02e4	5.822	0.466	1.000	2.85	13.0	104.1	0.0026412	3.92	
16	13C3-PFBS	302.0 > 98.8	7.36e3	4.183	0.335	1.000	3.10	13.8	110.8	0.0141320	5.67	





Ready 161122G2_5 CAP NUM

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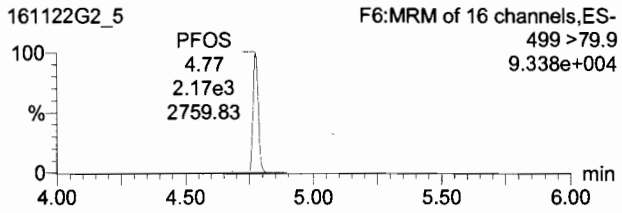
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_5, Date: 22-Nov-2016, Time: 10:38:18, ID: ST161122G2-5 PFC CS2 16K1708, Description: PFC CS2 16K1708 A

PFOS



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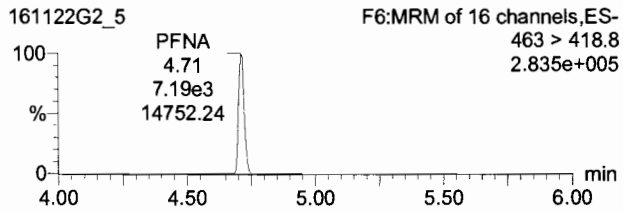

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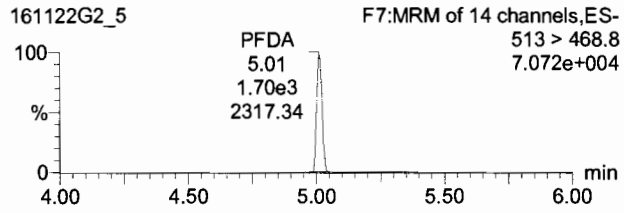

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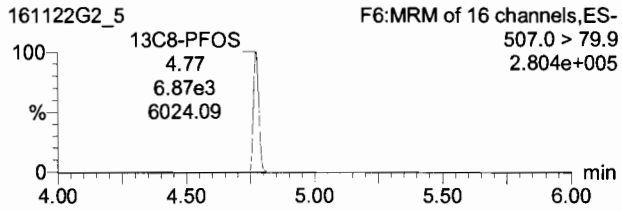

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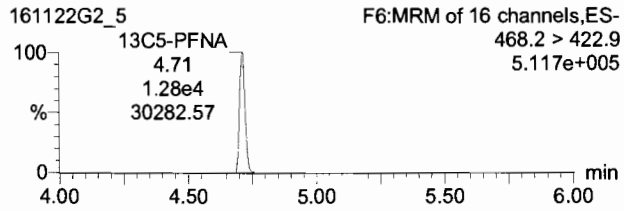

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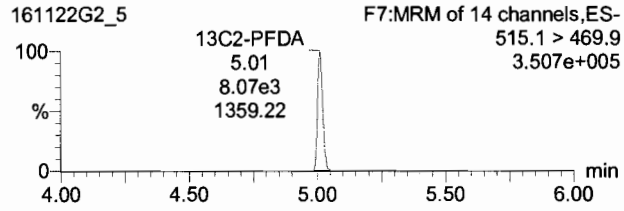

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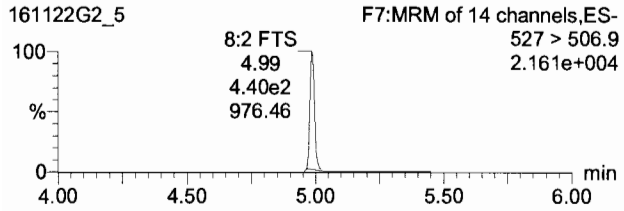
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_5, Date: 22-Nov-2016, Time: 10:38:18, ID: ST161122G2-5 PFC CS2 16K1708, Description: PFC CS2 16K1708 A

8:2 FTS



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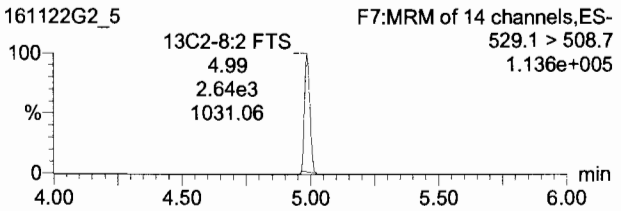
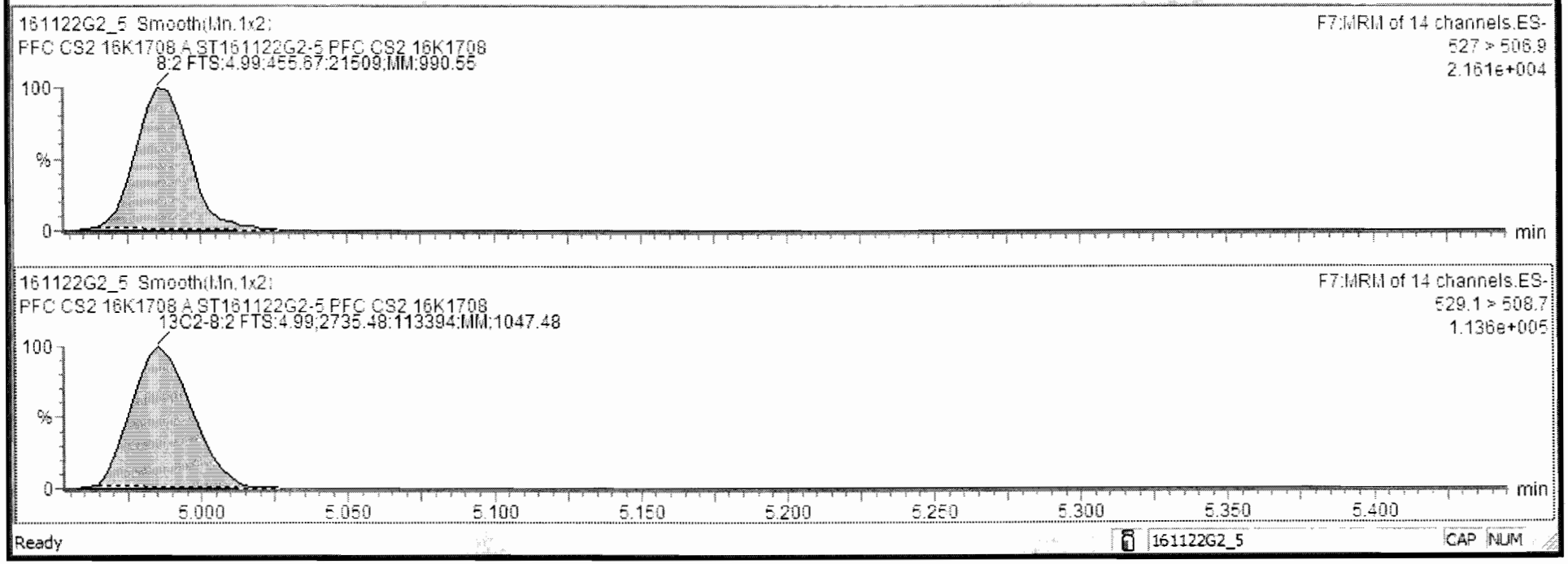


TargetLynx - 161122G2-CRV.qld * - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_5 - ST161122G2-5 PFC CS2 16K1708 - PFC CS2 16K1708 A

	Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	2.82e3		1.000	3.47	3.47	4.23	NO	84.5	0.0000000
5	PFHpA	363 > 318.9	8.49e3		1.000	3.97	3.98	4.28	NO	85.7	0.0896946
6	PFHxS	398.9 > 79.6	3.79e3		1.000	4.09	4.09	4.36	YES	87.2	0.0177626
7	6:2 FTS	427.1 > 407	9.08e2		1.000	4.32	4.32	3.69	NO	73.9	0.4496157
8	PFOA	413 > 368.7	9.24e3		1.000	4.37	4.37	4.40	YES	88.1	0.0000000
9	PFHpS	449 > 98.7	9.47e2		1.000	4.37	4.45	4.76	YES	95.2	0.2525704
10	PFOS	499 >79.9	2.17e3		1.000	4.77	4.77	4.93	YES	98.6	0.2032607
11	PFNA	463 > 418.8	7.19e3		1.000	4.71	4.71	4.37	YES	87.5	0.1046439
12	PFDA	513 > 468.8	1.70e3		1.000	5.01	5.01	4.44	NO	88.9	0.0382137
13	8:2 FTS	527 > 506.9	4.56e2		1.000	4.99	4.99	4.16	NO	83.2	0.0072296
14	13C3-PFBA	216.1 > 171.8	2.31e4	1.21	1.000	1.93	1.93	12.6	NO	100.8	0.0039178
15	13C3-PFPeA	266>221.8	1.02e4	0.448	1.000	2.84	2.85	13.0	NO	104.1	0.0026412
16	13C3-PFBS	302.0 > 98.8	7.36e3	0.302	1.000	3.10	3.10	13.8	NO	110.8	0.0141320



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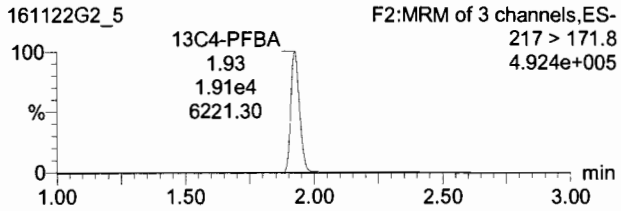
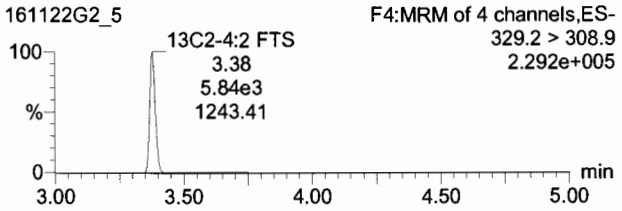
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_5, Date: 22-Nov-2016, Time: 10:38:18, ID: ST161122G2-5 PFC CS2 16K1708, Description: PFC CS2 16K1708 A

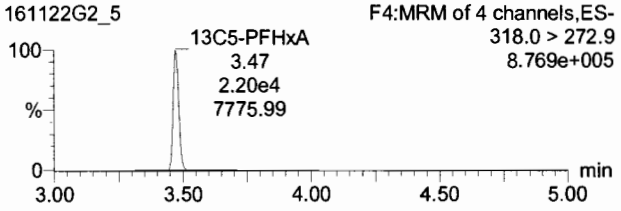
13C4-PFBA



13C2-4:2 FTS



13C5-PFHxA



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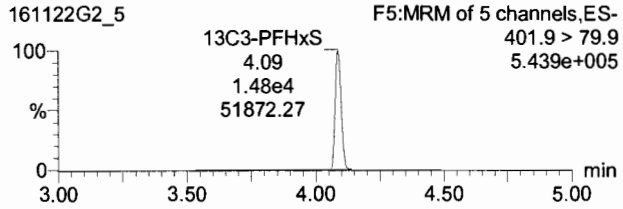
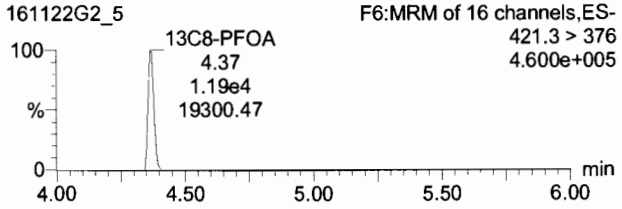
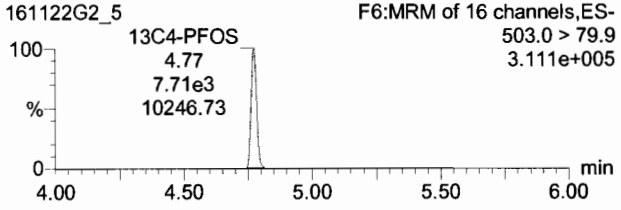


13C8-PFOA



13C4-PFOS



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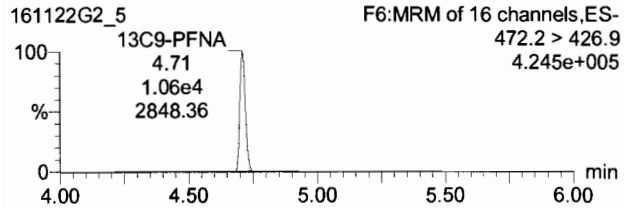

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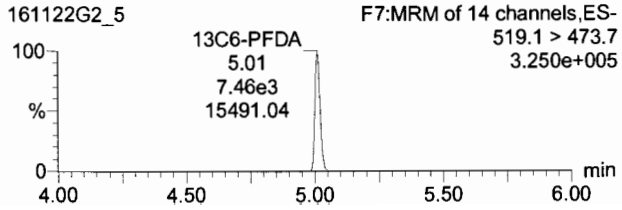

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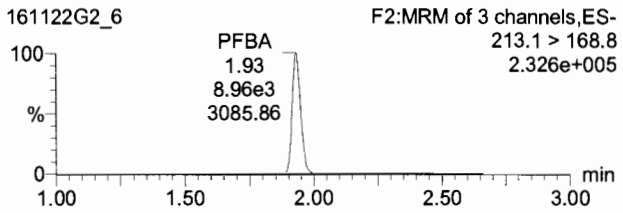
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_6, Date: 22-Nov-2016, Time: 10:50:54, ID: ST161122G2-6 PFC CS3 16K1709, Description: PFC CS3 16K1709 A

PFBA



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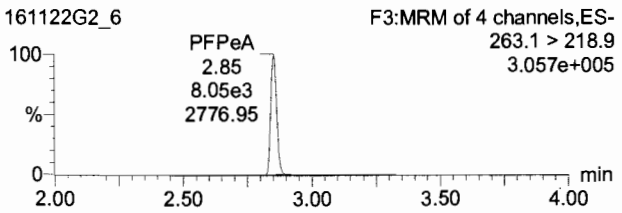

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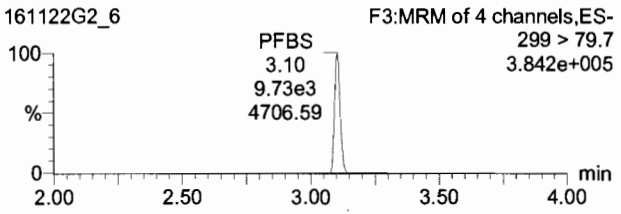

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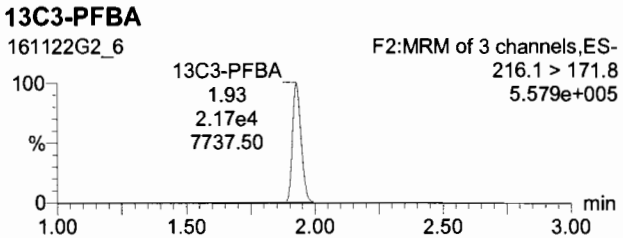

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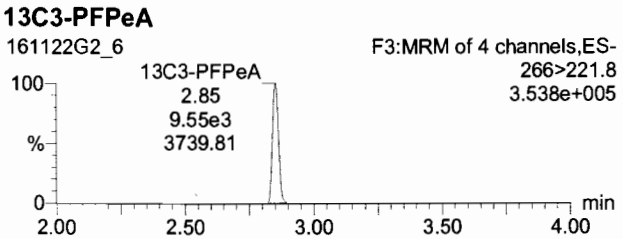

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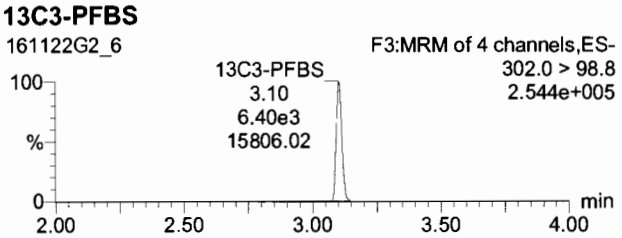
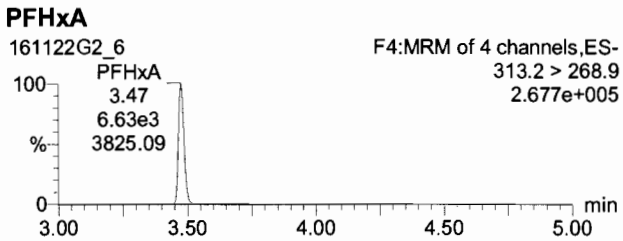


PFHxA



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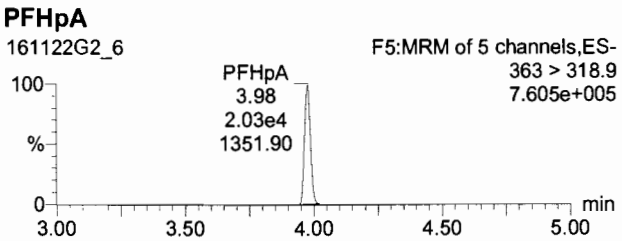

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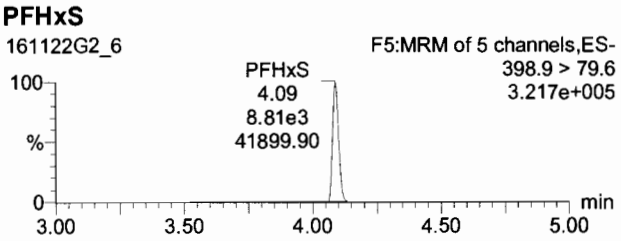
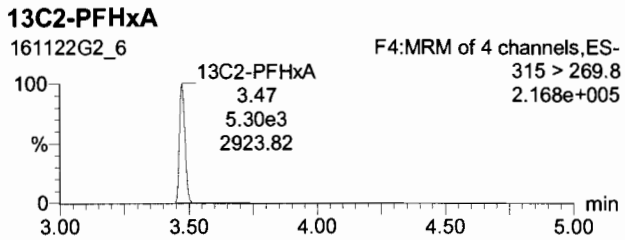


13C2-PFHxA



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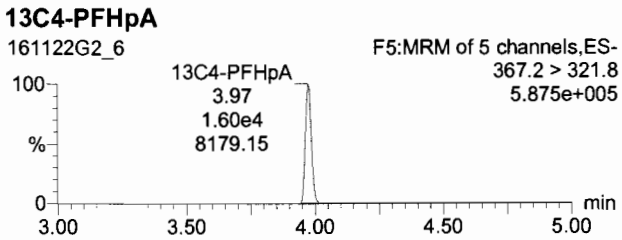

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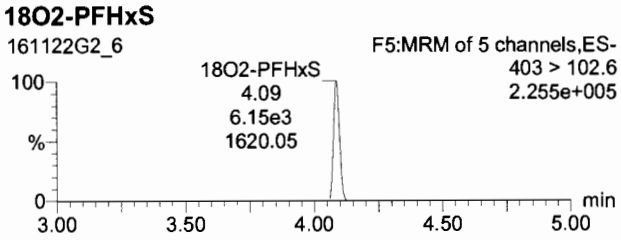

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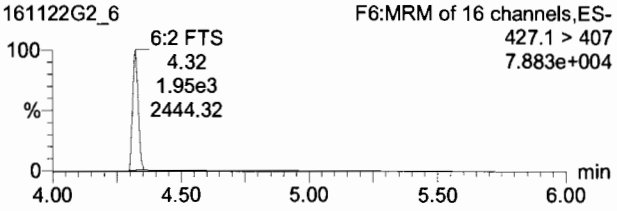
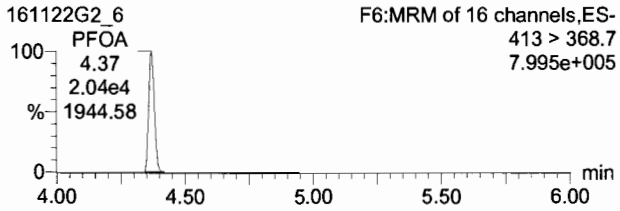
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_6, Date: 22-Nov-2016, Time: 10:50:54, ID: ST161122G2-6 PFC CS3 16K1709, Description: PFC CS3 16K1709 A

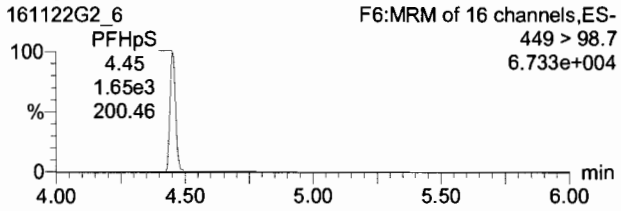
6:2 FTS



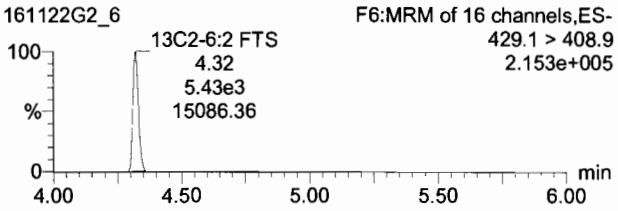
PFOA



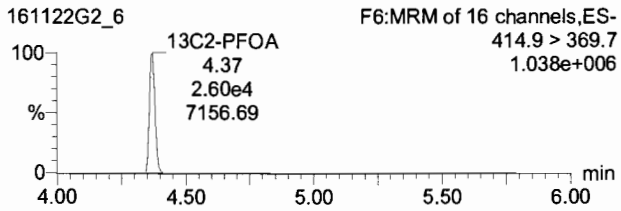
PFHpS



13C2-6:2 FTS



13C2-PFOA



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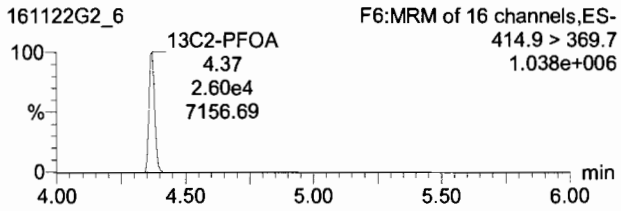

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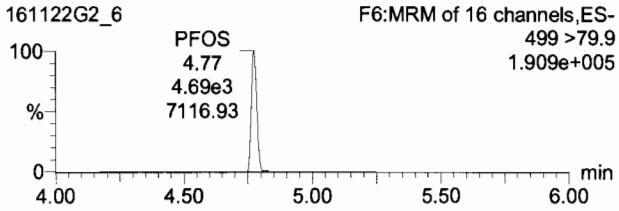
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_6, Date: 22-Nov-2016, Time: 10:50:54, ID: ST161122G2-6 PFC CS3 16K1709, Description: PFC CS3 16K1709 A

PFOS



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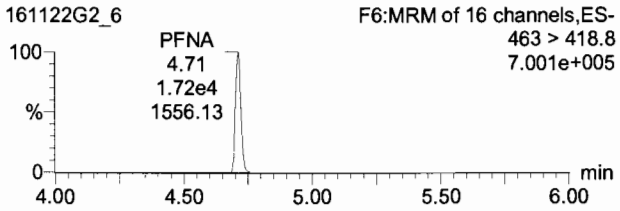
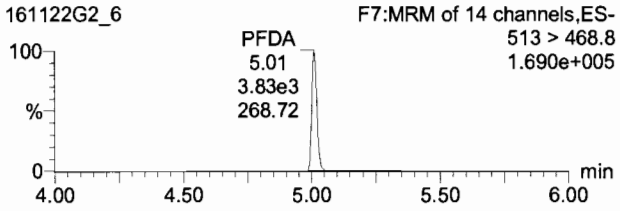


PFDA



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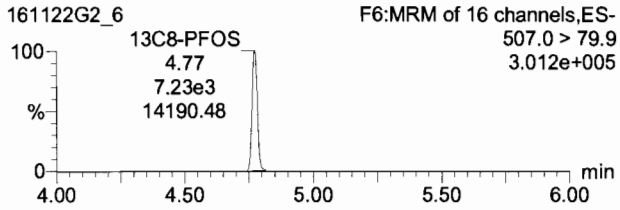
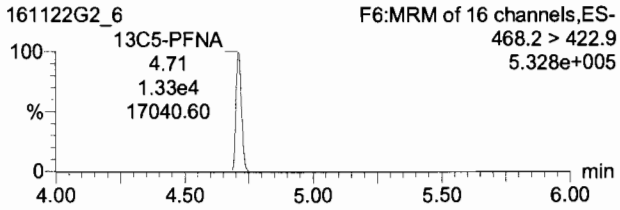


13C5-PFNA



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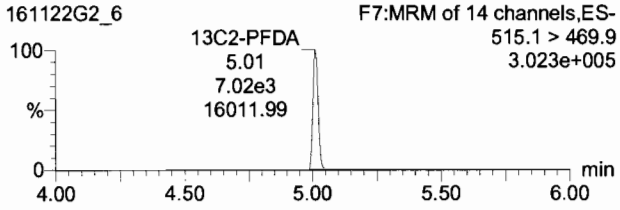

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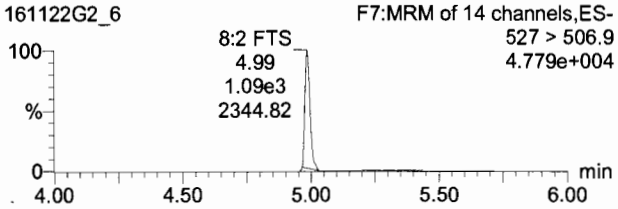
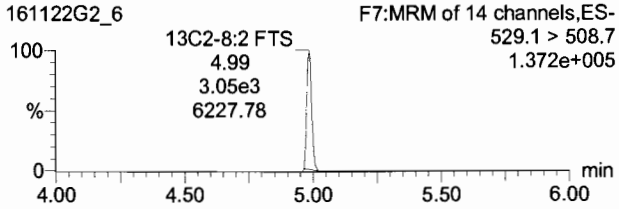
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_6, Date: 22-Nov-2016, Time: 10:50:54, ID: ST161122G2-6 PFC CS3 16K1709, Description: PFC CS3 16K1709 A

8:2 FTS



13C2-8:2 FTS

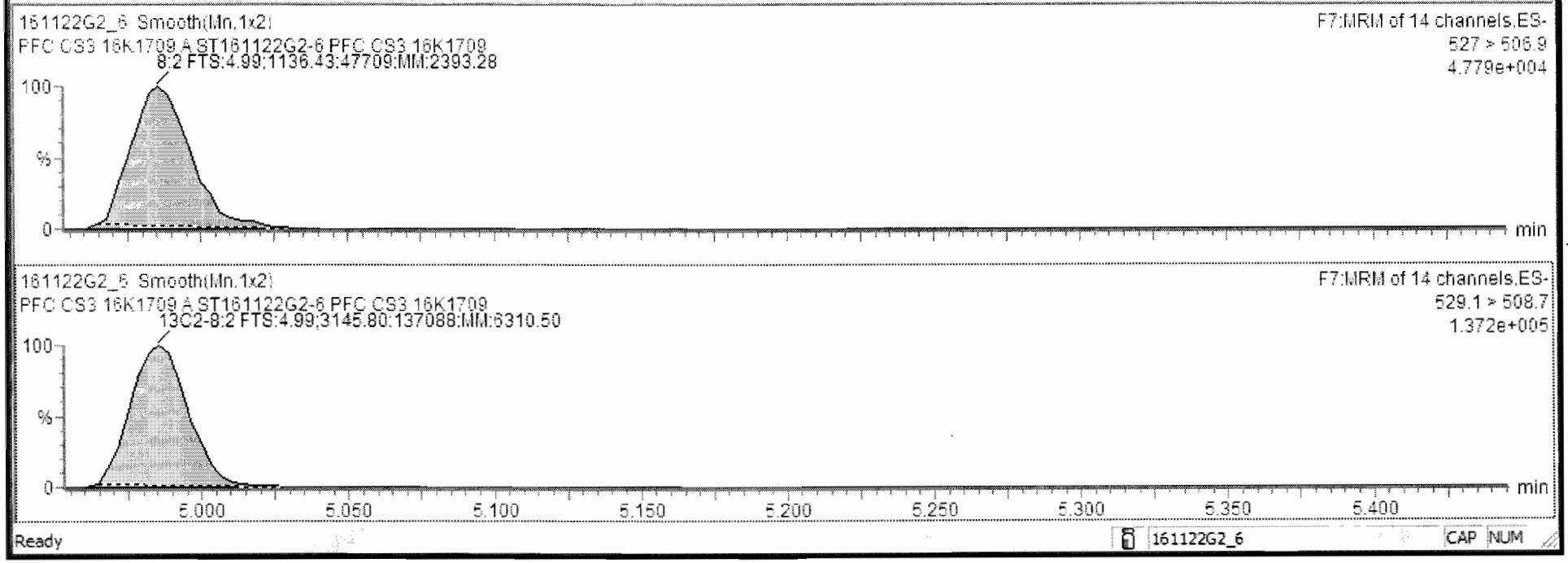


TargetLynx - 161122G2-CRV.qld * - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_6 - ST161122G2-6 PFC CS3 16K1709 - PFC CS3 16K1709 A

	Name	Trace	Area	RRF	Wt/Vol	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	6.63e3		1.000	3.47	3.47	10.4	YES	104.3	0.0000000
5	PFHpA	363 > 318.9	2.03e4		1.000	3.97	3.98	10.3	YES	103.0	0.1083914
6	PFHxS	398.9 > 79.6	8.81e3		1.000	4.09	4.09	10.4	YES	104.1	0.0160911
7	6:2 FTS	427.1 > 407	1.95e3		1.000	4.32	4.32	9.48	YES	94.8	0.4528547
8	PFOA	413 > 368.7	2.04e4		1.000	4.37	4.37	10.8	YES	108.1	0.0000000
9	PFHpS	449 > 98.7	1.65e3		1.000	4.37	4.45	8.86	YES	88.6	0.3575371
10	PFOS	499 >79.9	4.65e3		1.000	4.76	4.77	9.90	YES	99.0	0.2020896
11	PFNA	463 > 418.8	1.72e4		1.000	4.71	4.71	10.0	YES	100.1	0.1200018
12	PFDA	513 > 468.8	3.83e3		1.000	5.01	5.01	11.5	NO	114.8	0.1427597
13	8:2 FTS	527 > 506.9	1.14e3		1.000	4.99	4.99	9.07	YES	90.7	0.0043622
14	13C3-PFBA	216.1 > 171.8	2.17e4	1.21	1.000	1.93	1.93	13.3	NO	106.8	0.0044280
15	13C3-PFPeA	266>221.8	9.55e3	0.448	1.000	2.84	2.85	12.4	NO	99.4	0.0076173
16	13C3-PFBS	302.0 > 98.8	6.40e3	0.302	1.000	3.10	3.10	12.3	NO	98.6	0.0019245



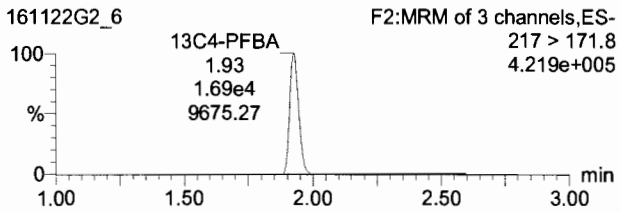
Ready 161122G2_6 CAP NUM

Dataset: Untitled

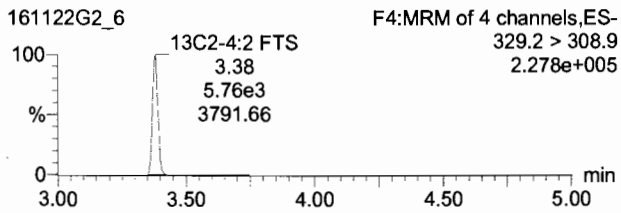
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_6, Date: 22-Nov-2016, Time: 10:50:54, ID: ST161122G2-6 PFC CS3 16K1709, Description: PFC CS3 16K1709 A

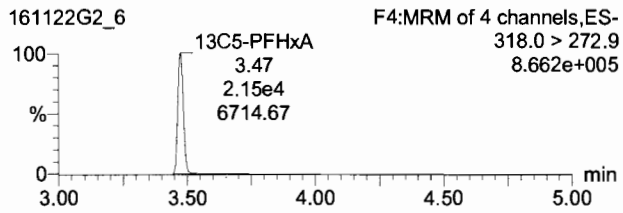
13C4-PFBA



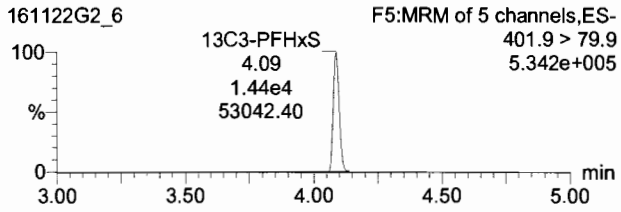
13C2-4:2 FTS



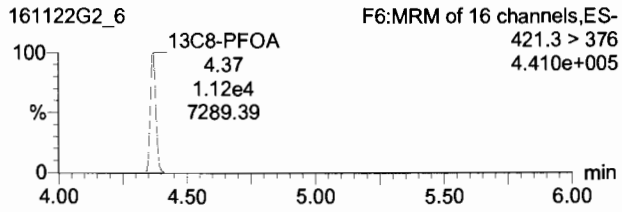
13C5-PFHxA



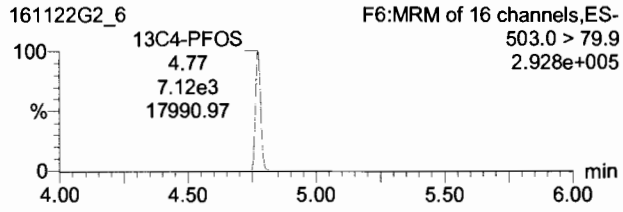
13C3-PFHxS



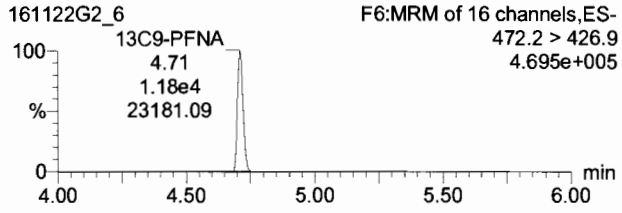
13C8-PFOA



13C4-PFOS



13C9-PFNA



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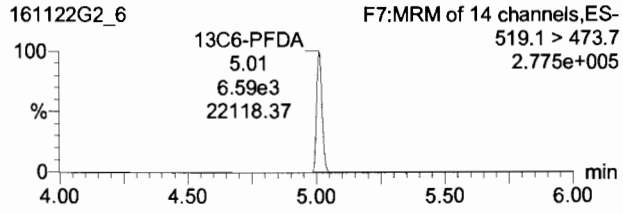

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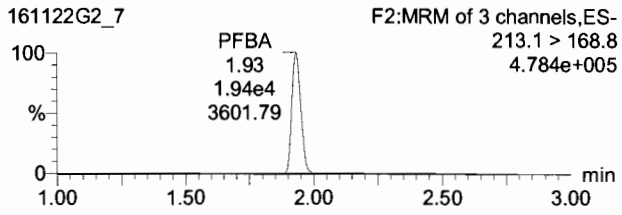
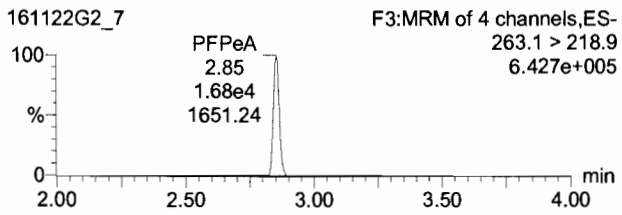
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_7, Date: 22-Nov-2016, Time: 11:03:32, ID: ST161122G2-7 PFC CS3.5 16K1710, Description: PFC CS3.5 16K1710 A

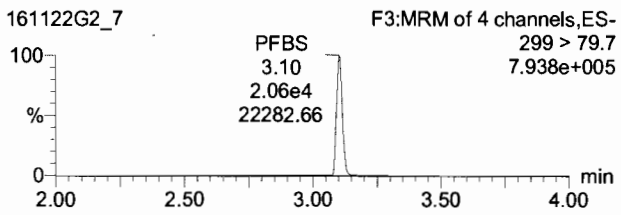
PFBA



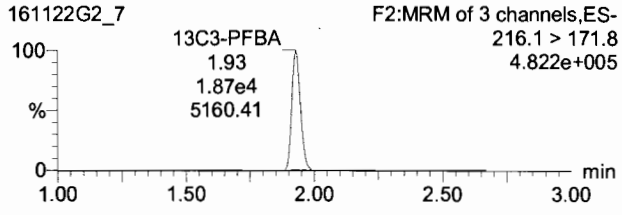
PFPeA



PFBS



13C3-PFBA



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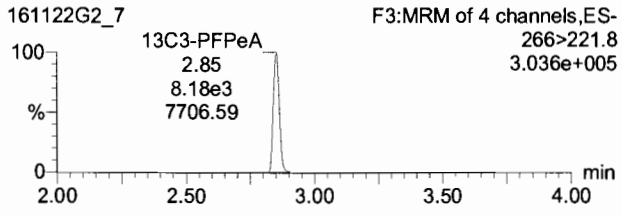

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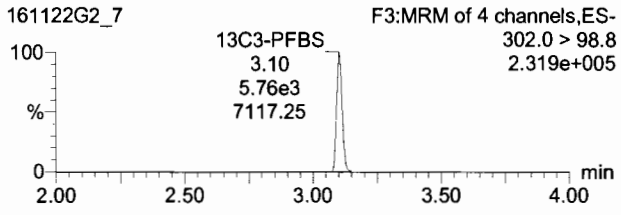

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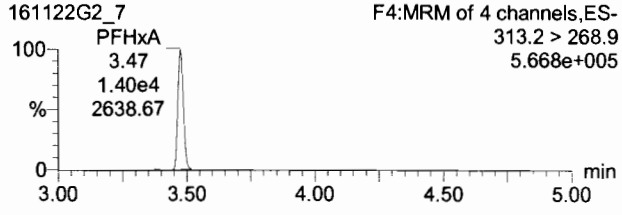
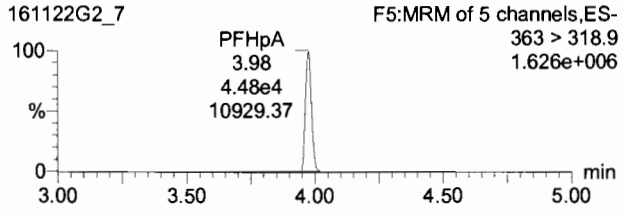


PFHpA



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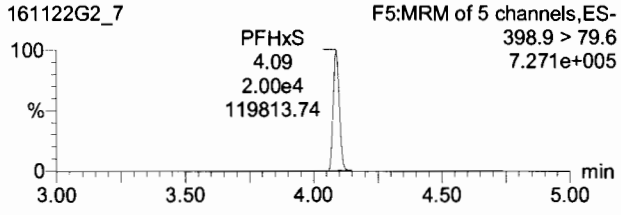
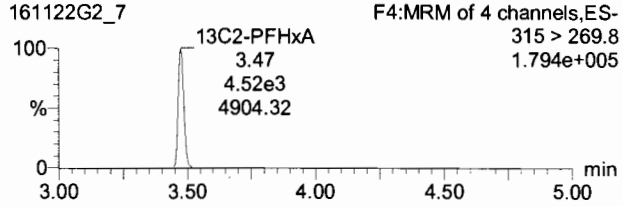


13C2-PFHxA



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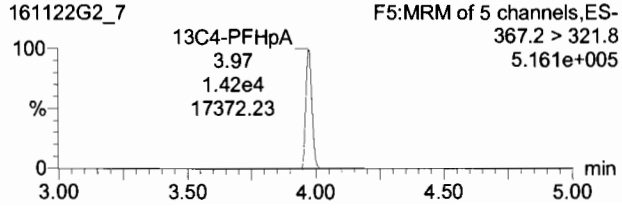
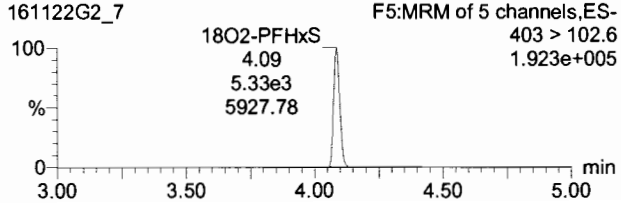


18O2-PFHxS



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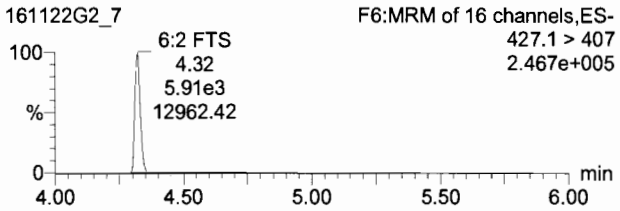
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_7, Date: 22-Nov-2016, Time: 11:03:32, ID: ST161122G2-7 PFC CS3.5 16K1710, Description: PFC CS3.5 16K1710 A

6:2 FTS



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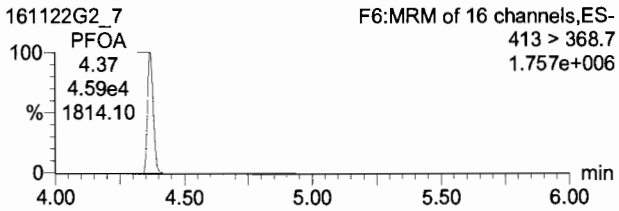
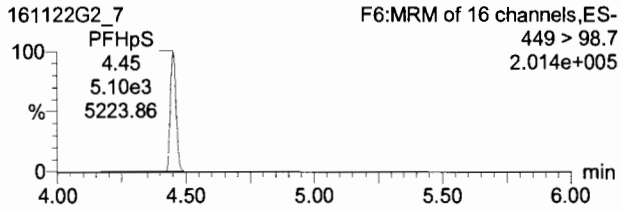
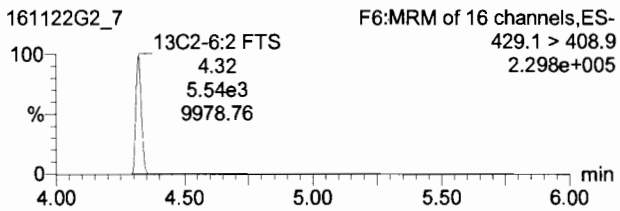


PFHpS



13C2-6:2 FTS



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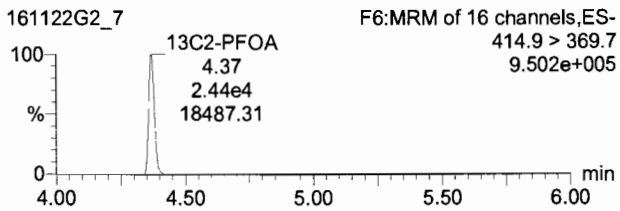
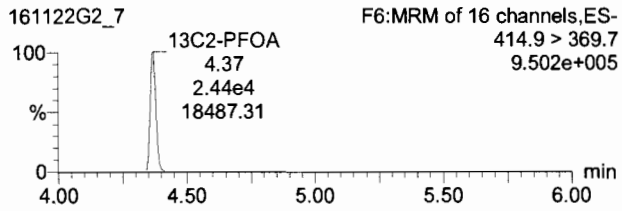


13C2-PFOA



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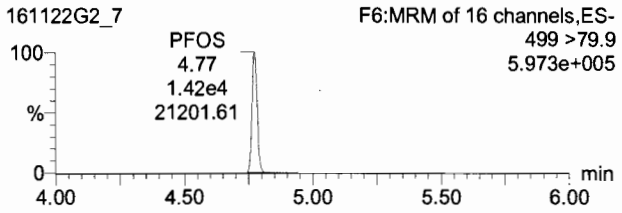
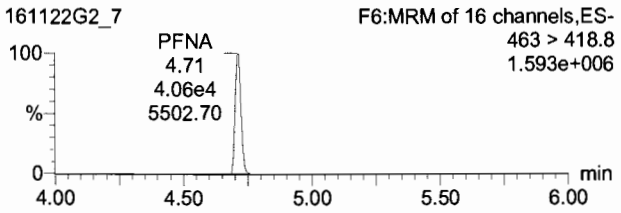
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_7, Date: 22-Nov-2016, Time: 11:03:32, ID: ST161122G2-7 PFC CS3.5 16K1710, Description: PFC CS3.5 16K1710 A

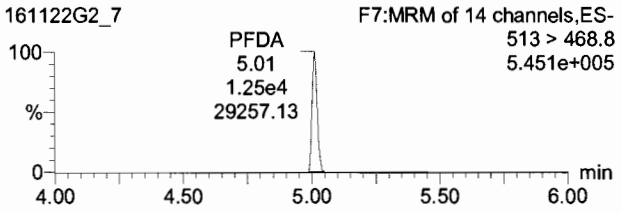
PFOS



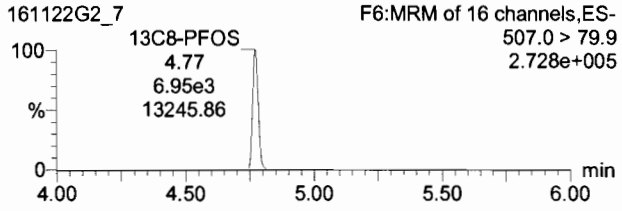
PFNA



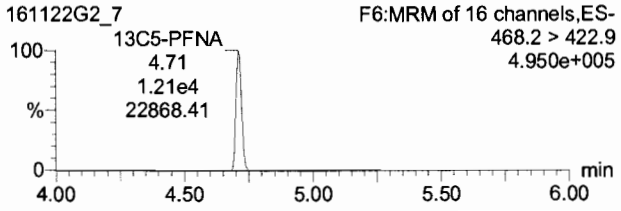
PFDA



13C8-PFOS



13C5-PFNA



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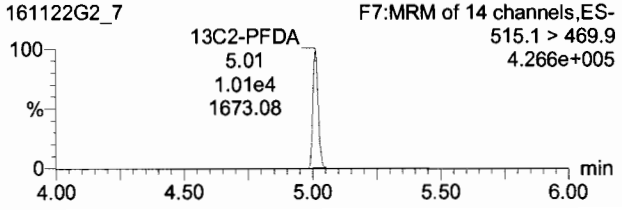

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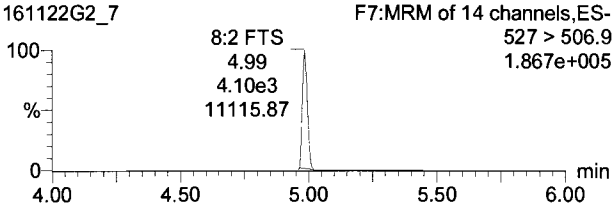
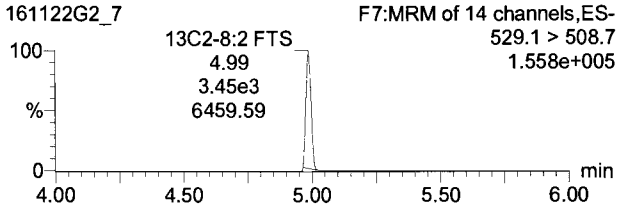
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_7, Date: 22-Nov-2016, Time: 11:03:32, ID: ST161122G2-7 PFC CS3.5 16K1710, Description: PFC CS3.5 16K1710 A

8:2 FTS



13C2-8:2 FTS

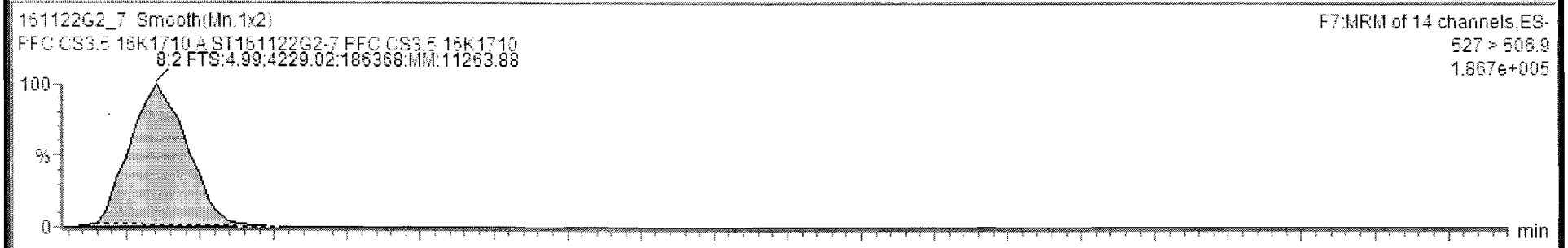


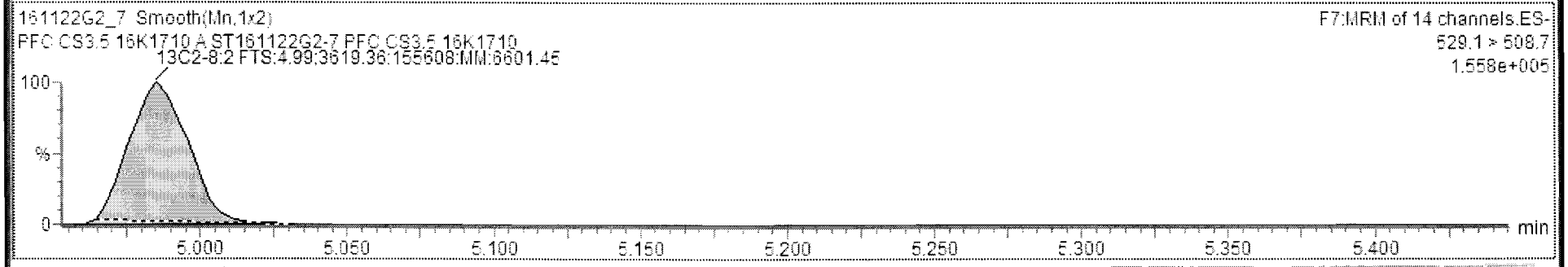
TargetLynx - 161122G2-CRV.qld * - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_7 - ST161122G2-7 PFC CS3.5 16K1710 - PFC CS3.5 16K1710 A

	Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	1.40e4		1.000	3.47	3.47	25.9	YES	103.6	0.0090379
5	PFHpA	363 > 318.9	4.48e4		1.000	3.97	3.98	25.4	YES	101.7	0.0949494
6	PFHxS	398.9 > 79.6	2.00e4		1.000	4.09	4.09	27.2	YES	108.9	0.0160447
7	6:2 FTS	427.1 > 407	5.91e3		1.000	4.32	4.32	28.5	YES	113.9	0.4488633
8	PFOA	413 > 368.7	4.59e4		1.000	4.37	4.37	26.0	YES	104.2	0.0000000
9	PFHpS	449 > 98.7	5.10e3		1.000	4.37	4.45	28.6	YES	114.5	0.2616468
10	PFOS	499 >79.9	1.42e4		1.000	4.77	4.77	30.8	YES	123.3	0.2026154
11	PFNA	463 > 418.8	4.06e4		1.000	4.71	4.71	25.6	YES	102.3	0.1150546
12	PFDA	513 > 468.8	1.25e4		1.000	5.01	5.01	26.1	NO	104.4	0.0359399
13	8:2 FTS	527 > 506.9	4.23e3		1.000	4.99	4.99	29.9	YES	119.7	0.0019300
14	13C3-PFBA	216.1 > 171.8	1.87e4	1.21	1.000	1.93	1.93	12.3	NO	98.0	0.0059610
15	13C3-PFPeA	266>221.8	8.18e3	0.448	1.000	2.84	2.85	12.1	NO	96.9	0.0036860
16	13C3-PFBS	302.0 > 98.8	5.76e3	0.302	1.000	3.10	3.10	12.6	NO	101.1	0.0045187





161122G2_7 CAP NUM

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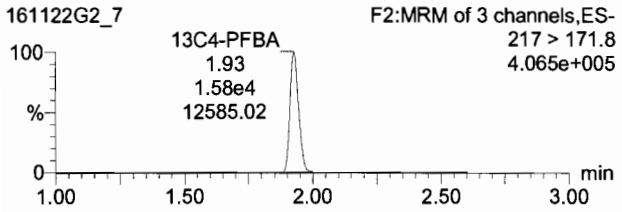
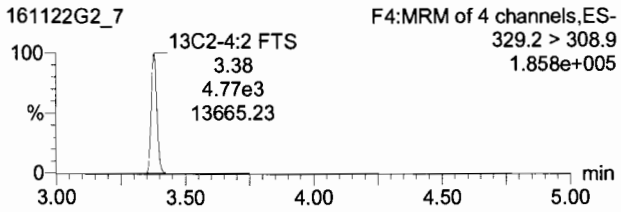
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_7, Date: 22-Nov-2016, Time: 11:03:32, ID: ST161122G2-7 PFC CS3.5 16K1710, Description: PFC CS3.5 16K1710 A

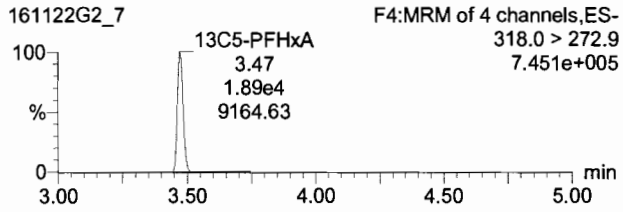
13C4-PFBA



13C2-4:2 FTS



13C5-PFHxA



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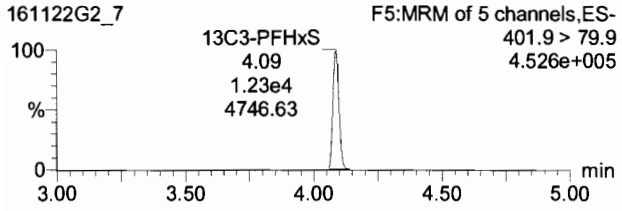
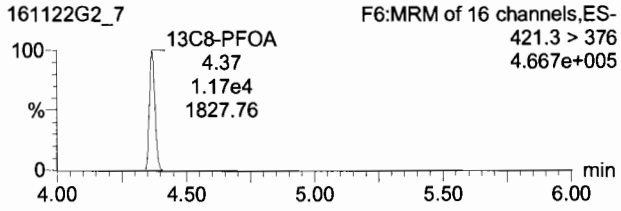


13C8-PFOA



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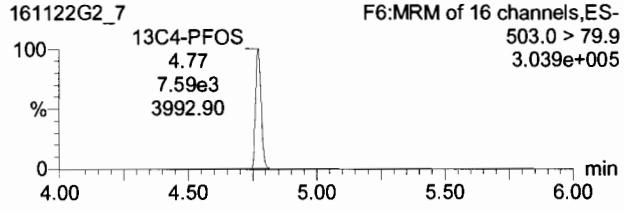

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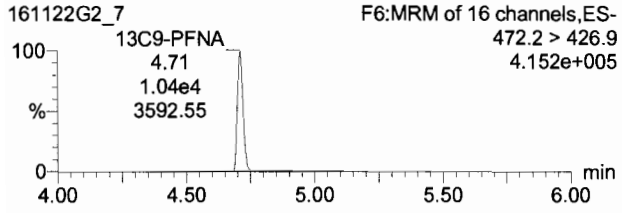

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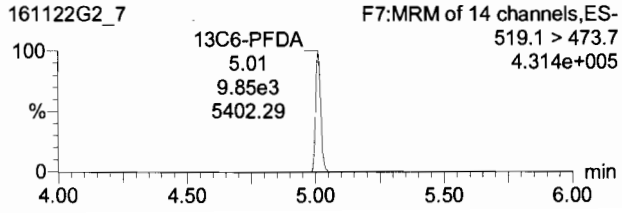

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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_8, Date: 22-Nov-2016, Time: 11:16:11, ID: ST161122G2-8 PFC CS4 16K1711, Description: PFC CS4 16K1711 A

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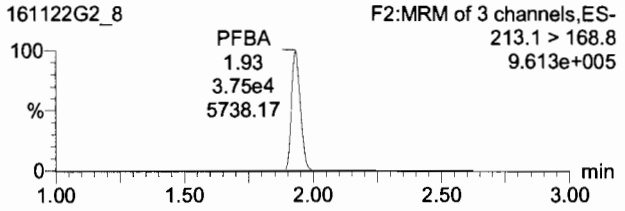

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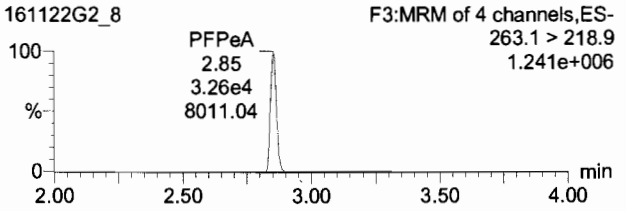

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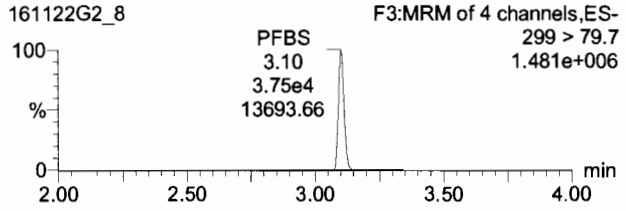

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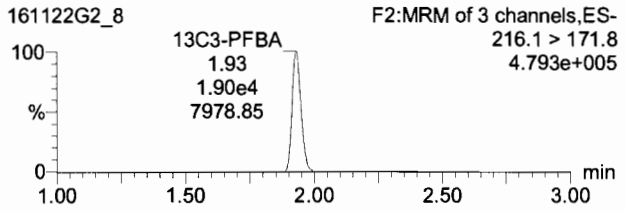

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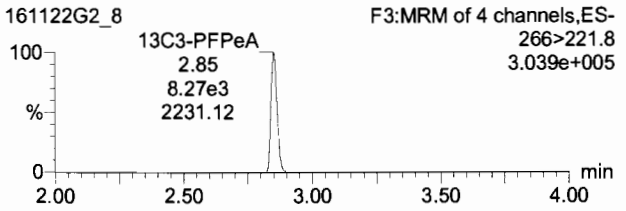

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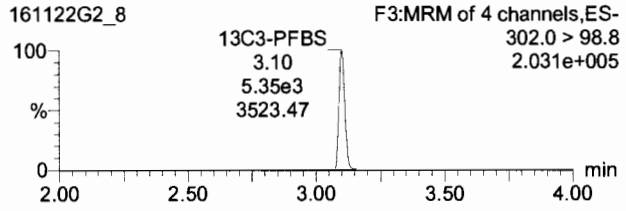

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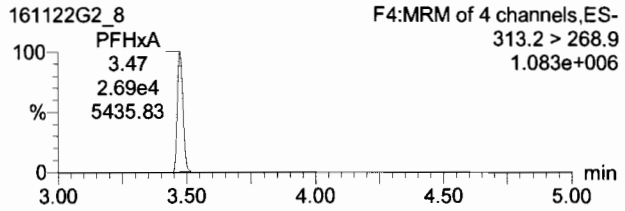

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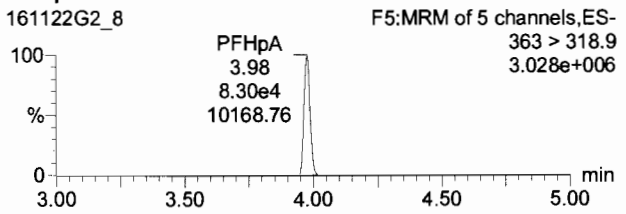

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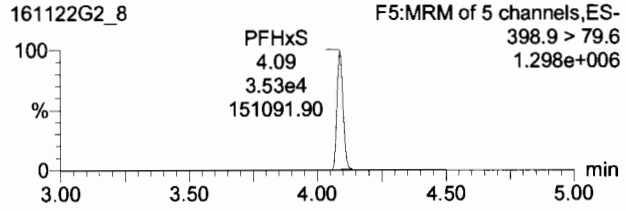

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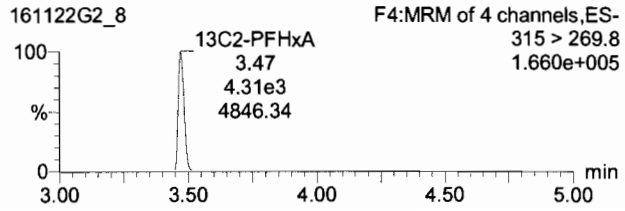

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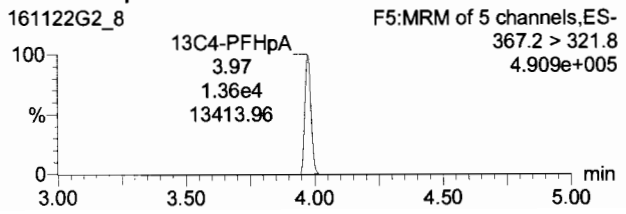

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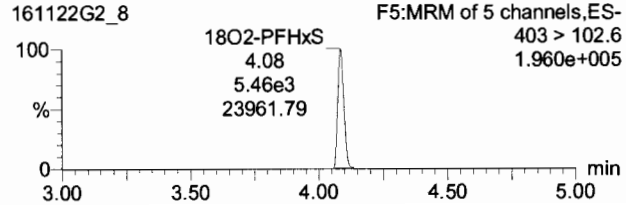

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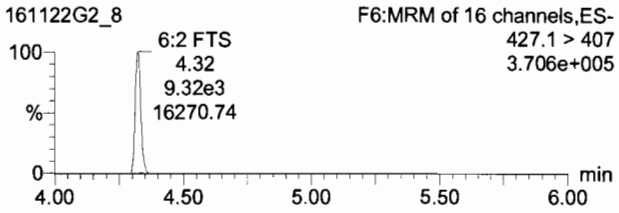
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_8, Date: 22-Nov-2016, Time: 11:16:11, ID: ST161122G2-8 PFC CS4 16K1711, Description: PFC CS4 16K1711 A

6:2 FTS



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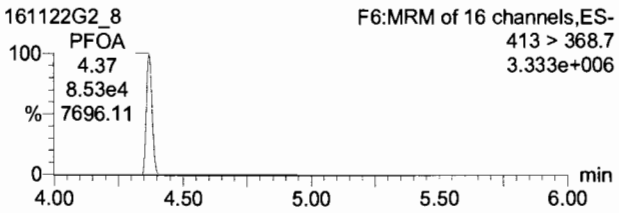

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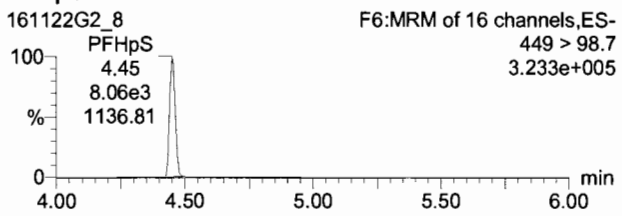
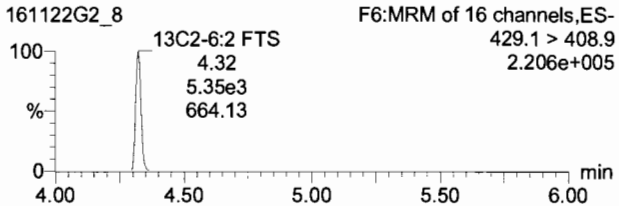


13C2-6:2 FTS



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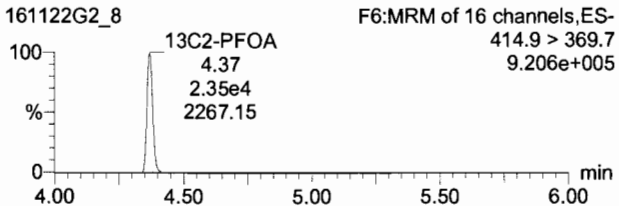

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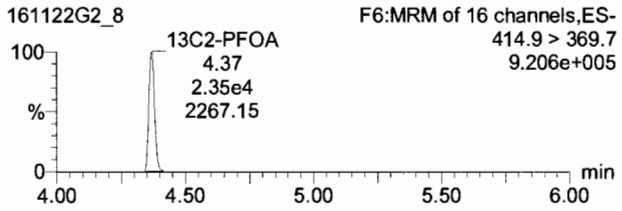

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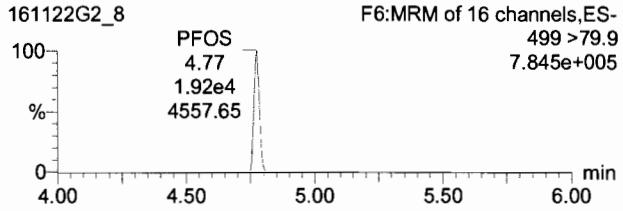
Name: 161122G2_8, Date: 22-Nov-2016, Time: 11:16:11, ID: ST161122G2-8 PFC CS4 16K1711, Description: PFC CS4 16K1711 A

PFOS



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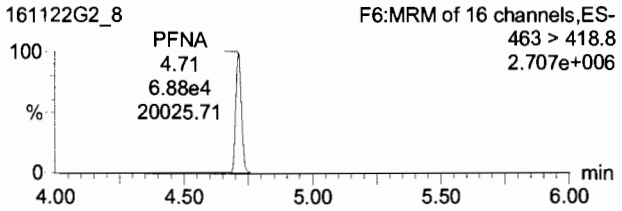

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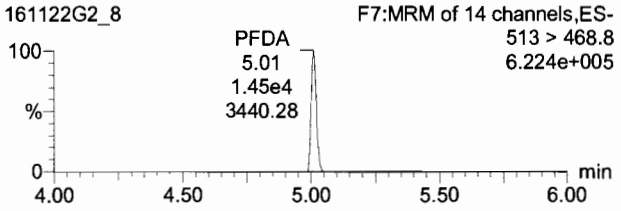

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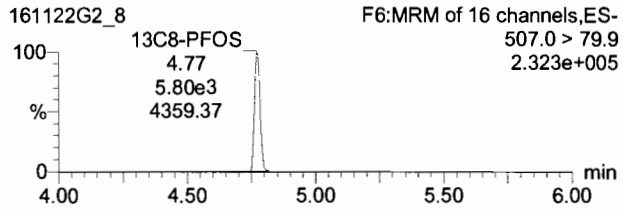

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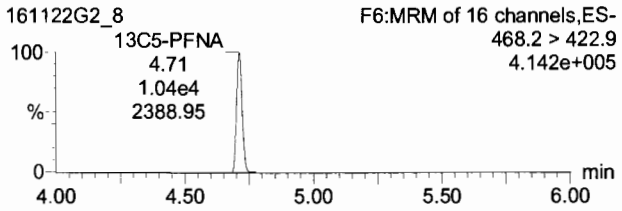

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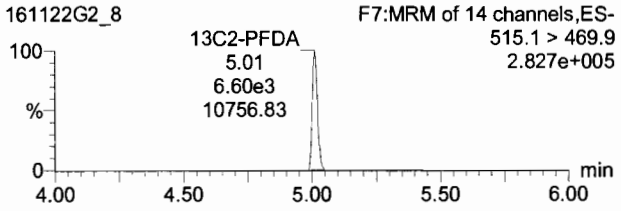

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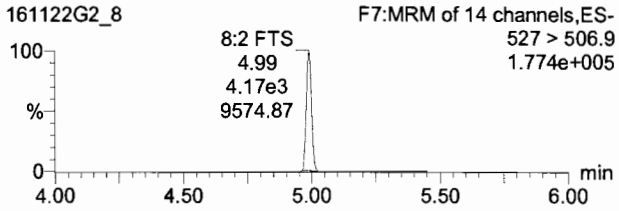
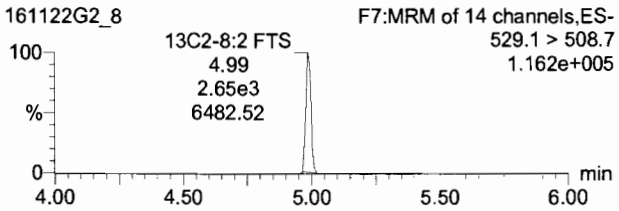
Name: 161122G2_8, Date: 22-Nov-2016, Time: 11:16:11, ID: ST161122G2-8 PFC CS4 16K1711, Description: PFC CS4 16K1711 A

8:2 FTS



13C2-8:2 FTS

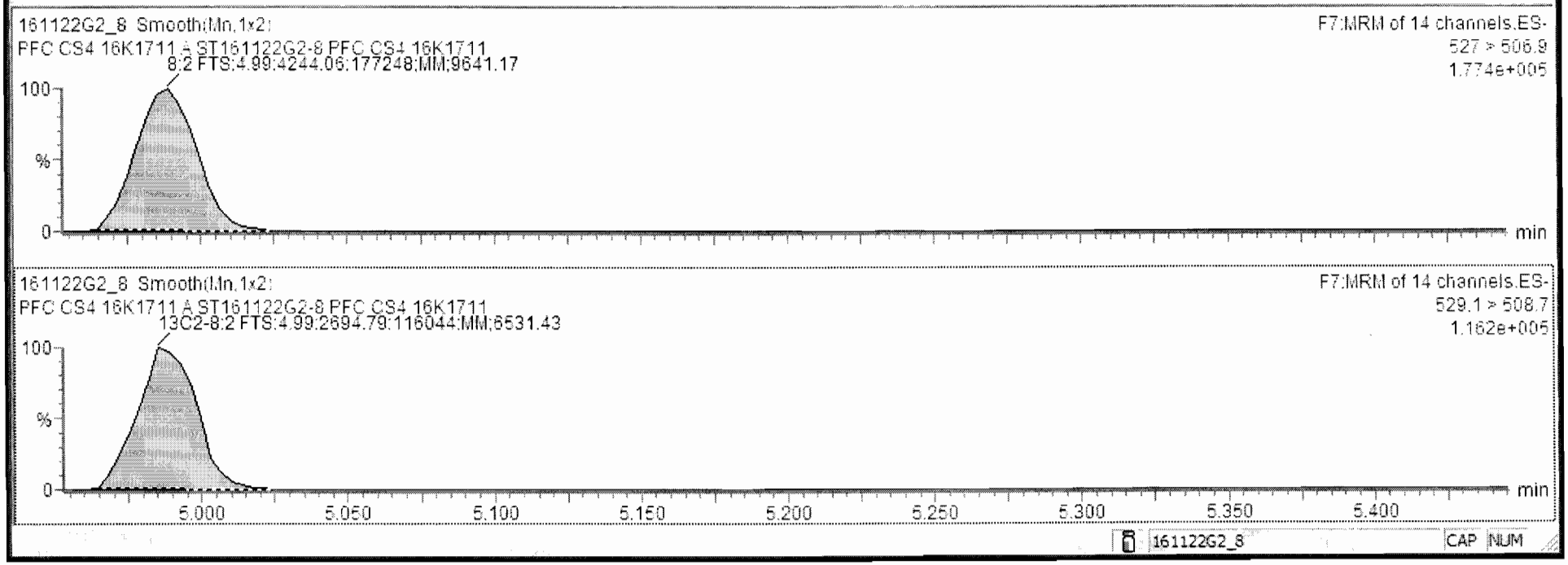


TargetLynx - 161122G2-CRV.qld * - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_8 - ST161122G2-8 PFC CS4 16K1711 - PFC CS4 16K1711 A

	Name	Trace	Area	RRF	Wt/Vol	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	2.69e4		1.000	3.47	3.47	52.1	YES	104.2	0.0090824
5	PFHpA	363 > 318.9	8.30e4		1.000	3.97	3.98	49.2	YES	98.3	0.1013540
6	PFHxS	398.9 > 79.8	3.53e4		1.000	4.08	4.09	47.1	YES	94.1	0.0162677
7	6:2 FTS	427.1 > 407	9.32e3		1.000	4.32	4.32	48.3	YES	96.7	0.4501120
8	PFOA	413 > 368.7	8.53e4		1.000	4.37	4.37	50.3	YES	100.7	0.0000000
9	PFHpS	449 > 98.7	8.06e3		1.000	4.37	4.45	46.8	YES	93.6	0.3525158
10	PFOS	499 >79.9	1.92e4		1.000	4.78	4.78	49.9	YES	99.9	0.2265026
11	PFNA	463 > 418.8	8.88e4		1.000	4.71	4.71	50.5	YES	101.0	0.1101360
12	PFDA	513 > 468.8	1.45e4		1.000	5.01	5.01	46.1	NO	92.3	0.0671726
13	8:2 FTS	527 > 506.9	4.24e3		1.000	4.99	4.99	40.8	YES	81.6	0.0051719
14	13C3-PFBA	216.1 > 171.8	1.90e4	1.21	1.000	1.93	1.93	12.1	NO	96.4	0.0037281
15	13C3-PFPeA	266>221.8	8.27e3	0.448	1.000	2.84	2.85	13.0	NO	103.9	0.0135113
16	13C3-PFBS	302.0 > 98.8	5.35e3	0.302	1.000	3.10	3.10	12.5	NO	99.6	0.0084692



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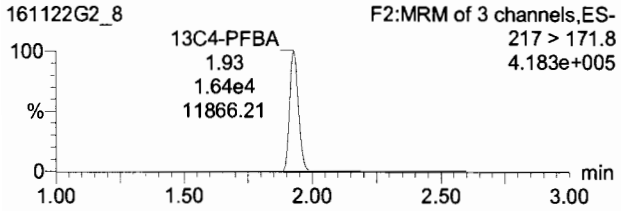
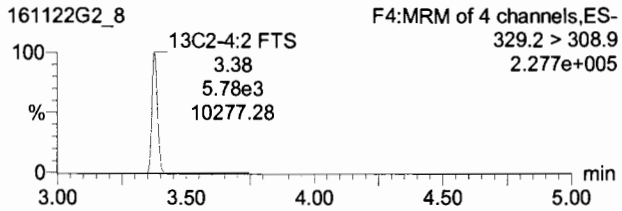
13C4-PFBA



13C2-4:2 FTS



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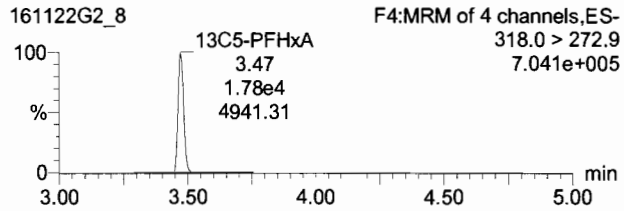

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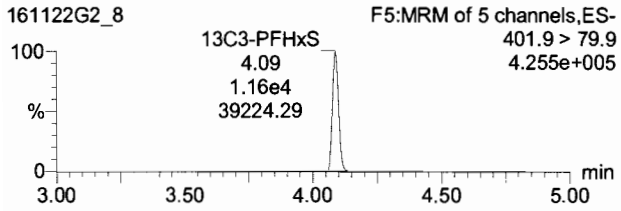

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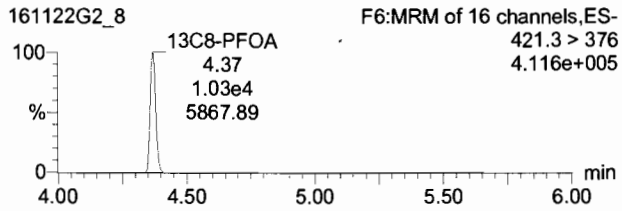

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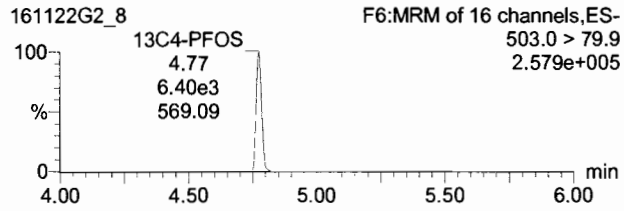

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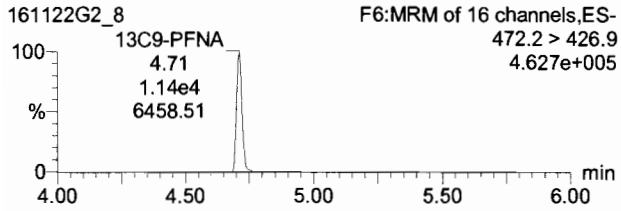

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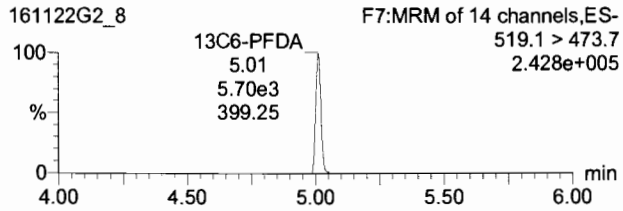

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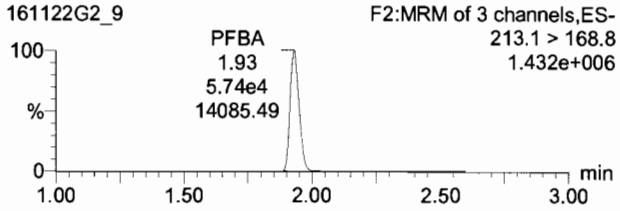
PFBA



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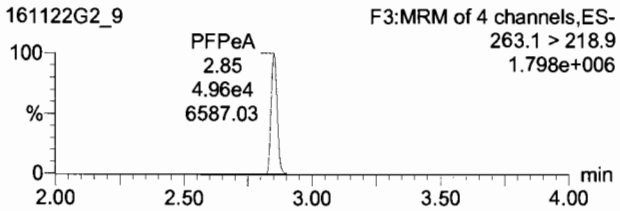

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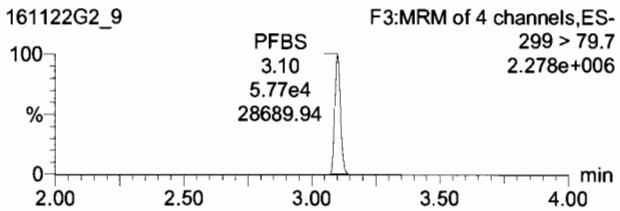

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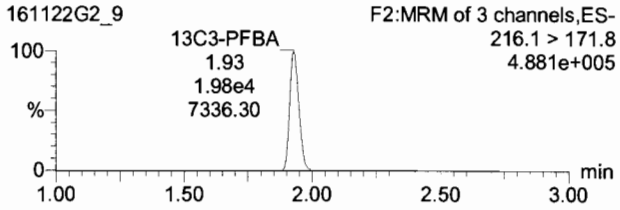

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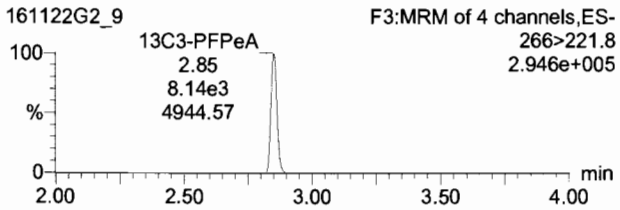

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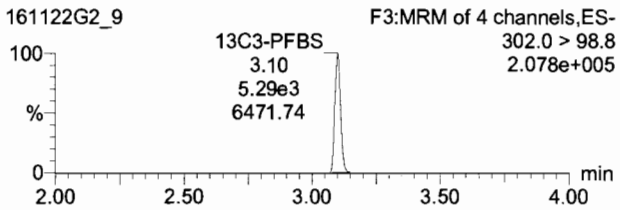

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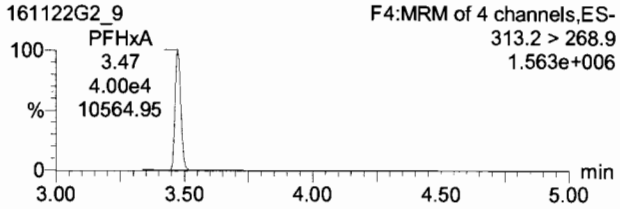

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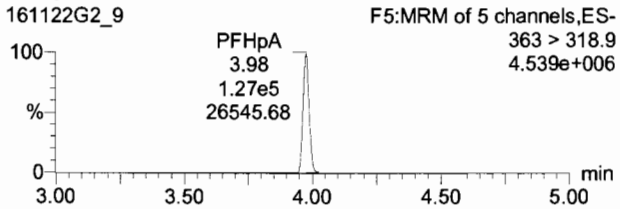

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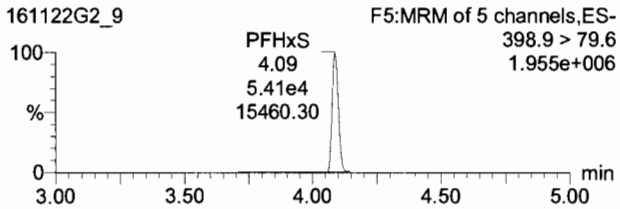

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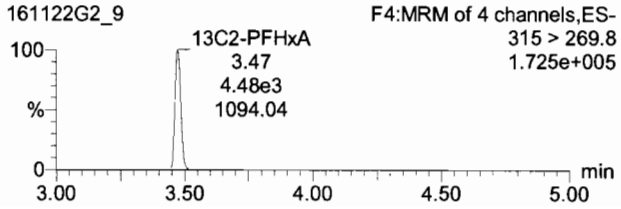

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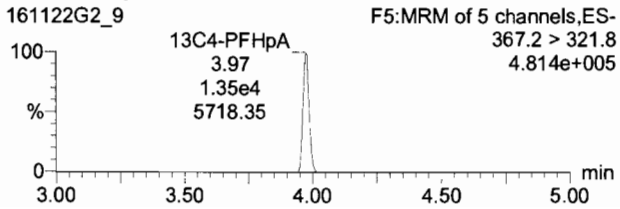

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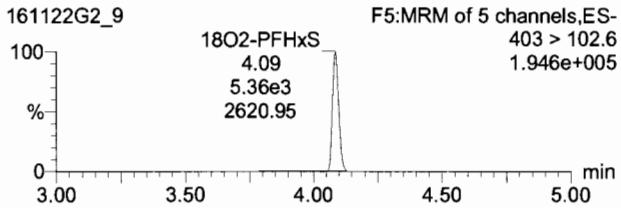

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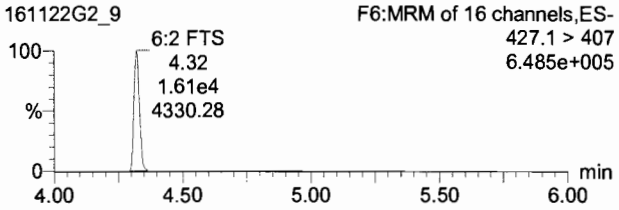
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_9, Date: 22-Nov-2016, Time: 11:28:50, ID: ST161122G2-9 PFC CS4.5 16K1712, Description: PFC CS4.5 16K17121 A

6:2 FTS



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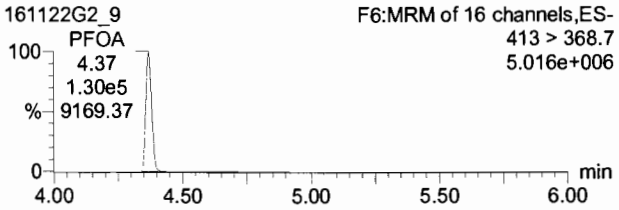

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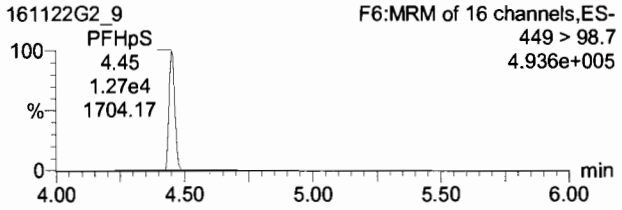

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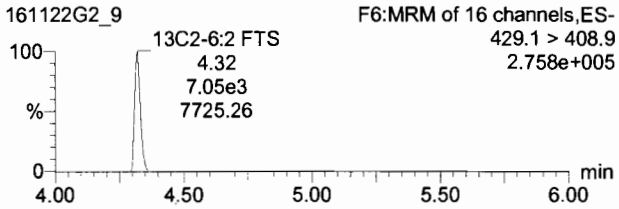

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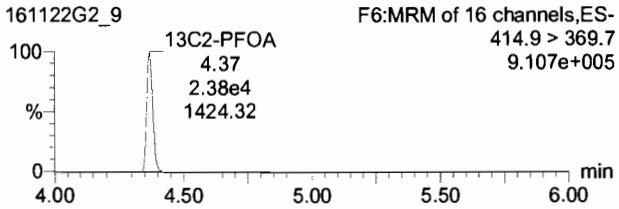

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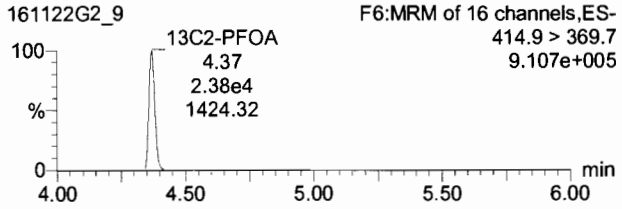

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Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
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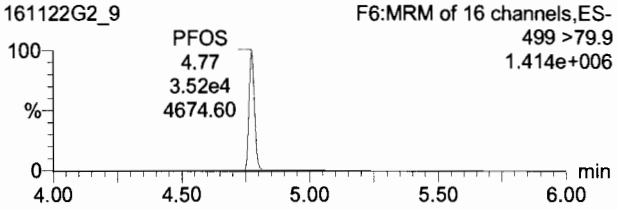
Name: 161122G2_9, Date: 22-Nov-2016, Time: 11:28:50, ID: ST161122G2-9 PFC CS4.5 16K1712, Description: PFC CS4.5 16K17121 A

PFOS



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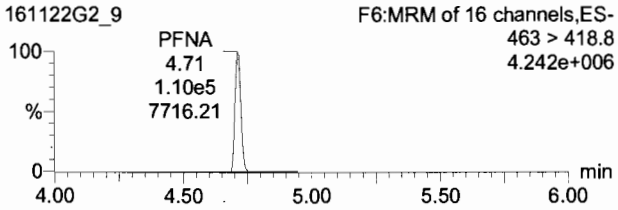

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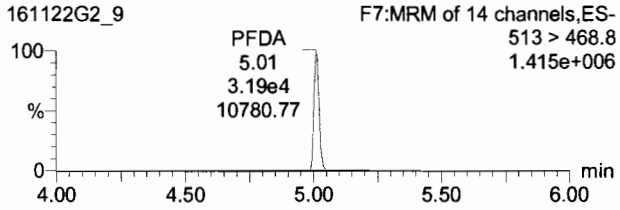

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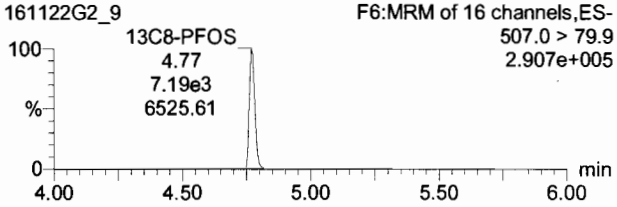

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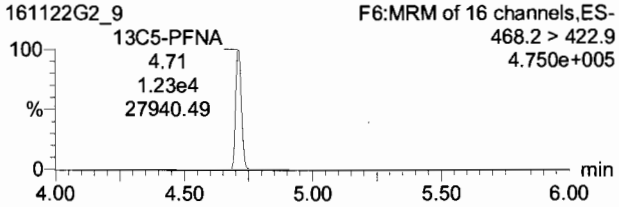

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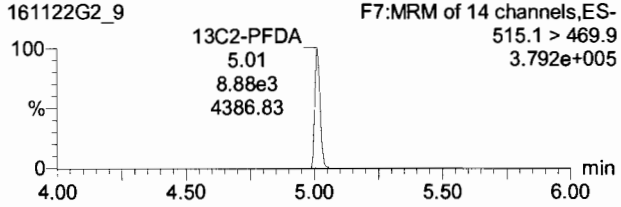

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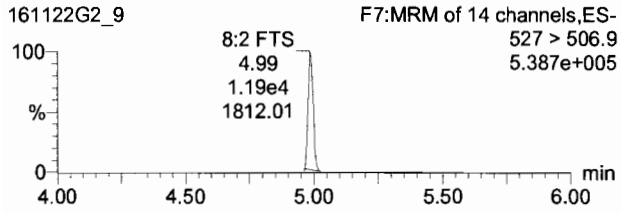
Name: 161122G2_9, Date: 22-Nov-2016, Time: 11:28:50, ID: ST161122G2-9 PFC CS4.5 16K1712, Description: PFC CS4.5 16K17121 A

8:2 FTS



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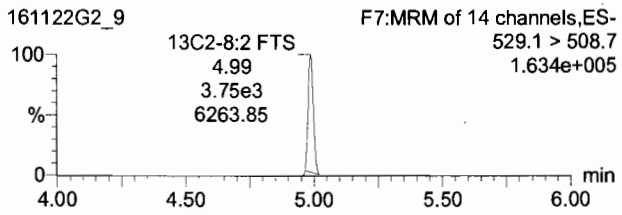
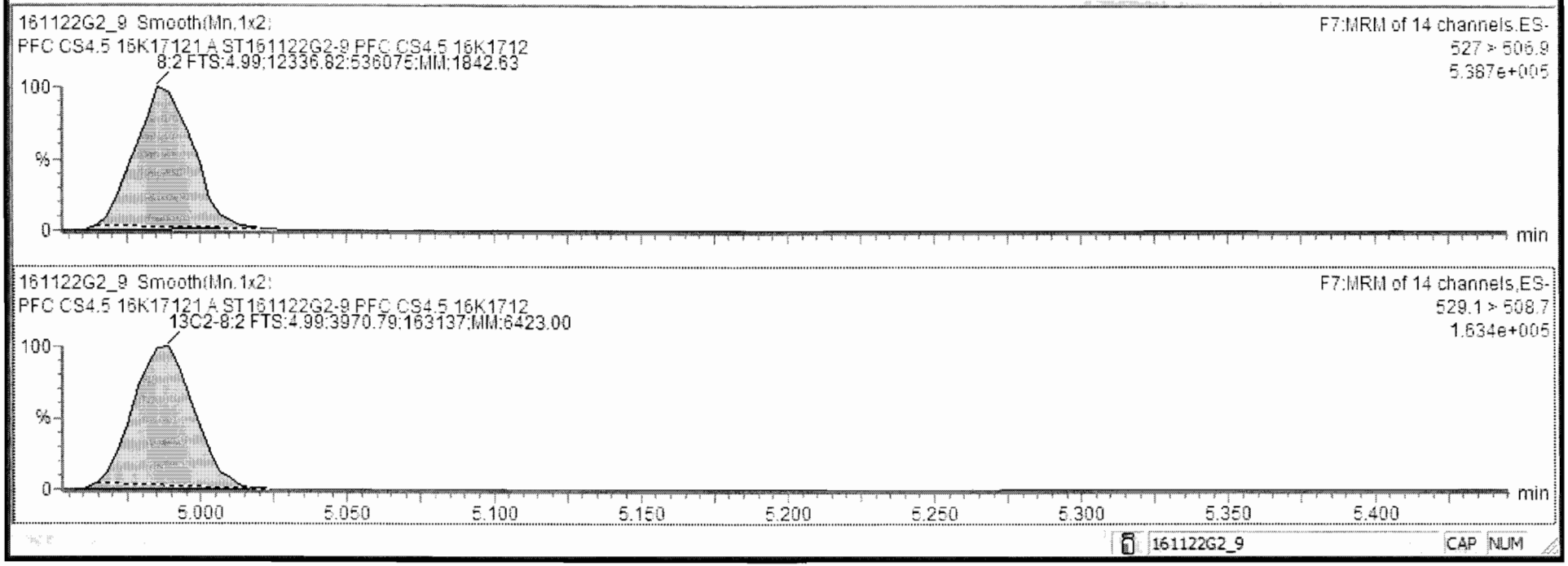


TargetLynx - 161122G2-CRV.qld * - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_9 - ST161122G2-9 PFC CS4.5 16K1712 - PFC CS4.5 16K17121 A

	Name	Trace	Area	RRF	Wt/VoL	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	4.00e4		1.000	3.47	3.47	74.5	YES	99.3	0.0019930
5	PFHpA	363 > 318.9	1.27e5		1.000	3.97	3.98	75.5	YES	100.7	0.0962936
6	PFHxS	398.9 > 79.6	5.41e4		1.000	4.09	4.09	73.4	YES	97.8	0.0272887
7	6:2 FTS	427.1 > 407	1.61e4		1.000	4.32	4.32	66.1	YES	88.1	0.4772740
8	PFOA	413 > 368.7	1.30e5		1.000	4.37	4.37	75.6	YES	100.8	0.0000000
9	PFHpS	449 > 98.7	1.27e4		1.000	4.37	4.46	72.8	YES	97.0	0.3559161
10	PFOS	499 >79.9	3.52e4		1.000	4.77	4.77	73.6	YES	98.2	0.2377618
11	PFNA	463 > 418.8	1.10e5		1.000	4.71	4.71	68.0	YES	90.7	0.1259394
12	PFDA	513 > 468.8	3.19e4		1.000	5.01	5.01	75.4	NO	100.5	0.0517738
13	8:2 FTS	527 > 506.9	1.23e4		1.000	4.99	4.99	84.1	YES	112.1	0.1062973
14	13C3-PFBA	216.1 > 171.8	1.98e4	1.21	1.000	1.93	1.93	12.4	NO	99.3	0.0041429
15	13C3-PFPeA	266>221.8	8.14e3	0.448	1.000	2.84	2.85	12.4	NO	99.0	0.0056902
16	13C3-PFBS	302.0 > 98.8	5.28e3	0.302	1.000	3.10	3.10	11.9	NO	95.3	0.0045397



161122G2_9 CAP NUM

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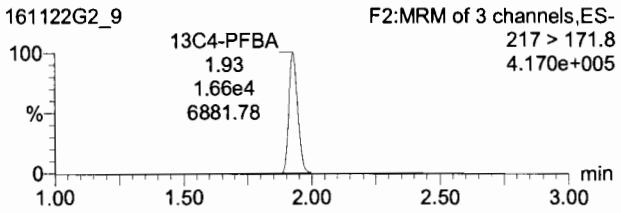
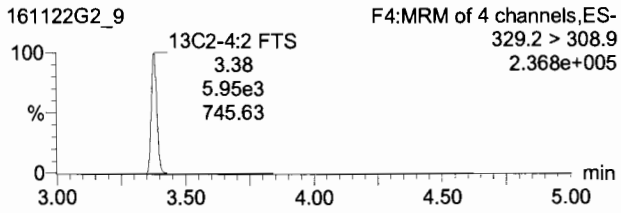
Name: 161122G2_9, Date: 22-Nov-2016, Time: 11:28:50, ID: ST161122G2-9 PFC CS4.5 16K1712, Description: PFC CS4.5 16K17121 A

13C4-PFBA



13C2-4:2 FTS



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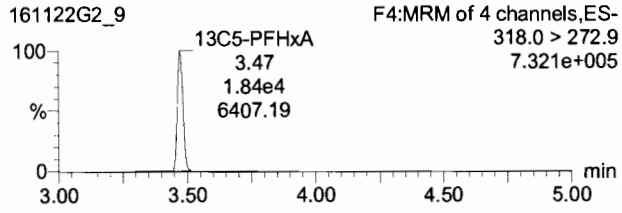

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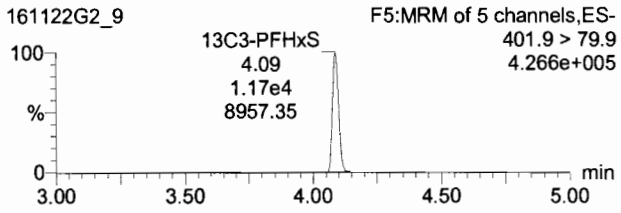

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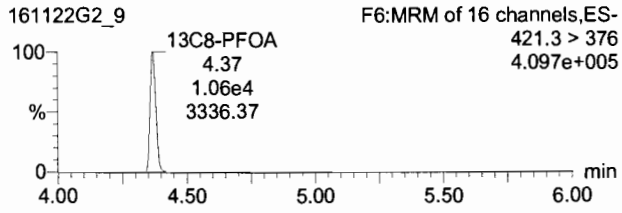

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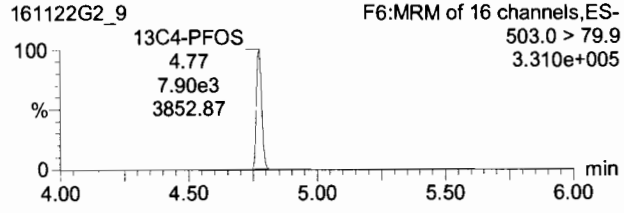

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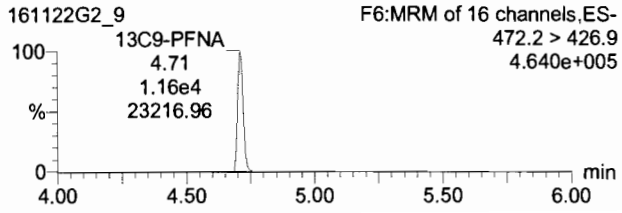

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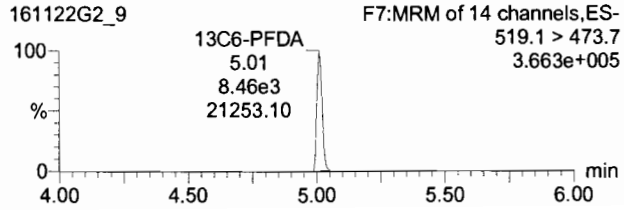

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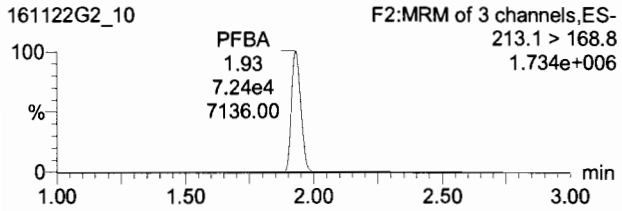

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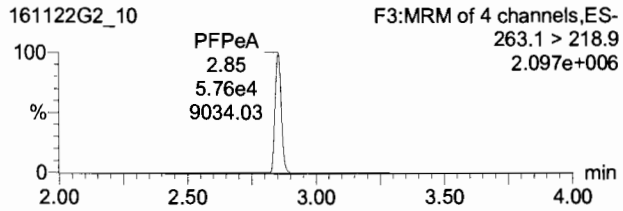

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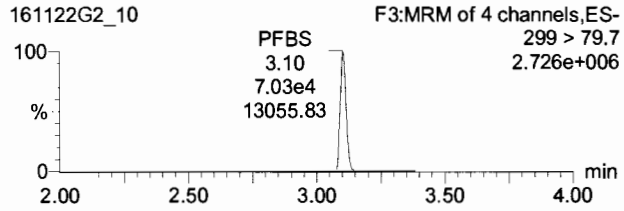

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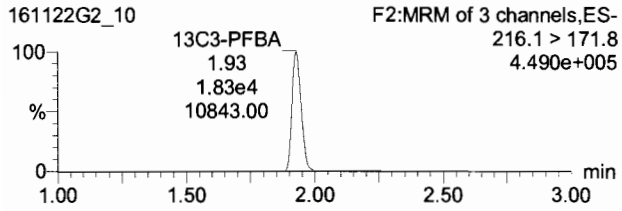

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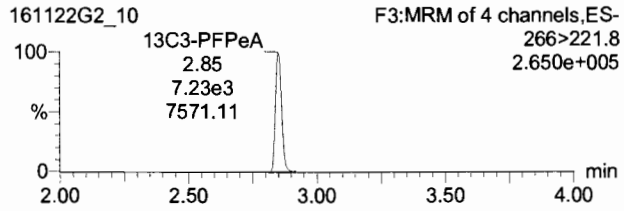

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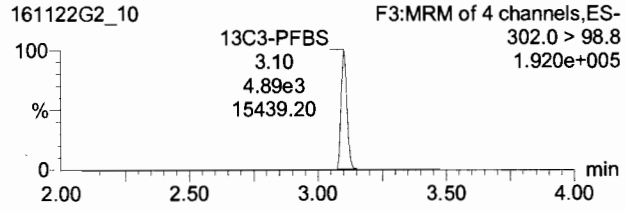

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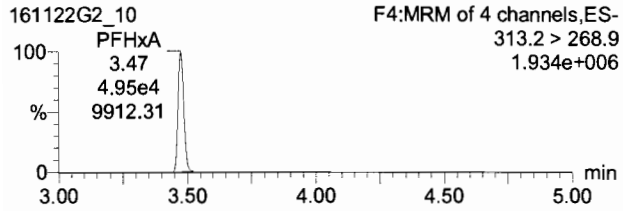

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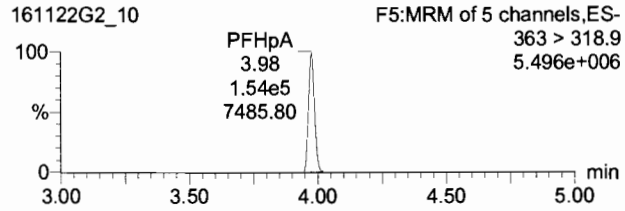

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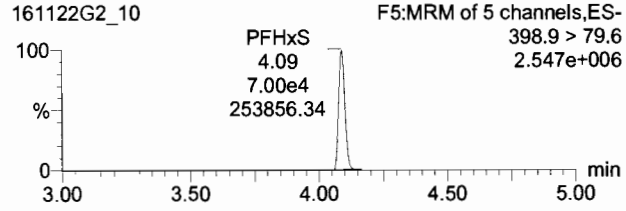

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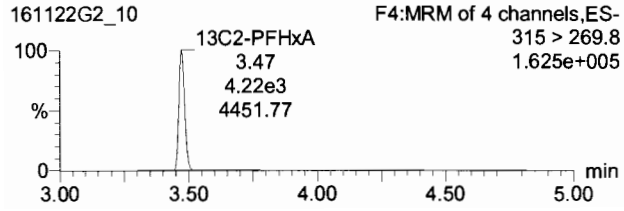

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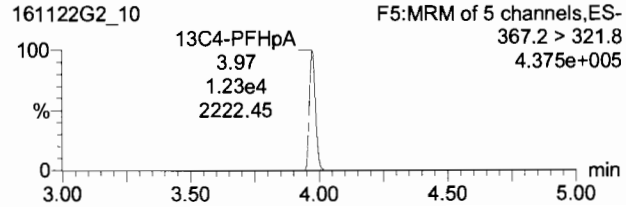

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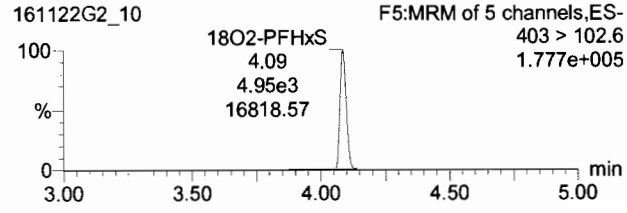

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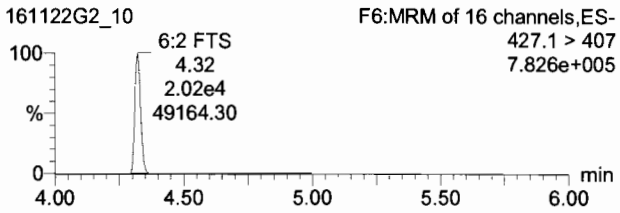

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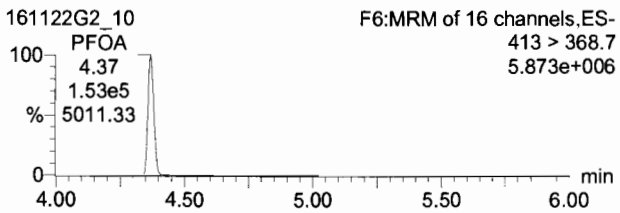

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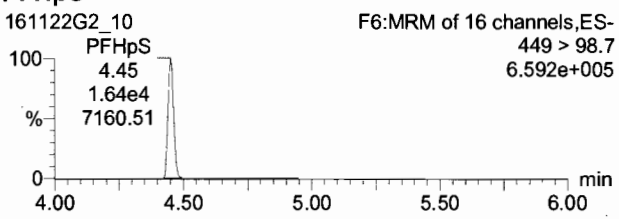

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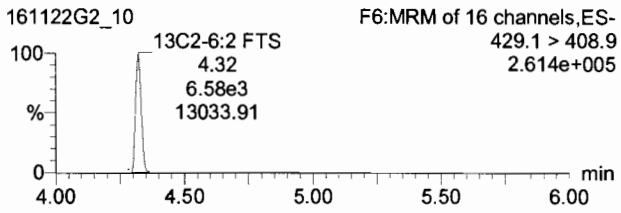
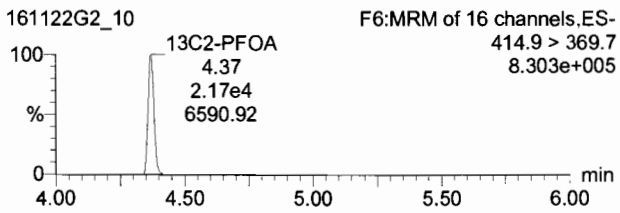


13C2-PFOA



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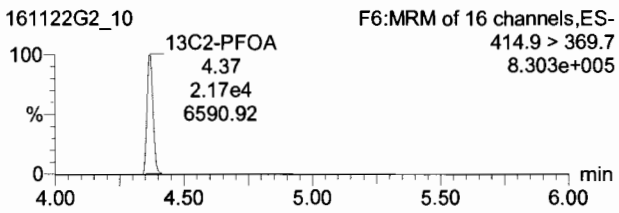

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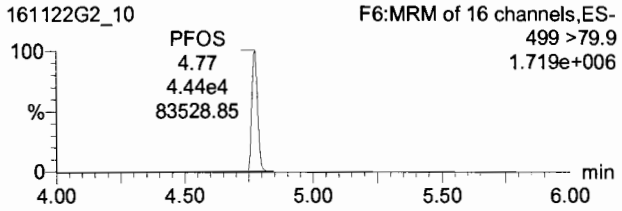
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_10, Date: 22-Nov-2016, Time: 11:41:28, ID: ST161122G2-10 PFC CS5 16K1713, Description: PFC CS5 16K1713 A

PFOS



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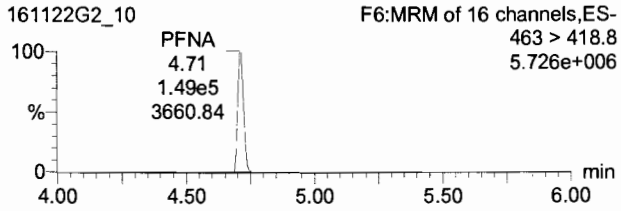

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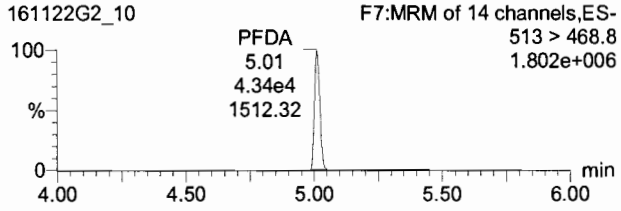
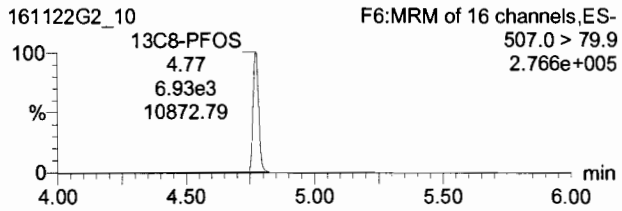
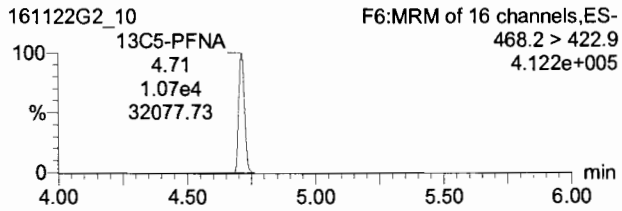


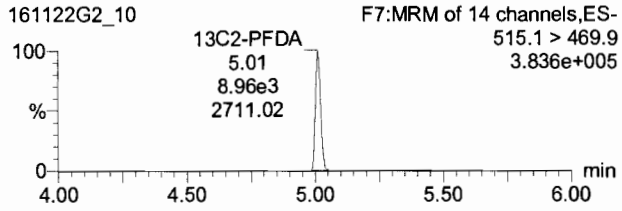
13C8-PFOS



13C5-PFNA



13C2-PFDA



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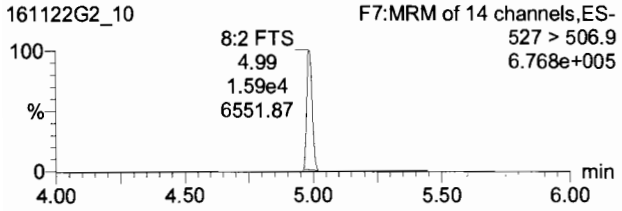
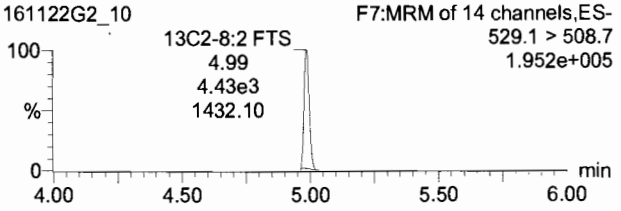
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_10, Date: 22-Nov-2016, Time: 11:41:28, ID: ST161122G2-10 PFC CS5 16K1713, Description: PFC CS5 16K1713 A

8:2 FTS



13C2-8:2 FTS

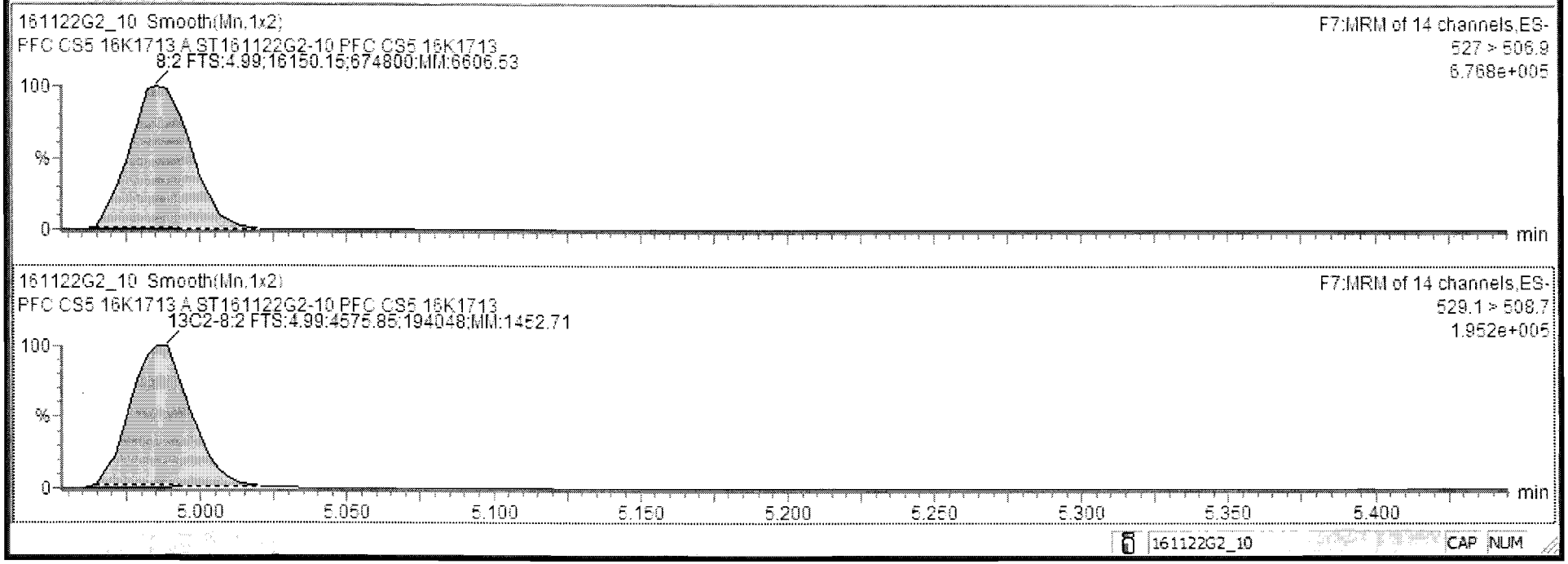


TargetLynx - 161122G2-CRV.qld * - [Chromatogram]

File Edit View Display Processing Window Help

161122G2_10 - ST161122G2-10 PFC CS5 16K1713 - PFC CS5 16K1713 A

	Name	Trace	Area	RRF	Wt/Vol	Pred.RT	RT	Conc.	>MDL	%Rec	DL
4	PFHxA	313.2 > 268.9	4.95e4		1.000	3.47	3.47	98.0	YES	98.0	0.0091412
5	PFHpA	363 > 318.9	1.54e5		1.000	3.97	3.98	100	YES	100.4	0.1228809
6	PFHxS	398.9 > 79.8	7.00e4		1.000	4.09	4.09	103	YES	102.7	0.0164978
7	6:2 FTS	427.1 > 407	2.02e4		1.000	4.32	4.32	95.3	YES	95.3	0.4475018
8	PFOA	413 > 368.7	1.53e5		1.000	4.37	4.37	97.9	YES	97.9	0.0000000
9	PFHpS	449 > 98.7	1.64e4		1.000	4.37	4.45	103	YES	103.1	0.2855073
10	PFOS	499 >79.9	4.44e4		1.000	4.78	4.77	96.1	YES	96.1	0.2015386
11	PFNA	463 > 418.8	1.49e5		1.000	4.71	4.71	106	YES	106.3	0.1762378
12	PFDA	513 > 468.8	4.34e4		1.000	5.01	5.01	101	NO	101.5	0.1963398
13	8:2 FTS	527 > 506.9	1.62e4		1.000	4.99	4.99	96.8	YES	96.8	0.0280690
14	13C3-PFBA	216.1 > 171.8	1.83e4	1.21	1.000	1.92	1.93	11.6	NO	92.9	0.0026509
15	13C3-PFPeA	266>221.8	7.23e3	0.448	1.000	2.84	2.85	11.6	NO	92.5	0.0036027
16	13C3-PFBS	302.0 > 98.8	4.89e3	0.302	1.000	3.10	3.10	11.6	NO	92.7	0.0018920



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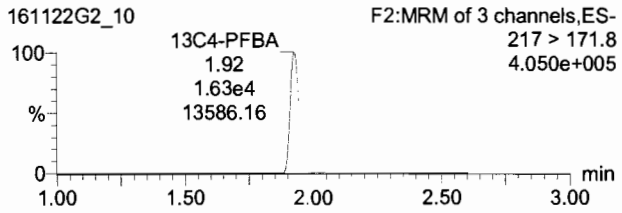
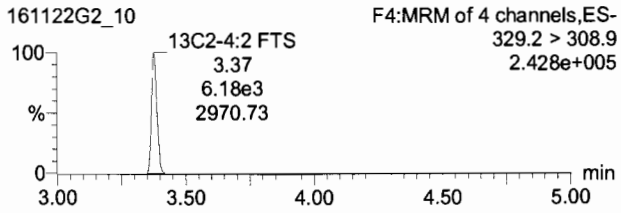
Last Altered: Tuesday, November 22, 2016 14:43:00 Pacific Standard Time
Printed: Tuesday, November 22, 2016 14:47:59 Pacific Standard Time

Name: 161122G2_10, Date: 22-Nov-2016, Time: 11:41:28, ID: ST161122G2-10 PFC CS5 16K1713, Description: PFC CS5 16K1713 A

13C4-PFBA



13C2-4:2 FTS



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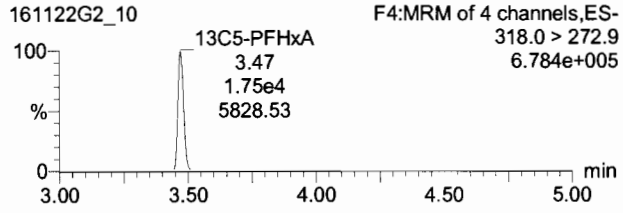
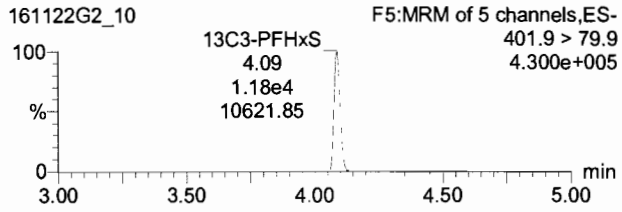


13C3-PFHxS



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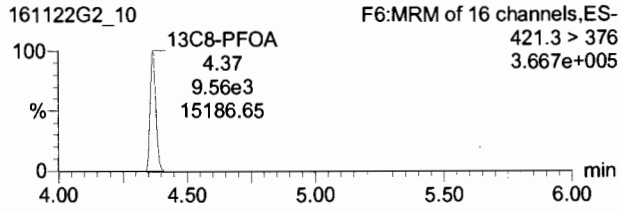
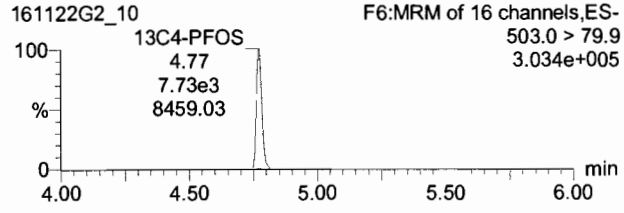
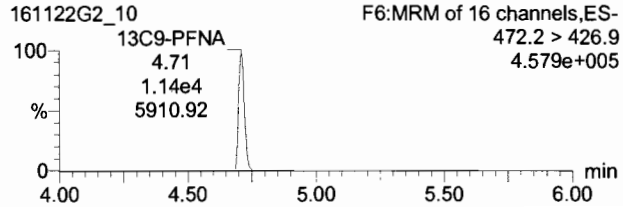


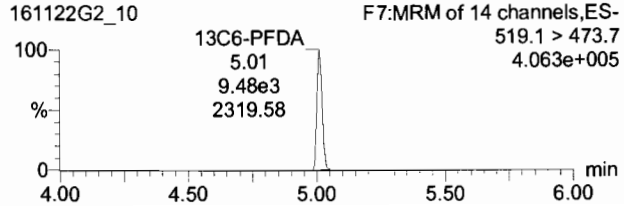
13C4-PFOS



13C9-PFNA



13C6-PFDA



Vista Analytical Laboratory Q1

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-12.qld

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Printed: Tuesday, November 22, 2016 15:30:54 Pacific Standard Time

Method: U:\G1.PRO\MethDB\PFAS_A_FULL_LINEAR.mdb 22 Nov 2016 14:48:20
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 15:25:21

Name: 161122G2_12, Date: 22-Nov-2016, Time: 12:06:50, ID: SS161122G2-1 PFC SS 16K2201, Description: PFC SS 16K2201

	#	Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
1	1	PFBA	213.1 > 168.8	1.99e4	1.93e4		1.000	1.94	26.3	105.2
2	2	PFPeA	263.1 > 218.9	1.36e4	8.81e3		1.000	2.85	19.4	77.4
3	3	PFBS	299 > 79.7	1.87e4	6.07e3		1.000	3.10	21.5	86.2
4	4	PFHxA	313.2 > 268.9	1.51e4	4.56e3		1.000	3.47	27.6	110.5
5	5	PFHpA	363 > 318.9	4.67e4	1.40e4		1.000	3.98	26.9	107.5
6	6	PFHxS	398.9 > 79.6	1.55e4	5.82e3		1.000	4.09	19.4	95.8 ~~77.7~~ (A)
7	7	6:2 FTS	427.1 > 407	4.23e3	5.80e3		1.000	4.32	20.8	83.4
8	8	PFOA	413 > 368.7	3.78e4	2.49e4		1.000	4.37	21.0	106.2 ~~83.9~~ (A)
9	9	PFHpS	449 > 98.7	4.68e3	2.49e4		1.000	4.45	25.7	103.0
10	10	PFOS	499 >79.9	9.75e3	7.54e3		1.000	4.77	19.6	99.4 ~~78.3~~ (A)
11	11	PFNA	463 > 418.8	4.01e4	1.20e4		1.000	4.71	25.5	102.1
12	12	PFDA	513 > 468.8	1.01e4	9.03e3		1.000	5.01	23.6	94.4
13	13	8:2 FTS	527 > 506.9	2.65e3	2.91e3		1.000	4.99	23.2	92.8
14	14	13C3-PFBA	216.1 > 171.8	1.93e4	1.41e4	1.205	1.000	1.94	14.2	113.8
15	15	13C3-PFPeA	266>221.8	8.81e3	1.61e4	0.448	1.000	2.85	15.3	122.1
16	16	13C3-PFBS	302.0 > 98.8	6.07e3	1.61e4	0.302	1.000	3.10	15.6	124.7
17	17	13C2-PFHxA	315 > 269.8	4.56e3	1.61e4	0.620	1.000	3.47	5.71	114.1
18	18	13C4-PFHpA	367.2 > 321.8	1.40e4	1.10e4	1.139	1.000	3.97	14.1	112.6
19	19	18O2-PFHxS	403 > 102.6	5.82e3	1.10e4	0.449	1.000	4.09	14.8	118.2
20	20	13C2-6:2 FTS	429.1 > 408.9	5.80e3	4.58e3	1.073	1.000	4.32	14.8	118.1
21	21	13C2-PFOA	414.9 > 369.7	2.49e4	8.18e3	2.262	1.000	4.37	16.8	134.6
22	22	13C8-PFOS	507.0 > 79.9	7.54e3	6.29e3	0.944	1.000	4.77	15.9	127.2
23	23	13C5-PFNA	468.2 > 422.9	1.20e4	9.84e3	1.082	1.000	4.71	14.1	113.0
24	24	13C2-PFDA	515.1 > 469.9	9.03e3	6.86e3	1.019	1.000	5.01	16.1	129.0
25	25	13C2-8:2 FTS	529.1 > 508.7	2.91e3	4.58e3	0.569	1.000	4.99	14.0	111.7
26	26	13C4-PFBA	217 > 171.8	1.41e4	1.41e4	1.000	1.000	1.94	12.5	100.0
27	27	13C2-4:2 FTS	329.2 > 308.9	4.58e3	4.58e3	1.000	1.000	3.38	12.5	100.0
28	28	13C5-PFHxA	318.0 > 272.9	1.61e4	1.61e4	1.000	1.000	3.47	12.5	100.0
29	29	13C3-PFHxS	401.9 > 79.9	1.10e4	1.10e4	1.000	1.000	4.09	12.5	100.0
30	30	13C8-PFOA	421.3 > 376	8.18e3	8.18e3	1.000	1.000	4.37	12.5	100.0
31	31	13C4-PFOS	503.0 > 79.9	6.29e3	6.29e3	1.000	1.000	4.77	12.5	100.0

75-125

AC
11/22/16
PW
11/23/16

(A) Percent recovery based on linear isomer only.

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-12.qld

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Printed: Tuesday, November 22, 2016 15:30:54 Pacific Standard Time

Name: 161122G2_12, Date: 22-Nov-2016, Time: 12:06:50, ID: SS161122G2-1 PFC SS 16K2201, Description: PFC SS 16K2201

	#-Name	Trace	Response	IS Resp	RRF	Wt/Vol	RT	Conc.	%Rec
32	32 13C9-PFNA	472.2 > 426.9	9.84e3	9.84e3	1.000	1.000	4.71	12.5	100.0
33	33 13C6-PFDA	519.1 > 473.7	6.86e3	6.86e3	1.000	1.000	5.01	12.5	100.0

Dataset: U:\G1.PRO\Results\2016\161122G2\161122G2-1.qld

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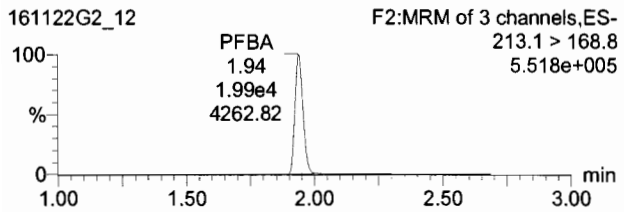
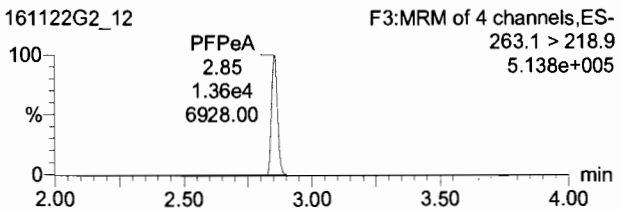
Calibration: U:\G1.PRO\CurveDB\C18_VAL-PFC_Q1_11-22-16_FULL_A.cdb 22 Nov 2016 14:59:27

Name: 161122G2_12, Date: 22-Nov-2016, Time: 12:06:50, ID: SS161122G2-1 PFC SS 16K2201, Description: PFC SS 16K2201

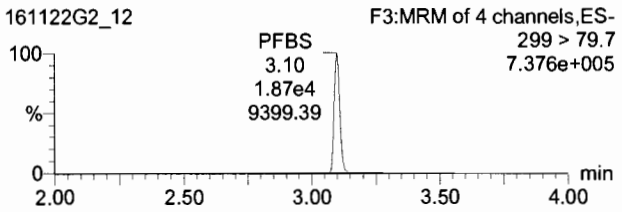
PFBA



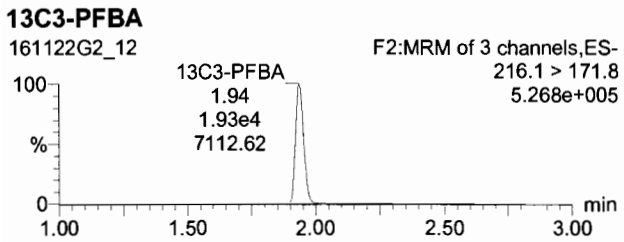
PFPeA



PFBS



13C3-PFBA



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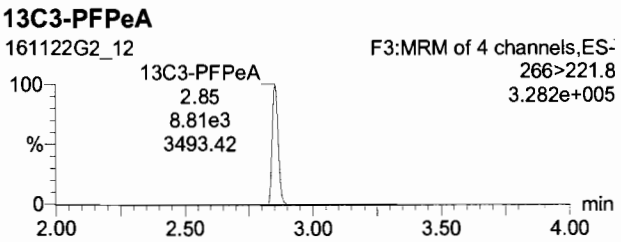

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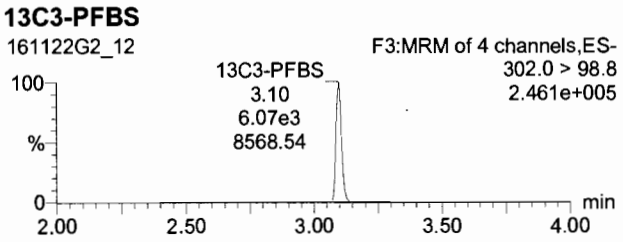
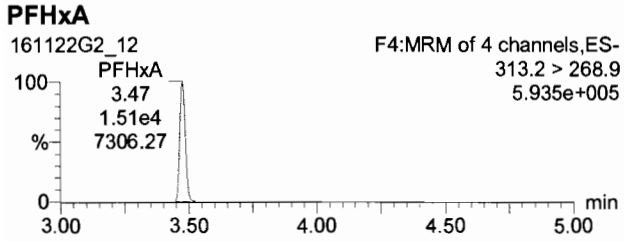
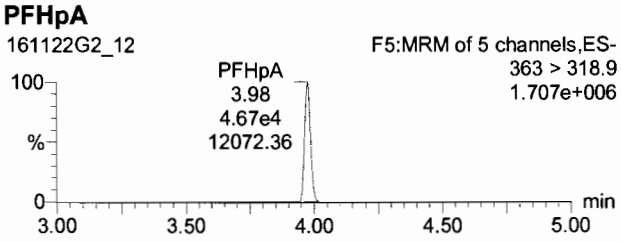


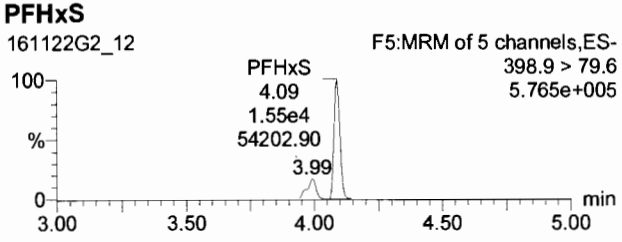
PFHxA



PFHpA



PFHxS



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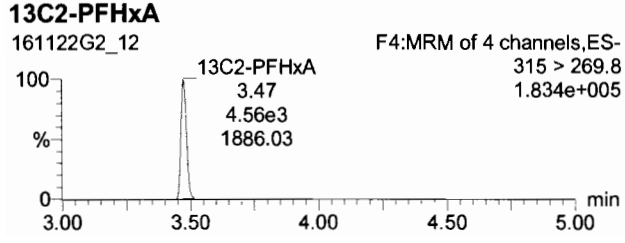

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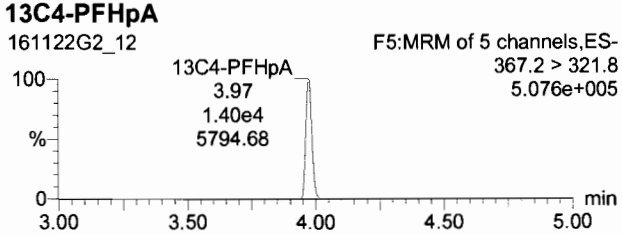
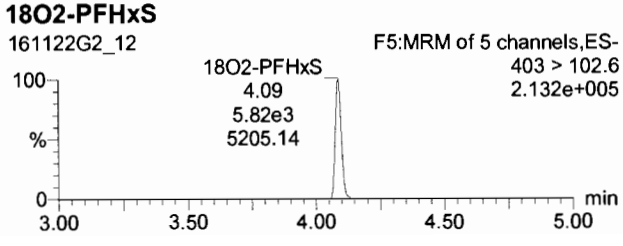


18O2-PFHxS



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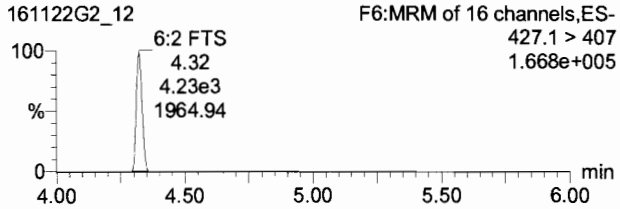
6:2 FTS



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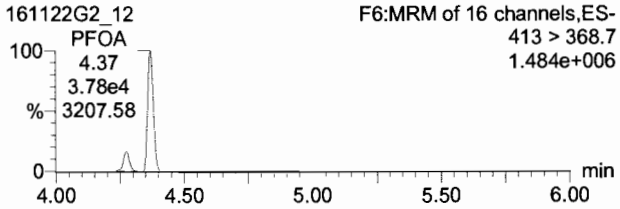

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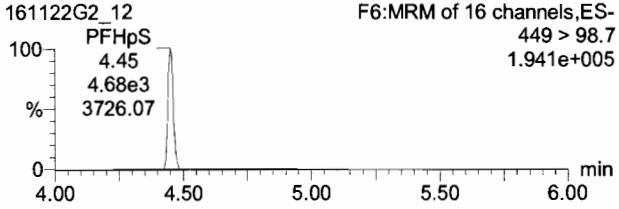
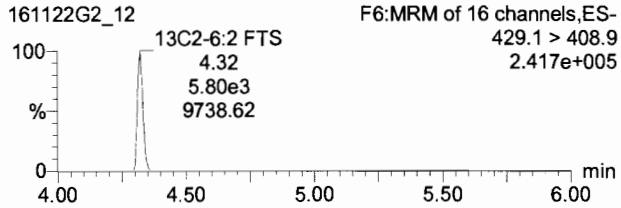
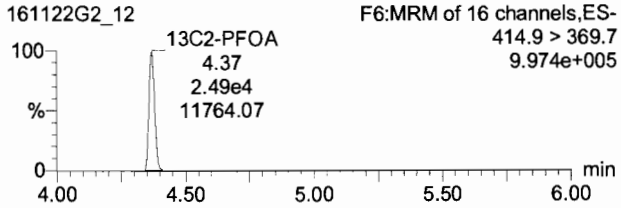


13C2-6:2 FTS



13C2-PFOA



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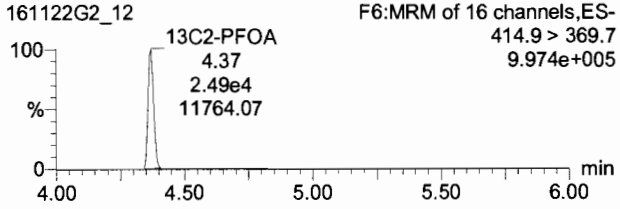

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Printed: Tuesday, November 22, 2016 15:11:00 Pacific Standard Time

Name: 161122G2_12, Date: 22-Nov-2016, Time: 12:06:50, ID: SS161122G2-1 PFC SS 16K2201, Description: PFC SS 16K2201

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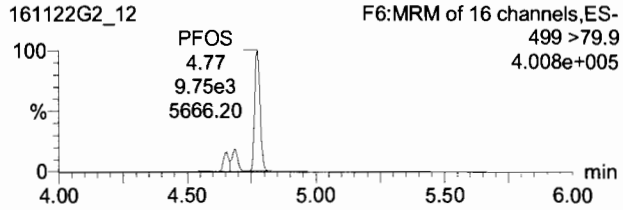

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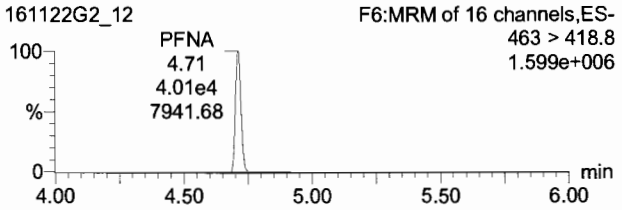

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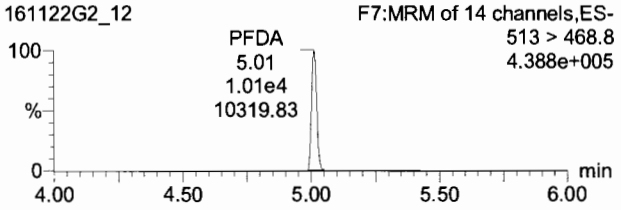
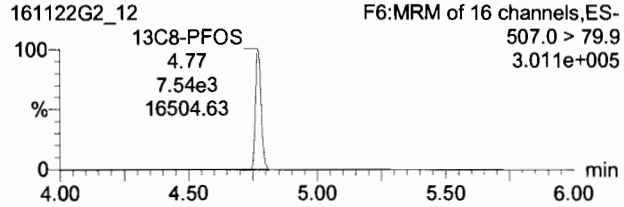
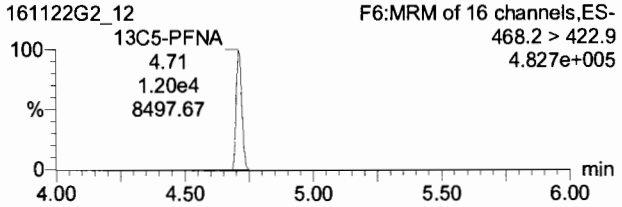


13C8-PFOS



13C5-PFNA



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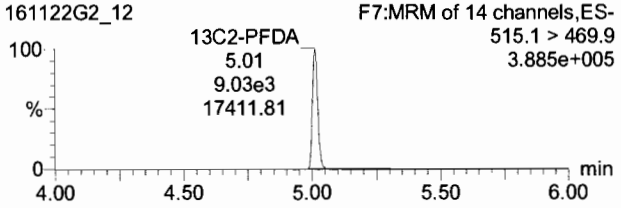

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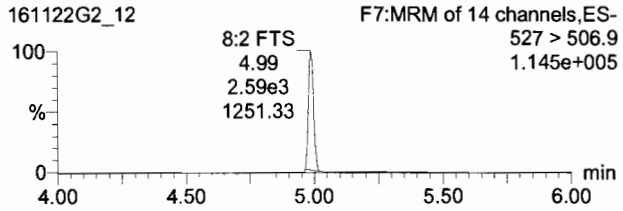
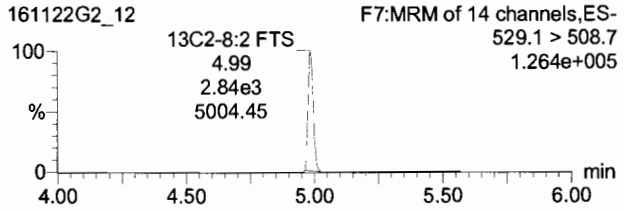
8:2 FTS



13C2-8:2 FTS



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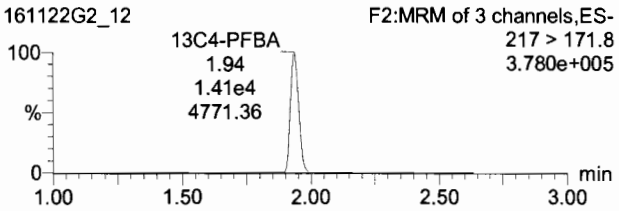
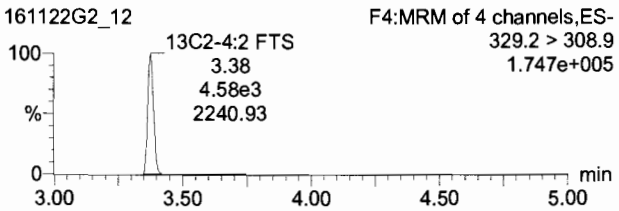
13C4-PFBA



13C2-4:2 FTS



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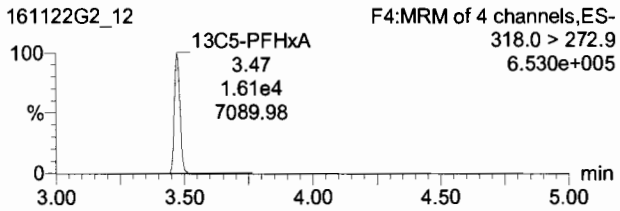

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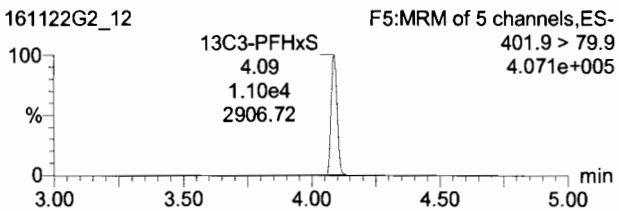

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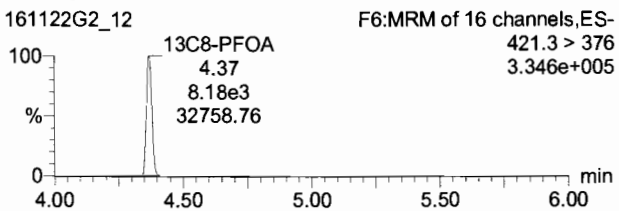

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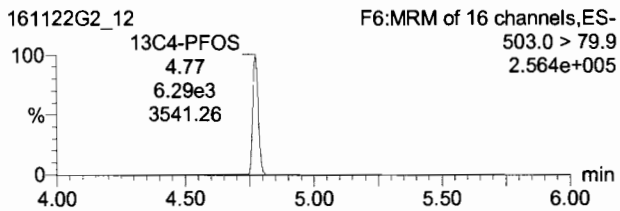

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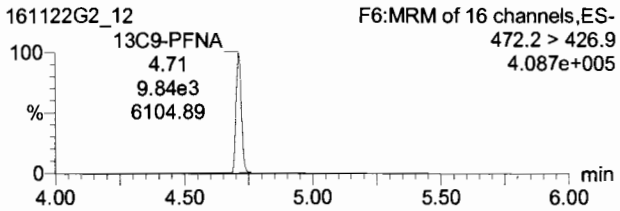

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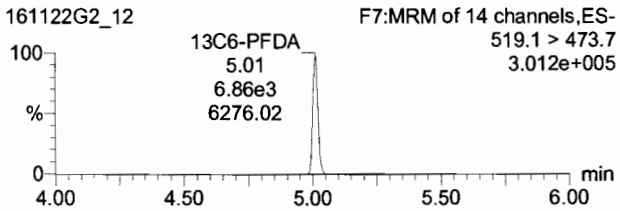

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ACID
(PFOA)","","","TRG","Yes","N","","Y","0.625","1.92","7.68","NG_L","NG_L","","","","","","","","","","","","","","","","","","
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LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

AMEC Foster Wheeler
7376 SW Durham Road
Portland, OR 97224
Attn: Ms. Marina Mitchell

January 10, 2017

SUBJECT: NAS Alameda Point, BGMP, Data Validation

Dear Ms. Mitchell,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on November 29, 30 & December 8, 16, 2016. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #37601:

SDG #	Fraction
320-22797-1, 320-22986-1, 320-23030-1 320-23072-1, 320-23077-1, 320-23087-1 320-23100-1, 320-23173-1, 320-23188-1 1601348, 1601359, 1601360, 1601380 1601381, 1601395, 1601391 160-19638-1, 160-19668-1, 101NJ	Volatiles, Vinyl Chloride, Semivolatiles, Organochlorine Pesticides, Metals, Gasoline Range Organics, TPH as Extractables, Wet Chemistry, Polychorinated Dioxins/Dibenzofurans, Methane, Ethane, & Ethylene, Perfluorinated Alkyl Acids, Gross Alpha Beta, Radium-226, Radium-228, Tritium, Isotopic Uranium, Strontium-90, Cesium-137- & Cobalt-60, Dechlorinating Bacteria

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, Field Sampling Plan and Quality Assurance Project Plan, for Basewide Groundwater Monitoring Program, Alameda Point, California, August 2015
- U.S. Department of Defense Quality Systems Manual for Environmental Laboratories, Version 5.0, July 2013
- Multi Agency Radiological Laboratory Analytical Protocols, Manual, July 2004
- USEPA, Contract Laboratory Program National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins and Chlorinated Dibenzofurans, Data Review, September 2011
- USEPA, National Functional Guidelines for Superfund Organic Methods Data Review, October 2013
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, January 2010
- 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,

Pei Geng
Project Manager/Senior Chemist

23,146 pages-SF EDD (RV4 - Added S) Attachment 1

80/20 Client Select

LDC #37601 (AMEC Foster Wheeler-Portland, OR / NAS Alameda Basewide)

LDC	SDG#	DATE REC'D	(2) DATE DUE	VOA (8260B)		Vinyl Cl. (TO-15)		SVOA (8270C)		SVOA (8270D -SIM)		Organo Pest. (8081A)		Metals (6020A)		D.Metals (6020A)		GRO (8260B)		DRO (8015B)		Dioxins (8290A		Methane Ethane Ethylene		PFAs (537)		D.Metals 7470A)											
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	W	S	W	S
A	320-22797-1	11/29/16	12/13/16	-	-	-	-	-	-	-	-	-	-	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-										
A	320-22797-1	11/29/16	12/13/16	-	-	-	-	-	-	-	-	-	-	-	-	3	0	-	-	-	-	-	-	-	-	-	-	-	-										
B	320-22986-1	11/29/16	12/13/16	2	0	-	-	4	0	-	-	5	0	0	0	6	0	1	0	1	0	0	0	0	0	-	-	6	0										
B	320-22986-1	11/29/16	12/13/16	6	0	-	-	3	0	-	-	2	0	2	0	2	0	2	0	2	0	2	0	2	0	-	-	2	0										
C	320-23030-1	11/29/16	12/13/16	7	0	-	-	6	0	-	-	6	0	2	0	6	0	2	0	2	0	4	0	2	0	-	-	6	0										
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E	320-23077-1	11/29/16	12/13/16	-	-	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
E	320-23077-1	11/29/16	12/13/16	-	-	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
F	320-23087-1	11/29/16	12/13/16	7	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	0	-	-	-	-										
G	320-23100-1	11/29/16	12/13/16	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
H	320-23173-1	11/29/16	12/13/16	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0	-	-	-	-										
I	320-23188-1	11/29/16	12/13/16	2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
J	1601348	11/29/16	12/13/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	0	-	-										
K	1601359	11/29/16	12/13/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0	-	-										
L	1601360	11/29/16	12/13/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0	-	-										
M	1601380	11/29/16	12/13/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0	-	-										
N	1601381	11/29/16	12/13/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	0	-	-										
O	1601395	11/30/16	12/14/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0	-	-										
P	1601391	12/08/16	12/22/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	0	-	-										
Total	J/PG			46	0	2	0	13	0	12	0	16	0	15	0	31	0	15	0	15	0	6	0	25	0	33	0	28	0	0	0	0	0	0	0	0	0	0	257

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B review). These sample counts do not include DL, RE, MS, MSD, or DUP's.

L:\AMEC FW\Alameda\37601ST_BGMP.wpd

80/20 Client Select

LDC #37601 (AMEC Foster Wheeler-Portland, OR / NAS Alameda Basewide)

LDC	SDG#	DATE REC'D	(2) DATE DUE	Cl,SO_4 (300.0)		NO_2-N NO_3-N (300.0		Sulfide (9034)		Total Cyanide (9012A)		Alk. (2320B)		TDS (2540C)		TOC (9060)		Salinity (2520B)		Gross A&B (900.0)		Ces-137 /Col. 60 (901.1)		Rad-226 (903.0)		Rad-228 (904.0)		Sr. 90 (905)		Total Trit. (906.0)		Iso. U (A-01-R)		Dehalo. (CENSUS)					
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	W	S	W	S
A	320-22797-1	11/29/30	12/13/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
A	320-22797-1	11/29/30	12/13/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
B	320-22986-1	11/29/30	12/13/16	0	0	0	0	0	0	5	0	0	0	0	0	0	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
B	320-22986-1	11/29/30	12/13/16	2	0	2	0	2	0	5	0	2	0	2	0	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
C	320-23030-1	11/29/30	12/13/16	2	0	2	0	2	0	6	0	2	0	2	0	2	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
D	320-23072-1	11/29/30	12/13/16	5	0	5	0	6	0	1	0	5	0	7	0	7	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
D	320-23072-1	11/29/30	12/13/16	4	0	4	0	5	0	2	0	4	0	2	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
F	320-23087-1	11/29/30	12/13/16	7	0	7	0	7	0	-	-	7	0	-	-	7	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
G	320-23100-1	11/29/30	12/13/16	4	0	4	0	4	0	-	-	4	0	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	--	--				
H	320-23173-1	11/29/30	12/13/16	4	0	4	0	4	0	-	-	4	0	-	-	4	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
I	320-23188-1	11/29/30	12/13/16	1	0	1	0	1	0	-	-	1	0	1	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-						
Q	160-19638-1	12/16/16	01/04/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7	0	7	0	7	0	7	0	7	0	7	0	7	0	-	-				
R	160-19668-1	12/16/16	01/04/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2	0	2	0	2	0	2	0	2	0	2	0	-	-				
S	101NJ	12/16/16	01/04/16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5	0				
Total	J/PG			29	0	29	0	31	0	19	0	29	0	18	0	26	0	6	0	9	0	9	0	9	0	9	0	9	0	9	0	9	0	5	0	0	0	0	255

Shaded cells indicate Stage 4 validation (all other cells are Stage 2B review). These sample counts do not include DL, RE, MS, MSD, or DUP's.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 13, 2016

Parameters: Dissolved Metals

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22797-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
28SW02_161017	320-22797-1	Water	10/17/16
28SW03_161017	320-22797-2	Water	10/17/16
28SW08_161017	320-22797-3	Water	10/17/16
28SW03_161017MS	320-22797-2MS	Water	10/17/16
28SW03_161017MSD	320-22797-2MSD	Water	10/17/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Arsenic and Copper by Environmental Protection Agency (EPA) SW 846 Method 6020A

All sample results were subjected to Stage 4 evaluation, 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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the method.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

Sample EB11-161017 was identified as an equipment blank. No contaminants were found.

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
28SW03_161017MS/MSD (28SW03_161017)	Copper	-	132 (85-118)	NA	-

Relative percent differences (RPD) were within QC limits.

VII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) 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. Sample Result Verification

All sample result verifications were acceptable.

XII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Dissolved Metals - Data Qualification Summary - SDG 320-22797-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Dissolved Metals - Laboratory Blank Data Qualification Summary - SDG 320-22797-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Dissolved Metals - Field Blank Data Qualification Summary - SDG 320-22797-1

No Sample Data Qualified in this SDG

LDC #: 37601A4a
SDG #: 320-22797-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 4

Date: 12/6/16
Page: 1 of 1
Reviewer: GG
2nd Reviewer:

METHOD: Dissolved Metals (EPA SW 846 Method 6020A)

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.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	A	
VI.	Field Blanks	ND	EB=4
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	
XIII.	Sample Result Verification	A	
XIV.	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	28SW02_161017	320-22797-1	Water	10/17/16
2	28SW03_161017	320-22797-2	Water	10/17/16
3	28SW08_161017	320-22797-3	Water	10/17/16
4	~~EB11-161017~~	320-22797-5	~~Water~~	~~10/17/16~~ G
5	28SW03_161017MS	320-22797-2MS	Water	10/17/16
6	28SW03_161017MSD	320-22797-2MSD	Water	10/17/16
7				
8				
9				
10				
11				
12				

Notes:

DC #: 37601A4a

VALIDATION FINDINGS CHECKLIST

Reviewer: CR
2nd Reviewer: [illegible]

Method: Metals (EPA SW 846 Method 6010/6020/7000)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓	✓		
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were the low standard checks within 70-130%	✓			
Were all initial calibration correlation coefficients within limits as specified by the method?	✓			
IV. 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.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
VI. Matrix spike/Matrix spike 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 +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. 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% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?	✓			
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?	✓			
Were all percent differences (%Ds) < 10%?	✓			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

DC #: 37601A4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-3		Al, Sb, (As), Ba, Be, Cd, Ca, Cr, Co, (Cu), Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
QC:S6		Al, Sb, (As), Ba, Be, Cd, Ca, Cr, Co, (Cu), Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____

Comments: Mercury by CVAA if performed

LDC #: 37601A4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer:
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

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 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
	5/6	w	Cu		132 (85-118)		2	Jdet/A (ND)

Comments:

LDC #: 37601A4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: CR
2nd Reviewer: [illegible]

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

%R = Found / True x 100 Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV	ICP/MS (Initial calibration)	As	0.0760S	0.08	95	95	Y
	CVAA (Initial calibration)						
	ICP (Continuing calibration)						
CCV (00:16)	ICP/MS (Continuing calibration)	Cu	0.1019	0.1	102	102	Y
	CVAA (Continuing calibration)						

Comments:

LDC #: 37601A4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ 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:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check	As	0.0972	0.1	97	97	Y
LCS	Laboratory control sample	Cu	0.2068	0.2	103	103	
5	Matrix spike	As	(SSR-SR) 0.2045	0.2	102	102	
5|6	Duplicate	Cu	0.2359	0.2640	11	11	
2	ICP serial dilution	As	ND	ND	NC	NC	

Comments: _____

LDC #: 37601A4a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: AL
2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

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 and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for Cu were recalculated and verified using the following equation:

Concentration = (RD)(FV)(Dil) / (In. Vol.)

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation:

$$1 = \frac{1.0386\ \mu g/L\ (50)}{1000} = 0.0519\ mg/L$$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	1	Cu	0.0519	0.0519	Y
	3	↓	0.0648	0.0648	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Salinity

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22797-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
28SW02_161017**	320-22797-1**	Water	10/17/16
28SW03_161017	320-22797-2	Water	10/17/16
28SW08_161017	320-22797-3	Water	10/17/16
DUP09-161017	320-22797-4	Water	10/17/16
28SW02_161017DUP	320-22797-1DUP	Water	10/17/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Salinity by Standard Method 2520B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration of the method were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met for the method when applicable.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. 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) analyses were not required by the method.

VII. Duplicates

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples 28SW03_161017 and DUP09-161017 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (ppth)		RPD (Limits)	Difference (Limits)	Flag	A or P
	28SW03_161017	DUP09-161017				
Salinity	23.3	23.5	1 (≤30)	-	-	-

X. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XI. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Salinity - Data Qualification Summary - SDG 320-22797-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Salinity - Laboratory Blank Data Qualification Summary - SDG 320-22797-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Salinity - Field Blank Data Qualification Summary - SDG 320-22797-1

No Sample Data Qualified in this SDG

LDC #: 37601A6
SDG #: 320-22797-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/10/16
Page: 1 of 1
Reviewer: a
2nd Reviewer: a

METHOD: (Analyte) Salinity (SM 2520B)

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	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	(2,4)
X.	Sample result verification	N	Not reviewed for Stage 2B validation
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:

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	28SW02_161017**	320-22797-1**	Water	10/17/16
2	28SW03_161017	320-22797-2	Water	10/17/16
3	28SW08_161017	320-22797-3	Water	10/17/16
4	DUP09-161017	320-22797-4	Water	10/17/16
5	28SW02_161017DUP	320-22797-1DUP	Water	10/17/16
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

LDC #: 3760A6

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

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?			✓	

LDC #: 37604A6

VALIDATION FINDINGS CHECKLIST

Reviewer: CR
2nd Reviewer:

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#: 37601A6 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Reviewer: CA
2nd Reviewer: CA

Inorganics, Method See Cover

Analyte	Concentration (ppth)		RPD (≤30)	Difference	Limits	Qualification (Parent only)
	2	4				
Salinity	23.3	23.5	1			

V:\FIELD DUPLICATES\FD_inorganic\37601A6.wpd

LDC #: 37601A6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: 9
2nd Reviewer: 9

METHOD: Inorganics, Method Sea cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ 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:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ 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	Salinity	9.52	10	95	95	Y
N	Matrix spike sample		(SSR-SR)				
5	Duplicate sample	Salinity	16.77	16.81	0.2	0.2	Y

Comments: _____

LDC #: 31601A6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of
Reviewer: CA
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 Salinity reported with a positive detect were recalculated and verified using the following equation:

Concentration = From Raw Data

Recalculation: 16.77 s/cm

#	Sample ID	Analyte	Reported Concentration (ppth)	Calculated Concentration (ppth)	Acceptable (Y/N)
	1	Salinity	16.8	16.8	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Volatiles

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22986-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024**	320-22986-1**	Water	10/24/16
M002A-R_161024**	320-22986-2**	Water	10/24/16
M003E-R_161024	320-22986-3	Water	10/24/16
M001E-R_161024**	320-22986-4**	Water	10/24/16
M026A-R_161024	320-22986-5	Water	10/24/16
M028A-R_161024**	320-22986-6**	Water	10/24/16
M028E-R_161024**	320-22986-7**	Water	10/24/16
DUP01_161024**	320-22986-8**	Water	10/24/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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 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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 15.0%.

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.

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 TB01_161024 was identified as a trip blank. No contaminants were found.

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB01_161024	10/24/16	Acetone	4.12 ug/L	All samples in SDG 320-22986-1
EB02_161024	10/24/16	Acetone	3.93 ug/L	All samples in SDG 320-22986-1

Sample SB01_161024 was identified as a source blank. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks.

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 was insufficient sample volume for analysis of the matrix spike and matrix spike duplicate.

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 M028E-R_161024** and DUP01_161024** were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024**	DUP01_161024**				
1,1-Dichloroethene	2.46	3.08	-	0.62 (≤20.0)	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024**	DUP01_161024**				
1,2-Dichlorobenzene	12.8	16.1	-	3.3 (≤20.0)	-	-
1,4-Dichlorobenzene	2.65	3.33	-	0.68 (≤20.0)	-	-
Benzene	5.43	9.25	-	3.82 (≤20.0)	-	-
Chlorobenzene	26.6	32.9	-	6.3 (≤20.0)	-	-
cis-1,2-Dichloroethene	73.2	181	85 (≤30)	-	J (all detects)	A
trans-1,2-Dichloroethene	1.28	8.00U	-	6.72 (≤20.0)	-	-
Vinyl chloride	392	800	68 (≤30)	-	J (all detects)	A
1,2-Dichloroethane	5.00U	9.31	-	4.31 (≤20.0)	-	-

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.

Due to field duplicate RPD, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Volatiles - Data Qualification Summary - SDG 320-22986-1

Sample	Compound	Flag	A or P	Reason
M028E-R_161024** DUP01_161024**	cis-1,2-Dichloroethene Vinyl chloride	J (all detects) J (all detects)	A	Field duplicates (RPD)

NAS Alameda Point, BGMP
Volatiles - Laboratory Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Field Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

LDC #: 37601B1
SDG #: 320-22986-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/8/16
Page: 1 of 1
Reviewer: 9
2nd Reviewer: 2

METHOD: GC/MS Volatiles (EPA SW846 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%. r^2 ICV ≤ 20%
IV.	Continuing calibration Endrin	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	SB=9. TB=10. EB=11,12
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	insufficient sample
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D=7+8
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation
XIV.	System performance	A	Not reviewed for Stage 2B validation
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	M001A-R_161024**	320-22986-1**	Water	10/24/16
2	M002A-R_161024**	320-22986-2**	Water	10/24/16
3	M003E-R_161024	320-22986-3	Water	10/24/16
4	M001E-R_161024**	320-22986-4**	Water	10/24/16
5	M026A-R_161024	320-22986-5	Water	10/24/16
6	M028A-R_161024**	320-22986-6**	Water	10/24/16
7	M028E-R_161024**	320-22986-7**	Water	10/24/16
8	DUP01_161024**	320-22986-8**	Water	10/24/16
~~9~~	~~SB01_161024~~	~~320-22986-9~~	~~Water~~	~~10/24/16~~
~~10~~	~~TB01_161024~~	~~320-22986-10~~	~~Water~~	~~10/24/16~~
~~11~~	~~EB01_161024~~	~~320-22986-11~~	~~Water~~	~~10/24/16~~
~~12~~	~~EB02_161024~~	~~320-22986-12~~	~~Water~~	~~10/24/16~~
13	MB 320-134973/44			

LDC #: 32018B1

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: M

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 #: 35601B7

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: M

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	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Isopropyl ether
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 37601B1

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: 9
2nd Reviewer: 2

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: FB Associated Samples: all

Compound	Blank ID	Blank ID	Sample Identification							
	11	12								
Methylene chloride										
Acetone	4.12	3.93								
Chloroform										

Blank units:_____ **Associated sample units:**_____
Sampling date:_____
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ Associated Samples:_____

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
Chloroform										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC#: 37601B1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: PG
2nd Reviewer: A

METHOD: GC/MS 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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	7	8				
H	2.46	3.08		0.62	≤20.0	
JJJ	12.8	16.1		3.3	≤20.0	
HHH	2.65	3.33		0.68	≤20.0	
V	5.43	9.25		3.82	≤20.0	
DD	26.6	32.9		6.3	≤20.0	
QQQ	73.2	181	85			blots/A
PPP	1.28	8.00U		6.72	≤20.0	
C	392	800	68			blots/A
L	5.00U	9.31		4.31	≤20.0	

V:\FIELD DUPLICATES\37601B1_Amec.wpd

LDC #: 37601B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 0

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 (20 std)	Recalculated RRF (20 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/18/16	RRR (1st internal standard)	0.2653	0.2653	0.2547	0.2547	4.7	4.7
			AA (2nd internal standard)	0.3521	0.3521	0.3522	0.3522	3.3	3.3
			HHH (3rd internal standard)	1.2447	1.2447	1.2431	1.2431	2.3	2.3
			(4th internal standard)						
2	ICAL	7/6/16	PPP (1st internal standard)	0.8416	0.8416	0.7911	0.7911	8.0	8.0
			(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#: 37601B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer:
2nd Reviewer: A

Method: GCMS

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
10/18/2016	HP10	Acetone	0	0.0076028	0.02
			s1	0.0355057	0.08
			s2	0.1937458	0.40
			s3	0.3659188	0.80
			s4	0.5677159	1.20
			s5	0.7291777	1.60

Regression Output		***Reported***
Constant	*0.002038*	*-0.08900*
Std Err of Y Est		
R Squared	*0.999140*	*0.999000*
Degrees of Freedom		
X Coefficient(s)	*0.460350*	*0.46920*
Std Err of Coef.		
Correlation Coefficient	*0.999570*	
Coefficient of Determination (r^2)	*0.999140*	*0.999000*

NR: not reported

LDC#: 37601B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: M

Method: GCMS

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
10/18/2016	HP10	t-Butanol	0	0.0233218	0.025
			s1	0.0424571	0.050
			s2	0.1609111	0.200
			s3	0.8259837	1.000
			s4	1.6217426	2.000
			s5	2.6318556	3.000
			s6	3.1402972	4.000

Regression Output		*Reported*
Constant	*0.013329*	*0.52550*
Std Err of Y Est		
R Squared	*0.995105*	*0.998000*
Degrees of Freedom		
X Coefficient(s)	*0.812970*	*0.81560*
Std Err of Coef.		
Correlation Coefficient	*0.997550*	
Coefficient of Determination (r^2)	*0.995105*	*0.998000*

NR: not reported

LDC #: 32618J

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

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	HSVA0910 2801	10/28/16	PPPP (1st internal standard)	0.7911	0.8258	0.8258	4.4	4.4
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
2	↓	10/28/16	QQQ (1st internal standard)	0.2577	0.2618	0.2618	2.8	2.8
			AA (2nd internal standard)	0.3522	0.3414	0.3414	3.1	3.1
			HHH (3rd internal standard)	1.243	1.25T	1.25T	1.1	1.1
			222 (4th internal standard)	200	205	205	2.3	2.3
3			F (1st internal standard)	20.0	19.5	19.5	2.5	2.5
			(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 #: 36018

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: [illegible]

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: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane	20.00	19.8	99	99	0
1,2-Dichloroethane-d4	↓	20.7	103	103	↓
Toluene-d8	↓	19.8	99	99	↓
Bromofluorobenzene	↓	19.9	99	99	✓

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 #: 37601B1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: 9
2nd Reviewer: M

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 = | LCSC - LCSDC | * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: 320-134973

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	20.0	20.0	18.13	19.70	91	91	99	99	8	8
Trichloroethene	↓	↓	18.98	19.63	95	95	98	98	3	3
Benzene			18.9T	20.0T	95	95	100	100	6	6
Toluene			19.75	20.28	9T	9T	101	101	5	5
Chlorobenzene			19.60	19.92	98	98	100	100	2	2

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 #: 37601B1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

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, QQQ:

Conc. = $\frac{(1609)(10.0)(10)}{(189222)(0.2547)(\quad)(\quad)}$

= 3.34 µg/L

#	Sample ID	Compound	Reported Concentration (µg/L)	Calculated Concentration ( )	Qualification
	2	QQQ	3.34		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Semivolatiles

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22986-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	320-22986-1	Water	10/24/16
M002A-R_161024	320-22986-2	Water	10/24/16
M001E-R_161024**	320-22986-4**	Water	10/24/16
M026A-R_161024	320-22986-5	Water	10/24/16
M028A-R_161024	320-22986-6	Water	10/24/16
M028E-R_161024**	320-22986-7**	Water	10/24/16
DUP01_161024**	320-22986-8**	Water	10/24/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Semivolatile Organic Compounds (SVOCs) by Environmental Protection Agency (EPA) SW 846 Method 8270C

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 15.0%.

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.

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 ending continuing calibration verifications (CCVs) were not provided per DoD 5.0 requirement. No data was reviewed since ending CCVs were not required by this method.

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

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 was identified as a source blank. No contaminants were found.

VII. Surrogates

Surrogates were not performed for this SDG.

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 with the following exceptions:

LCS ID (Associated Samples)	Compound	RPD (Limits)	Flag	A or P
LCS 320-134699 (All samples in SDG 320-22986-1)	Benzoic acid	23 (≤20)	NA	-

X. Field Duplicates

Samples M028E-R_161024** and DUP01_161024** were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024**	DUP01_161024**				
Bis(2-ethylhexyl)phthalate	1.03	1.05	-	0.02 (≤9.52)	-	-
1,2-Dichlorobenzene	12.9	11.2	-	1.7 (≤9.52)	-	-
1,4-Dichlorobenzene	2.64	2.35	-	0.29 (≤9.52)	-	-

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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Semivolatiles - Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Semivolatiles - Field Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

LDC #: 37601B2a
SDG #: 320-22986-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/8/16
Page: 1 of 1
Reviewer:
2nd Reviewer: [illegible]

METHOD: GC/MS Semivolatiles (EPA SW846 Method 8270C)

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%. r^2 ICV ≤ 20%
IV.	Continuing calibration /Ending	A	CCV ≤ 20/~~50~~% No Ending
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	SB=8. EB=9, 10
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	TW	LCS/D
X.	Field duplicates	TW	D=6+7
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation
XIV.	System performance	A	Not reviewed for Stage 2B validation
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	M001A-R_161024	320-22986-1	Water	10/24/16
2	M002A-R_161024	320-22986-2	Water	10/24/16
3	M001E-R_161024**	320-22986-4**	Water	10/24/16
4	M026A-R_161024	320-22986-5	Water	10/24/16
5	M028A-R_161024	320-22986-6	Water	10/24/16
6	M028E-R_161024**	320-22986-7**	Water	10/24/16
7	DUP01_161024**	320-22986-8**	Water	10/24/16
~~8~~	~~SB01_161024~~	~~320-22986-9~~	~~Water~~	~~10/24/16~~
~~9~~	~~EB01_161024~~	~~320-22986-11~~	~~Water~~	~~10/24/16~~
~~10~~	~~EB02_161024~~	~~320-22986-12~~	~~Water~~	~~10/24/16~~
11				
12				
13	MB 320-134699/1-A			

LDC #: 37601B2a

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: Q
2nd Reviewer: M

Method: Semivolatiles (EPA SW 846 Method 8270C)

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 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) 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 ICAL for each instrument?	✓			
Were all percent difference (%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 identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate %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 #: 37601B2Q1

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: M

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	T. 4-Chloroaniline	MM. 4-Chlorophenyl-phenyl ether	FFF. Di-n-octylphthalate	YYY. 2,3,5-Trimethylnaphthalene
B. Bis (2-chloroethyl) ether	U. Hexachlorobutadiene	NN. Fluorene	GGG. Benzo(b)fluoranthene	ZZZ. Perylene
C. 2-Chlorophenol	V. 4-Chloro-3-methylphenol	OO. 4-Nitroaniline	HHH. Benzo(k)fluoranthene	AAAA. Dibenzothiophene
D. 1,3-Dichlorobenzene	W. 2-Methylnaphthalene	PP. 4,6-Dinitro-2-methylphenol	III. Benzo(a)pyrene	BBBB. Benzo(a)fluoranthene
E. 1,4-Dichlorobenzene	X. Hexachlorocyclopentadiene	QQ. N-Nitrosodiphenylamine	JJJ. Indeno(1,2,3-cd)pyrene	CCCC. Benzo(b)fluorene
F. 1,2-Dichlorobenzene	Y. 2,4,6-Trichlorophenol	RR. 4-Bromophenyl-phenylether	KKK. Dibenz(a,h)anthracene	DDDD. cis/trans-Decalin
G. 2-Methylphenol	Z. 2,4,5-Trichlorophenol	SS. Hexachlorobenzene	LLL. Benzo(g,h,i)perylene	EEEE. Biphenyl
H. 2,2'-Oxybis(1-chloropropane)	AA. 2-Chloronaphthalene	TT. Pentachlorophenol	MMM. Bis(2-Chloroisopropyl)ether	FFFF. Retene
I. 4-Methylphenol	BB. 2-Nitroaniline	UU. Phenanthrene	NNN. Aniline	GGGG. C30-Hopane
J. N-Nitroso-di-n-propylamine	CC. Dimethylphthalate	VV. Anthracene	OOO. N-Nitrosodimethylamine	HHHH. 1-Methylphenanthrene
K. Hexachloroethane	DD. Acenaphthylene	WW. Carbazole	PPP. Benzoic Acid	IIII. 1,4-Dioxane
L. Nitrobenzene	EE. 2,6-Dinitrotoluene	XX. Di-n-butylphthalate	QQQ. Benzyl alcohol	JJJJ. Acetophenone
M. Isophorone	FF. 3-Nitroaniline	YY. Fluoranthene	RRR. Pyridine	KKKK. Atrazine
N. 2-Nitrophenol	GG. Acenaphthene	ZZ. Pyrene	SSS. Benzidine	LLLL. Benzaldehyde
O. 2,4-Dimethylphenol	HH. 2,4-Dinitrophenol	AAA. Butylbenzylphthalate	TTT. 1-Methylnaphthalene	MMMM. Caprolactam
P. Bis(2-chloroethoxy)methane	II. 4-Nitrophenol	BBB. 3,3'-Dichlorobenzidine	UUU.Benzo(b)thiophene	NNNN.
Q. 2,4-Dichlorophenol	JJ. Dibenzofuran	CCC. Benzo(a)anthracene	VVV.Benzonaphthothiophene	OOOO.
R. 1,2,4-Trichlorobenzene	KK. 2,4-Dinitrotoluene	DDD. Chrysene	WWW.Benzo(e)pyrene	PPPP.
S. Naphthalene	LL. Diethylphthalate	EEE. Bis(2-ethylhexyl)phthalate	XXX. 2,6-Dimethylnaphthalene	QQQQ.

LDC #: 3760B29

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: K

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

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/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LCS 320-134699	PPP	( )	( )	23 (≤30)	All (NO)	~~J (all detects)~~ A
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

Privileged and Confidential

LDC#: 37601B2a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer: [illegible]

METHOD: GC SVOC (EPA SW 846 Method 8270C)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	6	7				
EEE	1.03	1.05		0.02	≤9.52	
F	12.9	11.2		1.7	≤9.52	
E	2.64	2.35		0.29	≤9.52	

V:\FIELD DUPLICATES\37601B2b_Amec.wpd

LDC #: 36013B29

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: Q
2nd Reviewer: SC

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard
S = Standard deviation of the RRFs, X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (Reference Internal Standard)	Reported RRF (50 std)	Recalculated RRF (50 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/5/16	Phenol (1st internal standard)	1.7577	1.7577	1.6834	1.6834	7.9	7.9
			Naphthalene (2nd internal standard)	0.9654	0.9654	0.9565	0.9565	12.9	12.9
			Fluorene (3rd internal standard)	1.2437	1.2437	1.2832	1.2832	11.3	11.3
			Pentachlorophenol (4th internal standard)	0.1348	0.1348	0.1254	0.1254	9.2	9.2
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.8825	0.8825	0.8240	0.8240	6.0	6.0
			Benzo(a)pyrene (6th internal standard)	1.1593	1.1593	1.1277	1.1277	4.7	4.7
2			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Phenol (1st internal standard)						
			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Pentachlorophenol (4th internal standard)						
			Bis(2-ethylhexyl)phthalate (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 #: 3760B29

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: M

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

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	HSL1029	11/2/16	Phenol (1st internal standard)	1.6834	1.538	1.538	8.7	8.7
			Naphthalene (2nd internal standard)	0.9565	0.8995	0.8995	6.0	6.0
			Fluorene (3rd internal standard)	1.2832	1.204	1.204	6.2	6.2
			Pentachlorophenol (4th internal standard)	0.1254	0.1295	0.1295	3.2	3.2
			Bis(2-ethylhexyl)phthalate (5th internal standard)	0.8240	0.8803	0.8803	6.8	6.8
			Benzo(a)pyrene (6th internal standard)	1.1277	1.143	1.143	1.4	1.4
2			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (5th internal standard)					
			Benzo(a)pyrene (6th internal standard)					
3			Phenol (1st internal standard)					
			Naphthalene (2nd internal standard)					
			Fluorene (3rd internal standard)					
			Pentachlorophenol (4th internal standard)					
			Bis(2-ethylhexyl)phthalate (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 #: 37601B29

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: A
2nd reviewer: M

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 3

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	50.0	29.1	58	58	0
2-Fluorobiphenyl		31.9	64	64	
Terphenyl-d14		28.9	58	58	
Phenol-d5		19.5	39	39	
2-Fluorophenol		21.7	43	43	
2,4,6-Tribromophenol	↓	29.3	59	59	↓
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 3160B29

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: CJ
2nd Reviewer: M

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

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: 320-134699

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
Phenol	100	100	39.78	43.79	40	40	43	43	7	7
N-Nitroso-di-n-propylamine	↓	↓	78.21	82.55	78	78	83	83	5	5
4-Chloro-3-methylphenol			84.92	85.10	85	85	85	85	0	0
Acenaphthene			77.29	79.60	77	77	80	80	3	3
Pentachlorophenol	200	200	168.6	175.6	84	84	88	88	4	4
Pyrene	100	100	81.17	89.99	81	81	90	90	3	3

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 #: 37601B2g

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CF
2nd reviewer: RC

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C)

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. 3, S:

Conc. = $\frac{(TGT)(40.0)(1000)(10)(\quad)}{(90141B)(0.956)(1)(1055)(\quad)}$

= TGT. 1 µL

#	Sample ID	Compound	Reported Concentration (µL)	Calculated Concentration ( )	Qualification
	3	S	TGT		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Organochlorine Pesticides

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22986-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	320-22986-1	Water	10/24/16
M002A-R_161024	320-22986-2	Water	10/24/16
M002A-R_161024RE	320-22986-2RE	Water	10/24/16
M003E-R_161024	320-22986-3	Water	10/24/16
M001E-R_161024	320-22986-4	Water	10/24/16
M028A-R_161024	320-22986-6	Water	10/24/16
M028E-R_161024**	320-22986-7**	Water	10/24/16
DUP01_161024**	320-22986-8**	Water	10/24/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Organochlorine Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8081A

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
M002A-R_161024RE	All compounds	15	7	UJ (all non-detects)	A

II. GC Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

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 20.0% for all compounds.

Retention time windows were established as required by the method for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

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 required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 was identified as a source 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	Column	Surrogate	%R (Limits)	Affected Compound	Flag	A or P
M002A-R_161024	RTX-CLP I	Tetrachloro-m-xylene	40 (44-124)	All compounds	UJ (all non-detects)	A
M002A-R_161024	RTX-CLP II	Tetrachloro-m-xylene	39 (44-124)	All compounds	UJ (all non-detects)	A

Additionally, surrogate recoveries (%R) were not within QC limits for samples M001A-R_161024 and M001E-R_161024. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

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 with the following exceptions:

LCS ID (Associated Samples)	Compound	%R (Limits)	Flag	A or P
LCS 320-136607 (M002A-R_161024RE)	Endosulfan I	61 (62-136)	UJ (all non-detects)	P

Relative percent differences (RPD) were within QC limits.

X. Field Duplicates

Samples M028E-R_161024** and DUP01_161024** were identified as field duplicates. No results were detected in any of the samples.

XI. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Stage 4 validation.

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
M028A-R_161024	alpha-BHC Aldrin	168.3 40.5	NJ (all detects) NJ (all detects)	A

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identification

All target compound identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

The system performance was acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Flag	A or P
M002A-R_161024RE	All compounds	R	A

Due to surrogate %R and RPD between two columns, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Organochlorine Pesticides - Data Qualification Summary - SDG 320-22986-1

Sample	Compound	Flag	A or P	Reason
M002A-R_161024	All compounds	UJ (all non-detects)	A	Surrogates (%R)
M028A-R_161024	alpha-BHC Aldrin	NJ (all detects) NJ (all detects)	A	Compound quantitation (RPD between two columns)
M002A-R_161024RE	All compounds	R	A	Overall assessment of data

NAS Alameda Point, BGMP
Organochlorine Pesticides - Laboratory Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Organochlorine Pesticides - Field Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

LDC #: 37601B3a
SDG #: 320-22986-1
Laboratory: Test America Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 1/18/17
Page: 1 of 1
Reviewer:
2nd Reviewer: VC

METHOD: GC Organochlorine Pesticides (EPA SW846 Method 8081A)

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/TW	
II.	GC Instrument Performance Check	A	
III.	Initial calibration/ICV	A/A	RSD ≤ 20%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	SB=9. EB=10, 11
VII.	Surrogate spikes	TW	
VIII.	Matrix spike/Matrix spike duplicates	N	09
IX.	Laboratory control samples	TW	LCS/D
X.	Field duplicates	ND	D=7+8
XI.	Compound quantitation/RL/LOQ/LODs	TW	Not reviewed for Stage 2B validation
XII.	Target compound identification	A	Not reviewed for Stage 2B validation
XIII.	System Performance	A	Not reviewed for Stage 2B validation
XIV.	Overall assessment of data	TW	

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	M001A-R_161024	320-22986-1	Water	10/24/16
2	M002A-R_161024	320-22986-2	Water	10/24/16
3	M002A-R_161024RE	320-22986-2RE	Water	10/24/16
4	M003E-R_161024	320-22986-3	Water	10/24/16
5	M001E-R_161024	320-22986-4	Water	10/24/16
6	M028A-R_161024	320-22986-6	Water	10/24/16
7	M028E-R_161024**	320-22986-7**	Water	10/24/16
8	DUP01_161024**	320-22986-8**	Water	10/24/16
~~9~~	~~SB01_161024~~	~~320-22986-9~~	~~Water~~	~~10/24/16~~
~~10~~	~~EB01_161024~~	~~320-22986-11~~	~~Water~~	~~10/24/16~~
~~11~~	~~EB02_161024~~	~~320-22986-12~~	~~Water~~	~~10/24/16~~
12				
13				
14	MB 320-BS226/1-A			
15	MB 320-B660T/1A			

LDC #: 36018B3A

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: AC

Method: Pesticides (EPA SW 846 Method 8081)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?		✓		
Was cooler temperature criteria met?	✓			
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and at beginning of each 12-hour shift?	✓			
Were endrin and 4,4'-DDT breakdowns ≤ 15% for individual breakdown in the Evaluation mix standards?	✓			
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 RT windows properly established?	✓			
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 analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
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/Internal Standards				
Were all surrogate percent recovery (%R) within the QC limits?		✓		

LDC #3T601B34

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: M

Validation Area	Yes	No	NA	Findings/Comments
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	✓			
If any percent recovery (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
Were internal standard area counts within ± 50% of the average area calculated during calibration?	✓		✓	
VII. 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 extraction 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. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
Were relative percent difference (RPD) of the results between two columns ≤ 40%?		✓		
XII. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 35601B3Q

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: Q
2nd Reviewer: e

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
3 (ND)	W		10-24-16	11-8-16		15	Y/MH/SA

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 3T601B3A

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: Q
2nd Reviewer: M

METHOD: ✓ GC ___ HPLC

Are surrogates required by the method? Yes___ or No___.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were surrogates spiked into all samples and blanks?

Y (N) N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	1	STX-CLP1	X	32 (44-124)	No qual (10X)
	2	↓	X	40 ( )	N/A (ND)
		RTX-CLP II	Y	39 ( )	↓
	5	RTX-CLP I	X	31 ( )	No qual (10X)
		RTX-CLP II	Y	39 ( )	↓

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 36018B39

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

METHOD: / **GC** __ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a laboratory control samples (LCS) and laboratory control sample duplicate (LCSD) analyzed for each matrix in this SDG?

Y N N/A Were the LCS percent recoveries (%R) and relative percent differences (RPD) within the QC limits?

Level IV/D Only

Y N N/A Was an LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	LCS 320-13660	H	61 (62-126)	( )	( )	3, MB (NO)	J/UJ/P
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 36618B3d

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

METHOD: / GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the relative percent differences of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%RPD Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	A	6	168.3	NJ detects/A
	F		40.5	A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 37601B39

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: Q
2nd Reviewer: MC

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

#	Compound Name	Finding	Associated Samples	Qualifications
	3	All		R/UJ

Comments: _____

LDC #: 3T601B39

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: GC / HPLC

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (10 std)	Recalculated CF (11 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/29/16	D (SFX-CLP 1)	1.2120	1.2120	1.2679	1.2679	8.5	8.5
			D 0 ✓ 11	0.7060	0.7060	0.7368	0.7368	10.1	10.1
2									
3									
4									

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 #: 36018B3g

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: Q
2nd Reviewer: M

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	1103-003	11/3/16	5 (STX-CLP 1)	1.2679	1.258	1.258	0.8	0.8
			0 ↓ 1/	0.7368	0.7209	0.7209	2.2	2.2
2	1104-004	11/4/16	↓	1.2679	1.267	1.267	0.0	0.0
				0.7368	0.7293	0.7293	1.6	1.0
3								
4								

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 #: 37601B3A

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: Q
2nd reviewer: T

METHOD: GC Pesticides/PCBs (EPA SW 846 8081/8082)

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: 7

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene	STX-CP1	40.0	34.6	87	87	0
Decachlorobiphenyl	↓	↓	18.0	45	45	↓
Tetrachloro-m-xylene	STX-CP11	↓	28.1	70	70	↓
Decachlorobiphenyl	↓	↓	16.1	40	40	↓

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Tetrachloro-m-xylene						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Tetrachloro-m-xylene						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Tetrachloro-m-xylene						
Decachlorobiphenyl						

Notes:

LDC #: 37601B3A

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: 9
2nd Reviewer: AR

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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* (SSC-SC)/SA

Where: SSC = Spiked sample concentration; SA = Spike added; SC = Concentration

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery; LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 320-137536

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	Recalc.
gamma-BHC	0.500	0.500	0.544	0.542	103	103	103	103	0	0
4,4'-DDT	↓	↓	0.6186	0.646	124	124	128	128	4	4
Aroclor 1260										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 37601B39

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd reviewer: M

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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 = $\frac{(A)(V_t)(DF)}{(CF)(V_o)(V_i)(\%S)}$

A	=	Area of the compound to be measured
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)
CF	=	Calibration Factor of compound from initial calibration.
DF	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. T-8 ND:
#6 = A

Conc. = $\frac{(4339554)(200)(10)(1)}{(755784303)(1.3409)(1050.9)}$

= 0.0815 µg/L

#	Sample ID	Compound	Reported Concentration (µg/L)	Calculated Concentration ( )	Qualification
	6	A	0.0815		

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 13, 2016

Parameters: Metals

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22986-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M028E-R_161024**	320-22986-7**	Water	10/24/16
DUP01_161024**	320-22986-8**	Water	10/24/16
M001A-R_161024F	320-22986-1F	Water	10/24/16
M002A-R_161024F	320-22986-2F	Water	10/24/16
M003E-R_161024F	320-22986-3F	Water	10/24/16
M001E-R_161024F	320-22986-4F	Water	10/24/16
M026A-R_161024F	320-22986-5F	Water	10/24/16
M028A-R_161024F	320-22986-6F	Water	10/24/16
M028E-R_161024F**	320-22986-7F**	Water	10/24/16
DUP01_161024F**	320-22986-8F**	Water	10/24/16
M002A-R_161024MSF	320-22986-2MSF	Water	10/24/16
M002A-R_161024MSDF	320-22986-2MSDF	Water	10/24/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A
Mercury by EPA SW 846 Method 7470A

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB01_161024F and EB02_161024F were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB02_161024F	10/24/16	Sodium	0.0353 mg/L	M001A-R_161024F M002A-R_161024F M003E-R_161024F M001E-R_161024F M026A-R_161024F M028A-R_161024F M028E-R_161024F** DUP01_161024F**

Sample SB01_161024F was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB01_161024F	10/24/16	Chromium Sodium	0.00188 mg/L 0.0665 mg/L	M001A-R_161024F M002A-R_161024F M003E-R_161024F M001E-R_161024F M026A-R_161024F M028A-R_161024F M028E-R_161024F** DUP01_161024F**

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample.

For M002A-R_161024MSF/MSDF, no data were qualified for Aluminum and Zinc percent recoveries (%R) outside the QC limits since the parent sample results were greater than or equal to a 5X dilution.

For M002A-R_161024MSF/MSDF, no data were qualified for Calcium, Magnesium, and Sodium 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.

VIII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. The analysis criteria were met.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples M028E-R_161024** and DUP01_161024** and samples M028E-R_161024F** and DUP01_161024F** were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024**	DUP01_161024**				
Calcium	309	294	5 (≤30)	-	-	-
Magnesium	229	218	5 (≤30)	-	-	-
Potassium	84.5	82.8	2 (≤30)	-	-	-
Sodium	806	818	1 (≤30)	-	-	-

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024F**	DUP01_161024F**				
Arsenic	0.00768	0.00801	-	0.00033 (≤0.00300)		
Barium	0.0798	0.0807	1 (≤30)	-	-	-
Calcium	316	301	5 (≤30)	-	-	-
Iron	30.3	29.4	3 (≤30)	-	-	-
Magnesium	239	238	0 (≤30)	-	-	-
Manganese	6.88	6.84	1 (≤30)	-	-	-
Molybdenum	0.00187	0.00186	-	0.00001 (≤0.00300)	-	-
Potassium	83.4	82.6	1 (≤30)	-	-	-
Sodium	832	813	2 (≤30)	-	-	-

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

XIII. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Metals - Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Metals - Laboratory Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Metals - Field Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

LDC #: 37601B4a
SDG #: 320-22986-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/10/16
Page: 1 of 1
Reviewer: CL
2nd Reviewer: CL

METHOD: Metals (EPA SW 846 Method 6020A/7470A)

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.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	A	
VI.	Field Blanks	SW	SB=11 EB=12,13
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	(1,2) (9,10)
XII.	Internal Standard (ICP-MS)	A	
XIII.	Sample Result Verification	A	Not reviewed for Stage 2B validation
XIV.	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

** Indicates sample underwent Stage 4 validation / Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	M028E-R_161024**	320-22986-7**	Water	10/24/16
2	DUP01_161024**	320-22986-8**	Water	10/24/16
3	M001A-R_161024F	320-22986-1F	Water	10/24/16
4	M002A-R_161024F	320-22986-2F	Water	10/24/16
5	M003E-R_161024F	320-22986-3F	Water	10/24/16
6	M001E-R_161024F	320-22986-4F	Water	10/24/16
7	M026A-R_161024F	320-22986-5F	Water	10/24/16
8	M028A-R_161024F	320-22986-6F	Water	10/24/16
9	M028E-R_161024F**	320-22986-7F**	Water	10/24/16
10	DUP01_161024F**	320-22986-8F**	Water	10/24/16
11	SB01_161024F	320-22986-9F	Water	10/24/16
12	EB01_161024F	320-22986-11F	Water	10/24/16
13	EB02_161024F	320-22986-12F	Water	10/24/16
14	M002A-R_161024MSF	320-22986-2MSF	Water	10/24/16
15	M002A-R_161024MSDF	320-22986-2MSDF	Water	10/24/16

DC #: 37601B4a

VALIDATION FINDINGS CHECKLIST

Reviewer: CR
2nd Reviewer: [illegible]

Method: Metals (EPA SW 846 Method 6010/6020/7000)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?				
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were the low standard checks within 70-130%	✓			
Were all initial calibration correlation coefficients within limits as specified by the method?	✓			
IV. 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.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
VI. Matrix spike/Matrix spike 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 +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. 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% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?	✓			
Were all percent differences (%Ds) < 10%?	✓			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.	✓			

.DC #: 37601B4

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: 02
2nd reviewer: 4

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
3-10		(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo) B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
1,2		Al, Sb, As, Ba, Be, Cd, (Ca) Cr, Co, Cu, Fe, Pb, (Mg) Mn, Hg, Ni, (K) Se, Ag, (Na) Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
QC: 14,15		(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn) Hg, (Ni, K, Se, Ag, Na, Tl, V, Zn, Mo) B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____

Comments: Mercury by CVAA if performed

LDC #: 37601B4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: A
2nd Reviewer: A

METHOD: Trace Metals (EPA SW846 6010B/7000)

Blank units: mg/L **Associated sample units:** mg/L
Sampling date: 10/24/16 Soil factor applied _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: ~~All~~ 3-10

Analyte	Blank ID	Sample Identification											
	SB01_161024	Action Limit	No qualifiers										
Cr	0.00188	0.0094											
Na	0.0665	0.3325											

Sampling date: 10/24/16 Soil factor applied _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: ~~All~~ 3-10

Analyte	Blank ID	Sample Identification											
	EB02_161024	Action Limit	No qualifiers										
Na	0.0353	0.1765											

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 37601B4

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 8

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

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 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
	14/15		Al	NC	NC		4	No qual (Diluted out)
			Zn		NC		1	J (soil)

Comments: 14/15: Ca, Mg, Na 7+X

LDC#: 37601B4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: Metals (EPA Method 6010C/7470A)

Analyte	Concentration (mg/L)		RPD (≤30)	Difference	Limits	Qualifiers
	1	2				
Calcium	309	294	5			
Magnesium	229	218	5			
Potassium	84.5	82.8	2			
Sodium	806	818	1			

Analyte	Concentration (mg/L)		RPD (≤30)	Difference	Limits	Qualifiers
	9	10				
Arsenic	0.00768	0.00801		0.00033	(≤0.00300)	
Barium	0.0798	0.0807	1			
Calcium	316	301	5			
Iron	30.3	29.4	3			
Magnesium	239	238	0			
Manganese	6.88	6.84	1			
Molybdenum	0.00187	0.00186		0.00001	(≤0.00300)	
Potassium	83.4	82.6	1			
Sodium	832	813	2			

LDC #: 37601B4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: CR
2nd Reviewer: [illegible]

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

An initial and 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 (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV	ICP/MS (Initial calibration)	~~ICV~~ Mo	0.07886	0.08	99	99	Y
ICV	CVAA (Initial calibration)	Hg	0.00197	0.002	99	99	
	ICP (Continuing calibration)						
CCV (08:32)	ICP/MS (Continuing calibration)	Pb	0.09826	0.1	98	98	
CCV (16:12)	CVAA (Continuing calibration)	Hg	0.00486	0.005	97	97	Y

Comments:

CALCLC.4C4

LDC #: 37601B4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: GR
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ 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:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check	Cd	0.0956	0.1	96	96	Y
LCS	Laboratory control sample	Ca	1,027	1	103	103	
14	Matrix spike	As	(SSR-SR) 0.1995	0.2	100	100	
14 DUP	Duplicate	Zn K	~~0.2096~~ 56.85	57.02	0	0	
41	ICP serial dilution	Mg	288	268.8	6.6	6.6	

Comments: _____

LDC #: 37601B4 q

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: AR
2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

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 and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for As were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation:

$\frac{7.675\ ug/L}{1000} = 0.007675\ mg/L$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	1	Ca	309	309	Y
	2	K	82.8	82.8	
	9	As	0.00768	0.00768	
	10	Na	813	813	

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 19, 2016

Parameters: Wet Chemistry

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22986-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	320-22986-1	Water	10/24/16
M002A-R_161024	320-22986-2	Water	10/24/16
M001E-R_161024	320-22986-4	Water	10/24/16
M026A-R_161024	320-22986-5	Water	10/24/16
M028A-R_161024	320-22986-6	Water	10/24/16
M028E-R_161024**	320-22986-7**	Water	10/24/16
DUP01_161024**	320-22986-8**	Water	10/24/16
M028E-R_161024MS	320-22986-7MS	Water	10/24/16
M028E-R_161024MSD	320-22986-7MSD	Water	10/24/16
DUP01_161024MS	320-22986-8MS	Water	10/24/16
DUP01_161024MSD	320-22986-8MSD	Water	10/24/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Nitrate as Nitrogen, Nitrite as Nitrogen, Sulfate, and Chloride by Environmental Protection Agency (EPA) Method 300.0
Sulfide by EPA Method 9034
Total Cyanide by EPA Method 9012A
Alkalinity by Standard Method 2320B
Total Dissolved Solids by Standard Method 2540C
Total Organic Carbon by Standard Method 5310B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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
M028E-R_161024**	Nitrate as N Nitrite as N	52.00 Hours	48 Hours	UJ (all non-detects) UJ (all non-detects)	P
DUP01_161024**	Nitrate as N Nitrite as N	51.93 Hours	48 Hours	UJ (all non-detects) UJ (all non-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

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB01_161024	10/24/16	Cyanide	3.55 ug/L	All samples in SDG 320-22986-1

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
M001A-R_161024	Cyanide	4.07 ug/L	5.00U ug/L
M002A-R_161024	Cyanide	6.78 ug/L	6.78U ug/L
M001E-R_161024	Cyanide	4.14 ug/L	5.00U ug/L
M028E-R_161024**	Cyanide	6.21 ug/L	6.21U ug/L
DUP01_161024**	Cyanide	5.82 ug/L	5.82U ug/L

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. Duplicates

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples M028E-R_161024** and DUP01_161024** were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024**	DUP01_161024**				
Chloride	518000 ug/L	559000 ug/L	8 (≤30)	-	-	-
Sulfate	2300000 ug/L	2190000 ug/L	5 (≤30)	-	-	-
Alkalinity	893000 ug/L	869000 ug/L	3 (≤30)	-	-	-
Total dissolved solids	5070000 ug/L	5120000 ug/L	1 (≤30)	-	-	-
Cyanide	6.21 ug/L	5.82 ug/L	-	0.39 (≤10.0)	-	-

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024**	DUP01_161024**				
Total organic carbon	18.6 mg/L	16.8 mg/L	-	1.8 (≤10.0)	-	-

X. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, data were qualified as estimated in two samples.

Due to source blank contamination, data were qualified as not detected in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Wet Chemistry - Data Qualification Summary - SDG 320-22986-1

Sample	Analyte	Flag	A or P	Reason
M028E-R_161024** DUP01_161024**	Nitrate as N Nitrite as N	UJ (all non-detects) UJ (all non-detects)	P	Technical holding times

NAS Alameda Point, BGMP
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Field Blank Data Qualification Summary - SDG 320-22986-1

Sample	Analyte	Modified Final Concentration	A or P
M001A-R_161024	Cyanide	5.00U ug/L	A
M002A-R_161024	Cyanide	6.78U ug/L	A
M001E-R_161024	Cyanide	5.00U ug/L	A
M028E-R_161024**	Cyanide	6.21U ug/L	A
DUP01_161024**	Cyanide	5.82U ug/L	A

LDC #: 37601B6
SDG #: 320-22986-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/10/16
Page: 1 of 1
Reviewer: A
2nd Reviewer: A

METHOD: (Analyte) Nitrate-N, Nitrite-N, Sulfate, Chloride (EPA Method 300.0), Sulfide, (EPA Method 9034) Total Cyanide (EPA Method 9012A) Alkalinity (SM2320B), TDS (SM 2540C), TOC (SM 5310B)

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	SW	SB = 8 *EB = 10, 11
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	(6,7)
X.	Sample result verification	A	Not reviewed for Stage 2B validation
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:

** Indicates sample underwent Stage 4validation

	Client ID	Lab ID	Matrix	Date
1	M001A-R_161024	320-22986-1	Water	10/24/16
2	M002A-R_161024	320-22986-2	Water	10/24/16
3	M001E-R_161024	320-22986-4	Water	10/24/16
4	M026A-R_161024	320-22986-5	Water	10/24/16
5	M028A-R_161024	320-22986-6	Water	10/24/16
6	M028E-R_161024**	320-22986-7**	Water	10/24/16
7	DUP01_161024**	320-22986-8**	Water	10/24/16
~~8~~	~~SB01_161024~~	~~320-22986-9~~	~~Water~~	~~10/24/16~~
9	TB01_161024	320-22986-10	Water	10/24/16
10	EB01_161024	320-22986-11	Water	10/24/16
~~11~~	~~EB02_161024~~	~~320-22986-12~~	~~Water~~	~~10/24/16~~
12	M028E-R_161024MS	320-22986-7MS	Water	10/24/16
13	M028E-R_161024MSD	320-22986-7MSD	Water	10/24/16
14	DUP01_161024MS	320-22986-8MS	Water	10/24/16
15	DUP01_161024MSD	320-22986-8MSD	Water	10/24/16
16				
17				

LDC #: 37601B6

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

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?			✓	

LDC #: 37601B6

VALIDATION FINDINGS CHECKLIST

Reviewer: CR
2nd Reviewer: C

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 #: 37601B6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
6,7	pH (TDS) Cl F (NO3) (NO2) SO4 O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (Sulfide)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
1-7	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
9: 12,13	pH TDS (Cl) F (NO3) (NO2) (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
14,15	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Sulfide)
	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 #: 37601B6

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: G
2nd reviewer: [illegible]

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:	300.0	
Parameters:	NO_3-N, NO_2-N	
Technical holding time:	48 hrs	

Sample ID	Sampling date	Analysis date	Total Time	Qualifier	Analysis date	Total Time	Qualifier
6	10/24/16 13:06	10/26/16 17:06	52.00hrs	J(UJ)/P(ND)			
7	13:45	17:41	51.93hrs	↓ ↓			

LDC #: 37601B6

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer:
2nd Reviewer:

METHOD: Inorganics, EPA Method See Cover
Blank units: ug/L **Associated sample units: ug/L**
Sampling date: 10/24/16 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: All

Analyte	Blank ID	Action Limit	Sample Identification							
	SB01 161024		1	2	3	6	7			
Cyanide	3.55	17.75	4.07 / 5.00	6.78	4.14 / 5.00	6.21	5.82			

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#: 37601B6 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

Inorganics, Method See Cover

Analyte	Concentration (ug/L)		RPD (≤30)	Difference	Limits	Qualification (Parent only)
	6	7				
Chloride	518000	559000	8			
Sulfate	2300000	2190000	5			
Alkalinity	893000	869000	3			
TDS	5070000	5120000	1			
Cyanide	6.21	5.82		0.39	(≤10.0)	
TOC (mg/L)	18.6	16.8		1.8	(≤10.0)	

V:\FIELD DUPLICATES\FD_inorganic\37601B6.wpd

LDC #: 37601B6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, Method See cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ 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:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ 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	NO_3-N	1445	1500	96	96	Y
14	Matrix spike sample	Sulfide	(SSR-SR) 12000	20000	60	60	↓
14/15	Duplicate sample	↓	12000	12000	0	0	↓

Comments:

TOTCLC.6

LDC #: 37601B6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer: GK
2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of C1 was recalculated. Calibration date: 10/19/16

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. (ug/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	C1	s1	1	3919081	0.9979	0.9970	Y
		s2	2.5	10004848			
		s3	10	41263980			
		s4	25	105652649			
		s5	50	232376909			
Calibration verification	NO_3-N	ICV	1.44	1.50	96	96	
Calibration verification	CN	CCV	200	205.177	103	103	
Calibration verification	TOC	CCV	10	9.878	99	99	

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 #: 37601B6

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CL
2nd reviewer: [illegible]

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 CN reported with a positive detect were recalculated and verified using the following equation:

Concentration = $y = 1288.8x + 735.31$

Recalculation:

$$\frac{5857 - 1288}{735.31} = 6.214 \text{ ug/L}$$

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	6	Cl	518000	518000	Y
		SO_4: 2300000 →		2300000	
		Cyanide	6.21	6.21	
		TOC (mg/L)	18.6	18.6	
	7	Alk	869000	869000	
		TDS	5120000	5120000	↓

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Gasoline Range Organics

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22986-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M028A-R_161024	320-22986-6	Water	10/24/16
M028E-R_161024**	320-22986-7**	Water	10/24/16
DUP01_161024**	320-22986-8**	Water	10/24/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 20.0%.

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%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Sample EB02_161024 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB02_161024	10/24/16	Gasoline range organics (C6-C12)	15.0 ug/L	All samples in SDG 320-22986-1

Sample SB01_161024 was identified as a source blank. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

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 was insufficient sample volume for analysis of the matrix spike and matrix spike duplicate.

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 M028E-R_161024** and DUP01_161024** were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024**	DUP01_161024**				
Gasoline range organics (C6-C12)	184	355	-	171 (≤500)	-	-

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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Gasoline Range Organics – Data Qualification Summary – SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

LDC #: 37601B7
SDG #: 320-22986-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/8/16
Page: 1 of 1
Reviewer:
2nd Reviewer: MC

METHOD: GC/MS Gasoline Range Organics (EPA SW846 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 ≤ 20%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	SB-1. 2B-5
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	Insufficient sample
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D = 2+3
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation
XIV.	System performance	A	Not reviewed for Stage 2B validation
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	M028A-R_161024	320-22986-6	Water	10/24/16
2	M028E-R_161024**	320-22986-7**	Water	10/24/16
3	DUP01_161024**	320-22986-8**	Water	10/24/16
4	~~SB01_161024~~	~~320-22986-9~~	~~Water~~	~~10/24/16~~
5	~~EB02_161024~~	~~320-22986-12~~	~~Water~~	~~10/24/16~~
6				
7				
8				
9				

Notes:

	MB 320-134977/4						

LDC #: 36018T

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: A
2nd Reviewer: DC

Method: ✓ GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. 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 RT windows properly established?	✓			
IIb. 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%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. 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.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VI. Surrogate Spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. 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?			✓	

LDC #: 9601B7

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
VIII. 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?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 37601BT

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?

Blank units: MBL **Associated sample units:** MBL
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: all

Compound	Blank ID	Sample Identification								
	5									
4RO (C6-C12)	15.0									

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#: 37601B7

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: PG
2nd Reviewer:

METHOD: GC (EPA SW 846 Method 8015B)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	2	3				
GRO (C6-C12)	184	355		171	≤500	

V:\FIELD DUPLICATES\37601B7_Amec.wpd

LDC #: 3T60B7

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC _____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (1000 std)	Recalculated CF (1000 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	0 1eAz	9/21/16	GRO (C6-C12)	29185	29185	28759.796	28359.88	13.8	13.8
2									
3									
4									

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 #: 37601BT

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: a

METHOD: GC √ HPLC ____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	GAS10280	10/28/16	ERO (C6-C12)	28760	28199	28199	0.6	0.6
2								
3								
4								

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 #: 37601BT

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: [illegible]
2nd reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

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: 2

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
BFB		20.0	~~20.1~~ 20.1	100	100	0

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 3T601BT

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: 9
2nd Reviewer: AK

METHOD: √ **GC** __ **HPLC**

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* (SSC-SC)/SA

RPD = | SSCLCS - SSCLCSD | * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: _____

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	Recalc.
Gasoline (8015)	1000	1000	971.0	1022	97	97	102	102	5	5
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 37601BT

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: A

METHOD: ✓ GC ___ HPLC

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% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound in the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 2 Compound Name ~~TPH~~ (C6-C12)

Concentration = $\frac{(52215T)(10)}{(28359.796)}$

= 184.1 µg/L

#	Sample ID	Compound	Reported Concentrations (µg/L)	Recalculated Results Concentrations ( )	Qualifications
	2	~~TPH~~ C6-C12	184		

Comments: _____

SAMPCALew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 19, 2016

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22986-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M028A-R_161024	320-22986-6	Water	10/24/16
M028E-R_161024**	320-22986-7**	Water	10/24/16
DUP01_161024**	320-22986-8**	Water	10/24/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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. 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 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. 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.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB 320-134931/1-A	10/28/16	JP4 (C8-C13)	54.19 ug/L	All samples in SDG 320-22986-1

Sample concentrations were compared to concentrations detected in the laboratory blanks. 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

Sample EB02_161024 was identified as an equipment blank. No contaminants were found.

Sample SB01_161024 was identified as a source blank. No contaminants were found.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. 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.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples M028E-R_161024** and DUP01_161024** were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024**	DUP01_161024**				
Diesel range organics (C12-C24)	458	515	12 (≤30)	-	-	-
Motor oil range organics (C24-C36)	201	172	-	29 (≤476)	-	-

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XI. 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.

XII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Total Petroleum Hydrocarbons as Extractables – Data Qualification Summary – SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

LDC #: 37601B8
SDG #: 320-22986-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/8/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

TPH-E

METHOD: GC ~~Diesel Range Organics~~ (EPA SW 846 Method 8015B)

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/ICV	A/A	RSD ≤ 20%. ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	SW	
V.	Field blanks	ND	SB=4. EB=5
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	D = 2+3
X.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation
XI.	Target compound identification	A	Not reviewed for Stage 2B validation
XII.	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

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	M028A-R_161024	320-22986-6	Water	10/24/16
2	M028E-R_161024**	320-22986-7**	Water	10/24/16
3	DUP01_161024**	320-22986-8**	Water	10/24/16
~~4~~	~~SB01_161024~~	~~320-22986-9~~	~~Water~~	~~10/24/16~~
~~5~~	~~EB02_161024~~	~~320-22986-12~~	~~Water~~	~~10/24/16~~
6				
7				
8				
9				
10				
11				
12				

Notes:

	MB 320-132493/A						

LDC #: 37613B

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: DK

Method: ✓ GC ____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. 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 RT windows properly established?	✓			
IIb. 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%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. 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.	✓	✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. 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?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VII. 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?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 36018B

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 8

METHOD: GC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all samples associated with a given method blank?
(Y) N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
(Y) N N/A Was a method blank performed with each extraction batch?
(Y) N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Blank extraction date: 10/28/16 **Blank analysis date:** ~~10/21~~ 11/3/16
Conc. units: ug/L **Associated samples:** all

Compound	Blank ID	Sample Identification								
MB 320-134931/1-A										
JP4 (C8-C13)	54.19									

Blank extraction date:_____ **Blank analysis date:**_____ **Associated samples:**_____
Conc. units:_____

Compound	Blank ID	Sample Identification								

ALL 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#: 37601B8

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer:

METHOD: GC (EPA SW 846 Method 8015B)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	2	3				
DRO (C12-C24)	458	515	12			
MRO)C24-C36)	201	172		29	≤476	

V:\FIELD DUPLICATES\37601B8_Amec.wpd

LDC #: 37601B8

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC _____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (100 std)	Recalculated CF (1107 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/3/16	DRO (C12-C24)	15A706	15A706	159928	159928	4.5	4.5
2									
3									
4									

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 #: 37601B8

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: Q
2nd Reviewer: K

METHOD: GC / HPLC_____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	1103-006	11/3/16	DRO C12-C24	1599=8	16917 3	16917 3	5.8	5.8
2								
3								
4								

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 #: 36018B

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: 9
2nd reviewer: 9

METHOD: / GC __ HPLC

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: 2

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
TPH		13.3	10.7	77	77	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 32618B8

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: 9
2nd Reviewer: AC

METHOD: ✓ GC __HPLC

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* (SSC-SC)/SA

RPD = I SSCLCS - SSCLCSD I * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 320-134931

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	Recalc.
Gasoline (8015)										
Diesel (8015)	300		242.5		81	81				
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3760138

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

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% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 2 Compound Name DRO C12-C24

Concentration = $\frac{(25702404)(3000)(1)}{\cancel{(187069.337)}(159928.257)(1053)}$

= 457.9 µg/L

#	Sample ID	Compound	Reported Concentrations (µg/L)	Recalculated Results Concentrations ( )	Qualifications
	2	DRO	458		

Comments: _____

SAMPCALew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22986-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	320-22986-1	Water	10/24/16
M001E-R_161024	320-22986-4	Water	10/24/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011). 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:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) SW 846 Method 8290A

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The ion abundance ratios for all PCDDs/PCDFs were within method and validation criteria.

The minimum S/N ratio was greater than or equal to 2.5 for each unlabeled compound and greater than or equal to 10 for each labeled compound.

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.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within method and validation criteria.

The minimum S/N ratio was greater than or equal to 10 for each unlabeled compound and labeled compound.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB 320-135484/1-A	11/01/16	1,2,3,7,8-PeCDD	0.8766 pg/L	All samples in SDG 320-22986-1
		1,2,3,7,8-PeCDF	0.9129 pg/L	
		2,3,4,7,8-PeCDF	1.043 pg/L	
		1,2,3,4,7,8-HxCDD	1.179 pg/L	
		1,2,3,6,7,8-HxCDD	0.9536 pg/L	
		1,2,3,7,8,9-HxCDD	1.205 pg/L	
		1,2,3,4,7,8-HxCDF	1.169 pg/L	
		1,2,3,6,7,8-HxCDF	0.7736 pg/L	
		1,2,3,7,8,9-HxCDF	0.8532 pg/L	
		2,3,4,6,7,8-HxCDF	1.126 pg/L	
		1,2,3,4,6,7,8-HpCDD	2.586 pg/L	
		1,2,3,4,6,7,8-HpCDF	3.076 pg/L	
		1,2,3,4,7,8,9-HpCDF	1.024 pg/L	
		OCDD	7.729 pg/L	
		OCDF	6.890 pg/L	
		Total TCDF	1.415 pg/L	
		Total PeCDD	0.8766 pg/L	
		Total PeCDF	1.956 pg/L	
		Total HxCDD	3.338 pg/L	
		Total HxCDF	3.922 pg/L	
		Total HpCDD	4.388 pg/L	
		Total HpCDF	5.214 pg/L	

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. 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.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard recoveries (%R) were within QC limits.

XI. Compound Quantitation

All compound quantitations met validation criteria.

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.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

LDC #: 37601B21
SDG #: 320-22986-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 4

Date: 1/8/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA SW846 Method 8290A)

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.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A A	RSD ≤ 20%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/30%
V.	Laboratory Blanks	SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates	N	CS
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Internal standards	A	
XI.	Compound quantitation RL/LOQ/LODs	A	
XII.	Target compound identification	A	
XIII.	System performance	A	
XIV.	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	M001A-R_161024	320-22986-1	Water	10/24/16
2	M001E-R_161024	320-22986-4	Water	10/24/16
3				
4				
5				
6				
7				
8				
9				

Notes:

	MB 320-175482/1-A						

LDC #: 3760(B2)

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: Q
2nd Reviewer: [illegible]

Method: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. GC/MS Instrument performance check				
Was PFK exact mass 380.9760 verified?	✓			
Were the retention time windows established for all homologues?	✓			
Was the chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomers ≤ 25% ?	✓			
Is the static resolving power at least 10,000 (10% valley definition)?	✓			
Was the mass resolution adequately check with PFK?	✓			
Was the presence of 1,2,8,9-TCDD and 1,3,4,6,8-PeCDF verified?	✓			
IIIa. Initial calibration				
Was the initial calibration performed at 5 concentration levels?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% for unlabeled compounds and for labeled compounds ?	✓			
Did all calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound ≥ 2.5 and for each recovery and internal standard ≥ 10?	✓			
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 contiuning calibration performed at the beginning and end of each 12 hour period?	✓			
Were all percent differences (%D) ≤ 20% for unlabeled compounds and for labeled compounds ?	✓			30%
Did all routine calibration standards meet the Ion Abundance Ratio criteria?	✓			
Was the signal to noise ratio for each target compound and for each recovery and internal standard > 10?	✓			
V. Laboratory Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was a method blank performed for each matrix and whenever a sample extraction was performed?	✓			
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. Matrix spike/Matrix spike duplicates				

LDC #: 37601B21

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: [illegible]

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.		✓		
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?			✓	
VIII. Laboratory control samples				
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target compounds were detected in the field duplicates.			✓	
X. Internal standards				
Were internal standard recoveries within the 40-135% criteria?	✓			
Was the minimum S/N ratio of all internal standard peaks ≥ 10?	✓			
XI. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XII. Target compound identification				
For 2,3,7,8 substituted congeners with associated labeled standards, were the retention times of the two quantitation peaks within -1 to 3 sec. of the RT of the labeled standard?	✓			
For 2,3,7,8 substituted congeners without associated labeled standards, were the relative retention times of the two quantitation peaks within 0.005 time units of the RRT measured in the routine calibration?	✓			
For non-2,3,7,8 substituted congeners, were the retention times of the two quantitation peaks within RT established in the performance check solution?	✓			
Did compound spectra contain all characteristic ions listed in the table attached?	✓			
Was the Ion Abundance Ratio for the two quantitation ions within criteria?	✓			
Was the signal to noise ratio for each target compound and labeled standard ≥ 2.5?	✓			
Does the maximum intensity of each specified characteristic ion coincide within ± 2 seconds (includes labeled standards)?	✓			
For PCDF identification, was any signal (S/N ≥ 2.5, at ± seconds RT) detected in the corresponding PCDPE channel?			✓	
Was an acceptable lock mass recorded and monitored?	✓			
XIII. System performance				
System performance was found to be acceptable.	✓			
XIV. Overall assessment of data	✓			
Overall assessment of data was found to be acceptable.				

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

LDC #: 37601B21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: Q
2nd Reviewer: A

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290A)

Blank extraction date: 11/1/16 **Blank analysis date:** 11/9/16
Conc. units: pg/L **Associated samples:** All

Compound	Blank ID	Sample Identification								
	MB 320-135484/1-A	5X								
B	0.8766	4.383								
I	0.9129	4.5645								
J	1.043	5.215								
C	1.179	5.895								
D	0.9536	4.768								
E	1.205	6.025								
K	1.169	5.845								
L	0.7736	3.868								
N	0.8532	4.266								
M	1.126	5.63								
F	2.586	12.93								
O	3.076	15.38								
P	1.024	5.12								
G	7.729	38.645								
Q	6.890	34.45								
V	1.415	7.075								
S	0.8766	4.383								
W	1.956	9.78								
T	3.338	16.69								
X	3.922	19.61								
U	4.388	21.94								
Y	5.214	26.07								

LDC #: 37601B21

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: Q
2nd Reviewer: A

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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 (Reference Internal Standard)	Reported RRF (CS3 std)	Recalculated RRF (CS3 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/20/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.8401	0.8401	0.8424	0.8424	10.3	10.3
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	0.9564	0.9564	0.9855	0.9855	11.2	11.2
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	1.0149	1.0149	0.9894	0.9894	12.6	12.6
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.9270	0.9270	0.9313	0.9313	9.0	9.0
			OCDF (^{13}C-OCDF)	1.0799	1.0799	1.0796	1.0796	11.7	11.7
2	ICAL	10/3/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.9563	0.9563	0.9439	0.9439	3.2	3.2
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.0229	1.0229	1.0240	1.0240	2.0	2.0
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.9674	0.9674	0.9437	0.9437	4.7	4.7
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.9780	0.9780	0.9595	0.9595	4.6	4.6
			OCDF (^{13}C-OCDF)	1.2922	1.2922	1.2745	1.2745	4.0	4.0
3	ICAL	9/29/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.0774	1.0774	1.0649	1.0649	5.7	5.7
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)						
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)						
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)						
			OCDF (^{13}C-OCDF)						

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 #:37601B21

VALIDATION FINDINGS WORKSHEET
Routine Calibration Results Verification

Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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 CONC (CC)	Recalculated CONC (CC)	Reported %D	Recalculated %D
1	08N0163D5_2	11/8/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.8424	0.8647	0.8647	2.6	2.6
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	0.9855	1.025	1.025	4.0	4.0
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.9894	1.045	1.045	5.6	5.6
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.9313	0.9862	0.9862	5.9	5.9
			OCDF (^{13}C-OCDF)	1.0796	1.224	1.224	13.4	13.4
2	10N0164D5_3	11/10/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	0.9439	0.9095	0.9095	3.7	3.7
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)	1.0240	1.008	1.008	1.6	1.6
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)	0.9437	1.002	1.002	6.1	6.1
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)	0.9595	1.056	1.056	10.1	10.1
			OCDF (^{13}C-OCDF)	1.2745	1.231	1.231	3.4	3.4
3	10N0169D2_2	11/10/16	2,3,7,8-TCDF (^{13}C-2,3,7,8-TCDF)	1.0649	1.094	1.094	2.7	2.7
			2,3,7,8-TCDD (^{13}C-2,3,7,8-TCDD)					
			1,2,3,6,7,8-HxCDD (^{13}C-1,2,3,6,7,8-HxCDD)					
			1,2,3,4,6,7,8-HpCDD (^{13}C-1,2,4,6,7,8,-HpCDD)					
			OCDF (^{13}C-OCDF)					

Comments: Refer to Routine Calibration 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 Results Verification

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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 LCS - LCSD I * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 320-13584/2-A

Compound	Spike Added (PG/L)		Spiked Sample Concentration (PG/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
2,3,7,8-TCDD	200	NA	226	NA	113	113				
1,2,3,7,8-PeCDD	1000	↓	1172	↓	117	117				
1,2,3,4,7,8-HxCDD	↓	↓	1131	↓	113	113				
1,2,3,4,7,8,9-HpCDF	↓	↓	1107	↓	111	111				
OCDF	2000	↓	1981	↓	99	99				

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 #: 37601B21

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: 9

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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)

V_o = Volume or weight of sample extract in milliliters (ml) or grams (g).

RRF = Relative Response Factor (average) from the initial calibration

Df = Dilution Factor.

%S = Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. 1 , H :

Conc. = $\frac{(19157077)(2000)(1)}{(33750583)(1.0649)(1.0461)(\ )}$

= 101.9 pg/L

#	Sample ID	Compound	Reported Concentration (pg/L)	Calculated Concentration ( )	Qualification
	1	H	102		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Methane, Ethane, & Ethylene

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-22986-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M028E-R_161024	320-22986-7	Water	10/24/16
DUP01_161024	320-22986-8	Water	10/24/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Methane, Ethane, and Ethylene by Method RSK-175

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. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, 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.

Retention time windows were established as required by the method.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

V. Field Blanks

No field blanks were identified in this SDG.

VI. Surrogates

Surrogates were not required by the method.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there was insufficient sample volume for analysis of the matrix spike and matrix spike duplicate.

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

Samples M028E-R_161024 and DUP01_161024 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024	DUP01_161024				
Methane	11300	6290	57 (≤30)	-	J (all detects)	A
Ethane	28.4	76.8	-	48.4 (≤1.0)	J (all detects)	A
Ethylene	157	473	100 (≤30)	-	J (all detects)	A

X. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Flag	A or P
All samples in SDG 320-22986-1	Ethane	Eluted outside retention time window due to matrix interference and the confirmation column does not provide ethane quantitation due to coelute with acetylene.	J (all detects)	A

XI. Target Compound Identification

All target compound identifications met validation criteria.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to field duplicate RPD and difference and eluted outside retention time window, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Data Qualification Summary - SDG 320-22986-1

Sample	Compound	Flag	A or P	Reason
M028E-R_161024 DUP01_161024	Methane Ethylene	J (all detects) J (all detects)	A	Field duplicates (RPD)
M028E-R_161024 DUP01_161024	Ethane	J (all detects)	A	Field duplicates (difference)
M028E-R_161024 DUP01_161024	Ethane	J (all detects)	A	Compound quantitation (eluted outside retention time window)

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Laboratory Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Field Blank Data Qualification Summary - SDG 320-22986-1

No Sample Data Qualified in this SDG

LDC #: 37601B51
SDG #: 320-22986-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 4

Date: 12/8/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Methane-Ethane-Ethylene (Method RSK-175)

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/ICV	A A	RSD ≤ 20% . r² ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Matrix spike/Matrix spike duplicates	N	insufficient sample
VII.	Laboratory control samples	A	LCS ID
VIII.	Field duplicates	SW	D = 1+2
IX.	Compound quantitation RL/LOQ/LODs	SW	
X.	Target compound identification	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	M028E-R_161024	320-22986-7	Water	10/24/16
2	DUP01_161024	320-22986-8	Water	10/24/16
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Notes:

LDC #: 3T601BS1

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: A

Method: ✓ GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. 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 RT windows properly established?	✓			
IIb. 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%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. 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.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VI. Surrogate Spikes				
Were all surrogate percent recovery (%R) within the QC limits?			✓	
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. 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?			✓	

LDC #: 36018S1

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: M

Validation Area	Yes	No	NA	Findings/Comments
VIII. 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?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC#: 37601B51

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer:

METHOD: GC (RSK-175)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	2				
Methane	11300	6290	57			Not=A
Ethane	28.4	76.8		48.4	≤1.0	
Ethylene	157	473	100			

V:\FIELD DUPLICATES\37601B51_Amec.wpd

LDC #: 36601B51

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

METHOD: /GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	Ethane	Eluted outside retention time window due to matrix interference and the confirmation column does not provide ethane quantitation due to coelute with acetylene.	All	Jdets/A

Comments: See sample calculation verification worksheet for recalculations

LDC#: 36601B5T

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: E

Method: Methane by RSK-175

Calibration Date	Column	Compound	Standard	(Y) Response	(X) Concentration
11/2/2015	RT-U-Bond	Methane	0	126923	0.913
			s1	227824	1.830
			s2	7885907	73.0
			s3	40113712	365.0
			s4	171692801	2099.0
			s5	755021468	7374.0
			s6	1489294267	14470.0

Regression Output

		Reported
Constant	*-7164694.629779*	*36314.81310*
Std Err of Y Est		
R Squared	*0.999135*	*0.990000*
Degrees of Freedom		
X Coefficient(s)	*103122.632338*	*101233.21000*
Std Err of Coef.		
Correlation Coefficient	*0.999567*	
Coefficient of Determination (r^2)	*0.999135*	*0.990000*

LDC #: 37601B51

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC _____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (1.60 std)	Recalculated CF (1.60 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/2/16	Ethylene (RT-S-BOND)	84431	84431	84899.94	84900	3.9	3.9
2									
3									
4									

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 #: 36018S1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: CT
2nd Reviewer: MC

METHOD: GC ✓ HPLC ____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	16110404	11/4/16	Methanol (RT-U-BON0)	73.0	79.5	79.5	9.0	9.0
			Ethylene (RT-S-BON0)	128	136	136	6.3	6.0
2	16110418	11/4/16		73.0	79.1	79.1	8.4	8.4
				84900	89495	89472	5.4	5.4
3	16110410	11/4/16		73.0	75.9	75.9	3.9	3.9
				84900	85909	85907	1.2	1.2
4								

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 #: 37601B6

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: Q
2nd Reviewer: M

METHOD: / GC __HPLC

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* (SSC-SC)/SA

RPD = | SSCLCS - SSCLCSD | * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 580-34995

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	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)	146	146	149.7	154.2	107	107	106	106	3	3
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3760B4

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: A

METHOD: / **GC** __ **HPLC**

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% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 1 Compound Name Methanol

Concentration = (38404205 - 36314.8731)(3) / (101233.210)

= 1133 1.3 µg/L

#	Sample ID	Compound	Reported Concentrations (µg/L)	Recalculated Results Concentrations ( )	Qualifications
	1	Methanol	~~11330~~ 11300		

Comments: _____

SAMPCALew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Volatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23030-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M003A-R_161024	320-23030-4	Water	10/25/16
M034A-R_161025	320-23030-5	Water	10/25/16
M036A_161025	320-23030-6	Water	10/25/16
M038A_161025	320-23030-7	Water	10/25/16
M038E_161025	320-23030-8	Water	10/25/16
M039A_161025	320-23030-9	Water	10/25/16
M060E_161025	320-23030-10	Water	10/25/16
M034A-R_161025MS	320-23030-5MS	Water	10/25/16
M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
M038A_161025MS	320-23030-7MS	Water	10/25/16
M038A_161025MSD	320-23030-7MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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 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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 15.0%.

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.

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 TB02_161025 was identified as a trip blank. No contaminants were found.

Samples EB03_161025 and EB04_161025 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB04_161025	10/25/16	Acetone	3.81 ug/L	M003A-R_161024 M034A-R_161025 M036A_161025 M038A_161025 M038E_161025 M039A_161025 M060E_161025

Sample SB01-161024 (from SDG 320-22986-1) was identified as a source blank. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks.

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. For M034A-R_161025MS/MSD, no data were qualified for cis-1,2-Dichloroethene 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.

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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Volatiles - Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Laboratory Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Field Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

LDC #: 37601C1
SDG #: 320-23030-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/8/16
Page: 1 of 1
Reviewer: Q
2nd Reviewer: R

METHOD: GC/MS Volatiles (EPA SW846 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% or r² ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	SB01_161024 (320-22986-1), EB=1.2, TB=10
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A SW	
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~~	~~EB03_161025~~	~~320-23030-2~~	~~Water~~	~~10/25/16~~
~~2~~	~~EB04_161025~~	~~320-23030-3~~	~~Water~~	~~10/25/16~~
3	M003A-R_161024	320-23030-4	Water	10/25/16
4	M034A-R_161025	320-23030-5	Water	10/25/16
5	M036A_161025	320-23030-6	Water	10/25/16
6	M038A_161025	320-23030-7	Water	10/25/16
7	M038E_161025	320-23030-8	Water	10/25/16
8	M039A_161025	320-23030-9	Water	10/25/16
9	M060E_161025	320-23030-10	Water	10/25/16
~~10~~	~~TB02_161025~~	~~320-23030-11~~	~~Water~~	~~10/25/16~~
11	M034A-R_161025MS	320-23030-5MS	Water	10/25/16
12	M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
13	M038A_161025MS	320-23030-7MS	Water	10/25/16

LDC #: 37601C1
SDG #: 320-23030-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 1/18/16

Reviewer: 1
2nd Reviewer: 1

METHOD: GC/MS Volatiles (EPA SW846 Method 8260B)

	Client ID	Lab ID	Matrix	Date
14	M038A_161025MSD	320-23030-7MSD	Water	10/25/16
15				
16				
17				
18				
19				

Notes:

	MB 320-175124/12						

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 #: 37601c1

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: Q
2nd Reviewer: AC

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 10/25/16
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: 3 - 9

Compound	Blank ID	Sample Identification								
	2									
Methylene chloride										
Acetone	3.8 J									
Chloroform										

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								
Methylene chloride										
Acetone										
Chloroform										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC #: 37601C

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: 9
2nd Reviewer: A

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
		11/12	aaa	%R out	( )	( )		No qual >4X
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Semivolatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23030-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M003A-R_161024	320-23030-4	Water	10/25/16
M034A-R_161025	320-23030-5	Water	10/25/16
M036A_161025	320-23030-6	Water	10/25/16
M038A_161025	320-23030-7	Water	10/25/16
M038E_161025	320-23030-8	Water	10/25/16
M039A_161025	320-23030-9	Water	10/25/16
M034A-R_161025MS	320-23030-5MS	Water	10/25/16
M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
M038A_161025MS	320-23030-7MS	Water	10/25/16
M038A_161025MSD	320-23030-7MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Semivolatile Organic Compounds (SVOCs) by Environmental Protection Agency (EPA) SW 846 Method 8270C

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 15.0%.

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.

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 ending continuing calibration verifications (CCVs) were not provided per DoD 5.0 requirement. No data was reviewed since ending CCVs were not required by this method.

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 with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB 320-134940/1-A	10/28/16	Bis(2-ethylhexyl)phthalate	1.007 ug/L	All samples in SDG 320-23030-1

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
M003A-R_161024	Bis(2-ethylhexyl)phthalate	4.72 ug/L	4.72U ug/L
M036A_161025	Bis(2-ethylhexyl)phthalate	1.42 ug/L	2.90U ug/L

VI. Field Blanks

Samples EB03_161025 and EB04_161025 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 (from SDG 320-22986-1) was identified as a source blank. No contaminants were found.

VII. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for sample M034A-R_161025. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

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) and relative percent differences (RPD) were not within the QC limits for M034A-R_161025MS/MSD. No data were qualified for MS/MSD samples analyzed greater than or equal to a 5X dilution.

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.

Due to laboratory blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Semivolatiles - Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG 320-23030-1

Sample	Compound	Modified Final Concentration	A or P
M003A-R_161024	Bis(2-ethylhexyl)phthalate	4.72U ug/L	A
M036A_161025	Bis(2-ethylhexyl)phthalate	2.90U ug/L	A

NAS Alameda Point, BGMP
Semivolatiles - Field Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

LDC #: 37601C2a
SDG #: 320-23030-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/8/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Semivolatiles (EPA SW846 Method 8270C)

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%. r² ICV≤20%
IV.	Continuing calibration	A	CCV≤20%. No 2nd CCV
V.	Laboratory Blanks	SW	
VI.	Field blanks	ND	EB=1, 2, SB=SB01 61024 (320-22986-1)
VII.	Surrogate spikes	SN	
VIII.	Matrix spike/Matrix spike duplicates	SW	9/10: %R/RPD out (>500F)
IX.	Laboratory control samples	A	LCS
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	~~EB03_161025~~	~~320-23030-2~~	~~Water~~	~~10/25/16~~
2	~~EB04_161025~~	~~320-23030-3~~	~~Water~~	~~10/25/16~~
3	M003A-R_161024	320-23030-4	Water	10/25/16
4	M034A-R_161025	320-23030-5	Water	10/25/16
5	M036A_161025	320-23030-6	Water	10/25/16
6	M038A_161025	320-23030-7	Water	10/25/16
7	M038E_161025	320-23030-8	Water	10/25/16
8	M039A_161025	320-23030-9	Water	10/25/16
9	M034A-R_161025MS	320-23030-5MS	Water	10/25/16
10	M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
11	M038A_161025MS	320-23030-7MS	Water	10/25/16
12	M038A_161025MSD	320-23030-7MSD	Water	10/25/16
13				

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. 2,3,4,6-Tetrachlorophenol	U1.
V. 4-Chloro-3-methylphenol	VV. Anthracene	VVV.Benzonaphthothiophene	VVVV. 1,2,4,5-Tetrachlorobenzene	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 #: 3T601C29

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 10/28/16 **Blank analysis date:** 11/3/16
Conc. units: ug Associated Samples: ay

Compound	Blank ID	Sample Identification								
[redacted]	MB320-134940/1-A	3	5							
EEE	1.00T		4.72/U	1.42/2.90U						

Blank extraction date:_____ **Blank analysis date:**_____
Conc. units:_____ Associated Samples:_____

Compound	Blank ID	Sample Identification								
[redacted]										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 36601C29

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		+	All	— (—)	No qual (50x + 5000x)
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
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				( )	
				( )	
				( )	
				( )	
				( )	

(NBZ) = Nitrobenzene-d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl-d14
(PHL) = Phenol-d5
(2FP)= 2-Fluorophenol
(TBP) = 2,4,6-Tribromophenol
(2CP) = 2-Chlorophenol-d4
(DCB) = 1,2-Dichlorobenzene-d4

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Organochlorine Pesticides

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23030-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP08_161025	320-23030-1	Water	10/25/16
M003A-R_161024	320-23030-4	Water	10/25/16
M036A_161025	320-23030-6	Water	10/25/16
M038A_161025	320-23030-7	Water	10/25/16
M038E_161025	320-23030-8	Water	10/25/16
M039A_161025	320-23030-9	Water	10/25/16
M038A_161025MS	320-23030-7MS	Water	10/25/16
M038A_161025MSD	320-23030-7MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Organochlorine Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8081A

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

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 20.0% for all compounds.

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 required frequencies.

The percent differences (%D) were less than or equal to 20.0% 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 EB04_161025 was identified as an equipment blank. No contaminants were found.

Sample SB01_161024 (from SDG 320-22986-1) was identified as a source 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 with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
M038A_161025MS/MSD (M038A_161025)	Endrin	139 (60-138)	-	NA	-

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 DUP08_161025 and M039A_161025 were identified as field duplicates. No results were detected in any of the samples.

XI. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Organochlorine Pesticides - Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Organochlorine Pesticides - Laboratory Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Organochlorine Pesticides - Field Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

LDC #: 37601C3a
SDG #: 320-23030-1
Laboratory: Test America Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 1/18/16
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Organochlorine Pesticides (EPA SW846 Method 8081A)

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 Instrument Performance Check	A	
III.	Initial calibration/ICV	A/A	RSD<20%. ICV<=20%
IV.	Continuing calibration	A	CCV<=20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=2. SB=SB01_161024(320-22986-1)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	ND	D=1+T
XI.	Compound quantitation/RL/LOQ/LODs	N	
XII.	Target compound identification	N	
XIII.	System Performance	N	
XIV	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	DUP08_161025	320-23030-1	Water	10/25/16
2	~~EB04_161025~~	~~320-23030-3~~	~~Water~~	~~10/25/16~~
3	M003A-R_161024	320-23030-4	Water	10/25/16
4	M036A_161025	320-23030-6	Water	10/25/16
5	M038A_161025	320-23030-7	Water	10/25/16
6	M038E_161025	320-23030-8	Water	10/25/16
7	M039A_161025	320-23030-9	Water	10/25/16
8	M038A_161025MS	320-23030-7MS	Water	10/25/16
9	M038A_161025MSD	320-23030-7MSD	Water	10/25/16
10				
11				
12				
13				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticides

A. alpha-BHC	J. 4,4'-DDE	S. alpha-Chlordane	BB. Aroclor-1260	KK. p,p-DDT
B. beta-BHC	K. Endrin	T. gamma-Chlordane	CC. 2,4'-DDD	LL. o,p-DDT
C. delta-BHC	L. Endosulfan II	U. Toxaphene	DD. 2,4'-DDE	MM. o,p-DDE
D. gamma-BHC	M. 4,4'-DDD	V. Aroclor-1016	EE. 2,4'-DDT	NN. o,p-DDD
E. Heptachlor	N. Endosulfan sulfate	W. Aroclor-1221	FF. Hexachlorobenzene	OO. oxy-Chlordane
F. Aldrin	O. 4,4'-DDT	X. Aroclor-1232	GG. Chlordane	PP. cis-Nonachlor
G. Heptachlor epoxide	P. Methoxychlor	Y. Aroclor-1242	HH. Chlordane (Technical)	QQ. trans-Nonachlor
H. Endosulfan I	Q. Endrin ketone	Z. Aroclor-1248	II. p,p-DDE	RR. cis-Chlordane
I. Dieldrin	R. Endrin aldehyde	AA. Aroclor-1254	JJ. p,p-DDD	SS. trans-Chlordane

Notes:_____

LDC #: 36161C39

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: CL
2nd Reviewer: AC

METHOD: ✓ **GC** __ **HPLC**

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?
Y N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y (N) N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	8/9	K	139 (60-138)	( )	( )	5 (NO)	detects/A
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 13, 2016

Parameters: Metals

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23030-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M034A-R_161025	320-23030-5	Water	10/25/16
M060E_161025	320-23030-10	Water	10/25/16
M003A-R_161024F	320-23030-4F	Water	10/25/16
M034A-R_161025F	320-23030-5F	Water	10/25/16
M036A_161025F	320-23030-6F	Water	10/25/16
M038A_161025F	320-23030-7F	Water	10/25/16
M038E_161025F	320-23030-8F	Water	10/25/16
M039A_161025F	320-23030-9F	Water	10/25/16
M034A-R_161025MS	320-23030-5MS	Water	10/25/16
M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
M034A-R_161025MSF	320-23030-5MSF	Water	10/25/16
M034A-R_161025MSDF	320-23030-5MSDF	Water	10/25/16
M038A_161025MSF	320-23030-7MSF	Water	10/25/16
M038A_161025MSDF	320-23030-7MSDF	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A
Mercury by EPA SW 846 Method 7470A

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

III. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

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)	Calcium	0.04194 ug/L	M003A-R_161024F M034A-R_161025F M036A_161025F M038A_161025F M038E_161025F M039A_161025F

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

Samples EB03_161025F and EB04_161025F were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB03_161025F	10/25/16	Sodium	0.123 mg/L	M003A-R_161024F M034A-R_161025F M036A_161025F M038A_161025F M038E_161025F M039A_161025F

Sample SB01_161024F (from SDG 320-22986-1) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB01_161024F	10/24/16	Chromium Sodium	0.00188 mg/L 0.0665 mg/L	M003A-R_161024F M034A-R_161025F M036A_161025F M038A_161025F M038E_161025F M039A_161025F

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
M034A-R_161025F	Chromium	0.00555 mg/L	0.00555U mg/L

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
M034A-R_161025MSF/MSDF (M034A-R_161025F)	Iron Nickel	76 (87-118) 84 (85-117)	- -	J (all detects) J (all detects)	A

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
M034A-R_161025MSF/MSDF (M034A-R_161025F)	Lead	86 (88-115)	-	UJ (all non-detects)	A

Percent recoveries (%R) were not within the QC limits for M038A_161025MSF/MSDF. No data were qualified for MS/MSD samples analyzed greater than or equal to a 5X dilution.

For M034A-R_161025MS/MSD, no data were qualified for Calcium, Magnesium, Potassium, and Sodium percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

For M034A-R_161025MSF/MSDF, no data were qualified for Calcium, Manganese, Potassium, and Sodium percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

For M038A_161025MSF/MSDF, no data were qualified for Calcium, Copper, Magnesium, Potassium, and Sodium 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

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Serial Dilution

Serial dilution analysis was performed on an associated project sample. Percent differences (%D) were within QC limits with the following exceptions:

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Flag	A or P
M034A-R_161025	Sodium	48 (≤10)	M034A-R_161025	J (all detects)	A
M038A_161025F	Calcium Magnesium Potassium Sodium	38 (≤10) 26 (≤10) 30 (≤10) 29 (≤10)	M038A_161025F	J (all detects) J (all detects) J (all detects) J (all detects)	A

IX. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

X. Field Duplicates

No field duplicates were identified in this SDG.

XI. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS/MSD %R and serial dilution %D, data were qualified as estimated in three samples.

Due to source blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Metals - Data Qualification Summary - SDG 320-23030-1

Sample	Analyte	Flag	A or P	Reason
M034A-R_161025F	Iron Nickel	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
M034A-R_161025F	Lead	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)
M034A-R_161025	Sodium	J (all detects)	A	Serial dilution (%D)
M038A_161025F	Calcium Magnesium Potassium Sodium	J (all detects) J (all detects) J (all detects) J (all detects)	A	Serial dilution (%D)

NAS Alameda Point, BGMP
Metals - Laboratory Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Metals - Field Blank Data Qualification Summary - SDG 320-23030-1

Sample	Analyte	Modified Final Concentration	A or P
M034A-R_161025F	Chromium	0.00555U mg/L	A

LDC #: 37601C4a
SDG #: 320-23030-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/10/16
Page: 1 of 2
Reviewer: a
2nd Reviewer: a

METHOD: Metals (EPA SW 846 Method 6020A/7470A)

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.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB=3,4 SB=SB01-161024F (320-22986-1)
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	SW	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	N	
XII.	Internal Standard (ICP-MS)	A	
XIII.	Sample Result Verification	N	
XIV	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

Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	M034A-R_161025	320-23030-5	Water	10/25/16
2	M060E_161025	320-23030-10	Water	10/25/16
3	~~EB03_161025F~~	~~320-23030-2F~~	~~Water~~	~~10/25/16~~
4	~~EB04_161025F~~	~~320-23030-3F~~	~~Water~~	~~10/25/16~~
5	M003A-R_161024F	320-23030-4F	Water	10/25/16
6	M034A-R_161025F	320-23030-5F	Water	10/25/16
7	M036A_161025F	320-23030-6F	Water	10/25/16
8	M038A_161025F	320-23030-7F	Water	10/25/16
9	M038E_161025F	320-23030-8F	Water	10/25/16
10	M039A_161025F	320-23030-9F	Water	10/25/16
11	M034A-R_161025MS	320-23030-5MS	Water	10/25/16
12	M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
13	M034A-R_161025MSF	320-23030-5MSF	Water	10/25/16
14	M034A-R_161025MSDF	320-23030-5MSDF	Water	10/25/16
15	M038A_161025MSF	320-23030-7MSF	Water	10/25/16

LDC #: 37601C4a
SDG #: 320-23030-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/9/16
Page: 2 of 2
Reviewer:
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020A/7470A)

	Client ID	Lab ID	Matrix	Date
16	M038A_161025MSDF	320-23030-7MSDF	Water	10/25/16
17				
18				
19				
20				
21				

Notes:

LDC #: 31601C4k

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Reviewer: CR
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
5-10		(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo), B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
1,2		Al, Sb, As, Ba, Be, Cd (Ca) Cr, Co, Cu, Fe, Pb, (Mg) Mn, Hg, Ni, (K) Se, Ag, (Na) Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
QC: 11,12		Al, Sb, As, Ba, Be, Cd (Ca) Cr, Co, Cu, Fe, Pb, (Mg) Mn, Hg, Ni, (K) Se, Ag, (Na) Tl, V, Zn, Mo, B, Sn, Ti, ___
13,14,15,16		(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo), B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___

Comments: Mercury by CVAA if performed

LDC #: 37601C4a

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer:
2nd Reviewer:

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Soil preparation factor applied:
Sample Concentration units, unless otherwise noted: ug/L Associated Samples: 5-10

				Sample Identification										
Analyte	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Action Level	No qualifiers (≥5x)										
Ca	0.04194		0.2097											

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 37601C4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW846 6010B/7000)

Blank units: mg/L **Associated sample units:** mg/L
Sampling date: 10/24/16 Soil factor applied _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: ~~All~~ 5-10

Analyte	Blank ID	Sample Identification										
	SB01_161024F (SDG: 320-22986-1)	Action Limit	6									
Cr	0.00188	0.0094	0.00555									
Na	0.0665	0.3325										

Sampling date: 10/25/16 Soil factor applied _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: ~~All~~ 5-10

Analyte	Blank ID	Sample Identification										
	3	Action Limit	No qualifiers									
Na	0.123	0.615										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 37601C4G

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

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 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
	13/14	W	Fe	76 (87-118)			6	J/UJ/A Det
			Pb	86 (88-115)				ND
			Ni	84 (85-117)				Det
	15/16	W	Sb, As, Ba, Be, Cd, Cr, Co, Fe, Pb, Mn, Mo, Ni, Ag, Tl, V, Zn					Diluted out (100x dil)

Comments: 11/12: Ca, Mg, K, Na >4X 15/16: Ca, Cu, Mg, K, Na >4X
13/14: Ca, Mn, K, Na >4X

LDC #: 37601C4

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 1

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A If analyte concentrations were > 50X the MDL (ICP) ,or >100X the MDL (ICP/MS), was a serial dilution analyzed?

Y N N/A Were ICP serial dilution percent differences (%D) ≤10%?

Y N N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications
	1		Na	48	1	J (all applicable)
	8		Ca	38	8	
			Mg	26		
			K	30		
			Na	~~26~~ 29		

Comments: _____

SerDil.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23030-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP08_161025	320-23030-1	Water	10/25/16
M003A-R_161024	320-23030-4	Water	10/25/16
M034A-R_161025	320-23030-5	Water	10/25/16
M038A_161025	320-23030-7	Water	10/25/16
M038E_161025	320-23030-8	Water	10/25/16
M039A_161025	320-23030-9	Water	10/25/16
M060E_161025	320-23030-10	Water	10/25/16
M003A-R_161024MS	320-23030-4MS	Water	10/25/16
M003A-R_161024MSD	320-23030-4MSD	Water	10/25/16
M034A-R_161025MS	320-23030-5MS	Water	10/25/16
M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
M034A-R_161025DUP	320-23030-5DUP	Water	10/25/16
M038A_161025MS	320-23030-7MS	Water	10/25/16
M038A_161025MSD	320-23030-7MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Nitrate as Nitrogen, Nitrite as Nitrogen, Sulfate, and Chloride by Environmental Protection Agency (EPA) Method 300.0
Sulfide by EPA Method 9034
Total Cyanide by EPA Method 9012A
Alkalinity by Standard Method 2320B
Total Dissolved Solids by Standard Method 2540C
Total Organic Carbon by Standard Method 5310B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

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)	Cyanide	2.575 ug/L	DUP08_161025 M034A-R_161025 M038A_161025 M038E_161025 M039A_161025

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 with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
M034A-R_161025	Cyanide	8.85 ug/L	8.85U ug/L
M038A_161025	Cyanide	2.57 ug/L	5.00U ug/L

V. Field Blanks

Samples EB03_161025 and EB04_161025 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB04_161025	10/25/16	Cyanide	3.13 ug/L	All samples in SDG 320-23030-1

Sample SB01_161024 (from SDG 320-22986-1) was identified as a rinsate. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB01_161024	10/24/16	Cyanide	3.55 ug/L	All samples in SDG 320-23030-1

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
M034A-R_161025	Cyanide	8.85 ug/L	8.85U ug/L
M038A_161025	Cyanide	2.57 ug/L	5.00U ug/L
M038E_161025	Cyanide	16.7 ug/L	16.7U ug/L

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. Duplicates

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples DUP08_161025 and M039A_161025 were identified as field duplicates. No results were detected in any of the samples.

X. Sample Result Verification

Raw data were not reviewed for stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to laboratory blank contamination, data were qualified as not detected in two samples.

Due to equipment and source blank contamination, data were qualified as not detected in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Wet Chemistry - Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 320-23030-1

Sample	Analyte	Modified Final Concentration	A or P
M034A-R_161025	Cyanide	8.85U ug/L	A
M038A_161025	Cyanide	5.00U ug/L	A

NAS Alameda Point, BGMP
Wet Chemistry - Field Blank Data Qualification Summary - SDG 320-23030-1

Sample	Analyte	Modified Final Concentration	A or P
M034A-R_161025	Cyanide	8.85U ug/L	A
M038A_161025	Cyanide	5.00U ug/L	A
M038E_161025	Cyanide	16.7U ug/L	A

LDC #: 37601C6
SDG #: 320-23030-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/10/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: (Analyte) Nitrate-N, Nitrite-N, Sulfate, Chloride (EPA Method 300.0), Sulfide, (EPA Method 9034) Total Cyanide (EPA Method 9012A) Alkalinity (SM2320B), TDS (SM 2540C), TOC (SM 5310B)

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	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	SW	EB=2,3, SB=SB01_161024 (320-22986-1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	ND	(1,8)
X.	Sample result verification	N	
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	DUP08_161025	320-23030-1	Water	10/25/16
2	~~EB03_161025~~	~~320-23030-2~~	~~Water~~	~~10/25/16~~
3	~~EB04_161025~~	~~320-23030-3~~	~~Water~~	~~10/25/16~~
4	M003A-R_161024	320-23030-4	Water	10/25/16
5	M034A-R_161025	320-23030-5	Water	10/25/16
6	M038A_161025	320-23030-7	Water	10/25/16
7	M038E_161025	320-23030-8	Water	10/25/16
8	M039A_161025	320-23030-9	Water	10/25/16
9	M060E_161025	320-23030-10	Water	10/25/16
10	M003A-R_161024MS	320-23030-4MS	Water	10/25/16
11	M003A-R_161024MSD	320-23030-4MSD	Water	10/25/16
12	M034A-R_161025MS	320-23030-5MS	Water	10/25/16
13	M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
14	M034A-R_161025DUP	320-23030-5DUP	Water	10/25/16
15	M038A_161025MS	320-23030-7MS	Water	10/25/16
16	M038A_161025MSD	320-23030-7MSD	Water	10/25/16
17				

LDC #: 37601C6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
5,9	pH (TDS) (Cl) F (NO3) (NO2) (SO4) O-PO4 (Alk) (CN) NH3 TKN (TOC) Cr6+ ClO4 (Sulfide)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
1,4-8	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
QC:10,11	pH TDS Cl F NO3 NO2 SO4 O-PO4 (Alk) (CN) NH3 TKN TOC Cr6+ ClO4
12,13	pH (TDS) (Cl) F (NO3) (NO2) (SO4) O-PO4 (Alk) (CN) NH3 TKN (TOC) Cr6+ ClO4 (Sulfide)
14	pH TDS Cl F NO3 NO2 SO4 O-PO4 (Alk) CN NH3 TKN TOC Cr6+ ClO4
15,16	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 #: 37601C6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: Inorganics, Method See Cover

Conc. units: ug/L **Associated Samples:** 1, 5-8

Analyte	Blank ID	Blank ID	Blank Action Limit										
	PB	ICB/CCB (mg/L)		5	6								
Cyanide	2.575		12.875	8.85	2.57 / 5.00								

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 #: 37601C6

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer:
2nd Reviewer:

METHOD: Inorganics, EPA Method See Cover
Blank units: ug/L **Associated sample units: ug/L**
Sampling date: 10/24/16 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: All

Analyte	Blank ID	Action Limit	Sample Identification							
	SB01_161024 (from SDG 320-22986-1)		5	6	7					
Cyanide	3.55	17.75	8.85	2.57 / 5.00	16.7					

Sampling date: 10/25/16 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: All

Analyte	Blank ID	Action Limit	Sample Identification							
	3		5	6						
Cyanide	3.13	15.65	8.85	2.57 / 5.00						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Gasoline Range Organics

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23030-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M034A-R_161025	320-23030-5	Water	10/25/16
M036A_161025	320-23030-6	Water	10/25/16
M034A-R_161025MS	320-23030-5MS	Water	10/25/16
M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 20.0%.

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%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB03_161025 and EB04_161025 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 (from SDG 320-22986-1) was identified as a source 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) 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

Internal standard data were not reviewed for Stage 2B validation.

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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Gasoline Range Organics – Data Qualification Summary – SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

LDC #: 37601C7
SDG #: 320-23030-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/8/16
Page: 1 of 1
Reviewer:
2nd Reviewer: JC

METHOD: GC/MS Gasoline Range Organics (EPA SW846 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	RRD ≤ 20%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=1, 2. SB01_161024 (320-229861)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
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	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	~~EB03_161025~~	~~320-23030-2~~	~~Water~~	~~10/25/16~~
2	~~EB04_161025~~	~~320-23030-3~~	~~Water~~	~~10/25/16~~
3	M034A-R_161025	320-23030-5	Water	10/25/16
4	M036A_161025	320-23030-6	Water	10/25/16
5	M034A-R_161025MS	320-23030-5MS	Water	10/25/16
6	M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
7				
8				
9				
10				
11				

Notes:

	MB 320-175123/12						

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 19, 2016

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23030-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M034A-R_161025	320-23030-5	Water	10/25/16
M036A_161025	320-23030-6	Water	10/25/16
M034A-R_161025MS	320-23030-5MS	Water	10/25/16
M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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. 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 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. 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.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB 320-134931/1-A	10/28/16	JP4 (C8-C13)	54.19 ug/L	All samples in SDG 320-23030-1

Sample concentrations were compared to concentrations detected in the laboratory blanks. 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

Samples EB03_161025 and EB04_161025 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB03_161025	10/25/16	Diesel range organics (C12-C24)	24.4 ug/L	All samples in SDG 320-23030-1

Sample SB01_161024 (from SDG 320-22986-1) was identified as a source blank. No contaminants were found.

The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
M036A_161025	Diesel range organics (C12-C24)	84.0 ug/L	84.0U ug/L

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

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 not within the QC limits for M034A-R_161025MS/MSD. No data were qualified since the parent sample results were greater than 4X the spiked concentration. Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XI. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to equipment blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Total Petroleum Hydrocarbons as Extractables – Data Qualification Summary – SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 320-23030-1

Sample	Compound	Modified Final Concentration	A or P
M036A_161025	Diesel range organics (C12-C24)	84.0U ug/L	A

LDC #: 37601C8
SDG #: 320-23030-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/8/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC ~~Diesel Range Organics~~ TPH 2 (EPA SW 846 Method 8015B)

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/ICV	A/A	RSD ≤ 20%. ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	SW	
V.	Field blanks	SW	ZB=1,2. SB01-161024 (320-22986-1)
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	5/16: %R out > 4X
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Compound quantitation RL/LOQ/LODs	N	
XI.	Target compound identification	N	
XII.	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~~	~~EB03_161025~~	~~320-23030-2~~	~~Water~~	~~10/25/16~~
~~2~~	~~EB04_161025~~	~~320-23030-3~~	~~Water~~	~~10/25/16~~
3	M034A-R_161025	320-23030-5	Water	10/25/16
4	M036A_161025	320-23030-6	Water	10/25/16
5	M034A-R_161025MS	320-23030-5MS	Water	10/25/16
6	M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
7				
8				
9				
10				
11				
12				

Notes:

LDC #: 3T601C8

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Blank extraction date: 10/28/16 **Blank analysis date:** 11/3/16
Conc. units: MSL **Associated samples:** NY

Compound	Blank ID	Sample Identification								
MB320-134931/1-A			1	4	[illegible]					
JP4 (C8-C13)	54.19		~~24.4/40.0 U~~	~~84.0~~						

Blank extraction date:_____ **Blank analysis date:**_____ **Associated samples:**_____
Conc. units:_____

Compound	Blank ID	Sample Identification								

ALL 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 #: 35601C8

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: 9
2nd Reviewer: K

METHOD: GC

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?
Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 10/25/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: 3-4 All

Compound	Blank ID	Sample Identification								
	1	2	4							
DRO (C12-C24)	24*		84.0/U							

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Polychlorinated Dioxins/Dibenzofurans

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23030-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP08_161025	320-23030-1	Water	10/25/16
M038A_161025	320-23030-7	Water	10/25/16
M038E_161025	320-23030-8	Water	10/25/16
M039A_161025	320-23030-9	Water	10/25/16
M038A_161025MS	320-23030-7MS	Water	10/25/16
M038A_161025MSD	320-23030-7MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review (September 2011). 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:

Polychlorinated Dioxins/Dibenzofurans by Environmental Protection Agency (EPA) SW 846 Method 8290

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

The static resolving power was at least 10,000 (10% valley definition).

III. Initial Calibration and Initial Calibration Verification

A five point initial calibration was performed as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

The ion abundance ratios for all PCDDs/PCDFs were within method and 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.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within method and validation criteria.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB 320-135484/1-A	11/01/16	1,2,3,7,8-PeCDD 1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total TCDF Total PeCDD Total PeCDF Total HxCDD Total HxCDF Total HpCDD Total HpCDF	0.8766 pg/L 0.9129 pg/L 1.043 pg/L 1.179 pg/L 0.9536 pg/L 1.205 pg/L 1.169 pg/L 0.7736 pg/L 0.8532 pg/L 1.126 pg/L 2.586 pg/L 3.076 pg/L 1.024 pg/L 7.729 pg/L 6.890 pg/L 1.415 pg/L 0.8466 pg/L 1.956 pg/L 3.338 pg/L 3.922 pg/L 4.388 pg/L 5.214 pg/L	M038A_161025 M038E_161025 M039A_161025
MB 320-137212/1-A	11/11/16	1,2,3,7,8,9-HxCDD 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total HxCDD Total HxCDF Total HpCDD Total HpCDF	0.6393 pg/L 0.7566 pg/L 0.8246 pg/L 1.363 pg/L 1.125 pg/L 0.8027 pg/L 5.128 pg/L 1.539 pg/L 0.6393 pg/L 1.581 pg/L 2.668 pg/L 1.928 pg/L	DUP08_161025

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
M038A_161025	2,3,4,7,8-PeCDF	0.827 pg/L	11.7U pg/L
	1,2,3,4,7,8-HxCDD	0.536 pg/L	23.5U pg/L
	1,2,3,6,7,8-HxCDD	0.980 pg/L	11.7U pg/L
	1,2,3,7,8,9-HxCDD	0.997 pg/L	11.7U pg/L
	1,2,3,4,7,8-HxCDF	1.05 pg/L	6.11U pg/L
	1,2,3,6,7,8-HxCDF	0.614 pg/L	11.7U pg/L
	1,2,3,7,8,9-HxCDF	0.223 pg/L	6.11U pg/L
	2,3,4,6,7,8-HxCDF	0.750 pg/L	6.11U pg/L
	1,2,3,4,6,7,8-HpCDD	10.2 pg/L	23.5U pg/L
	1,2,3,4,6,7,8-HpCDF	2.72 pg/L	6.11U pg/L
	OCDF	4.63 pg/L	23.5U pg/L
	Total TCDF	3.81 pg/L	4.70U pg/L
	Total PeCDF	5.96 pg/L	6.11U pg/L
	Total HxCDD	8.75 pg/L	11.7U pg/L
	Total HxCDF	6.18 pg/L	11.7U pg/L
	Total HpCDF	6.76 pg/L	11.7U pg/L
M038E_161025	1,2,3,7,8-PeCDF	0.553 pg/L	6.05U pg/L
	2,3,4,7,8-PeCDF	0.549 pg/L	11.6U pg/L
	1,2,3,4,7,8-HxCDD	0.938 pg/L	23.3U pg/L
	1,2,3,6,7,8-HxCDD	0.713 pg/L	11.6U pg/L
	1,2,3,7,8,9-HxCDD	1.31 pg/L	11.6U pg/L
	1,2,3,4,7,8-HxCDF	0.665 pg/L	6.05U pg/L
	1,2,3,6,7,8-HxCDF	0.544 pg/L	11.6U pg/L
	1,2,3,7,8,9-HxCDF	1.05 pg/L	6.05U pg/L
	2,3,4,6,7,8-HxCDF	0.931 pg/L	6.05U pg/L
	1,2,3,4,6,7,8-HpCDD	2.50 pg/L	23.3U pg/L
	1,2,3,4,6,7,8-HpCDF	1.42 pg/L	6.05U pg/L
	1,2,3,4,7,8,9-HpCDF	1.22 pg/L	11.6U pg/L
	OCDD	9.88 pg/L	93.1U pg/L
	OCDF	3.52 pg/L	23.3U pg/L
	Total PeCDF	1.10 pg/L	6.05U pg/L
	Total HxCDD	2.96 pg/L	11.6U pg/L
	Total HxCDF	3.19 pg/L	11.6U pg/L
	Total HpCDD	4.65 pg/L	23.3U pg/L
	Total HpCDF	2.63 pg/L	11.6U pg/L
M039A_161025	1,2,3,4,6,7,8-HpCDD	3.17 pg/L	23.6U pg/L
	1,2,3,4,6,7,8-HpCDF	1.86 pg/L	6.13U pg/L
	OCDD	26.2 pg/L	94.4U pg/L
	OCDF	3.38 pg/L	23.6U pg/L
	Total HpCDD	7.73 pg/L	23.6U pg/L
	Total HpCDF	3.85 pg/L	11.8U pg/L
DUP08_161025	1,2,3,7,8,9-HxCDD	0.538 pg/L	11.8U pg/L
	1,2,3,6,7,8-HxCDF	0.604 pg/L	11.8U pg/L
	1,2,3,7,8,9-HxCDF	0.584 pg/L	6.13U pg/L
	1,2,3,4,6,7,8-HpCDD	2.95 pg/L	23.6U pg/L
	1,2,3,4,6,7,8-HpCDF	1.83 pg/L	6.13U pg/L
	1,2,3,4,7,8,9-HpCDF	0.867 pg/L	11.8U pg/L
	OCDF	5.89 pg/L	23.6U pg/L
	Total HxCDD	0.748 pg/L	11.8U pg/L
	Total HxCDF	3.30 pg/L	11.8U pg/L
	Total HpCDD	11.2 pg/L	23.6U pg/L
	Total HpCDF	6.95 pg/L	11.8U pg/L

VI. Field Blanks

No field blanks were identified in this SDG.

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
M038A_161025MS/MSD (M038A_161025)	1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD	140 (80-126) 123 (79-122)	145 (80-126) 125 (79-122)	J (all detects) J (all detects)	A
M038A_161025MS/MSD (M038A_161025)	1,2,3,7,8-PeCDD 1,2,3,4,7,8,9-HpCDF	128 (76-121) 131 (77-128)	126 (76-121) 130 (77-128)	NA	-

Relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	%R (Limits)	Flag	A or P
LCS 320-137212/2-A (DUP08_161025)	1,2,3,7,8-PeCDD	122 (76-121)	NA	-

IX. Field Duplicates

Samples DUP08_161025 and M039A_161025 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (pg/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP08_161025	M039A_161025				
1,2,3,7,8-PeCDF	0.433	6.13U	-	5.697 (≤47.2)	-	-
2,3,4,7,8-PeCDF	0.472	11.8U	-	11.328 (≤47.2)	-	-
1,2,3,7,8,9-HxCDD	0.538	23.6U	-	23.062 (≤47.2)	-	-
1,2,3,4,7,8-HxCDF	0.745	6.13U	-	5.385 (≤47.2)	-	-
1,2,3,6,7,8-HxCDF	0.604	11.8U	-	11.196 (≤47.2)	-	-
1,2,3,7,8,9-HxCDF	0.584	6.13U	-	5.546 (≤47.2)	-	-

Compound	Concentration (pg/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP08_161025	M039A_161025				
2,3,4,6,7,8-HxCDF	0.528	6.13U	-	5.602 (≤47.2)	-	-
1,2,3,4,6,7,8-HpCDD	2.95	3.17	-	0.22 (≤47.2)	-	-
1,2,3,4,6,7,8-HpCDF	1.83	1.86	-	0.03 (≤47.2)	-	-
1,2,3,4,7,8,9-HpCDF	0.867	11.8U	-	10.933 (≤47.2)	-	-
OCDD	44.6	26.2	-	18.4 (≤113)	-	-
OCDF	5.89	3.38	-	2.51 (≤94.4)	-	-
Total PeCDF	0.905	6.13U	-	5.225 (≤47.2)	-	-
Total HxCDD	0.748	11.8U	-	11.052 (≤47.2)	-	-
Total HxCDF	3.30	11.8U	-	8.5 (≤47.2)	-	-
Total HpCDD	11.2	7.73	-	3.47 (≤47.2)	-	-
Total HpCDF	6.95	3.85	-	3.1 (≤47.2)	-	-

X. Internal Standards

All internal standard recoveries (%R) were within QC limits.

XI. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

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, data were qualified as estimated in one sample.

Due to laboratory blank contamination, data were qualified as not detected in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Polychlorinated Dioxins/Dibenzofurans - Data Qualification Summary - SDG 320-23030-1

Sample	Compound	Flag	A or P	Reason
M038A_161025	1,2,3,4,7,8-HxCDD 1,2,3,4,6,7,8-HpCDD	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

NAS Alameda Point, BGMP
Polychlorinated Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG 320-23030-1

Sample	Compound	Modified Final Concentration	A or P
M038A_161025	2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF OCDF Total TCDF Total PeCDF Total HxCDD Total HxCDF Total HpCDF	11.7U pg/L 23.5U pg/L 11.7U pg/L 11.7U pg/L 6.11U pg/L 11.7U pg/L 6.11U pg/L 6.11U pg/L 23.5U pg/L 6.11U pg/L 23.5U pg/L 4.70U pg/L 6.11U pg/L 11.7U pg/L 11.7U pg/L 11.7U pg/L	A
M038E_161025	1,2,3,7,8-PeCDF 2,3,4,7,8-PeCDF 1,2,3,4,7,8-HxCDD 1,2,3,6,7,8-HxCDD 1,2,3,7,8,9-HxCDD 1,2,3,4,7,8-HxCDF 1,2,3,6,7,8-HxCDF 1,2,3,7,8,9-HxCDF 2,3,4,6,7,8-HxCDF 1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF 1,2,3,4,7,8,9-HpCDF OCDD OCDF Total PeCDF Total HxCDD Total HxCDF Total HpCDD Total HpCDF	6.05U pg/L 11.6U pg/L 23.3U pg/L 11.6U pg/L 11.6U pg/L 6.05U pg/L 11.6U pg/L 6.05U pg/L 6.05U pg/L 23.3U pg/L 6.05U pg/L 11.6U pg/L 93.1U pg/L 23.3U pg/L 6.05U pg/L 11.6U pg/L 11.6U pg/L 23.3U pg/L 11.6U pg/L	A
M039A_161025	1,2,3,4,6,7,8-HpCDD 1,2,3,4,6,7,8-HpCDF OCDD OCDF Total HpCDD Total HpCDF	23.6U pg/L 6.13U pg/L 94.4U pg/L 23.6U pg/L 23.6U pg/L 11.8U pg/L	A

Sample	Compound	Modified Final Concentration	A or P
DUP08_161025	1,2,3,7,8,9-HxCDD	11.8U pg/L	A
	1,2,3,6,7,8-HxCDF	11.8U pg/L	
	1,2,3,7,8,9-HxCDF	6.13U pg/L	
	1,2,3,4,6,7,8-HpCDD	23.6U pg/L	
	1,2,3,4,6,7,8-HpCDF	6.13U pg/L	
	1,2,3,4,7,8,9-HpCDF	11.8U pg/L	
	OCDF	23.6U pg/L	
	Total HxCDD	11.8U pg/L	
	Total HxCDF	11.8U pg/L	
	Total HpCDD	23.6U pg/L	
	Total HpCDF	11.8U pg/L	

NAS Alameda Point, BGMP
Polychlorinated Dioxins/Dibenzofurans - Field Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

LDC #: 37601C21
SDG #: 320-23030-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/8/16
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: HRGC/HRMS Polychlorinated Dioxins/Dibenzofurans (EPA SW846 Method 8290)

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.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	RSD≤20%. ICV≤20%
IV.	Continuing calibration	A	CCV≤20/30%
V.	Laboratory Blanks	A SW	
VI.	Field blanks	N	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS
IX.	Field duplicates	SW	D=1+4
X.	Internal standards	A	
XI.	Compound quantitation RL/LOQ/LODs	N	
XII.	Target compound identification	N	
XIII.	System performance	N	
XIV.	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	DUP08_161025	320-23030-1	Water	10/25/16
2	M038A_161025	320-23030-7	Water	10/25/16
3	M038E_161025	320-23030-8	Water	10/25/16
4	M039A_161025	320-23030-9	Water	10/25/16
5	M038A_161025MS	320-23030-7MS	Water	10/25/16
6	M038A_161025MSD	320-23030-7MSD	Water	10/25/16
7				
8				
9				
10				
11				

Notes:

VALIDATION FINDINGS WORKSHEET

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

A. 2,3,7,8-TCDD	F. 1,2,3,4,6,7,8-HpCDD	K. 1,2,3,4,7,8-HxCDF	P. 1,2,3,4,7,8,9-HpCDF	U. Total HpCDD
B. 1,2,3,7,8-PeCDD	G. OCDD	L. 1,2,3,6,7,8-HxCDF	Q. OCDF	V. Total TCDF
C. 1,2,3,4,7,8-HxCDD	H. 2,3,7,8-TCDF	M. 2,3,4,6,7,8-HxCDF	R. Total TCDD	W. Total PeCDF
D. 1,2,3,6,7,8-HxCDD	I. 1,2,3,7,8-PeCDF	N. 1,2,3,7,8,9-HxCDF	S. Total PeCDD	X. Total HxCDF
E. 1,2,3,7,8,9-HxCDD	J. 2,3,4,7,8-PeCDF	O. 1,2,3,4,6,7,8-HpCDF	T. Total HxCDD	Y. Total HpCDF

Notes:_____

LDC #: 37601C21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [redacted]
2nd Reviewer: [redacted]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290A)

Blank extraction date: 11/1/16 **Blank analysis date:** 11/9/16
Conc. units: pg/L **Associated samples:** 2-4

Compound	Blank ID	Sample Identification								
[redacted]	MB 320-135484/1-A	5X	2	3	4					
B	0.8766	4.383								
I	0.9129	4.5645		0.553/6.05						
J	1.043	5.215	0.827/11.7	0.549/11.6						
C	1.179	5.895	/0.536/23.5	0.938/23.3						
D	0.9536	4.768	0.980/11.7	0.713/11.6						
E	1.205	6.025	0.997/11.7	1.31/11.6						
K	1.169	5.845	1.05/6.11	0.665/6.05						
L	0.7736	3.868	0.614/11.7	0.544/11.6						
N	0.8532	4.266	0.223/6.11	1.05/6.05						
M	1.126	5.63	0.750/6.11	0.931/6.05						
F	2.586	12.93	10.2/23.5	2.50/23.3	3.17/23.6					
O	3.076	15.38	2.72/6.11	1.42/6.05	1.86/6.13					
P	1.024	5.12		1.22/11.6						
G	7.729	38.645		9.88/93.1	26.2/94.4					
Q	6.890	34.45	4.63/23.5	3.52/23.3	3.38/23.6					
V	1.415	7.075	3.81/4.70							
S	0.8766	4.383								
W	1.956	9.78	5.96/6.11	1.10/6.05						
T	3.338	16.69	8.75/11.7	2.96/11.6						
X	3.922	19.61	6.18/11.7	3.19/11.6						
U	4.388	21.94		4.65/23.3	7.73/23.6					
Y	5.214	26.07	6.76/11.7	2.63/11.6	3.85/11.8					

LDC #: 37601c21

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: V
2nd Reviewer: M

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290A)

Blank extraction date: 11/11/16 **Blank analysis date:** 11/15/16
Conc. units: pg/L **Associated samples:** 1

Compound	Blank ID	Sample Identification								
[redacted]	MB 320-137212/1-A	5X	1							
E	0.6393	3.1965	0.538/11.8							
L	0.7566	3.783	0.604/11.8							
N	0.8246	4.123	0.584//6.13							
F	1.363	6.815	2.95/23.6							
O	1.125	5.625	1.83/6.13							
P	0.8027	4.0135	0.867/11.8							
G	5.128	25.64								
Q	1.539	7.695	5.89/23.6							
T	0.6393	3.1965	0.748/11.8							
X	1.581	7.905	3.30/11.8							
U	2.668	13.34	11.2/23.6							
Y	1.928	9.64	6.95/11.8							

LDC #: 37601c2/

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: 9
2nd Reviewer: AC

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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
		5/6	B	128 (76-121)	126 (76-121)	( )	2 (ND)	J dets/A
			C	140 (80-126)	145 (80-126)	( )	(dets)	↓
			F	123 (79-122)	125 (79-122)	( )	↓	
			P	131 (77-128)	130 (77-128)	( )	(ND)	↓
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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				( )	( )	( )		

LDC #: 36021

SDG #:

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Reviewer:

2nd Reviewer:

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA SW 846 Method 8290)

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 Was a LCS analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	Date	Lab ID/Reference	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		LCS 330-13-21/3A	B	122 (76-121)	( )	( )	All (NO)	See cover letter
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
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LDC#: 37601C21

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: 9
2nd Reviewer: A

METHOD: Dioxins/Furans (EPA SW846 Method 8290A)

Analyte	Concentration (pg/L)		RPD (≤25)	Difference	Limits	Qualifiers (Parent Only)
	1	4				
I	0.433	6.13U		5.697	≤47.2	
J	0.472	11.8U		11.328	≤47.2	
E	0.538	23.6U		23.062	≤47.2	
K	0.745	6.13U		5.385	≤47.2	
L	0.604	11.8U		11.196	≤47.2	
N	0.584	6.13U		5.546	≤47.2	
M	0.528	6.13U		5.602	≤47.2	
F	2.95	3.17		0.22	≤47.2	
O	1.83	1.86		0.03	≤47.2	
P	0.867	11.8U		10.933	≤47.2	
G	44.6	26.2		18.4	≤113	
Q	5.89	3.38		2.51	≤94.4	
W	0.905	6.13U		5.225	≤47.2	
T	0.748	11.8U		11.052	≤47.2	
X	3.30	11.8U		8.5	≤47.2	
U	11.2	7.73		3.47	≤47.2	
Y	6.95	3.85		3.1	≤47.2	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Methane, Ethane, & Ethylene

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23030-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M034A-R_161025	320-23030-5	Water	10/25/16
M060E_161025	320-23030-10	Water	10/25/16
M034A-R_161025MS	320-23030-5MS	Water	10/25/16
M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
M034A-R_161025DUP	320-23030-5DUP	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Methane, Ethane, and Ethylene by Method RSK-175

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. 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/Duplicate Sample Analysis

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
M034A-R_161025MS/MSD (M034A-R_161025)	Ethane Ethylene	176 (74-131) 47 (72-133)	185 (74-131) 57 (72-133)	J (all detects) J (all detects)	A

For M034A-R_161025MS/MSD, no data were qualified for Methane 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.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VII. 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.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Flag	A or P
M034A-R_161025	Ethane	Eluted outside retention time window due to matrix interference and the confirmation column does not provide ethane quantitation due to coelute with acetylene.	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

X. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XI. 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 eluted outside retention time window, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Data Qualification Summary - SDG 320-23030-1

Sample	Compound	Flag	A or P	Reason
M034A-R_161025	Ethane Ethylene	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
M034A-R_161025	Ethane	J (all detects)	A	Compound quantitation (eluted outside retention time window)

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Laboratory Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Field Blank Data Qualification Summary - SDG 320-23030-1

No Sample Data Qualified in this SDG

LDC #: 37601C51 **VALIDATION COMPLETENESS WORKSHEET** Date: 1-13-16
SDG #: 320-23030-1 Stage 2B Page: 1 of 1
Laboratory: Test America Reviewer: Q
2nd Reviewer: C

METHOD: GC Methane-Ethane-Ethylene (Method RSK-175)

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/ICV	A / A	RSD ≤ 20% or r² ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Matrix spike/Matrix spike duplicates /Dup	SW / A	
VII.	Laboratory control samples	A	LCS/D
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs	SW N	
X.	Target compound identification	N	
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	M034A-R_161025	320-23030-5	Water	10/25/16
2	M060E_161025	320-23030-10	Water	10/25/16
3	M034A-R_161025MS	320-23030-5MS	Water	10/25/16
4	M034A-R_161025MSD	320-23030-5MSD	Water	10/25/16
5	M034A-R_161025DUP	320-23030-5DUP	Water	10/25/16
6				
7				
8				
9				
10				
11				
12				

Notes:

LDC #: 36061

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

METHOD: / **GC** __ **HPLC**

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?

(Y) N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	3/4	Ethane	176 (74-131)	185 (74-131)	( )	1 (dets)	dets/A
		Ethylene	47 (72-133)	57 (72-133)	( )		↓
		Methane	FOR only	( )	( )		No Cmpd
			( )	( )	( )		>4x SA
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 36676E51

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: AC

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	Ethane	Eluted outside retention time window due to matrix interference and the confirmation column does not provide ethane quantitation due to coelute with acetylene.	1	Jdets/A

Comments: See sample calculation verification worksheet for recalculations

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Volatiles

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23072-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP02_161026**	320-23072-1**	Water	10/26/16
M040A_161026	320-23072-3	Water	10/26/16
M041A_161025	320-23072-4	Water	10/25/16
M041E_161025	320-23072-5	Water	10/25/16
M051A_161026**	320-23072-6**	Water	10/26/16
M052A_161026**	320-23072-7**	Water	10/26/16
M053A_161026	320-23072-8	Water	10/26/16
M058A_161026	320-23072-9	Water	10/26/16
M059A_161026**	320-23072-10**	Water	10/26/16
M060A_161025	320-23072-11	Water	10/25/16
M054A_161026**	320-23072-16**	Water	10/26/16
M055A_161026**	320-23072-17**	Water	10/26/16
M056A_161026	320-23072-18	Water	10/26/16
M057A_161026**	320-23072-19**	Water	10/26/16
M058A_161026MS	320-23072-9MS	Water	10/26/16
M058A_161026MSD	320-23072-9MSD	Water	10/26/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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 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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 15.0%.

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.

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 TB03_161026 was identified as a trip blank. No contaminants were found.

Samples EB03_161025, EB04_161025 (both from SDG 320-23030-1), EB05_161026, EB06_161026, and EB07_161026 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB06_161026	10/26/16	Acetone	3.29 ug/L	DUP02_161026** M040A_161026 M051A_161026** M052A_161026** M053A_161026 M058A_161026 M059A_161026** M054A_161026** M055A_161026** M056A_161026 M057A_161026**
EB04_161025	10/25/16	Acetone	3.81 ug/L	M041A_161025 M041E_161025 M060A_161025

Sample SB01_161024 (from SDG 320-22986-1) was identified as a source blank. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks.

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 DUP02_161026** and M053A_161026 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026**	M053A_161026				
1,1-Dichloroethene	1.99	8.00U	-	6.01 (≤20.0)	-	-
1,2,4-Trimethylbenzene	363	338	7 (≤30)	-	-	-
1,2-Dichlorobenzene	96.7	72.6	28 (≤30)	-	-	-
1,3,5-Trimethylbenzene	71.0	72.2	-	1.2 (≤20.0)	-	-
1,4-Dichlorobenzene	12.7	8.46	-	4.24 (≤20.0)	-	-
Benzene	6.55	7.90	19 (≤30)	1.35 (≤20.0)	-	-
Chlorobenzene	6.74	8.00U	-	1.26 (≤20.0)	-	-
cis-1,2-Dichloroethene	628	810	25 (≤30)	-	-	-
Ethylbenzene	87.0	84.8	-	2.2 (≤20.0)	-	-
Isopropylbenzene	23.4	19.4	-	4 (≤20.0)	-	-
m,p-Xylenes	367	362	1 (≤30)	-	-	-
Naphthalene	194	191	2 (≤30)	-	-	-
n-Butylbenzene	14.0	15.3	-	1.3 (≤20.0)	-	-
n-Propylbenzene	26.9	25.4	-	1.5 (≤20.0)	-	-
o-Xylene	182	187	3 (≤30)	-	-	-
p-Isopropyltoluene	15.2	15.9	-	0.7 (≤20.0)	-	-
sec-Butylbenzene	11.8	11.2	-	0.6 (≤20.0)	-	-
tert-Butylbenzene	2.25	8.00U	-	5.75 (≤20.0)	-	-
Toluene	268	622	80 (≤30)	-	J (all detects)	A
trans-1,2-Dichloroethene	2.47	8.00U	-	5.53 (≤20.0)	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026**	M053A_161026				
Vinyl chloride	64.1	67.0	-	2.9 (≤20.0)	-	-

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.

Due to field duplicate RPD, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Volatiles - Data Qualification Summary - SDG 320-23072-1

Sample	Compound	Flag	A or P	Reason
DUP02_161026** M053A_161026	Toluene	J (all detects)	A	Field duplicates (RPD)

NAS Alameda Point, BGMP
Volatiles - Laboratory Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Field Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

LDC #: 37601D1
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/9/16
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW846 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%, r²	ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20%/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	TB=11, EB=12,13,14, SB01_161024 (320-22986-1), *
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D=1+2
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation
XIV.	System performance	A	Not reviewed for Stage 2B validation
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 2	DUP02_161026**	320-23072-1**	Water	10/26/16
2 1	M040A_161026	320-23072-3	Water	10/26/16
3 1	M041A_161025	320-23072-4	Water	10/25/16
4 1	M041E_161025	320-23072-5	Water	10/25/16
5 2	M051A_161026**	320-23072-6**	Water	10/26/16
6 2	M052A_161026**	320-23072-7**	Water	10/26/16
7 2	M053A_161026	320-23072-8	Water	10/26/16
8 2	M058A_161026	320-23072-9	Water	10/26/16
9 2	M059A_161026**	320-23072-10**	Water	10/26/16
10 1	M060A_161025	320-23072-11	Water	10/25/16
~~11 1~~	~~TB03_161026~~	~~320-23072-12~~	~~Water~~	~~10/26/16~~
~~12 2~~	~~EB05_161026~~	~~320-23072-13~~	~~Water~~	~~10/26/16~~
~~13 2~~	~~EB06_161026~~	~~320-23072-14~~	~~Water~~	~~10/26/16~~

* EB03_160925, EB04_161025 (320-23030-1)

LDC #: 37601D1
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 11/6/16
Page: 2 of 2
Reviewer: Q
2nd Reviewer: A

METHOD: GC/MS Volatiles (EPA SW846 Method 8260B)

	Client ID	Lab ID	Matrix	Date
~~14~~ 2	~~EB07_161026~~	~~320-23072-15~~	~~Water~~	~~10/26/16~~
15 2	M054A_161026**	320-23072-16**	Water	10/26/16
16 2	M055A_161026**	320-23072-17**	Water	10/26/16
17 2	M056A_161026	320-23072-18	Water	10/26/16
18 2	M057A_161026**	320-23072-19**	Water	10/26/16
19 2	M058A_161026MS	320-23072-9MS	Water	10/26/16
20 2	M058A_161026MSD	320-23072-9MSD	Water	10/26/16
21				
22				
23				
24				
25				

Notes:

	MB 320-135471						
	MB 320-135681/10						

LDC #: 37601b1

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: RC

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 #: 37601

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: MC

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	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.1,1-Difluoroethane
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP. Isopropyl ether
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC #: 36010

VALIDATION FINDINGS WORKSHEET
Field Blanks

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were field blanks identified in this SDG?

Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L

Sampling date: 10/26/16

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: 1-2, 5-9, 15-18

Compound	Blank ID	Sample Identification								
	13									
Methylene chloride										
Acetone	3.29									
Chloroform										

Blank units: ug/L **Associated sample units:** ug/L

Sampling date: 10/25/16

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: 3-4, 10

Compound	Blank ID	Sample Identification								
	EB04-161025									
Methylene chloride										
Acetone	3.81									
Chloroform										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC#: 37601D1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer:

METHOD: GC/MS 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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	7				
H	1.99	8.00U		6.01	≤20.0	
DDD	363	338	7			
JJJ	96.7	72.6	28			
AAA	71.0	72.2		1.2	≤20.0	
HHH	12.7	8.46		4.24	≤20.0	
V	6.55	7.90	19	1.35	≤20.0	
DD	6.74	8.00U		1.26	≤20.0	
QQQ	628	810	25			
EE	87.0	84.8		2.2	≤20.0	
VV	23.4	19.4		4	≤20.0	
RRR	367	362	1			
MMM	194	191	2			
III	14.0	15.3		1.3	≤20.0	
YY	26.9	25.4		1.5	≤20.0	
SSS	182	187	3			
GGG	15.2	15.9		0.7	≤20.0	
EEE	11.8	11.2		0.6	≤20.0	
CCC	2.25	8.00U		5.75	≤20.0	
CC	268	622	80			J+ (all detects) / A
PPP	2.47	8.00U		5.53	≤20.0	
C	64.1	67.0		2.9	≤20.0	

LDC #: 37601P1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: A

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 (20 std)	Recalculated RRF (20 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/18/16	QQQ (1st internal standard)	0.2653	0.2653	0.254T	0.254T	4.T	4.T
			AA (2nd internal standard)	0.3521	0.3521	0.3522	0.3522	3.3	3.3
			HHH (3rd internal standard)	1.244T	1.244T	1.2431	1.2431	2.3	2.3
			(4th internal standard)						
2	ICAL	7/14/16	PPP (1st internal standard)	0.8416	0.8416	0.7911	0.7911	8.0	8.0
			(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#: 37601B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: M

Method: GCMS

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
10/18/2016	HP10	Acetone	0	0.0076028	0.02
			s1	0.0355057	0.08
			s2	0.1937458	0.40
			s3	0.3659188	0.80
			s4	0.5677159	1.20
			s5	0.7291777	1.60

Regression Output		*Reported*
Constant	*0.002038*	*-0.08900*
Std Err of Y Est		
R Squared	*0.999140*	*0.999000*
Degrees of Freedom		
X Coefficient(s)	*0.460350*	*0.46920*
Std Err of Coef.		
Correlation Coefficient	*0.999570*	
Coefficient of Determination (r^2)	*0.999140*	*0.999000*

NR: not reported

LDC#: 37601B1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: MC

Method: GCMS

Calibration Date	System	Compound	Standard	(Y) Response	(X) Concentration
10/18/2016	HP10	t-Butanol	0	0.0233218	0.025
			s1	0.0424571	0.050
			s2	0.1609111	0.200
			s3	0.8259837	1.000
			s4	1.6217426	2.000
			s5	2.6318556	3.000
			s6	3.1402972	4.000

Regression Output		***Reported***
Constant	*0.013329*	*0.52550*
Std Err of Y Est		
R Squared	*0.995105*	*0.998000*
Degrees of Freedom		
X Coefficient(s)	*0.812970*	*0.81560*
Std Err of Coef.		
Correlation Coefficient	*0.997550*	
Coefficient of Determination (r^2)	*0.995105*	*0.998000*

NR: not reported

LDC #: 36101

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: A

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	HSC1102A	11/5/16	PPP (1st internal standard)	0.7911	0.7948	0.7948	0.5	0.5
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
2	HSC1102A	11/5/16	QQQ (1st internal standard)	0.2547	0.2578	0.2578	1.2	1.2
			AA (2nd internal standard)	0.3522	0.3500	0.3500	0.6	0.6
			HHH (3rd internal standard)	1.2431	1.221	1.221	1.8	1.8
			222 (4th internal standard)	200	229	229	14.3	14.3
3			F (1st internal standard)	20.0	22.0	22.0	9.8	9.8
			(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 #: 37601D1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: A

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	20.0	19.9	100	100	0
1,2-Dichloroethane-d4		20.7	104	104	
Toluene-d8		19.9	100	100	
Bromofluorobenzene		21.0	105	105	

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 #: 36061

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: 9

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: 19/20

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	200	200	ND	199.7	209.7	100	100	105	105	5	5
Trichloroethene	↓	↓	↓	196.2	200.9	98	98	100	100	2	2
Benzene	↓	↓	10.1	213.1	214.2	101	101	102	102	1	1
Toluene	↓	↓	ND	211.9	207.8	106	106	104	104	2	2
Chlorobenzene	↓	↓	19.3	213.5	220.5	97	97	101	101	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 #: 37601D1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: 9
2nd Reviewer: M

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: 320-135681

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	20.0	20.0	20.02	21.23	100	100	106	106	6	6
Trichloroethene	↓	↓	19.76	~~20.59~~ 20.59	99	99	103	103	4	4
Benzene			20.33	20.63	102	102	103	103	1	1
Toluene			20.42	20.11	102	102	101	101	2	2
Chlorobenzene			19.70	20.34	99	99	102	102	3	3

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 #: 37601

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd reviewer: [illegible]

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. 1, QQQ

Conc. = $\frac{(37820)(10.0)(10)}{(17487)(0.2547)(\quad)(\quad)}$

= 628.25 µg/L

#	Sample ID	Compound	Reported Concentration (µg/L)	Calculated Concentration ( )	Qualification
	1	QQQ	628		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Polynuclear Aromatic Hydrocarbons

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23072-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP02_161026	320-23072-1	Water	10/26/16
DUP02_161026DL	320-23072-1DL	Water	10/26/16
M041A_161025	320-23072-4	Water	10/25/16
M041E_161025	320-23072-5	Water	10/25/16
M051A_161026**	320-23072-6**	Water	10/26/16
M052A_161026**	320-23072-7**	Water	10/26/16
M053A_161026	320-23072-8	Water	10/26/16
M053A_161026DL	320-23072-8DL	Water	10/26/16
M058A_161026	320-23072-9	Water	10/26/16
M059A_161026**	320-23072-10**	Water	10/26/16
M055A_161026	320-23072-17	Water	10/26/16
M056A_161026	320-23072-18	Water	10/26/16
M057A_161026	320-23072-19	Water	10/26/16
M058A_161026MS	320-23072-9MS	Water	10/26/16
M058A_161026MSD	320-23072-9MSD	Water	10/26/16
M054A_161026	320-23072-16	Water	10/26/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Polynuclear Aromatic Hydrocarbons (PAHs) 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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 perfluorotributylamine (PFTBA) 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

Samples EB05_161026, EB06_161026, EB06_161026RE, and EB07_161026 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB05_161026	10/26/16	Naphthalene	0.0130	DUP02_161026 DUP02_161026DL M051A_161026** M052A_161026** M053A_161026 M053A_161026DL M058A_161026 M059A_161026** M055A_161026 M056A_161026 M057A_161026 M054A_161026
EB06_161026	10/26/16	Naphthalene	0.00991	DUP02_161026 DUP02_161026DL M051A_161026** M052A_161026** M053A_161026 M053A_161026DL M058A_161026 M059A_161026** M055A_161026 M056A_161026 M057A_161026 M054A_161026
EB06_161026RE	10/26/16	Naphthalene	0.0125	DUP02_161026 DUP02_161026DL M051A_161026** M052A_161026** M053A_161026 M053A_161026DL M058A_161026 M059A_161026** M055A_161026 M056A_161026 M057A_161026 M054A_161026

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks.

VII. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for samples DUP02_161026 and M051A_161026**. Using professional judgment, no data were qualified when one surrogate %R was outside the QC limits and the %R was greater than or equal to 10%.

Additionally, surrogate recoveries (%R) were not within QC limits for several samples. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

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 DUP02_161026 and M053A_161026 and samples DUP02_161026DL and M053A_161026DL were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026	M053A_161026				
1-Methylnaphthalene	17.7	14.0	23 (≤30)	-	-	-
2-Methylnaphthalene	20.3	18.5	9 (≤30)	-	-	-
Acenaphthene	3.16	2.22	35 (≤30)	-	J (all detects)	A
Fluoranthene	0.116	0.116	-	0 (≤0.479)	-	-
Fluorene	1.15	0.968	-	0.182 (≤0.479)	-	-
Naphthalene	132	107	21 (≤30)	-	-	-
Phenanthrene	0.416	0.404	-	0.012 (≤0.479)	-	-
Pyrene	0.126	0.102	-	0.024 (≤0.479)	-	-
Benzo(a)anthracene	0.144U	0.0325	-	0.1115 (≤0.479)	-	-
Chrysene	0.144U	0.0458	-	0.0982 (≤0.479)	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026DL	M053A_161026DL				
1-Methylnaphthalene	19.4	14.6	28 (≤30)	-	-	-

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026DL	M053A_161026DL				
2-Methylnaphthalene	22.5	19.3	15 (≤30)	-	-	-
Acenaphthene	3.25	2.53	-	0.72 (≤2.41)	-	-
Fluorene	1.26	0.879	-	0.381 (≤2.41)	-	-
Naphthalene	140	116	19 (≤30)	-	-	-
Phenanthrene	0.453	0.371	-	0.082 (≤2.41)	-	-

XI. Internal Standards

All internal standard areas and retention times were within QC limits.

XII. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
DUP02_161026 M053A_161026	Naphthalene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

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.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were deemed unusable as follows:

Sample	Compound	Flag	A or P
DUP02_161026 M053A_161026	Naphthalene	R	A
DUP02_161026DL M053A_161026DL	All compounds except Naphthalene	R	A

Due to field duplicate RPD, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG 320-23072-1

Sample	Compound	Flag	A or P	Reason
DUP02_161026 M053A_161026	Acenaphthene	J (all detects)	A	Field duplicates (RPD)
DUP02_161026 M053A_161026	Naphthalene	R	A	Overall assessment of data
DUP02_161026DL M053A_161026DL	All compounds except Naphthalene	R	A	Overall assessment of data

NAS Alameda Point, BGMP
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Polynuclear Aromatic Hydrocarbons - Field Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

LDC #: 37601D2b
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/9/16
Page: 1 of 2
Reviewer: 9
2nd Reviewer: M

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (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	PFTBA
III.	Initial calibration/ICV	A/A	RSD ≤ 15%, ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	EB 11-14.
VII.	Surrogate spikes	SW	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D 1+7. 2+8
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	SW	Not reviewed for Stage 2B validation.
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation.
XIV.	System performance	A	Not reviewed for Stage 2B validation.
XV.	Overall assessment of data	SW	

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	DUP02_161026**	320-23072-1**	Water	10/26/16
2	DUP02_161026DL**	320-23072-1DL**	Water	10/26/16
3	M041A_161025	320-23072-4	Water	10/25/16
4	M041E_161025	320-23072-5	Water	10/25/16
5	M051A_161026**	320-23072-6**	Water	10/26/16
6	M052A_161026 **	320-23072-7 **	Water	10/26/16
7	M053A_161026	320-23072-8	Water	10/26/16
8	M053A_161026DL	320-23072-8DL	Water	10/26/16
9	M058A_161026	320-23072-9	Water	10/26/16
10	M059A_161026 **	320-23072-10 **	Water	10/26/16
~~11~~	~~EB05_161026~~	~~320-23072-13~~	~~Water~~	~~10/26/16~~
~~12~~	~~EB06_161026~~	~~320-23072-14~~	~~Water~~	~~10/26/16~~
13	EB06_161026RE	320-23072-14RE	Water	10/26/16

LDC #: 37601D2b
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/9/16

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270D-SIM)

	Client ID	Lab ID	Matrix	Date
~~14~~	~~EB07_161026~~	~~320-23072-15~~	~~Water~~	~~10/26/16~~
15 2	M055A_161026	320-23072-17	Water	10/26/16
16 2	M056A_161026	320-23072-18	Water	10/26/16
17 2	M057A_161026	320-23072-19	Water	10/26/16
18 2	M058A_161026MS	320-23072-9MS	Water	10/26/16
19 2	M058A_161026MSD	320-23072-9MSD	Water	10/26/16
20 2	M054A_161026	L -16	L	10/26/16
21				
22				
23				
24				

Notes:

	MB 320-135467/1-A						
	MB 320-135673/1-A						
	~~MB 3~~						

LDC #: 36100b

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: CL
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 #: 35618b

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: 9

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 #: 36010H

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: A
2nd Reviewer: AC

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Y N N/A Were field blanks identified in this SDG?

Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L

Sampling date: 10/26/16

Field blank type: (circle one) Field Blank / Rinsate / Other: FB Associated Samples: 1-2, 5-10, 15-17, 20

Compound	Blank ID	Blank	Blank	Sample Identification						
	11	12	13	4						
5	0.0130	0.00991	0.0125	~~0.0319~~ 0.0143J						

Blank units:_____ **Associated sample units:**_____

Sampling date:_____

Field blank type: (circle one) Field Blank / Rinsate / Other:_____ Associated Samples:_____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

Privileged and Confidential

LDC #: 37601D-2b

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N (N/A) If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1	NBZ	40 (55-111)	No qual
		5		131 ( )	
		6		226 ( )	No qual (DF=5x)
			TTP	0 (58-132)	
		7	NBZ	156 ( )	(5x)
			TPH	0 ( )	
		8	NBZ	54 ( )	
			TPH	0 ( )	
		9	NBZ	17 ( )	No qual
		20	NBZ	363 ( )	(50x)
			TPH	0 ( )	
		15	NBZ	51 ( )	(10x)
			TPH	0 ( )	

(NBZ) = Nitrobenzene-d5
(FBP) = 2-Fluorobiphenyl
(TPH) = Terphenyl-d14
(PHL) = Phenol-d5
(2FP)= 2-Fluorophenol
(TBP) = 2,4,6-Tribromophenol
(2CP) = 2-Chlorophenol-d4
(DCB) = 1,2-Dichlorobenzene-d4

LDC#: 37601D2b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer: [illegible]

METHOD: GC SVOC (EPA SW 846 Method 8270C)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	7				
TTT	17.7	14.0	23			
W	20.3	18.5	9			
GG	3.16	2.22	35			vlots/b
YY	0.116	0.116		0	≤0.479	
NN	1.15	0.968		0.182	≤0.479	
S	132	107	21			
UU	0.416	0.404		0.012	≤0.479	
ZZ	0.126	0.102		0.024	≤0.479	
CCC	0.144U	0.0325		0.1115	≤0.479	
DDD	0.144U	0.0458		0.0982	≤0.479	

Compound	Concentration (ug/L)		RPD (≤30%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	2	8				
TTT	19.4	14.6	28			
W	22.5	19.3	15			
GG	3.25	2.53		0.72	≤2.41	
NN	1.26	0.879		0.381	≤2.41	
S	140	116	19			
UU	0.453	0.371		0.082	≤2.41	

LDC #: 36010-6

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported RLs

Reviewer: Q
2nd Reviewer: RC

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

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?

#	Date	Compound	Finding	Associated Samples	Qualifications
		1, T	S > calib range		Dets/ND

Comments: See sample calculation verification worksheet for recalculations

Privileged and Confidential

LDC #: 37601D=h

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: Q
2nd Reviewer: A

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

(Y) N N/A Was the overall quality and usability of the data acceptable?

#	Date	Compound	Finding	Associated Samples	Qualifications
		1, 7	S		R/A
		2, 8	All except S		J

Comments: _____

LDC #: 37601D2b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: CA
2nd Reviewer: AC

METHOD: GC/MS PAH

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 (100 std)	Recalculated RRF (100 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	6/20/16	Naphthalene (2nd internal standard)	1.0293	1.0293	1.0431	1.0431	3.6	3.6
			Fluorene (3rd internal standard)	1.4035	1.4035	1.4420	1.4420	4.2	4.2
			Phenanthrene (4th internal standard)	1.1915	1.1915	1.1966	1.1966	3.6	3.6
			Chrysene (5th internal standard)	1.2333	1.2333	1.2257	1.2257	3.1	3.1
			Benzo(a)pyrene (6th internal standard)	1.3221	1.3221	1.3253	1.3253	4.9	4.9
2			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Phenanthrene (4th internal standard)						
			Chrysene (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
3			Naphthalene (2nd internal standard)						
			Fluorene (3rd internal standard)						
			Phenanthrene (4th internal standard)						
			Chrysene (5th internal standard)						
			Benzo(a)pyrene (6th internal standard)						
4			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 #: 37601D2b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS PAHs (EPA SW 846 Method 8270D-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	PAK1104	11/4/16	Naphthalene (2nd internal standard)	1.0431	0.9816	0.9816	5.9	5.9
			Fluorene (3rd internal standard)	1.4420	1.432	1.432	0.7	0.7
			Phenanthrene (4th internal standard)	1.1966	1.177	1.177	1.6	1.6
			Chrysene (5th internal standard)	1.2257	1.219	1.219	0.5	0.5
			Benzo(a)pyrene (6th internal standard)	1.3253	1.333	1.333	0.6	0.6
2	PAK1105	11/5/16	Naphthalene (2nd internal standard)	1.0431	0.9667	0.9667	7.3	7.3
			Fluorene (3rd internal standard)	1.4420	1.434	1.434	0.5	0.5
			Phenanthrene (4th internal standard)	1.1966	1.165	1.165	2.6	2.6
			Chrysene (5th internal standard)	1.2257	1.219	1.219	0.6	0.6
			Benzo(a)pyrene (6th internal standard)	1.3253	1.321	1.321	0.3	0.3
3	PAK1109	11/9/16	Naphthalene (2nd internal standard)	1.0431	1.041	1.041	0.2	0.2
			Fluorene (3rd internal standard)	1.4420	1.444	1.444	0.1	0.1
			Phenanthrene (4th internal standard)	1.1966	1.193	1.193	0.3	0.3
			Chrysene (5th internal standard)	1.2257	1.219	1.219	0.6	0.6
			Benzo(a)pyrene (6th internal standard)	1.3253	1.310	1.310	1.2	1.2
4			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 #: 37610-6

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: Q
2nd reviewer: A

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: 5

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	250	327.0	131	131	0
2-Fluorobiphenyl	↓	200.5	80	80	↓
Terphenyl-d14	↓	219	88	88	↓

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 #: 36210-TV

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: 9

METHOD: GC/MS PAH (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 = | MSC - MSC | * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 18/19

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
~~FF~~	0.237	0.240	0.0503	0.2380	0.2683	T9	T9	91	91	12	12
22	↓	↓	ND	0.1875	0.2128	TT	TT	89	89	15	15

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 #: 35621U-D

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: 1
2nd Reviewer: 1

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 = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: 320-13546T

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	0.250	0.250	0.1843	0.1899	74	74	76	76	3	3
Pyrene	↓	↓	0.2036	0.2043	81	81	80	82	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 #: 36010b2h

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: Q
2nd reviewer: K

METHOD: GC/MS SVOA (EPA SW 846 Method 8270C-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. 5, 5:

Conc. = $\frac{(140777)(500.0)(1)(5)}{(110713)(1.043)(1)(1040.1)}$

= 1.90 ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Qualification
	5	5	1.90		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Organochlorine Pesticides

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23072-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M040A_161026**	320-23072-3**	Water	10/26/16
M041A_161025**	320-23072-4**	Water	10/25/16
M041E_161025	320-23072-5	Water	10/25/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Organochlorine Pesticides by Environmental Protection Agency (EPA) SW 846 Method 8081A

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

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 20.0% for all compounds.

Retention time windows were established as required by the method for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

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 required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB04_161025 (from SDG 320-23030-1) and EB05_161026 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 (from SDG 320-22986-1) was identified as a source 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. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identification

All target compound identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

The system performance was acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIV. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Organochlorine Pesticides - Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Organochlorine Pesticides - Laboratory Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Organochlorine Pesticides - Field Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

LDC #: 37601D3a
SDG #: 320-23072-1
Laboratory: Test America Inc.

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/9/16
Page: 1 of 2
Reviewer:
2nd Reviewer: A

METHOD: GC Organochlorine Pesticides (EPA SW846 Method 8081A)

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 Instrument Performance Check	A	
III.	Initial calibration/ICV	A/A	RSD≤20%. ICV≤20%
IV.	Continuing calibration	A	CCV≤20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB=4. EB04_161025 (320-23030-1)
VII.	Surrogate spikes	A	SB01_161024 (320-22986-1)
VIII.	Matrix spike/Matrix spike duplicates	N	CG
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Compound quantitation/RL/LOQ/LODs	A	Not reviewed for Stage 2B validation
XII.	Target compound identification	A	Not reviewed for Stage 2B validation
XIII.	System Performance	A	Not reviewed for Stage 2B validation
XIV	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	M040A_161026**	320-23072-3**	Water	10/26/16
2	M041A_161025**	320-23072-4**	Water	10/25/16
3	M041E_161025	320-23072-5	Water	10/25/16
~~4~~	~~EB05_161026~~	~~320-23072-13~~	~~Water~~	~~10/26/16~~
5				
6				
7				
8				
9				
10				

Notes:

	MB320-135644/A					
	MB320-135455/A					

LDC #: 37601D3a

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: 4

Method: Pesticides (EPA SW 846 Method 8081)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and at beginning of each 12-hour shift?	✓			
Were endrin and 4,4'-DDT breakdowns ≤ 15% for individual breakdown in the Evaluation mix standards?	✓			
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 RT windows properly established?	✓			
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 analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
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/Internal Standards				
Were all surrogate percent recovery (%R) within the QC limits?	✓			

LDC #: 35601039

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: A

Validation Area	Yes	No	NA	Findings/Comments
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recovery (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
Were internal standard area counts within ± 50% of the average area calculated during calibration?			✓	
VII. 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 extraction 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. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
Were relative percent difference (RPD) of the results between two columns ≤ 40%?			✓	
XII. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 3T60|039

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: YC

METHOD: GC ✓ HPLC ____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (10 std)	Recalculated CF (10 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/29/16	D (SDX-CCP I)	1.2120	1.2120	1.2679	1.2679	8.5	8.5
			D (SDX-CCP II)	0.7060	0.7060	0.7368	0.7368	10.1	10.1
2									
3									
4									

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 #: 3T60/D31

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC_____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	1103-020	11/3/16	D (SPX-CAP 1)	1.26T9	1.2T0	1.2T0	0.2	0.2
			0 ↓ 11	0.T368	0.T115	0.T115	3.4	3.4
2	1104-004	11/4/16	↓	1.26T9	1.26T	126T	0.0	0.0
			↓	0.T368	0.T293	0.T293	1.0	1.0
3								
4								

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 #: 37601D39

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: 9
2nd reviewer: AC

METHOD: GC Pesticides/PCBs (EPA SW 846 8081/8082)

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	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene	STX-CA1	40.0	31.2	78	78	0
Decachlorobiphenyl			15.1	38	38	
Tetrachloro-m-xylene	II		30.0	75	75	
Decachlorobiphenyl	II		14.3	36	36	

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Tetrachloro-m-xylene						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Tetrachloro-m-xylene						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Tetrachloro-m-xylene						
Decachlorobiphenyl						

Notes:

LDC #: 37601D39

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: 9
2nd Reviewer: 9

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = | LCS - LCSD | * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 320 - 35475

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	0.500	NA	0.497	NA	92	92				
4,4'-DDT	↓	↓	0.597	↓	119	119				
Aroclor 1260										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36010 39

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CL
2nd reviewer: JL

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

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 = $\frac{(A)(V_t)(DF)}{(CF)(V_o)(V_i)(\%S)}$

A	=	Area of the compound to be measured
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)
CF	=	Calibration Factor of compound from initial calibration.
DF	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.

Example:

Sample I.D. ND _____:
LCS 320-135425: D

Conc. = $\frac{(150697529)(200)(10)(1)}{(5171281533)(1.2679)(1000)}$

= 0.459T ug/L

#	Sample ID	Compound	Reported Concentration (ug/L)	Calculated Concentration ( )	Qualification
	LCS	D	0.459T		

Note: _____

LDC Report# 37601D4a

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 20, 2016

Parameters: Metals

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23072-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP02_161026**	320-23072-1**	Water	10/26/16
M051A_161026	320-23072-6	Water	10/26/16
M052A_161026	320-23072-7	Water	10/26/16
M053A_161026	320-23072-8	Water	10/26/16
M058A_161026	320-23072-9	Water	10/26/16
M059A_161026	320-23072-10	Water	10/26/16
M060A_161025	320-23072-11	Water	10/25/16
M054A_161026	320-23072-16	Water	10/26/16
M055A_161026	320-23072-17	Water	10/26/16
M056A_161026	320-23072-18	Water	10/26/16
M057A_161026	320-23072-19	Water	10/26/16
DUP02_161026F**	320-23072-1F**	Water	10/26/16
DUP03_161026F	320-23072-2F	Water	10/26/16
M040A_161026F	320-23072-3F	Water	10/26/16
M041A_161025F	320-23072-4F	Water	10/25/16
M041E_161025F	320-23072-5F	Water	10/25/16
M051A_161026F**	320-23072-6F**	Water	10/26/16
M052A_161026F**	320-23072-7F**	Water	10/26/16
M053A_161026F	320-23072-8F	Water	10/26/16
M058A_161026F	320-23072-9F	Water	10/26/16
M059A_161026F**	320-23072-10F**	Water	10/26/16
M054A_161026F	320-23072-16F	Water	10/26/16
M055A_161026F	320-23072-17F	Water	10/26/16
M056A_161026F	320-23072-18F	Water	10/26/16
M057A_161026F	320-23072-19F	Water	10/26/16
M058A_161026MS	320-23072-9MS	Water	10/26/16
M058A_161026MSD	320-23072-9MSD	Water	10/26/16

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M058A_161026MSF	320-23072-9MSF	Water	10/26/16
M058A_161026MSDF	320-23072-9MSDF	Water	10/26/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silver, Sodium, Thallium, Vanadium, and Zinc by Environmental Protection Agency (EPA) SW 846 Method 6020A
Mercury by EPA SW 846 Method 7470A

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. ICPMS Tune

The mass calibration was within 0.1 AMU and the percent relative standard deviation (%RSD) was less than or equal to 5%.

III. Instrument Calibration

Initial and continuing calibrations were performed as required by the methods.

The initial calibration verification (ICV) and continuing calibration verification (CCV) standards were within QC limits.

IV. ICP Interference Check Sample Analysis

The frequency of interference check sample (ICS) analysis was met. All criteria were within QC limits.

V. 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
ICB/CCB	Sodium	0.05500 mg/L	M058A_161026F
ICB/CCB	Sodium	0.03119 mg/L	DUP02_161026F** DUP03_161026F
ICB/CCB	Calcium	0.07167 mg/L	M059A_161026 M060A_161025

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.

VI. Field Blanks

Samples EB05_161026F, EB06_161026F and EB07_161026F were identified as equipment blanks. No contaminants were found.

Sample SB01_161024F (from SDG 320-22986-1) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB01_161024F	10/24/16	Chromium Sodium	0.00188 mg/L 0.0665 mg/L	DUP02_161026F** DUP03_161026F M040A_161026F M041A_161025F M041E_161025F M051A_161026F** M052A_161026F** M053A_161026F M058A_161026F M059A_161026F** M054A_161026F M055A_161026F M056A_161026F M057A_161026

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample.

For M058A_161026MS/MSD, no data were qualified for Calcium, Magnesium, and Sodium percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

For M058A_161026MSF/MSDF, no data were qualified for Calcium, Iron, Magnesium, Potassium, and Sodium 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.

VIII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

IX. Serial Dilution

Serial dilution analysis was performed on an associated project sample. The analysis criteria were met.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples DUP02_161026** and M053A_161026, samples DUP02_161026F** and M053A_161026F, and samples DUP03_161026F and M059A_161026F** were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026**	M053A_161026				
Calcium	164	154	6 (≤30)	-	-	-
Magnesium	30.2	29.4	3 (≤30)	-	-	-
Potassium	21.3	19.9	7 (≤30)	-	-	-
Sodium	65.4	49.2	28 (≤30)	-	-	-

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026F**	M053A_161026F				
Arsenic	0.00775	0.00812	-	0.00037 (≤0.00300)	-	-
Barium	0.107	0.113	5 (≤30)	-	-	-
Calcium	149	153	3 (≤30)	-	-	-
Cobalt	0.00119	0.00130	-	0.00011 (≤0.00300)	-	-
Iron	11.3	12.2	8 (≤30)	-	-	-
Magnesium	29.1	31.1	7 (≤30)	-	-	-
Manganese	1.49	1.58	6 (≤30)	-	-	-
Nickel	0.00147	0.00189	-	0.00042 (≤0.00300)	-	-

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026F**	M053A_161026F				
Potassium	20.2	20.9	3 (≤30)	-	-	-
Sodium	53.1	54.2	2 (≤30)	-	-	-
Zinc	0.0100U	0.00481	-	0.00519 (≤0.0120)	-	-

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP03_161026F	M059A_161026F**				
Arsenic	0.0102	0.0104	-	0.0002 (≤0.00300)	-	-
Barium	0.0403	0.0407	1 (≤30)	-	-	-
Calcium	100	103	3 (≤30)	-	-	-
Cobalt	0.00200U	0.00102	-	0.00098 (≤0.00300)	-	-
Iron	3.93	4.02	2 (≤30)	-	-	-
Magnesium	39.6	41.3	4 (≤30)	-	-	-
Manganese	1.90	2.02	6 (≤30)	-	-	-
Molybdenum	0.00155	0.00160	-	0.00005 (≤0.00300)	-	-
Nickel	0.00161	0.00172	-	0.00011 (≤0.00300)	-	-
Potassium	13.1	13.8	5 (≤30)	-	-	-
Sodium	42.2	43.4	3 (≤30)	-	-	-
Zinc	0.0133	0.0143	-	0.001 (≤0.0120)	-	-

XII. Internal Standards (ICP-MS)

All internal standard percent recoveries (%R) were within QC limits.

XIII. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Metals - Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Metals - Laboratory Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Metals - Field Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

LDC #: 37601D4a
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/10/16
Page: 1 of 2
Reviewer: G
2nd Reviewer: G

METHOD: Metals (EPA SW 846 Method 6020A/7470A)

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.	ICP/MS Tune	A	
III.	Instrument Calibration	A	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Laboratory Blanks	SW	
VI.	Field Blanks	SW	EB= 22,23,24 SB= SB01_161024F (320-22986-1)
VII.	Matrix Spike/Matrix Spike Duplicates	SW	
VIII.	Duplicate sample analysis	N	
IX.	Serial Dilution	A	
X.	Laboratory control samples	A	LCS
XI.	Field Duplicates	SW	(1,4) (12,19) (13,21)
XII.	Internal Standard (ICP-MS)	A	
XIII.	Sample Result Verification	A	Not reviewed for Stage 2B validation
XIV.	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

** Indicates sample underwent Stage 4 validation / Samples appended with "F" were analyzed as Dissolved

	Client ID	Lab ID	Matrix	Date
1	DUP02_161026**	320-23072-1**	Water	10/26/16
2	M051A_161026	320-23072-6	Water	10/26/16
3	M052A_161026	320-23072-7	Water	10/26/16
4	M053A_161026	320-23072-8	Water	10/26/16
5	M058A_161026	320-23072-9	Water	10/26/16
6	M059A_161026	320-23072-10	Water	10/26/16
7	M060A_161025	320-23072-11	Water	10/25/16
8	M054A_161026	320-23072-16	Water	10/26/16
9	M055A_161026	320-23072-17	Water	10/26/16
10	M056A_161026	320-23072-18	Water	10/26/16
11	M057A_161026	320-23072-19	Water	10/26/16
12	DUP02_161026F**	320-23072-1F**	Water	10/26/16
13	DUP03_161026F	320-23072-2F	Water	10/26/16
14	M040A_161026F	320-23072-3F	Water	10/26/16
15	M041A_161025F	320-23072-4F	Water	10/25/16

LDC #: 37601D4a
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/10/16
Page: 2 of 2
Reviewer:
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6020A/7470A)

	Client ID	Lab ID	Matrix	Date
16	M041E_161025F	320-23072-5F	Water	10/25/16
17	M051A_161026F**	320-23072-6F**	Water	10/26/16
18	M052A_161026F**	320-23072-7F**	Water	10/26/16
19	M053A_161026F	320-23072-8F	Water	10/26/16
20	M058A_161026F	320-23072-9F	Water	10/26/16
21	M059A_161026F**	320-23072-10F**	Water	10/26/16
22	EB05_161026F	320-23072-13F	Water	10/26/16
23	EB06_161026F	320-23072-14F	Water	10/26/16
24	EB07_161026F	320-23072-15F	Water	10/26/16
25	M054A_161026F**	320-23072-16F**	Water	10/26/16
26	M055A_161026F	320-23072-17F	Water	10/26/16
27	M056A_161026F	320-23072-18F	Water	10/26/16
28	M057A_161026F	320-23072-19F	Water	10/26/16
29	M058A_161026MS	320-23072-9MS	Water	10/26/16
30	M058A_161026MSD	320-23072-9MSD	Water	10/26/16
31	M058A_161026MSF	320-23072-9MSF	Water	10/26/16
32	M058A_161026MSDF	320-23072-9MSDF	Water	10/26/16
33				
34				
35				
36				

Notes:

DC #: 376010-1a

VALIDATION FINDINGS CHECKLIST

Reviewer: CR
2nd Reviewer: CT

Method: Metals (EPA SW 846 Method 6010/6020/7000)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?	✓			
Were %RSD of isotopes in the tuning solution ≤5%?	✓			
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were the low standard checks within 70-130%	✓			
Were all initial calibration correlation coefficients within limits as specified by the method?	✓			
IV. 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.	✓			
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
VI. Matrix spike/Matrix spike 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 +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. 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% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?	✓			
If the %Rs were outside the criteria, was a reanalysis performed?	✓			
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?	✓			
Were all percent differences (%Ds) < 10%?	✓			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.			✓	
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.	✓			
Target analytes were detected in the field duplicates.	✓			
XIII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.	✓			

DC #: 37601D4a

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Reviewer: OZ
2nd reviewer: [illegible]

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-11		Al, Sb, As, Ba, Be, Cd, (Ca), Cr, Co, Cu, Fe, Pb, (Mg), Mn, Hg, Ni, (K), Se, Ag, (Na), Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
12-28		(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo) B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
QC: 29, 30		Al, Sb, As, Ba, Be, Cd, (Ca), Cr, Co, Cu, Fe, Pb, (Mg), Mn, Hg, Ni, (K), Se, Ag, (Na), Tl, V, Zn, Mo, B, Sn, Ti, ____
31, 32		(Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo) B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____

Comments: Mercury by CVAA if performed

LDC #: 37601D4a

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: G
2nd Reviewer: G

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000) Soil preparation factor applied: ____

Sample Concentration units, unless otherwise noted: Mg/L Associated Samples: 20

				Sample Identification										
Analyte	Maximum PB[a] (ug/l)	Maximum ICB/CCB[a] (mg/l)	Action Level	No qualifiers (>5x)										
Na		0.05500	0.275											

Sample Concentration units, unless otherwise noted: Mg/L Associated Samples: 12, 13

				Sample Identification										
Analyte	Maximum PB[a] (ug/l)	Maximum ICB/CCB[a] (mg/l)	Action Level	No qualifiers (>5x)										
Na		0.03119	0.15595											

Sample Concentration units, unless otherwise noted: Mg/L Associated Samples: 6, 7

				Sample Identification										
Analyte	Maximum PB[a] (ug/l)	Maximum ICB/CCB[a] (mg/l)	Action Level	No qualifiers (>5x)										
Ca		0.07167	0.35835											

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 37601D4a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: CA
2nd Reviewer: 9

METHOD: Trace Metals (EPA SW846 6010B/7000)

Blank units: mg/L **Associated sample units:** mg/L
Sampling date: 10/24/16 Soil factor applied _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: 12-21, 25-28

Analyte	Blank ID	Sample Identification										
	SB01_161024F (SDG: 320-22986-1)	Action Limit	No qualifiers									
Cr	0.00188	0.0094										
Na	0.0665	0.3325										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 37601D4a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: a
2nd Reviewer: a

METHOD: Trace metals (EPA SW 846 Method 6010/7000)

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 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
							7-4x -see below	

Comments: 29/30: Ca, Mg, Na 7-4x

31/32: Ca, Fe, Mg, K, Na 7-4x

LDC#: 37601D4a

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: a
2nd Reviewer:

METHOD: Metals (EPA Method 6010C/7470A)

Analyte	Concentration (mg/L)		RPD (≤30)	Difference	Limits	Qualifiers
	1	4				
Calcium	164	154	6			
Magnesium	30.2	29.4	3			
Potassium	21.3	19.9	7			
Sodium	65.4	49.2	28			

Analyte	Concentration (mg/L)		RPD (≤30)	Difference	Limits	Qualifiers
	12	19				
Arsenic	0.00775	0.00812		0.00037	(≤0.00300)	
Barium	0.107	0.113	5			
Calcium	149	153	3			
Cobalt	0.00119	0.00130		0.00011	(≤0.00300)	
Iron	11.3	12.2	8			
Magnesium	29.1	31.1	7			
Manganese	1.49	1.58	6			
Nickel	0.00147	0.00189		0.00042	(≤0.00300)	
Potassium	20.2	20.9	3			
Sodium	53.1	54.2	2			
Zinc	0.0100U	0.00481		0.00519	(≤0.0120)	

LDC#: 37601D4a **VALIDATION FINDINGS WORKSHEET** Page: 1 of 2
Field Duplicates Reviewer: a
2nd Reviewer:

METHOD: Metals (EPA Method 6010C/7470A)

Analyte	Concentration (mg/L)		RPD (≤30)	Difference	Limits	Qualifiers
	13	21				
Arsenic	0.0102	0.0104		0.0002	(≤0.00300)	
Barium	0.0403	0.0407	1			
Calcium	100	103	3			
Cobalt	0.00200U	0.00102		0.00098	(≤0.00300)	
Iron	3.93	4.02	2			
Magnesium	39.6	41.3	4			
Manganese	1.90	2.02	6			
Molybdenum	0.00155	0.00160		0.00005	(≤0.00300)	
Nickel	0.00161	0.00172		0.00011	(≤0.00300)	
Potassium	13.1	13.8	5			
Sodium	42.2	43.4	3			
Zinc	0.0133	0.0143		0.001	(≤0.0120)	

LDC #: 37601D4

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: CR
2nd Reviewer: CR

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

An initial and 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 (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (ug/L)	True (ug/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
	ICP (Initial calibration)						
ICV	ICP/MS (Initial calibration)	~~ICV~~ Ni	0.0775	0.08	97	97	Y
ICV	CVAA (Initial calibration)	Hg	0.00197	0.002	99	99	
	ICP (Continuing calibration)						
CCV (CA:11)	ICP/MS (Continuing calibration)	~~CCV~~ Ag	~~0.0515~~ 0.05131	0.05	103	103	
CCV	CVAA (Continuing calibration)	Hg	0.00485	0.005	97	97	Y

Comments:

LDC #: 37601D4

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ 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:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check	Co	0.0947	0.1	95	95	Y
LCS	Laboratory control sample	Fe	1.057	1	106	106	
31	Matrix spike	Be	(SSR-SR) 0.2029	0.2	104	104	
31/32	Duplicate	Zn	0.1857	0.1914	3	3	
5	ICP serial dilution	Na	95.8	97.7	2	2	

Comments:

LDC #: 37601D-1a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: RJ
2nd reviewer: R

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

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 and within the linear range of the ICP?
Y N N/A Are all detection limits below the CRDL?

Detected analyte results for K were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation:

$12 = \frac{20187.144\ ug/L}{1000} = 20.19\ mg/L$

#	Sample ID	Analyte	Reported Concentration (mg/L)	Calculated Concentration (mg/L)	Acceptable (Y/N)
	1	Ca	164	164	Y
	12	K	20.2	20.2	
	17	Ba	0.0504	0.0504	
	18	Co	0.00345	0.00345	
	21	Mn	2.02	2.02	
	25	Mg	21.9	21.9	

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Wet Chemistry

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23072-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP02_161026**	320-23072-1**	Water	10/26/16
M040A_161026**	320-23072-3**	Water	10/26/16
M041A_161025**	320-23072-4**	Water	10/25/16
M041E_161025	320-23072-5	Water	10/25/16
M051A_161026**	320-23072-6**	Water	10/26/16
M052A_161026**	320-23072-7**	Water	10/26/16
M053A_161026	320-23072-8	Water	10/26/16
M058A_161026	320-23072-9	Water	10/26/16
M059A_161026**	320-23072-10**	Water	10/26/16
M060A_161025	320-23072-11	Water	10/25/16
M054A_161026**	320-23072-16**	Water	10/26/16
M055A_161026	320-23072-17	Water	10/26/16
M056A_161026	320-23072-18	Water	10/26/16
M057A_161026	320-23072-19	Water	10/26/16
DUP02_161026MS	320-23072-1MS	Water	10/26/16
DUP02_161026MSD	320-23072-1MSD	Water	10/26/16
M058A_161026MS	320-23072-9MS	Water	10/26/16
M058A_161026MSD	320-23072-9MSD	Water	10/26/16
M054A_161026MS	320-23072-16MS	Water	10/26/16
M054A_161026MSD	320-23072-16MSD	Water	10/26/16
M058A_161026DUP	320-23072-9DUP	Water	10/26/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Nitrate as Nitrogen, Nitrite as Nitrogen, Sulfate, and Chloride by Environmental Protection Agency (EPA) Method 300.0
Sulfide by EPA Method 9034
Total Cyanide by EPA Method 9012A
Alkalinity by Standard Method 2320B
Total Dissolved Solids by Standard Method 2540C
Total Organic Carbon by Standard Method 5310B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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
M060A_161025	Nitrate as N Nitrite as N	69.32 Hours	48 Hours	UJ (all non-detects) UJ (all non-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)	Chloride	152.0 ug/L	M051A_161026** M058A_161026 M060A_161025 M055A_161026 M057A_161026
ICB/CCB	Chloride	0.1605 mg/L	M051A_161026** M058A_161026 M060A_161025 M055A_161026 M057A_161026
PB (prep blank)	Cyanide	2.575 ug/L	M041A_161025** M041E_161025

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

Sample EB05_161026 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
EB05_161026	10/25/16	Cyanide	2.69 ug/L	M040A_161026** M041A_161025** M041E_161025

Sample SB01_161024 (from SDG 320-22986-1) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
SB01_161024	10/24/16	Cyanide	3.55 ug/L	M040A_161026** M041A_161025** M041E_161025

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
M040A_161026**	Cyanide	2.08 ug/L	5.00U ug/L

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. Duplicates

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples DUP02_161026** and M053A_161026 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026**	M053A_161026				
Chloride	65200 ug/L	51300 ug/L	24 (≤30)	-	-	-
Sulfate	27800 ug/L	23800 ug/L	16 (≤30)	-	-	-
Alkalinity	552000 ug/L	570000 ug/L	3 (≤30)	-	-	-
TDS	814000 ug/L	814000 ug/L	0 (≤30)	-	-	-
Total organic carbon	37.2 mg/L	36.0 mg/L	3 (≤30)	-	-	-

X. Sample Result Verification

All sample result verifications were acceptable for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to technical holding time, data were qualified as estimated in one sample.

Due to equipment and source blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Wet Chemistry - Data Qualification Summary - SDG 320-23072-1

Sample	Analyte	Flag	A or P	Reason
M060A_161025	Nitrate as N Nitrite as N	UJ (all non-detects) UJ (all non-detects)	P	Technical holding times

NAS Alameda Point, BGMP
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Field Blank Data Qualification Summary - SDG 320-23072-1

Sample	Analyte	Modified Final Concentration	A or P
M040A_161026**	Cyanide	5.00U ug/L	A

LDC #: 37601D6
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/10/16
Page: 1 of 2
Reviewer: a
2nd Reviewer: a

METHOD: (Analyte) Nitrate-N, Nitrite-N, Sulfate, Chloride (EPA Method 300.0), Sulfide, (EPA Method 9034) Total Cyanide (EPA Method 9012A) Alkalinity (SM2320B), TDS (SM 2540C), TOC (SM 5310B)

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	SW	
V	Field blanks	SW	EB=11 SB=SB01_161024 (from 320-22986-1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	(1,7)
X.	Sample result verification	A	Not reviewed for Stage 2B validation
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:

** Indicates sample underwent Stage 4validation

	Client ID	Lab ID	Matrix	Date
1	DUP02_161026**	320-23072-1**	Water	10/26/16
2	M040A_161026**	320-23072-3**	Water	10/26/16
3	M041A_161025**	320-23072-4**	Water	10/25/16
4	M041E_161025	320-23072-5	Water	10/25/16
5	M051A_161026**	320-23072-6**	Water	10/26/16
6	M052A_161026**	320-23072-7**	Water	10/26/16
7	M053A_161026	320-23072-8	Water	10/26/16
8	M058A_161026	320-23072-9	Water	10/26/16
9	M059A_161026**	320-23072-10**	Water	10/26/16
10	M060A_161025	320-23072-11	Water	10/25/16
~~11~~	~~EB05_161026~~	320-23072-13	Water	~~10/26/16~~
12	M054A_161026**	320-23072-16**	Water	10/26/16
13	M055A_161026	320-23072-17	Water	10/26/16
14	M056A_161026	320-23072-18	Water	10/26/16
15	M057A_161026	320-23072-19	Water	10/26/16
16	DUP02_161026MS	320-23072-1MS	Water	10/26/16
17	DUP02_161026MSD	320-23072-1MSD	Water	10/26/16

LDC #: 37601D6
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/9/16

Reviewer: CK
2nd Reviewer: A

METHOD: (Analyte) Nitrate-N, Nitrite-N, Sulfate, Chloride (EPA Method 300.0), Sulfide, (EPA Method 9034) Total Cyanide (EPA Method 9012A) Alkalinity (SM2320B), TDS (SM 2540C), TOC (SM 5310B)

	Client ID	Lab ID	Matrix	Date
18	M058A_161026MS	320-23072-9MS	Water	10/26/16
19	M058A_161026MSD	320-23072-9MSD	Water	10/26/16
20	M054A_161026MS	320-23072-16MS	Water	10/26/16
21	M054A_161026MSD	320-23072-16MSD	Water	10/26/16
22	MS DUP			
23				
24				
25				
26				

Notes:

DC #: 3760106

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

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?			✓	

DC #: 376016

VALIDATION FINDINGS CHECKLIST

Reviewer: CR
2nd Reviewer: [illegible]

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 #: 37601D6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1,5,6,7,8	pH (TDS) (Cl) F (NO3) (NO2) (SO4) O-PO4 (Alk) CN NH3 TKN TOC Cr6+ ClO4
10,13,15	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
1-5	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
1,5-10,12-15	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (Sulfide)
2-4	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk (CN) NH3 TKN TOC Cr6+ ClO4
1,5-10,12-15	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
(2-16,17	pH TDS (Cl) F NO3 NO2 (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
16,19	pH (TDS) (Cl) F (NO3) (NO2) (SO4) O-PO4 Alk CN NH3 TKN (TOC) Cr6+ ClO4 (Sulfide)
20,21	pH (TDS) Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
22	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 #: 37601D

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: [illegible]
2nd reviewer: [illegible]

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:	300.0	
Parameters:	NO3-N, NO2-N	
Technical holding time:	48hrs	

Sample ID	Sampling date	Analysis date	Total Time	Qualifier	Analysis date	Total Time	Qualifier
10	10/25/16 14:00	10/28/16 11:19	69.32hrs	J (UJ/P/ND)			

LDC #: 37601D6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: a
2nd Reviewer: a

METHOD: Inorganics, Method See Cover

Conc. units: ug/L **Associated Samples:** 5, 8, 10, 13, 15

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No qualifiers								
Cl	152.0	0.1605	760									

Conc. units: ug/L **Associated Samples:** 3, 4

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No qualifiers								
Cyanide	2.575		12.875									

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 #: 37601D6

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: G
2nd Reviewer: G

METHOD: Inorganics, EPA Method See Cover
Blank units: ug/L **Associated sample units: ug/L**
Sampling date: 10/24/16 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: 2-4

Analyte	Blank ID	Action Limit	Sample Identification							
	SB01_161024 (from SDG 320-22986-1)		2							
Cyanide	3.55	17.75	2.08 / 5.00							

Sampling date: 10/25/16 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: 2-4

Analyte	Blank ID	Action Limit	Sample Identification							
	11		2							
Cyanide	2.69	13.45	2.08 / 5.00							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#: 37601D6 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Reviewer:
2nd Reviewer:

Inorganics, Method See Cover

Analyte	Concentration (ug/L)		RPD (≤30)	Difference	Limits	Qualification (Parent only)
	1	7				
Chloride	65200	51300	24			
Sulfate	27800	23800	16			
Alkalinity	552000	570000	3			
TDS	814000	814000	0			
TOC (mg/L)	37.2	44.0	17			

V:\FIELD DUPLICATES\FD_inorganic\37601D6.wpd

LDC #: 31601D6

Validation Findings Worksheet
Initial and Continuing Calibration Calculation Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

Method: Inorganics, Method See Cover

The correlation coefficient (r) for the calibration of SO4 was recalculated. Calibration date: 10/19/16

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. (ug/L)	Area	Recalculated r or r^2	Reported r or r^2	Acceptable (Y/N)
Initial calibration	SO4	s1	1	3919081	*0.9979*	0.9970	Y
		s2	2.5	10004848			
		s3	10	41263980			
		s4	25	105652649			
		s5	50	232376909			
Calibration verification	Alk	CCV	119	113.5	95	95	
Calibration verification	CN	CCV	0.2	0.2008	100	100	
Calibration verification							

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 #: 37801O6

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: a
2nd Reviewer: a

METHOD: Inorganics, Method See cover

Percent recoveries (%R) for a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$$\%R = \frac{Found}{True} \times 100$$

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:

$$RPD = \frac{|S-D|}{(S+D)/2} \times 100$$

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	CN	97.54	100	98	98	Y
18	Matrix spike sample	TOS	(SSR-SR) 1008000	1000000	101	101	
18/19	Duplicate sample	Sulfide	14000	14000	C	C	

Comments: _____

TOTCLC.6

LDC #: 37601B

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of
Reviewer: a
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 SO_4 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $43355768.84x - 4857576$

Recalculation: $1000 \times \frac{120052794 + 4857576}{43355768.84} = 27800.96$ ug/L

#	Sample ID	Analyte	Reported Concentration (ug/L)	Calculated Concentration (ug/L)	Acceptable (Y/N)
	1	SO_4	27800	27800	Y
		Cl	65200	65200	
	2	Sulfide	2.08	2.08	
	3	CN: ND	ND	ND	
	5	Alk	448000	448000	
	6	TDS 1080000 →		1080000	
	9	TOC	16.3	16.3	
	12	TOC	23.8	23.8	

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Gasoline Range Organics

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23072-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP02_161026	320-23072-1	Water	10/26/16
M051A_161026**	320-23072-6**	Water	10/26/16
M052A_161026	320-23072-7	Water	10/26/16
M053A_161026	320-23072-8	Water	10/26/16
M058A_161026	320-23072-9	Water	10/26/16
M059A_161026	320-23072-10	Water	10/26/16
M054A_161026	320-23072-16	Water	10/26/16
M055A_161026	320-23072-17	Water	10/26/16
M056A_161026	320-23072-18	Water	10/26/16
M057A_161026	320-23072-19	Water	10/26/16
M058A_161026MS	320-23072-9MS	Water	10/26/16
M058A_161026MSD	320-23072-9MSD	Water	10/26/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Gasoline Range Organics by Environmental Protection Agency (EPA) SW 846 Method 8260B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 20.0%.

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%.

V. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks.

VI. Field Blanks

Samples EB05_161026, EB06_161026, and EB07_161026 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 (from SDG 320-22986-1) was identified as a source 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) 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 DUP02_161026 and M053A_161026 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026	M053A_161026				
Gasoline range organics (C6-C12)	4730	4840	-	110 (≤1000)	-	-

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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Gasoline Range Organics – Data Qualification Summary – SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Gasoline Range Organics - Field Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

LDC #: 37601D7
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/9/16
Page: 1 of 1
Reviewer: T
2nd Reviewer: A

METHOD: GC/MS Gasoline Range Organics (EPA SW846 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 ≤ 20%. ICV ≤ 20%
IV.	Continuing calibration	A	CCV ≤ 20%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	EB-7, 8, 9; SB01-161024 (320-23986-1)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	FM	D = 1, 4
XI.	Internal standards	N	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation
XIV.	System performance	A	Not reviewed for Stage 2B validation
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

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	DUP02_161026** D1	320-23072-1**	Water	10/26/16
2	M051A_161026**	320-23072-6**	Water	10/26/16
3	M052A_161026	320-23072-7	Water	10/26/16
4	M053A_161026 D1	320-23072-8	Water	10/26/16
5	M058A_161026	320-23072-9	Water	10/26/16
6	M059A_161026	320-23072-10	Water	10/26/16
~~7~~	~~EB05_161026~~	~~320-23072-13~~	~~Water~~	~~10/26/16~~
~~8~~	~~EB06_161026~~	~~320-23072-14~~	~~Water~~	~~10/26/16~~
~~9~~	~~EB07_161026~~	~~320-23072-15~~	~~Water~~	~~10/26/16~~
10	M054A_161026	320-23072-16	Water	10/26/16
11	M055A_161026	320-23072-17	Water	10/26/16
12	M056A_161026	320-23072-18	Water	10/26/16
13	M057A_161026	320-23072-19	Water	10/26/16

LDC #: 37601D7
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 12/9/16
Page: 2 of 2
Reviewer: Q
2nd Reviewer: K

METHOD: GC/MS Gasoline Range Organics (EPA SW846 Method 8260B)

	Client ID	Lab ID	Matrix	Date
14	M058A_161026MS	320-23072-9MS	Water	10/26/16
15	M058A_161026MSD	320-23072-9MSD	Water	10/26/16
16				
17				
18				
19				
20				

Notes:

	MB 320-175682/10						

LDC #: 3760AT

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: RC

Method: ✓ GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. 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 RT windows properly established?	✓			
IIb. 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%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. 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.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VI. Surrogate Spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. 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?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. 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?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC#: 37601D7

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: PG
2nd Reviewer: A

METHOD: GC (EPA SW 846 Method 8015B)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	4				
GRO (C6-C12)	4730	4840		110	≤1000	

V:\FIELD DUPLICATES\37601D7_Amec.wpd

LDC #: 3760DT

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC ✓ HPLC ____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (1000std)	Recalculated CF (1000std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	1CAL	9/21/16	EPO (C6-C12)	29185	29185	28359.796	28359.88	13.8	13.8
2									
3									
4									

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 #: 36107

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: 9
2nd Reviewer: A

METHOD: GC_____HPLC_____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	FAS1107	11/3/16	PCB-12	28360	27490	27490	3.1	3.1
2								
3								
4								

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 #: 37601OT

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: 9
2nd reviewer: 7

METHOD: / GC __ HPLC

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: 2

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
BFB		20.0	21.5	107	107	0

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID:

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 36610T

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: 9
2nd Reviewer: 2

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) and relative percent differences (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 SC = Sample concentration
SA = Spike added

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 14/15

Compound	Spike Added (ug/L)		Sample Conc. (ug/L)	Spike 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	Recalc.
Gasoline (8015)	10000	10000	189	9030	9345	88	88	92	92	3	3
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

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 #: 37601OT

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

METHOD: ✓ GC __HPLC

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* (SSC-SC)/SA

RPD = I SSCLCS - SSCLCSD I * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 320-135687/7

Compound	Spike Added (ug/Kg)		Spiked Sample Concentration (ug/Kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)	1000	1000	981.6	975.8	98	98	98	98	1	1
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 37601T

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: 9
2nd Reviewer: 2

METHOD: ✓ GC ___ HPLC

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% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 2 Compound Name 4R0

Concentration = $\frac{(344817)(10)}{(28359.796)}$

= 1215.9 µg/L

#	Sample ID	Compound	Reported Concentrations (µg/L)	Recalculated Results Concentrations ( )	Qualifications
	2	4R0	1220		

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 19, 2016

Parameters: Total Petroleum Hydrocarbons as Extractables

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23072-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP02_161026	320-23072-1	Water	10/26/16
M051A_161026**	320-23072-6**	Water	10/26/16
M052A_161026	320-23072-7	Water	10/26/16
M053A_161026	320-23072-8	Water	10/26/16
M058A_161026	320-23072-9	Water	10/26/16
M059A_161026	320-23072-10	Water	10/26/16
M054A_161026	320-23072-16	Water	10/26/16
M055A_161026	320-23072-17	Water	10/26/16
M056A_161026	320-23072-18	Water	10/26/16
M057A_161026	320-23072-19	Water	10/26/16
M058A_161026MS	320-23072-9MS	Water	10/26/16
M058A_161026MSD	320-23072-9MSD	Water	10/26/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Total Petroleum Hydrocarbons (TPH) as Extractables by Environmental Protection Agency (EPA) SW 846 Method 8015B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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. 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 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. 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.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. No contaminants were found in the laboratory blanks with the following exceptions:

Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB 320-135668/1-A	11/02/16	Diesel range organics (C12-C24)	17.63 ug/L	All samples in SDG 320-23072-1

Sample concentrations were compared to concentrations detected in the laboratory blanks. 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

Samples EB05_161026, EB06_161026, and EB07_161026 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB05_161026	10/26/16	Diesel range organics (C12-C24)	22.6 ug/L	All samples in SDG 320-23072-1
EB06_161026	10/26/16	Diesel range organics (C12-C24)	22.1 ug/L	All samples in SDG 320-23072-1
EB07_161026	10/26/16	Diesel range organics (C12-C24)	20.8 ug/L	All samples in SDG 320-23072-1

Sample SB01_161024 (from SDG 320-22986-1) was identified as a source blank. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VI. Surrogates

Surrogates were added to all samples as required by the method. Surrogate recoveries (%R) were not within QC limits for several samples. No data were qualified for samples analyzed at greater than or equal to 5X dilution.

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. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples DUP02_161026 and M053A_161026 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026	M053A_161026				
Diesel range organics (C12-C24)	8100	10100	22 (≤30)	-	-	-
Motor oil range organics (C24-C36)	1310	1760	-	450 (≤2400)	-	-

X. Compound Quantitation

All compound quantitations met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

XI. 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.

XII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Total Petroleum Hydrocarbons as Extractables – Data Qualification Summary – SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Total Petroleum Hydrocarbons as Extractables - Laboratory Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Total Petroleum Hydrocarbons as Extractables - Field Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

LDC #: 37601D8
SDG #: 320-23072-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B/4

Date: 11/9/16
Page: 1 of 1
Reviewer: Q
2nd Reviewer: M

METHOD: GC ~~Diesel Range Organics~~ TPH-D (EPA SW 846 Method 8015B)

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/ICV	A/A	RSD ≤ 20%. ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	SW	
V.	Field blanks	SW	EB = T-9, SB01_161024 (320-22986-1)
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	D=1+4
X.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation
XI.	Target compound identification	A	Not reviewed for Stage 2B validation
XII.	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	DUP02_161026	320-23072-1	Water	10/26/16
2	M051A_161026**	320-23072-6**	Water	10/26/16
3	M052A_161026	320-23072-7	Water	10/26/16
4	M053A_161026	320-23072-8	Water	10/26/16
5	M058A_161026	320-23072-9	Water	10/26/16
6	M059A_161026	320-23072-10	Water	10/26/16
~~7~~	~~EB05_161026~~	~~320-23072-13~~	~~Water~~	~~10/26/16~~
~~8~~	~~EB06_161026~~	~~320-23072-14~~	~~Water~~	~~10/26/16~~
~~9~~	~~EB07_161026~~	320-23072-15	Water	10/26/16
10	M054A_161026	320-23072-16	Water	10/26/16
11	M055A_161026	320-23072-17	Water	10/26/16
12	M056A_161026	320-23072-18	Water	10/26/16
13	M057A_161026	320-23072-19	Water	10/26/16
14	M058A_161026MS	320-23072-9MS	Water	10/26/16
15	M058A_161026MSD	320-23072-9MSD	Water	10/26/16
16				
17				

LDC #: 36601D8

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: Q
2nd Reviewer: AC

Method: GC HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. 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 RT windows properly established?	✓			
IIb. 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%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. 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.	✓			
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VI. Surrogate Spikes				
Were all surrogate percent recovery (%R) within the QC limits?	.	✓		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. 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?	✓			

LDC #: 37601D8

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: 8

Validation Area	Yes	No	NA	Findings/Comments
VIII. 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?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 36108

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: / GC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Blank extraction date: 11/3/16 **Blank analysis date:** 11/9/16
Conc. units: ug/L **Associated samples:** all

Compound	Blank ID	Sample Identification								
MB	320-175668/1-A									
DRO (C12-C24)	17.63									

Blank extraction date:_____ **Blank analysis date:**_____ **Associated samples:**_____
Conc. units:_____

Compound	Blank ID	Sample Identification								

ALL 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 #: 37601D8

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: T
2nd Reviewer: [illegible]

METHOD: GC

(Y) N N/A Field blanks were identified in this SDG.
(Y) N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 10/26/16
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: all

Compound	Blank ID	Blank	Blank	Sample Identification						
	T	8	9							
DRO (C12-C24)	22.6	22.1	20.8							

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 37601D8

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: T
2nd Reviewer: M

METHOD: / **GC** __ **HPLC**

Are surrogates required by the method? Yes___ or No___.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	1		TPH	127 (56-125)	No qual (OR>5x)
				( )	
	4			42 ( )	
				( )	
	10			160 ( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene		
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin		
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin		
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate		
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC#: 37601D8

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer:

METHOD: GC (EPA SW 846 Method 8015B)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	4				
DRO (C12-C24)	8100	10100	22			
MRO)C24-C36)	1310	1760		450	≤2400	

V:\FIELD DUPLICATES\37601D8_Amec.wpd

LDC #: 36108

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: A

METHOD: GC ✓ HPLC _____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (100 std)	Recalculated CF (100 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/3/16	DRO C12-C24	154706	154706	159928.359	159928.3	4.5	4.5
2									
3									
4									

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 #: 37601D8

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: M

METHOD: GC ✓ HPLC ____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	1109-008	11/9/16	DRO C12-C24	159928	160092	160092	0.1	0.1
2								
3								
4								

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 #: 36108

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: Q
2nd reviewer: R

METHOD: / GC __ HPLC

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: 2

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
TPH		13.7	11.2	84	84	0

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

LDC #: 35601D8

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: Q
2nd Reviewer: E

METHOD: / GC ___HPLC

The percent recoveries (%R) and relative percent differences (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 =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 4/15

Compound	Spike Added (ug/L)		Sample Conc. (ug/L)	Spike 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	Recalc.
Gasoline (8015)											
Diesel (8015)	294	286	2160	2412	2383	87	86	T9	T8	1	1
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

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 #: 36018

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer:
2nd Reviewer:

METHOD: ✓ GC __ HPLC

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* (SSC-SC)/SA

RPD = | SSCLCS - SSCLCSD | * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: 320-135668

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)	300	NA	200.9	NA	67	67				
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3760108

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

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% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 2 Compound Name ORO

Concentration = $\frac{(21870 8999)(3000)(1)}{(159928.357)(1055.1)}$

= 3888.4 µg/L

#	Sample ID	Compound	Reported Concentrations (µg/L)	Recalculated Results Concentrations ( )	Qualifications
	2	ORO	3890		

Comments: _____

SAMPCALew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Methane, Ethane, & Ethene

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23072-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP02_161026**	320-23072-1**	Water	10/26/16
M051A_161026**	320-23072-6**	Water	10/26/16
M052A_161026**	320-23072-7**	Water	10/26/16
M053A_161026	320-23072-8	Water	10/26/16
M058A_161026	320-23072-9	Water	10/26/16
M059A_161026**	320-23072-10**	Water	10/26/16
M060A_161025	320-23072-11	Water	10/25/16
M054A_161026	320-23072-16	Water	10/26/16
M055A_161026	320-23072-17	Water	10/26/16
M056A_161026	320-23072-18	Water	10/26/16
M057A_161026	320-23072-19	Water	10/26/16
M058A_161026MS	320-23072-9MS	Water	10/26/16
M058A_161026MSD	320-23072-9MSD	Water	10/26/16
M058A_161026DUP	320-23072-9DUP	Water	10/26/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Methane, Ethane, and Ethene by Method RSK-175

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, 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.

Retention time windows were established as required by the method for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

Retention times of all compounds in the calibration standards were within the established retention time windows for samples which underwent Stage 4 validation. Raw data were not reviewed for Stage 2B validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. 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. Relative percent differences (RPD) were within QC limits.

VII. 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.

VIII. Field Duplicates

Samples DUP02_161026** and M053A_161026 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ppbv)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026**	M053A_161026				
Methane	7980	10000	22 (≤30)	-	-	-
Ethane	7.55	8.33	-	0.78 (≤15.0)	-	-
Ethylene	7.08	8.44	-	1.36 (≤15.0)	-	-

IX. Compound Quantitation

All compound quantitations were within validation criteria with the following exceptions:

Sample	Compound	Finding	Flag	A or P
DUP02_161026** M051A_161026** M052A_161026** M059A_161026** M057A_161026 M055A_161026	Ethane	Eluted outside retention time window due to matrix interference and the confirmation column does not provide ethane quantitation due to coelute with acetylene	J (all detects)	A

Sample	Compound	Finding	Flag	A or P
M060A_161025 M054A_161026 M056A_161026	Ethylene	Results could not be confirmed due to matrix interference	NJ (all detects)	A

Raw data were not reviewed for Stage 2B validation.

X. Target Compound Identification

All target compound identifications met validation criteria for samples which underwent Stage 4 validation. Raw data were not reviewed for stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to eluted outside retention time window and matrix spike interference, data were qualified as estimated in nine samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Methane, Ethane, & Ethene - Data Qualification Summary - SDG 320-23072-1

Sample	Compound	Flag	A or P	Reason
DUP02_161026** M051A_161026** M052A_161026** M059A_161026** M057A_161026 M055A_161026	Ethane	J (all detects)	A	Compound quantitation (eluted outside retention time window)
M060A_161025 M054A_161026 M056A_161026	Ethylene	NJ (all detects)	A	Compound quantitation (matrix interference)

NAS Alameda Point, BGMP
Methane, Ethane, & Ethene - Laboratory Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Methane, Ethane, & Ethene - Field Blank Data Qualification Summary - SDG 320-23072-1

No Sample Data Qualified in this SDG

LDC #: 37601D51 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/9/16
SDG #: 320-23072-1 Stage 2B/4 Page: 1 of 1
Laboratory: Test America Reviewer: R
2nd Reviewer: R

METHOD: GC Methane-Ethane-Ethene (Method RSK-175)

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/ICV	A/A	RSD ≤ 20%. r² ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Matrix spike/Matrix spike duplicates	A	
VII.	Laboratory control samples	A	LCS/0
VIII.	Field duplicates	SW	D=1+4
IX.	Compound quantitation RL/LOQ/LODs	SW	Not reviewed for Stage 2B validation.
X.	Target compound identification	A	Not reviewed for Stage 2B validation.
XI.	System performance	A	Not reviewed for Stage 2B validation.
XII	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

** Indicates sample underwent Stage 4 validation

	Client ID	Lab ID	Matrix	Date
1	DUP02_161026**	320-23072-1**	Water	10/26/16
2	M051A_161026**	320-23072-6**	Water	10/26/16
3	M052A_161026**	320-23072-7**	Water	10/26/16
4	M053A_161026	320-23072-8	Water	10/26/16
5	M058A_161026	320-23072-9	Water	10/26/16
6	M059A_161026**	320-23072-10**	Water	10/26/16
7	M060A_161025	320-23072-11	Water	10/25/16
8	M054A_161026	320-23072-16	Water	10/26/16
9	M055A_161026	320-23072-17	Water	10/26/16
10	M056A_161026	320-23072-18	Water	10/26/16
11	M057A_161026	320-23072-19	Water	10/26/16
12	M058A_161026MS	320-23072-9MS	Water	10/26/16
13	M058A_161026MSD	320-23072-9MSD	Water	10/26/16
14	M058A_161026DUP	320-23072-9DUP	Water	10/26/16
15				
16				
17				

LDC #: 37601051

VALIDATION FINDINGS CHECKLIST

Reviewer: CD
2nd Reviewer: TC

Method: / GC _____ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	/			
Was cooler temperature criteria met?	/			
IIa. 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 RT windows properly established?	/			
IIb. 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%?	/			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	/			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	/			
Were all the retention times within the acceptance windows?	/			
IV. 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.		/		
V. Field Blanks				
Were field blanks identified in this SDG?		/		
Were target compounds detected in the field blanks?			/	
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?		/		
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			/	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			/	
VII. 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?	/			

LDC #: 37601D51

VALIDATION FINDINGS CHECKLIST

Reviewer: CA
2nd Reviewer: M

Validation Area	Yes	No	NA	Findings/Comments
VIII. 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?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?	✓			
Were target compounds detected in the field duplicates?	✓			
X. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC#: 37601D51

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer: M

METHOD: GC (RSK-175)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	4				
Methane	7980	10000	22			
Ethane	7.55	8.33		0.78	≤15.0	
Ethylene	7.08	8.44		1.36	≤15.0	

V:\FIELD DUPLICATES\37601D51_Amec.wpd

LDC #: 36605I

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: 9
2nd Reviewer: RC

METHOD: / GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	Ethane	Eluted outside retention time window due to matrix interference and the confirmation column does not provide ethane quantitation due to coelute with acetylene.	1-3, 6, 11, 9, *	Jdets/A
	Ethylene	results could not be confirmed due to matrix interference	7-8, 10	NJdets/A

Comments: See sample calculation verification worksheet for recalculations

LDC#: 36297A51

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer:
2nd Reviewer: AC

Method: Methane by RSK-175

Calibration Date	Column	Compound	Standard	(Y) Response	(X) Concentration
11/2/2015	RT-U-Bond	Methane	0	126923	0.913
			s1	227824	1.830
			s2	7885907	73.0
			s3	40113712	365.0
			s4	171692801	2099.0
			s5	755021468	7374.0
			s6	1489294267	14470.0

Regression Output

		Reported
Constant	*-7164694.629779*	*36314.81310*
Std Err of Y Est		
R Squared	*0.999135*	*0.990000*
Degrees of Freedom		
X Coefficient(s)	*103122.632338*	*101233.21000*
Std Err of Coef.		
Correlation Coefficient	*0.999567*	
Coefficient of Determination (r^2)	*0.999135*	*0.990000*

LDC #: 36105

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: 1
2nd Reviewer: M

METHOD: GC / HPLC _____

The calibration Factor (CF), average CF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

A = Area of compound,
C = Concentration of compound,
S = Standard deviation of the CF
X = Mean of the CFs

#	Standard ID	Calibration Date	Compound	Reported CF (160 std)	Recalculated CF (160 std)	Reported Average CF (initial)	Recalculated Average CF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL	11/3/16	Ethylene (RT-S-BOND	84431	84431	84899.92	84900	3.9	3.9
2									
3									
4									

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 #: 36105

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: Q
2nd Reviewer: 1

METHOD: GC / HPLC

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	16110T29	11/4/16	Methanol (RT-U-BOND)	73.0	79.9	79.9	9.5	9.5
			Ethylene (RT-S-BOND)	84900	89937	89913	5.9	5.9
2	16110T40	11/8/16	↓	73.0	73.8	73.8	1.0	1.0
				84900	84408	84385	0.6	0.6
3	16110T18	11/7/16	↓	73.0	76.9	76.9	5.3	5.3
				84900	87238	87215	2.8	2.7
4								

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 #: 36605

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: Q
2nd Reviewer: E

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) and relative percent differences (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 SC = Sample concentration
SA = Spike added
RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100 MS = Matrix spike MSD = Matrix spike duplicate

MS/MSD samples: 12/13

Compound	Spike Added (ug/L)		Sample Conc. (ug/L)	Spike 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	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)	146	146	6890	7022	7057	88	90	112	114	0	0
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											

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 #: 37601 DS1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: R

METHOD: / GC __HPLC

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* (SSC-SC)/SA

RPD = | SSCLCS - SSCLCSD | * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: R 280-350261

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	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)	146	146	158.4	156.7	108	108	107	107	1	1
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 36105

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: Q
2nd Reviewer: R

METHOD: / GC __ HPLC

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% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 2 Compound Name Methanol

Concentration = (4768750|-3634.81310)(1) / (101233.21)

= 409.83 ug/L

#	Sample ID	Compound	Reported Concentrations (ug/L)	Recalculated Results Concentrations ( )	Qualifications
	2	Methanol	409		

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Vinyl Chloride

Validation Level: Stage 2B & 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23077-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP04_161026	320-23077-1	Air	10/26/16
MG1-04-D-R_161026**	320-23077-2**	Air	10/26/16

**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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Vinyl Chloride by Environmental Protection Agency (EPA) Method TO-15

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 for 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

The canisters were properly pressurized and handled.

All technical holding time requirements were met.

II. GC/MS Instrument Performance Check

A bromofluorobenzene (BFB) tune was performed at 24 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 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 the 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.

All canisters were cleaned as required by the method. The laboratory indicated that canister certification was performed by batch. No contaminants were found in the representative canister blank.

VI. Field Blanks

No field blanks were identified in this SDG.

VII. Surrogates

Surrogates were not required by the method.

VIII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

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 DUP04_161026 and MG1-04-D-R_161026** were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/m^3)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP04_161026	MG1-04-D-R_161026**				
Vinyl chloride	107	118	10 (≤50)	-	-	-

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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Vinyl Chloride - Data Qualification Summary - SDG 320-23077-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Vinyl Chloride - Laboratory Blank Data Qualification Summary - SDG 320-23077-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Vinyl Chloride - Field Blank Data Qualification Summary - SDG 320-23077-1

No Sample Data Qualified in this SDG

LDC #: 37601E48

SDG #: 320-23077-1

Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Stage 2B/4

Date: 12/9/16

Page: 1 of 1

Reviewer: 4

2nd Reviewer: K

METHOD: GC/MS Vinyl Chloride (EPA Method TO-15)

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 / ICV ≤ 30%
IV.	Continuing calibration	A	CCV ≤ 30%
V.	Laboratory Blanks/Canister Blanks	A	lwy batch
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicate0s	SW	D=1+2
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Not reviewed for Stage 2B validation.
XIII.	Target compound identification	A	Not reviewed for Stage 2B validation.
XIV.	System performance	A	Not reviewed for Stage 2B validation.
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	DUP04_161026	320-23077-1	Air	10/26/16
2	MG1-04-D-R_161026**	320-23077-2**	Air	10/26/16
3				
4				
5				
6				
7				
8				

Notes:

	MB320-B608516						

LDC #: 35601248

VALIDATION FINDINGS CHECKLIST

Reviewer: Q
2nd Reviewer: 2

Method: Volatiles (EPA Method TO-15)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was canister pressure 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 24 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) < 30%?	✓			
IIIb. Initial calibration verificattion				
Was an initial calibration verification standard analyzed after every ICAL 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 24 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
V. Laboratory Blanks/Canister Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 24 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
Was a canister blank analyzed for every canister?	✓			
Was there contamination in the canister blanks? If yes, please see the Canister 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 (Optional)				
Were all surrogate percent recoveries (%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?			✓	
VIII. Laboratory Duplicate				
Was a laboratory duplicate analyzed for this SDG?		✓		
Were the relative percent differences (RPD) within the QC limits?			✓	

LDC #: 36012E48

VALIDATION FINDINGS CHECKLIST

Reviewer: 9
2nd Reviewer: M

Validation Area	Yes	No	NA	Findings/Comments
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 ± 40% from the associated calibration standard?	✓			
Were retention times within ± 20.0 seconds from 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 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 (EPA Method TO-15)

A. Chloromethane	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene	BB. 1,1,2,2-Tetrachloroethane	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane	CC. Toluene	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform	EE. Ethylbenzene	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

LDC#: 37601E48

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: PG
2nd Reviewer: M

METHOD: GC/MS (Method TO-15)

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/m3)		RPD (≤50%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	2				
C	107	118	10			

V:\FIELD DUPLICATES\37601E48_Amec.wpd

LDC #: 37601248

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: A
2nd Reviewer: M

METHOD: GC/MS VOA (EPA Method TO-15)

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 (2 std)	Recalculated RRF (2 std)	Reported Average RRF (initial)	Recalculated Average RRF (initial)	Reported %RSD	Recalculated %RSD
1	ICAL2	10/4/16	~~Methylene chloride~~ (1st internal standard)	0.9426	0.9426	0.9492	0.9492	6.8	6.8
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
2			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
3			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd internal standard)						
4			Methylene chloride (1st internal standard)						
			Trichlorethene (2nd internal standard)						
			Toluene (3rd 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 #: 3T601248

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: MC

METHOD: GC/MS VOA (EPA TO-15)

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	MS9110402	11/4/16	~~Methylene chloride~~ C (1st internal standard)	0.9492	1.059	1.059	11.5	11.5
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
2			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
3			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd internal standard)					
4			Methylene chloride (1st internal standard)					
			Trichlorethene (2nd internal standard)					
			Toluene (3rd 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 #: 36012A8

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA Method TO-15)

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 = | LCS - LCSD | * 2/(LCS + LCSD) LCS = Laboraotry control sample percent recovery LCSD = Laboratory control sample duplicate percent recovery

LCS ID: 320-136085

Compound	Spike Added (ug/m3)		Spiked Sample Concentration (ug/m3)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene										
Trichloroethene										
Benzene										
Toluene										
Chlorobenzene										
C	51.1	51.1	55.96	57.19	109	109	112	112	2	2

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 #: 38012A8

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: Q
2nd reviewer: K

METHOD: GC/MS VOA (EPA Method TO-15)

(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 , 2 :

Conc. = $\frac{(306963)(4.0)(2.25)(62.50)}{(62905)(0.9492)(24.5)(\quad)}$

= 118.03 µg/m3

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Volatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23087-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M14-06_161027	320-23087-1	Water	10/27/16
M14-15_161027	320-23087-2	Water	10/27/16
M14-21_161027	320-23087-3	Water	10/27/16
M14-16_161027	320-23087-5	Water	10/27/16
M14-17R_161027	320-23087-6	Water	10/27/16
M14-18_161027	320-23087-7	Water	10/27/16
M14-20D_161027	320-23087-8	Water	10/27/16
M14-06_161027MS	320-23087-1MS	Water	10/27/16
M14-06_161027MSD	320-23087-1MSD	Water	10/27/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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 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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 15.0%.

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.

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 TB10_161027 was identified as a trip blank. No contaminants were found.

Sample EB14_161027 was identified as an equipment blank. No contaminants were found.

Sample SB01-161024 (from SDG 320-22986-1) was identified as a source 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Volatiles - Data Qualification Summary - SDG 320-23087-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Laboratory Blank Data Qualification Summary - SDG 320-23087-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Field Blank Data Qualification Summary - SDG 320-23087-1

No Sample Data Qualified in this SDG

LDC #: 37601F1
SDG #: 320-23087-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/9/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA SW846 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% . r^2 ICV ≤ 20%
IV.	Continuing calibration /Ending	A	CCV ≤ 20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	TB=4 . EB=9 . SB01_161024(320-22986-1)
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	M14-06_161027	320-23087-1	Water	10/27/16
2	M14-15_161027	320-23087-2	Water	10/27/16
3	M14-21_161027	320-23087-3	Water	10/27/16
~~4~~	~~TB10_161027~~	~~320-23087-4~~	~~Water~~	~~10/27/16~~
5	M14-16_161027	320-23087-5	Water	10/27/16
6	M14-17R_161027	320-23087-6	Water	10/27/16
7	M14-18_161027	320-23087-7	Water	10/27/16
8	M14-20D_161027	320-23087-8	Water	10/27/16
~~9~~	~~EB14_161027~~	~~320-23087-9~~	~~Water~~	~~10/27/16~~
10	M14-06_161027MS	320-23087-1MS	Water	10/27/16
11	M14-06_161027MSD	320-23087-1MSD	Water	10/27/16
12				
13				

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23087-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M14-06_161027	320-23087-1	Water	10/27/16
M14-15_161027	320-23087-2	Water	10/27/16
M14-21_161027	320-23087-3	Water	10/27/16
M14-16_161027	320-23087-5	Water	10/27/16
M14-17R_161027	320-23087-6	Water	10/27/16
M14-18_161027	320-23087-7	Water	10/27/16
M14-20D_161027	320-23087-8	Water	10/27/16
M14-06_161027MS	320-23087-1MS	Water	10/27/16
M14-06_161027MSD	320-23087-1MSD	Water	10/27/16
M14-18_161027MS	320-23087-7MS	Water	10/27/16
M14-18_161027MSD	320-23087-7MSD	Water	10/27/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Nitrate as Nitrogen, Nitrite as Nitrogen, Sulfate, and Chloride by Environmental Protection Agency (EPA) Method 300.0
Sulfide by EPA Method 9034
Alkalinity by Standard Method 2320B
Total Organic Carbon by Standard Method 5310B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

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
ICB/CCB	Chloride	0.1474 mg/L	M14-18_161027

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. For M14-06_161027MS/MSD and M14-18_161027MS/MSD, no data were qualified for 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. Duplicates

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Wet Chemistry - Data Qualification Summary - SDG 320-23087-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 320-23087-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Field Blank Data Qualification Summary - SDG 320-23087-1

No Sample Data Qualified in this SDG

LDC #: 37601F6
SDG #: 320-23087-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/6/16
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: (Analyte) Nitrate-N, Nitrite-N, Sulfate, Chloride (EPA Method 300.0), Sulfide, (EPA Method 9034) Alkalinity (SM2320B), TOC (SM 5310B)

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	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	SW	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	8/9, 10/11: MS/D (~~10/11~~: Sa, TKN)
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Sample result verification	N	
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	M14-06_161027	320-23087-1	Water	10/27/16
2	M14-15_161027	320-23087-2	Water	10/27/16
3	M14-21_161027	320-23087-3	Water	10/27/16
4	M14-16_161027	320-23087-5	Water	10/27/16
5	M14-17R_161027	320-23087-6	Water	10/27/16
6	M14-18_161027	320-23087-7	Water	10/27/16
7	M14-20D_161027	320-23087-8	Water	10/27/16
8	M14-06_161027MS	320-23087-1MS	Water	10/27/16
9	M14-06_161027MSD	320-23087-1MSD	Water	10/27/16
10	M14-18_161027MS	320-23087-7MS	Water	10/27/16
11	M14-18_161027MSD	320-23087-7MSD	Water	10/27/16
12				
13				
14				
15				

Notes:

LDC #: 37601F6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-8	pH TDS (Cl) F (NO3) (NO2) (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (Sulfide)
	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: 8,9	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
	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 #: 37601F6

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: A
2nd Reviewer: 9

METHOD: Inorganics, Method See Cover

Conc. units: ug/L **Associated Samples:** 6

Analyte	Blank ID	Blank ID	Blank Action Limit									
	PB	ICB/CCB (mg/L)		No qualifiers								
Cl		0.1474	737									

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".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Methane, Ethane, & Ethylene

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23087-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M14-06_161027	320-23087-1	Water	10/27/16
M14-15_161027	320-23087-2	Water	10/27/16
M14-21_161027	320-23087-3	Water	10/27/16
M14-16_161027	320-23087-5	Water	10/27/16
M14-17R_161027	320-23087-6	Water	10/27/16
M14-18_161027	320-23087-7	Water	10/27/16
M14-20D_161027	320-23087-8	Water	10/27/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Methane, Ethane, and Ethylene by Method RSK-175

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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. 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 20.0% for all compounds.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. 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

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.

VII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

VIII. Field Duplicates

No field duplicates were identified in this SDG.

IX. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Flag	A or P
M14-06_161027 M14-15_161027	Ethane	Eluted outside retention time window due to matrix interference and the confirmation column does not provide ethane quantitation due to coelute with acetylene.	J (all detects)	A

Raw data were not reviewed for Stage 2B validation.

X. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to eluted outside retention time window, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Data Qualification Summary - SDG 320-23087-1

Sample	Compound	Flag	A or P	Reason
M14-06_161027 M14-15_161027	Ethane	J (all detects)	A	Compound quantitation (eluted outside retention time window)

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Laboratory Blank Data Qualification Summary - SDG 320-23087-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Field Blank Data Qualification Summary - SDG 320-23087-1

No Sample Data Qualified in this SDG

LDC #: 37601F51 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/9/16
SDG #: 320-23087-1 Stage 2B Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Methane-Ethane-Ethylene (Method RSK-175)

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/ICV	A / A	RSD ≤ 20%. ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Matrix spike/Matrix spike duplicates	N	CS
VII.	Laboratory control samples	A	LCS
VIII.	Field duplicates	N	
IX.	Compound quantitation RL/LOQ/LODs	~~A~~ N	
X.	Target compound identification	N	
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	M14-06_161027	320-23087-1	Water	10/27/16
2	M14-15_161027	320-23087-2	Water	10/27/16
3	M14-21_161027	320-23087-3	Water	10/27/16
4	M14-16_161027	320-23087-5	Water	10/27/16
5	M14-17R_161027	320-23087-6	Water	10/27/16
6	M14-18_161027	320-23087-7	Water	10/27/16
7	M14-20D_161027	320-23087-8	Water	10/27/16
8				
9				
10				
11				
12				

Notes:

LDC #: 36676E51

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: 9
2nd Reviewer: AC

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N (N/A) Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N (N/A) Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	Ethane	Eluted outside retention time window due to matrix interference and the confirmation column does not provide ethane quantitation due to coelute with acetylene.	1-2	Jdets/A

Comments: See sample calculation verification worksheet for recalculations

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Volatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23100-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
26PZ02_161028	320-23100-1	Water	10/28/16
26PZ03_161028	320-23100-2	Water	10/28/16
26MW03_161028	320-23100-4	Water	10/28/16
26PZ01_161028	320-23100-5	Water	10/28/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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 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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 15.0%.

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.

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 with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/04/16	Dichlorodifluoromethane Chloromethane	25.3 20.7	All samples in SDG 320-23100-1	UJ (all non-detects) UJ (all non-detects)	A

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 with the following exceptions:

Blank ID	Analysis Date	Compound	Concentration	Associated Samples
MB 320-136152/13	11/04/16	1,2,4-Trimethylbenzene	0.1637 ug/L	All samples in SDG 320-23100-1

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Sample TB11_161028 was identified as a trip blank. No contaminants were found.

Sample EB16_161028 was identified as an equipment blank. No contaminants were found.

Sample SB01-161024 (from SDG 320-22986-1) was identified as a source 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 was insufficient sample volume for analysis of the matrix spike and matrix spike duplicate.

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.

Due to continuing calibration %D, data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Volatiles - Data Qualification Summary - SDG 320-23100-1

Sample	Compound	Flag	A or P	Reason
26PZ02_161028 26PZ03_161028 26MW03_161028 26PZ01_161028	Dichlorodifluoromethane Chloromethane	UJ (all non-detects) UJ (all non-detects)	A	Continuing calibration (%D)

NAS Alameda Point, BGMP
Volatiles - Laboratory Blank Data Qualification Summary - SDG 320-23100-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Field Blank Data Qualification Summary - SDG 320-23100-1

No Sample Data Qualified in this SDG

LDC #: 37601G1
SDG #: 320-23100-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/9/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (EPA SW846 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%, r^2 ICV ≤ 20%
IV.	Continuing calibration /Endeg	TW	CCV ≤ 20/50%
V.	Laboratory Blanks	TW	
VI.	Field blanks	ND	TB=3. EB=6. SB01_161024 (320-22986-1)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	insufficient sample
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	26PZ02_161028	320-23100-1	Water	10/28/16
2	26PZ03_161028	320-23100-2	Water	10/28/16
~~3~~	~~TB11_161028~~	~~320-23100-3~~	~~Water~~	~~10/28/16~~
4	26MW03_161028	320-23100-4	Water	10/28/16
5	26PZ01_161028	320-23100-5	Water	10/28/16
~~6~~	~~EB16_161028~~	~~320-23100-6~~	~~Water~~	~~10/28/16~~
7				
8				
9				
10				
11				

Notes:

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 #: 37601F1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

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 Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/4/16	HSC1104A	N	25.3		All (NO)	Y/N/A
			A	20.7			[illegible]

CONCAL.1SB

LDC #: 37601E1

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: O
2nd Reviewer: [illegible]

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 Was a method blank associated with every sample in this SDG?
(Y) N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
(Y) N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/4/16
Conc. units: ug/L Associated Samples: All

Compound	Blank ID	Sample Identification								
[illegible] NB	320-136157/13									
Methylene chloride										
Acetone										
DDD	0.163J									

Blank analysis date:
Conc. units: Associated Samples:

Compound	Blank ID	Sample Identification								
[illegible]										
Methylene chloride										
Acetone										

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23100-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
269Z02_161028	320-23100-1	Water	10/28/16
26PZ03_161028	320-23100-2	Water	10/28/16
26MW03_161028	320-23100-4	Water	10/28/16
26PZ01_161028	320-23100-5	Water	10/28/16
269Z02_161028MS	320-23100-1MS	Water	10/28/16
269Z02_161028MSD	320-23100-1MSD	Water	10/28/16
269Z02_161028DUP	320-23100-1DUP	Water	10/28/16
26MW03_161028MS	320-23100-4MS	Water	10/28/16
26MW03_161028MSD	320-23100-4MSD	Water	10/28/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Nitrate as Nitrogen, Nitrite as Nitrogen, Sulfate, and Chloride by Environmental Protection Agency (EPA) Method 300.0
Sulfide by EPA Method 9034
Alkalinity by Standard Method 2320B
Total Dissolved Solids by Standard Method 2540C

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

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. Relative percent differences (RPD) were within QC limits.

VII. Duplicates

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Wet Chemistry - Data Qualification Summary - SDG 320-23100-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 320-23100-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Field Blank Data Qualification Summary - SDG 320-23100-1

No Sample Data Qualified in this SDG

LDC #: 37601G6
SDG #: 320-23100-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/10/16
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: (Analyte) Nitrate-N, Nitrite-N, Sulfate, Chloride (EPA Method 300.0), Sulfide, (EPA Method 9034) Alkalinity (SM2320B), TDS (SM 2540C)

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	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Sample result verification	N	
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	269Z02_161028	320-23100-1	Water	10/28/16
2	26PZ03_161028	320-23100-2	Water	10/28/16
3	26MW03_161028	320-23100-4	Water	10/28/16
4	26PZ01_161028	320-23100-5	Water	10/28/16
5	269Z02_161028MS	320-23100-1MS	Water	10/28/16
6	269Z02_161028MSD	320-23100-1MSD	Water	10/28/16
	269Z02_161028DUP	320-23100-1DUP	Water	10/28/16
7	26MW03_161028MS	320-23100-4MS	Water	10/28/16
8	26MW03_161028MSD	320-23100-4MSD	Water	10/28/16
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 3760166

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1-4	pH (TDS) (Cl) F (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN TOC Cr6+ ClO4 (S2-)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC 5,6	pH TDS (Cl) F (NO3) (NO2) (SO4) O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
7	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4 (S2-)
8,9	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

mments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Volatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23173-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP06_161031	320-23173-1	Water	10/31/16
M14-09D_161031	320-23173-3	Water	10/31/16
M14-09S_161031	320-23173-4	Water	10/31/16
M14-14_161031	320-23173-5	Water	10/31/16
M14-09D_161031MS	320-23173-3MS	Water	10/31/16
M14-09D_161031MSD	320-23173-3MSD	Water	10/31/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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 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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 15.0%.

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.

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 TB12_161031 was identified as a trip blank. No contaminants were found.

Sample EB17_161031 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB17_161031	10/31/16	Methylene chloride Ethyl tert-butyl ether	1.54 ug/L 0.315 ug/L	DUP06_161031 M14-09D_161031 M14-09S_161031 M14-14_161031

Sample SB01-161024 (from SDG 320-22986-1) was identified as a source blank. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks.

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 DUP06_161031 and M14-09D_161031 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP06_161031	M14-09D_161031				
cis-1,2-Dichloroethene	5.66	5.67	-	0.01 (≤10.0)	-	-
Vinyl chloride	14.9	15.7	-	0.8 (≤10.0)	-	-

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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Volatiles - Data Qualification Summary - SDG 320-23173-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Laboratory Blank Data Qualification Summary - SDG 320-23173-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Field Blank Data Qualification Summary - SDG 320-23173-1

No Sample Data Qualified in this SDG

LDC #: 37601H1
SDG #: 320-23173-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/8/16
Page: 1 of 1
Reviewer: T
2nd Reviewer: T

METHOD: GC/MS Volatiles (EPA SW846 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% . r² ICV≤20%
IV.	Continuing calibration	SW A	CCV≤20/25%
V.	Laboratory Blanks	SW A	
VI.	Field blanks	SW	EB=2 . TB=6 . SB01_161024 (320-23986-1)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	D=1+3
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	DUP06_161031	320-23173-1	Water	10/31/16
~~2~~	~~EB17_161031~~	~~320-23173-2~~	~~Water~~	~~10/31/16~~
3	M14-09D_161031	320-23173-3	Water	10/31/16
4	M14-09S_161031	320-23173-4	Water	10/31/16
5	M14-14_161031	320-23173-5	Water	10/31/16
~~6~~	~~TB12_161031~~	~~320-23173-6~~	~~Water~~	~~10/31/16~~
7	M14-09D_161031MS	320-23173-3MS	Water	10/31/16
8	M14-09D_161031MSD	320-23173-3MSD	Water	10/31/16
9				
10				
11				

Notes:

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 #: 37601H1

VALIDATION FINDINGS WORKSHEET
Field Blanks

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

(Y) N N/A Were field blanks identified in this SDG?

(Y) N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L

Sampling date: 10/31/16

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: EB Associated Samples: 1, 3-5

Compound	Blank ID	Sample Identification								
[redacted]	2									
Methylene chloride	1.54									
Acetone										
Chloroform										
AAAA	0.315									

Blank units: _____ **Associated sample units:** _____

Sampling date: _____

Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								
[redacted]										
Methylene chloride										
Acetone										
Chloroform										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC#: 37601H1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer:

METHOD: GC/MS 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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	3				
QQQ	5.66	5.67		0.01	≤10.0	
C	14.9	15.7		0.8	≤10.0	

V:\FIELD DUPLICATES\37601H1_Amec.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23173-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP06_161031	320-23173-1	Water	10/31/16
M14-09D_161031	320-23173-3	Water	10/31/16
M14-09S_161031	320-23173-4	Water	10/31/16
M14-14_161031	320-23173-5	Water	10/31/16
M14-09D_161031MS	320-23173-3MS	Water	10/31/16
M14-09D_161031MSD	320-23173-3MSD	Water	10/31/16
M14-09D_161031DUP	320-23173-3DUP	Water	10/31/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Nitrate as Nitrogen, Nitrite as Nitrogen, Sulfate, and Chloride by Environmental Protection Agency (EPA) Method 300.0
Sulfide by EPA Method 9034
Alkalinity by Standard Method 2320B
Total Organic Carbon by Standard Method 5310B

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

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. Relative percent differences (RPD) were within QC limits.

VII. Duplicates

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples DUP06_161031 and M14-09D_161031 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP06_161031	M14-09D_161031				
Chloride	47000 ug/L	46700 ug/L	1 (≤30)	-	-	-
Sulfate	1690000 ug/L	1670000 ug/L	1 (≤30)	-	-	-
Alkalinity	446000 ug/L	439000 ug/L	2 (≤30)	-	-	-
Total organic carbon	10.6 mg/L	14.2 mg/L	-	3.6 (≤5)	-	-

X. Sample Result Verification

Raw data were not reviewed for stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Wet Chemistry - Data Qualification Summary - SDG 320-23173-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 320-23173-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Field Blank Data Qualification Summary - SDG 320-23173-1

No Sample Data Qualified in this SDG

LDC #: 37601H6
SDG #: 320-23173-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/10/16
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: (Analyte) Nitrate-N, Nitrite-N, Sulfate, Chloride (EPA Method 300.0), Sulfide, (EPA Method 9034) Alkalinity (SM2320B), TOC (SM 5310B)

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	N	
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicate sample analysis	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	D=1+2
X.	Sample result verification	N	
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	DUP06_161031	320-23173-1	Water	10/31/16
2	M14-09D_161031	320-23173-3	Water	10/31/16
3	M14-09S_161031	320-23173-4	Water	10/31/16
4	M14-14_161031	320-23173-5	Water	10/31/16
5	M14-09D_161031MS	320-23173-3MS	Water	10/31/16
6	M14-09D_161031MSD	320-23173-3MSD	Water	10/31/16
7	M14-09D_161031DUP	320-23173-3DUP	Water	10/31/16
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

LDC #: 37601H6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
H-1	pH TDS (Cl) F (NO3) NO2 (SO4) O-PO4 (Alk) CN NH3 TKN (TOC) Cr6+ ClO4 (S2-)
	pH TDS Cl F NO3 NO2 SO4 O-PO4 Alk CN NH3 TKN TOC Cr6+ ClO4
QC-S6	pH TDS (Cl) F (NO3) (NO2) (SO4) O-PO4 Alk CN NH3 TKN (TOC) Cr6+ ClO4 (S2-)
7	pH TDS Cl F NO3 NO2 SO4 O-PO4 (Alk) CN NH3 TKN TOC Cr6+ ClO4 (S2-)
	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

nments:

LDC#: 37601H6 **VALIDATION FINDINGS WORKSHEET**
Field Duplicates

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: [signature]

Inorganics, Method See Cover

Analyte	Concentration (ug/L) 1	Concentration (ug/L) 2	RPD (≤30)	Difference	Limits	Qualification (Parent only)
Chloride	47000	46700	1			
Sulfate	1690000	1670000	1			
Alkalinity	446000	439000	2			
TOC (mg/L)	10.6	14.2		3.6	(≤5)	

V:\FIELD DUPLICATES\FD_inorganic\37601H6.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Methane, Ethane, & Ethylene

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23173-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP06_161031	320-23173-1	Water	10/31/16
M14-09D_161031	320-23173-3	Water	10/31/16
M14-09S_161031	320-23173-4	Water	10/31/16
M14-09D_161031MS	320-23173-3MS	Water	10/31/16
M14-09D_161031MSD	320-23173-3MSD	Water	10/31/16
M14-09D_161031DUP	320-23173-3DUP	Water	10/31/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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:

Methane, Ethane, and Ethylene by Method RSK-175

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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. Initial Calibration and Initial Calibration Verification

An initial calibration was performed as required by the method.

For compounds where average calibration factors were utilized, 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.

The percent differences (%D) of the initial calibration verification (ICV) standard were less than or equal to 20.0% for all compounds.

III. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) were less than or equal to 20.0% for all compounds.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. 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/Duplicate Sample Analysis

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
M14-09D_161031MS/MSD (M14-09D_161031)	Ethane	-	139 (74-131)	J (all detects)	A

Relative percent differences (RPD) were within QC limits.

Duplicate (DUP) sample analysis was performed on an associated project sample. Results were within QC limits.

VII. 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.

VIII. Field Duplicates

Samples DUP06_161031 and M14-09D_161031 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP06_161031	M14-09D_161031				
Methane	182	176	3 (≤30)	-	-	-
Ethane	5.11	4.82	-	0.29 (≤5.0)	-	-
Ethylene	1.02	0.976	-	0.044 (≤5.0)		

IX. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Flag	A or P
DUP06_161031 M14-09D_161031	Ethane	Eluted outside retention time window due to matrix interference and the confirmation column does not provide ethane quantitation due to coelute with acetylene.	J (all detects)	A

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
DUP06_161031	Ethylene	45.0	NJ (all detects)	A
M14-09D_161031	Ethylene	43.9	NJ (all detects)	A
M14-09S_161031	Ethylene	49.5	NJ (all detects)	A

Raw data were not reviewed for Stage 2B validation.

X. Target Compound Identification

Raw data were not reviewed for Stage 2B validation.

XI. 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, RPD between two columns and eluted outside retention time window, data were qualified as estimated in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Data Qualification Summary - SDG 320-23173-1

Sample	Compound	Flag	A or P	Reason
M14-09D_161031	Ethane	J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)
DUP06_161031 M14-09D_161031	Ethane	J (all detects)	A	Compound quantitation (eluted outside retention time window)
DUP06_161031 M14-09D_161031 M14-09S_161031	Ethylene	NJ (all detects)	A	Compound quantitation (RPD between two columns)

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Laboratory Blank Data Qualification Summary - SDG 320-23173-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Methane, Ethane, & Ethylene - Field Blank Data Qualification Summary - SDG 320-23173-1

No Sample Data Qualified in this SDG

LDC #: 37601H51
SDG #: 320-23173-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/8/16
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Methane-Ethane-Ethylene (Method RSK-175)

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/ICV	A/A	RSD ≤ 20%, r² ICV ≤ 20%
III.	Continuing calibration	A	CCV ≤ 20%
IV.	Laboratory Blanks	A	
V.	Field blanks	N	
VI.	Matrix spike/Matrix spike duplicates /DUP	SW/A	
VII.	Laboratory control samples	A	LCS/D
VIII.	Field duplicates	SW	1 = 1+2
IX.	Compound quantitation RL/LOQ/LODs	SW	
X.	Target compound identification	N	
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	DUP06_161031	320-23173-1	Water	10/31/16
2	M14-09D_161031	320-23173-3	Water	10/31/16
3	M14-09S_161031	320-23173-4	Water	10/31/16
4	M14-09D_161031MS	320-23173-3MS	Water	10/31/16
5	M14-09D_161031MSD	320-23173-3MSD	Water	10/31/16
6	M14-09D_161031DUP	320-23173-3DUP	Water	10/31/16
7				
8				
9				
10				
11				
12				

Notes:

LDC #: 37601H5

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 9

METHOD: ✓ GC __ HPLC

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?

Y N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y N N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	4/5	Ethane	( )	139 (74-131)	( )	2 (dot3)	J dot3/5
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC#: 37601H51

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer:

METHOD: GC (RSK-175)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	2				
Methane	182	176	3			
Ethane	5.11	4.82		0.29	≤5.0	
Ethylene	1.02	0.976		0.044	≤5.0	

V:\FIELD DUPLICATES\37601H51_Amec.wpd

LDC #: 36601H51

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: 9
2nd Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	Ethane	Eluted outside retention time window due to matrix interference and the confirmation column does not provide ethane quantitation due to coelute with acetylene.	1, 2	Jdets/A
			RPD > 40%	
	Ethylene	1	45.0	NJdets/B
		2	43.9	
		3	49.5	

Comments: See sample calculation verification worksheet for recalculations

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 13, 2016

Parameters: Volatiles

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23188-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
26MW08_161101	320-23188-1	Water	11/01/06
DUP07_161101	320-23188-2	Water	11/01/06

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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 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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

For compounds where average relative response factors (RRFs) were utilized, the percent relative standard deviations (%RSD) were less than or equal to 15.0%.

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.

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 TB13_161101 was identified as a trip blank. No contaminants were found.

Sample EB18_161101 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB18_161101	11/01/16	Methylene chloride Toluene	2.06 ug/L 0.529 ug/L	26MW08_161101 DUP07_161101

Sample SB01-161024 (from SDG 320-22986-1) was identified as a source blank. No contaminants were found.

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks.

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 was insufficient sample volume for analysis of the matrix spike and matrix spike duplicate.

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 26MW08_161101 and DUP07_161101 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	26MW08_161101	DUP07_161101				
cis-1,2-Dichloroethene	4.06	3.68	-	0.38 (≤10.0)	-	-

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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Volatiles - Data Qualification Summary - SDG 320-23188-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Laboratory Blank Data Qualification Summary - SDG 320-23188-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Volatiles - Field Blank Data Qualification Summary - SDG 320-23188-1

No Sample Data Qualified in this SDG

LDC #: 37601I1
SDG #: 320-23188-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 1/18/16
Page: 1 of 1
Reviewer: CL
2nd Reviewer: DC

METHOD: GC/MS Volatiles (EPA SW846 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% . r² ICV≤20%
IV.	Continuing calibration	A	CCV≤20/50%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	TB=3. EB=4. SB01_161024 (320-22986)
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	MS insufficient sample
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	SW	D=1+2
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	26MW08_161101	320-23188-1	Water	11/01/06
2	DUP07_161101	320-23188-2	Water	11/01/06
~~3~~	~~TB13_161101~~	~~320-23188-3~~	~~Water~~	~~11/01/06~~
~~4~~	~~EB18_161101~~	~~320-23188-4~~	~~Water~~	~~11/01/06~~
5				
6				
7				
8				
9				

Notes:

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 #: 37601 1

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: Q
2nd Reviewer: K

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/L
Sampling date: 11/1/16
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other: EB Associated Samples: 1-2

Compound	Blank ID	Sample Identification								
[redacted]	4									
Methylene chloride	2.06									
Acetone										
Chloroform										
cc	0.59									

Blank units:_____ **Associated sample units:**_____
Sampling date:_____
Field blank type: (circle one) Field Blank / Rinsate / Trip Blank / Other:_____ Associated Samples:_____

Compound	Blank ID	Sample Identification								
[redacted]										
Methylene chloride										
Acetone										
Chloroform										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as Methylene chloride, Acetone, 2-Butanone and Carbon disulfide that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC#: 37601I1

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer: PG
2nd Reviewer:

METHOD: GC/MS 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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	2				
QQQ	4.06	3.68		0.38	≤10.0	

V:\FIELD DUPLICATES\37601I1_Amec.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Wet Chemistry

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 320-23188-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
26MW08_161101	320-23188-1	Water	11/01/06

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Nitrate as Nitrogen, Nitrite as Nitrogen, Sulfate, and Chloride by Environmental Protection Agency (EPA) Method 300.0
Sulfide by EPA Method 9034
Alkalinity by Standard Method 2320B
Total Dissolved Solids by Standard Method 2540C

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

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

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.

VII. Duplicates

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Sample Result Verification

Raw data were not reviewed for stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Wet Chemistry - Data Qualification Summary - SDG 320-23188-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG 320-23188-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Wet Chemistry - Field Blank Data Qualification Summary - SDG 320-23188-1

No Sample Data Qualified in this SDG

LDC #: 37601I6
SDG #: 320-23188-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/10/16
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: (Analyte) Nitrate-N, Nitrite-N, Sulfate, Chloride (EPA Method 300.0), Sulfide, (EPA Method 9034) Alkalinity (SM2320B), TDS (SM 2540C)

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	Initial calibration	A	
III.	Calibration verification	A	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	CS
VII.	Duplicate sample analysis	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Sample result verification	N	
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	26MW08_161101	320-23188-1	Water	11/01/06
2				
3				
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10				
11				
12				
13				
14				
15				

Notes:

LDC #: 37601I6

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: CR
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH (TDS) (Cl) F (NO3) (NO2) (SO4) O-PO4 (Alk) CN NH3 TKN TOC Cr6+ ClO4 (S2-)
	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

mments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 2B

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1601348

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M06-02_161024	1601348-09	Water	10/24/16
M06-04_161024	1601348-10	Water	10/24/16
S6-MW-07_161024	1601348-11	Water	10/24/16
S6-MW06_161024	1601348-14	Water	10/24/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 not required by the method.

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.

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 with the following exceptions:

Blank ID	Analysis Date	Compound	Concentration	Associated Samples
B6J0196-BLK	10/31/16	PFOA	1.04 ug/L	All samples in SDG 1601348

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated laboratory blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
M06-04_161024	PFOA	1.94 ug/L	1.98U ug/L

VI. Field Blanks

Samples EB-M06-02_161024, EB-S6-MW06_161024, EB-S6-MW-07_161024, and EB11_161024 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB-S6-MW-07_161024	10/24/16	PFOA	0.796 ug/L	S6-MW-07_161024
EB11_161024	10/24/16	PFOA	0.894 ug/L	All samples in SDG 1601348

Samples FB-M06-02_161024, FB-S6-MW06_161024, and FB-S6-MW-07_161024 were identified as field blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
FB-S6-MW-07_161024	10/24/16	PFOA	0.665 ug/L	S6-MW-07_161024
FB-S6-MW06_161024	10/24/16	PFOA	0.790 ug/L	S6-MW06_161024

Sample SB02_161024 was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
SB02_161024	10/24/16	PFOA	1.31 ug/L	All samples in SDG 1601348

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
M06-04_161024	PFOA	1.94 ug/L	1.98U ug/L

VII. 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.

VIII. Ongoing Precision Recovery Samples

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to laboratory blank contamination, data were qualified as not detected in one sample.

Due to equipment and source blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1601348

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 1601348

Sample	Compound	Modified Final Concentration	A or P
M06-04_161024	PFOA	1.98U ug/L	A

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 1601348

Sample	Compound	Modified Final Concentration	A or P
M06-04_161024	PFOA	1.98U ug/L	A

LDC #: 37601J96 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/9/16
SDG #: 1601348 Stage 2B Page: 1 of 1
Laboratory: Vista Analytical Laboratory Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS Perfluorinated Alkyl Acids (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	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	A, A	r 2/~~25~~ 20 label, ICV ≤ ~~25~~ 30%
IV.	Continuing calibration	A	CCV ≤ ~~25%~~ 30% / ~~QC for labeled/unlabeled~~
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	EB=1→.11, FB=4-6, SB=10
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	OPR
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-M06-02_161024~~	~~1601348-01~~	~~Water~~	~~10/24/16~~
2	EB-S6-MW06_161024	1601348-03	Water	10/24/16
3	EB-S6-MW-07_161024	1601348-04	Water	10/24/16
4	FB-M06-02_161024	1601348-05	Water	10/24/16
5	FB-S6-MW06_161024	1601348-07	Water	10/24/16
~~6~~	~~FB-S6-MW-07_161024~~	~~1601348-08~~	~~Water~~	~~10/24/16~~
7	M06-02_161024	1601348-09	Water	10/24/16
8	M06-04_161024	1601348-10	Water	10/24/16
9	S6-MW-07_161024	1601348-11	Water	10/24/16
~~10~~	~~SB02_161024~~	~~1601348-12~~	~~Water~~	~~10/24/16~~
~~11~~	~~EB11_161024~~	~~1601348-13~~	~~Water~~	~~10/24/16~~
12	S6-MW06_161024	1601348-14	Water	10/24/16
13				
14	B6J0196-~~BK~~1			

LDC #: 36014196

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: 9
2nd Reviewer: 9

METHOD: √GC/MS

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Blank extraction date: 10/31/16 **Blank analysis date:** 11/1/16
Conc. units: ng/L **Associated samples:** all

Compound	Blank ID	Sample Identification								
BB	10196-BK1	8								
PFOA	1.04	1.94/1.98U								

Blank extraction date: _____ **Blank analysis date:** _____ **Associated samples:** _____
Conc. units: _____

Compound	Blank ID	Sample Identification								

ALL 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 #: 3760N96

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

SB02_161024 (1601348)

METHOD: GC
Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?
Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: [illegible]

Compound	Blank ID	~~Blank~~	Sample Identification							
SB02_161024			8							
PFOA	1.31		1.94 / ~~1.93~~ 1.98							

Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: 9

Compound	Blank ID	Blank	Sample Identification							
	3	6								
PFOA	0.796	0.665								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 37604196

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: 9
2nd Reviewer: M

METHOD: GC

(Y) N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?

Blank units: ng/L **Associated sample units:** ng/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: FB Associated Samples: 12

Compound	Blank ID	Sample Identification								
	5									
PFOA	0.790									

Blank units: ~~ng/L~~ ng/L **Associated sample units:** ng/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: FB Associated Samples: All

Compound	Blank ID	Sample Identification								
	11		8							
PFOA	0.894		1.94/~~1.97~~ 1.98U							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 19, 2016

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 2B

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1601359

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
5-3MW1S_161025	1601359-01	Water	10/25/16
5-3MW7S_161025	1601359-02	Water	10/25/16
DUP05_161024	1601359-03	Water	10/24/16
M05-20_161024	1601359-11	Water	10/24/16
M08-07_161025	1601359-12	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 not required by the method.

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.

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 with the following exceptions:

Blank ID	Analysis Date	Compound	Concentration	Associated Samples
B6K0031-BLK1	11/04/16	PFOA	1.08 ug/L	All samples in SDG 1601359

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Samples EB12_161025 (from SDG 1601360) and EB11_161024 (from SDG 1601348) were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB11_161024	10/24/16	PFOA	0.894 ug/L	DUP05_161024 M05-20_161024

Sample FB-M08-07_161025 was identified as a field blank. No contaminants were found.

Sample SB02_161024 (from SDG 1601348) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
SB02_161024	10/24/16	PFOA	1.31 ug/L	All samples in SDG 1601359

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks.

VII. 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.

VIII. Ongoing Precision Recovery Samples

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples DUP05_161024 and M05-20_161024 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Differences (Limits)	Flag	A or P
	DUP05_161024	M05-20_161024				
PFBS	1.94	3.91U	-	1.97 (≤7.89)	-	-
PFOA	17.9	17.7	-	0.2 (≤7.89)	-	-
PFOS	10.2	12.6	-	2.4 (≤7.89)	-	-

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1601359

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 1601359

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 1601359

No Sample Data Qualified in this SDG

LDC #: 37601K96
SDG #: 1601359
Laboratory: Vista Analytical Laboratory

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/9/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS Perfluorinated Alkyl Acids (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	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	A, A	r^2/~~25~~ 20 for labeled. ICV ≤ ~~25~~ 30%
IV.	Continuing calibration	A	CCV ≤ ~~30~~/ ~~QC limits for labeled~~
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	FB=4. SB02_161024(1601348), EB12_161025
VII.	Surrogate spikes	N	EB11-161024(1601348) (1601360)
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	OPR
X.	Field duplicates	SW	D=3+5
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	5-3MW1S_161025	1601359-01	Water	10/25/16
2	5-3MW7S_161025	1601359-02	Water	10/25/16
3	DUP05_161024	1601359-03	Water	10/24/16
~~4~~	~~FB-M08-07_161025~~	~~1604359-10~~	~~Water~~	~~10/25/16~~
5	M05-20_161024	1601359-11	Water	10/24/16
6	M08-07_161025	1601359-12	Water	10/25/16
7				
8				

Notes:

	B6K0031-B4K1						

LDC #: 36016K96

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ~~GC~~ LC/MS

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Blank extraction date: 11/4/16 **Blank analysis date:** 11/6/16
Conc. units: ng/L **Associated samples:** all

Compound	Blank ID	Sample Identification								
[illegible]	BLK0031-BK1									
PFOA	1.08									

Blank extraction date: _____ **Blank analysis date:** _____ **Associated samples:** _____
Conc. units: _____

Compound	Blank ID	Sample Identification								
[illegible]										

ALL 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 #: 3T601K96

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Q
2nd Reviewer: Q

SB02_161024 (1601348)

METHOD: GC

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?

Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: All

Compound	Blank ID	Sample Identification								
	SB02_161024									
PFOA	1.31									

Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: 3, 5

Compound	Blank ID	Sample Identification								
	SB11_161024									
PFOA	0.894									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#: 37601K96

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer: [illegible]

METHOD: LC/MS (EPA Method 537)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	3	5				
PFBS	1.94	3.91U		1.97	≤7.89	
PFOA	17.9	17.7		0.2	≤7.89	
PFOS	10.2	12.6		2.4	≤7.89	

V:\FIELD DUPLICATES\37601K96_Amec.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 2B

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1601360

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M05-02_161025	1601360-09	Water	10/25/16
M05-03_161025	1601360-10	Water	10/25/16
M10-01_161025	1601360-11	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 not required by the method.

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.

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

Samples EB12_161025, EB-M05-02_161025, EB-M05-03_161025, EB-M08-07_161025, and EB-M10-01_161025 were identified as equipment blanks. No contaminants were found.

Samples FB-M05-02_161025, FB-M05-03_161025, and FB-M10-01_161025 were identified as field blanks. No contaminants were found.

Sample SB02_161024 (from SDG 1601348) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
SB02_161024	10/24/16	PFOA	1.31 ug/L	All samples in SDG 1601360

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks.

VII. 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.

VIII. Ongoing Precision Recovery Samples

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1601360

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 1601360

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 1601360

No Sample Data Qualified in this SDG

LDC #: 37601L96
SDG #: 1601360
Laboratory: Vista Analytical Laboratory

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/9/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS Perfluorinated Alkyl Acids (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	
II.	GC/MS Instrument performance check	N	~~20~~ 20% 30
III.	Initial calibration/ICV	A / A	r^2/~~25 label~~ ICV ≤ ~~25~~ 70
IV.	Continuing calibration	A	CCV ≤ ~~25~~ ~~ac limits for labeled/unlabeled~~ 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	EB1-5. FB=8. SB02_161024(1601348)
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	OPR
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	EB12_161025	1601360-01	Water	10/25/16
2	EB-M05-02_161025	1601360-02	Water	10/25/16
3	EB-M05-03_161025	1601360-03	Water	10/25/16
4	EB-M08-07_161025	1601360-04	Water	10/25/16
5	EB-M10-01_161025	1601360-05	Water	10/25/16
6	FB-M05-02_161025	1601360-06	Water	10/25/16
7	FB-M05-03_161025	1601360-07	Water	10/25/16
8	FB-M10-01_161025	1601360-08	Water	10/25/16
9	M05-02_161025	1601360-09	Water	10/25/16
10	M05-03_161025	1601360-10	Water	10/25/16
11	M10-01_161025	1601360-11	Water	10/25/16
12				
13				
14	B6K0029-B4K1			

LDC #: 37601

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC

SB02_161024 (1601348)

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?
Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: All

Compound	Blank ID	Sample Identification								
SB02_161024										
PFOA	1.31									

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 19, 2016

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 2B

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1601380

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M04-05_161027	1601380-06	Water	10/27/16
M04-06_161027	1601380-07	Water	10/27/16
MW360-4_161027	1601380-08	Water	10/27/16
M03-06_161027	1601380-15	Water	10/27/16
MW4-2-1_161027	1601380-16	Water	10/27/16

Introduction

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The analyses were performed by the following method:

Perfluorinated Alkyl Acids by Environmental Protection Agency (EPA) Method 537

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:

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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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 not required by the method.

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.

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 with the following exceptions:

Blank ID	Analysis Date	Compound	Concentration	Associated Samples
B6K0038-BLK1	11/07/16	PFOS	0.892 ug/L	All samples in SDG 1601380

Sample concentrations were compared to concentrations detected in the laboratory blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated laboratory blanks.

VI. Field Blanks

Samples EB-MW360-4_161027 and EB13_161027 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB13_161027	10/27/16	PFOS	0.799 ug/L	All samples in SDG 1601380

Sample FB-MW360-4_161027 was identified as a field blank. No contaminants were found.

Sample SB02_161024 (from SDG 1601348) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
SB02_161024	10/24/16	PFOA	1.31 ug/L	All samples in SDG 1601380

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
M04-05_161027	PFOA	5.28 ug/L	5.28U ug/L
M04-06_161027	PFOA	3.68 ug/L	3.68U ug/L
MW4-2-1_161027	PFOA	4.68 ug/L	4.68U ug/L

VII. 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.

VIII. Ongoing Precision Recovery Samples

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to source blank contamination, data were qualified as not detected in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1601380

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 1601380

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 1601380

Sample	Compound	Modified Final Concentration	A or P
M04-05_161027	PFOA	5.28U ug/L	A
M04-06_161027	PFOA	3.68U ug/L	A
MW4-2-1_161027	PFOA	4.68U ug/L	A

LDC #: 37601M96

SDG #: 1601380

Laboratory: Vista Analytical Laboratory

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 12/9/16

Page: 1 of 1

Reviewer:

2nd Reviewer: [illegible]

METHOD: LC/MS Perfluorinated Alkyl Acids (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	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	A	r^2 / ~~25%~~ 20% label ICV ≤ ~~25%~~ 30%
IV.	Continuing calibration	A	CCV ≤ ~~25%~~ 30% ~~QC limits/unlabeled~~
V.	Laboratory Blanks	SW	
VI.	Field blanks	SW	EB=1. 6. FB=2. SB02_161024(1601348)
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	OPR
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-MW360-4_161027~~	~~1601380-02~~	~~Water~~	~~10/27/16~~
2	~~FB-MW360-4_161027~~	~~1601380-05~~	~~Water~~	~~10/27/16~~
3	M04-05_161027	1601380-06	Water	10/27/16
4	M04-06_161027	1601380-07	Water	10/27/16
5	MW360-4_161027	1601380-08	Water	10/27/16
6	~~EB13_161027~~	~~1601380-09~~	~~Water~~	~~10/27/16~~
7	M03-06_161027	1601380-15	Water	10/27/16
8	MW4-2-1_161027	1601380-16	Water	10/27/16
9				
10				
11				
12				

Notes:

	B6K0038-B4C1						

LDC #3T601M96

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 9

METHOD: __ GC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all samples associated with a given method blank?
(Y) N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
(Y) N N/A Was a method blank performed with each extraction batch?
(Y) N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Blank extraction date: 11/7/16 **Blank analysis date:** 11/8/16
Conc. units: ng/L **Associated samples:** all

Compound	Blank ID	Sample Identification								
BK0038-BLK1		3								
PFOS	0.892		8							

Blank extraction date:_____ **Blank analysis date:**_____ **Associated samples:**_____
Conc. units:_____

Compound	Blank ID	Sample Identification								

ALL 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 #: 37601M96

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: Q
2nd Reviewer: AK

METHOD: GC

SB02-161024 (1601348)

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?
Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: All

Compound	Blank ID	Sample Identification								
SB02-161024		3	4	8						
PFOA	1.31	5.28 U ~~2.64 U~~	3.68 U ~~1.84 U~~	4.68 U ~~2.34 U~~						

Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/27/16
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: All

Compound	Blank ID	Sample Identification								
	6									
PFOS	0.799									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 19, 2016

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 2B

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1601381

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
MW4-2-11_161028	16-01381-07	Water	10/28/16
MW4-2-14_161028	16-01381-08	Water	10/28/16
MW4-2-16_161028	16-01381-09	Water	10/28/16
MW4-2-6_161028	16-01381-13	Water	10/28/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 not required by the method.

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.

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 EB15_161028 was identified as an equipment blank. No contaminants were found.

Sample SB02_161024 (from SDG 1601348) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
SB02_161024	10/24/16	PFOA	1.31 ug/L	All samples in SDG 1601381

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
MW4-2-11_161028	PFOA	0.706 ug/L	2.03U ug/L
MW4-2-16_161028	PFOA	0.915 ug/L	1.95U ug/L

VII. 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.

VIII. Ongoing Precision Recovery Samples

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to source blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1601381

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 1601381

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 1601381

Sample	Compound	Modified Final Concentration	A or P
MW4-2-11_161028	PFOA	2.03U ug/L	A
MW4-2-16_161028	PFOA	1.95U ug/L	A

LDC #: 37601N96
SDG #: 1601381
Laboratory: Vista Analytical Laboratory

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/9/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS Perfluorinated Alkyl Acids (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	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	A, A	r^2 ≤ ~~25~~ 20% for label. ICV ≤ ~~25~~ 30%
IV.	Continuing calibration	A	CCV ≤ ~~25~~ QC / QC limits ~~label~~ for [illegible] 30%
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	ZB=4. SB02_161024(1601348)
VII.	Surrogate spikes	N	CS
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	OPR
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	MW4-2-11_161028	16-01381-07	Water	10/28/16
2	MW4-2-14_161028	16-01381-08	Water	10/28/16
3	MW4-2-16_161028	16-01381-09	Water	10/28/16
~~4~~	~~EB15_161028~~	~~16-01381-10~~	~~Water~~	~~10/28/16~~
5	MW4-2-6_161028	16-01381-13	Water	10/28/16
6				
7				
8				
9				
10				

Notes:

	BLK0042-B41						

LDC #: 37601

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

SB02_161024 (1601348)

METHOD: GC
Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?
Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: [illegible]

Compound	Blank ID	Sample Identification								
SB02_161024			1	3	~~5~~					
PFOA	1.31		0.706/2.03U/8.12	0.915/1.95U						

Blank units:_____ **Associated sample units:**_____
Sampling date:_____
Field blank type: (circle one) Field Blank / Rinsate / Other:_____ Associated Samples:_____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 19, 2016

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 2B

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1601395

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
26MW06_161101	1601395-01	Water	11/01/16
26MW08_161101	1601395-02	Water	11/01/16
26SW01_161101	1601395-03	Water	11/01/16
26SW04_161101	1601395-04	Water	11/01/16
DUP07_161101	1601395-05	Water	11/01/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 not required by the method.

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 with the following exceptions:

Date	Compound	r^2	Associated Samples	Flag	A or P
11/13/16	PFBS	0.986884	All samples in SDG 1601395	J (all detects) UJ (all non-detects)	A

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

Samples EB-26SW04_161101 and EB18_161101 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB-26SW04_161101	11/01/16	PFOS	3.19 ug/L	26SW04_161101

Sample FB-26SW04_161101 was identified as a field blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
FB-26SW04_161101	11/01/16	PFOS	10.5 ug/L	26SW04_161101

Sample SB02_161024 (from SDG 1601348) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
SB02_161024	10/24/16	PFOA	1.31 ug/L	All samples in SDG 1601395

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
26MW06_161101	PFOA	1.93 ug/L	1.98U ug/L

VII. 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.

VIII. Ongoing Precision Recovery Samples

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples 26MW08_161101 and DUP07_161101 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Differences (Limits)	Flag	A or P
	26MW08_161101	DUP07_161101				
PFOA	16.2	27.5	-	11.3 (≤7.95)	J (all detects)	A
PFOS	15.9	0.893U	-	15.007 (≤7.95)	J (all detects) UJ (all non-detects)	A

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Compound Quantitation

Raw data were not reviewed for Stage 2B validation.

XII. Target Compound Identifications

Raw data were not reviewed for Stage 2B validation.

XIII. System Performance

Raw data were not reviewed for Stage 2B validation.

XIV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to initial calibration r^2 and field duplicate difference, data were qualified as estimated in five samples.

Due to source blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1601395

Sample	Compound	Flag	A or P	Reason
26MW06_161101 26MW08_161101 26SW01_161101 26SW04_161101 DUP07_161101	PFBS	J (all detects) UJ (all non-detects)	A	Initial calibration (r^2)
26MW08_161101 DUP07_161101	PFOA	J (all detects)	A	Field duplicates (differences)
26MW08_161101 DUP07_161101	PFOS	J (all detects) UJ (all non-detects)	A	Field duplicates (differences)

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 1601395

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 1601395

Sample	Compound	Modified Final Concentration	A or P
26MW06_161101	PFOA	1.98U ug/L	A

LDC #: 37601O96
SDG #: 1601395
Laboratory: Vista Analytical Laboratory

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/9/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS Perfluorinated Alkyl Acids (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	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	~~SW~~ A	r^2 / ≤ ~~25~~ 20% ~~15~~ % for labeled. ICV ≤ ~~25~~ 30%
IV.	Continuing calibration	A	CCV ≤ ~~25~~ 30% / ~~RC for labeled/unlabed~~
V.	Laboratory Blanks	A	
VI.	Field blanks	~~SW~~	EB=6, 8, FB=7. SB02_161024 (1601348)
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	N	CS
IX.	Laboratory control samples	A	OPR
X.	Field duplicates	~~SW~~	D=2+5
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	26MW06_161101	1601395-01	Water	11/01/16
2	26MW08_161101	1601395-02	Water	11/01/16
3	26SW01_161101	1601395-03	Water	11/01/16
4	26SW04_161101	1601395-04	Water	11/01/16
5	DUP07_161101	1601395-05	Water	11/01/16
~~6~~	~~EB-26SW04_161101~~	~~1601395-08~~	~~Water~~	~~11/01/16~~
~~7~~	~~FB-26SW04_161101~~	~~1601395-11~~	~~Water~~	~~11/01/16~~
8	~~EB18_161101~~	~~1601395-12~~	~~Water~~	~~11/01/16~~
9				
10				

Notes:

	B6K0076-BK1						

LDC #: 37601096

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC ✓ HPLC [illegible]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a 5 point calibration curve performed?
Y N N/A Was a linear fit used for evaluation? If yes, the acceptance criteria for each compound is %RSD less than or equal to ~~20.0%~~ 25.
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? _____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Was initial calibration performed at the required frequency?

Level IV Only

Y N N/A Were the retention time windows properly established for all compounds?
Y N N/A Were compounds run at the required concentrations in the initial calibrations?

#	Date	Standard ID	Column / Detector	Compound	Finding RSD Limit ≤20%	Associated Samples	Qualifications
	~~11/11/16~~	~~ICAC~~	~~PFBS~~	~~PFBS~~	~~r^2=0.977505~~	[illegible]	
				~~PFOS~~	~~r=0.972067~~		
	11/13/16	ICAC		PFBS	r^2=0.986884	All (dets+ND)	J/UJ/A

Comments_____

INICALNew.wpd

LDC #: 3T601

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: A
2nd Reviewer: M

METHOD: GC

SB02_161024 (1601348)

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?
Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: All

Compound	Blank ID	Sample Identification								
	SB02_161024	1								
PFOA	1.31	1.93/1.984								

Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 11/1/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: 4

Compound	Blank ID	Blank 1	Sample Identification							
	6	7								
PFOS	3.19	10.5								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#: 37601O96

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer: [illegible]

METHOD: LC/MS (EPA Method 537)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	2	5				
PFOA	16.2	27.5		11.3	≤7.95	det/A
PFOS	15.9	0.893U		15.007	≤7.95	J/UJ/A

V:\FIELD DUPLICATES\37601O96_Amec.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 14, 2016

Parameters: Perfluorinated Alkyl Acids

Validation Level: Stage 4

Laboratory: Vista Analytical Laboratory

Sample Delivery Group (SDG): 1601391

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP06_161031	1601391-01	Water	10/31/16
M14-09D_161031	1601391-08	Water	10/31/16
M14-09S_161031	1601391-09	Water	10/31/16
M14-14_161031	1601391-10	Water	10/31/16
M14-22_161031	1601391-11	Water	10/31/16
M14-23_161031	1601391-19	Water	10/31/16
M14-24_161031	1601391-20	Water	10/31/16
M14-09D_161031MS	1601391-08MS	Water	10/31/16
M14-09D_161031MSD	1601391-08MSD	Water	10/31/16
M14-22_161031MS	1601391-11MS	Water	10/31/16
M14-22_161031MSD	1601391-11MSD	Water	10/31/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA National Functional Guidelines (NFG) for Superfund Organic Methods Data Review (October 2013). 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

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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 with the following exceptions:

Date	Compound	r^2	Associated Samples	Flag	A or P
11/11/16	PFBS PFOS	0.977505 0.972067	All samples in SDG 1601391	J (all detects) J (all detects)	A

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

Samples EB-M14-09D_161031, EB-M14-09S_161031, EB-M14-14_161031, EB17_161031, EB-M14-22_161031, EB-M14-23_161031, and EB-M14-24_161031 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
EB17_161031	10/31/16	PFOA PFOS	20.1 ug/L 21.7 ug/L	All samples in SDG 1601391
EB-M14-23_161031	10/31/16	PFOS	3.11 ug/L	M14-23_161031
EB-M14-24_161031	10/31/16	PFOS	1.70 ug/L	M14-24_161031
EB-M14-09S_161031	10/31/16	PFOS	3.12 ug/L	M14-09S_161031

Samples FB-M14-09D_161031, FB-M14-09S_161031, FB-M14-14_161031, FB-M14-22_161031, FB-M14-23_161031, and FB-M14-24_161031 were identified as field blanks. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
FB-M14-24_161031	10/31/16	PFOS	1.61 ug/L	M14-24_161031
FB-M14-23_161031	10/31/16	PFOS	1.61 ug/L	M14-23_161031
FB-M14-09S_161031	10/31/16	PFOS PFOA	1.58 ug/L 0.676 ug/L	M14-09S_161031

Sample SB02_161024 (from SDG 1601348) was identified as a source blank. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Compound	Concentration	Associated Samples
SB02_161024	10/24/16	PFOA	1.31 ug/L	All samples in SDG 1601391

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated field blanks.

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) and relative percent differences (RPD) were not within the QC limits for M14-09D_161031MS/MSD. No data were qualified since the parent sample results were greater than 4X the spiked concentration.

VIII. Ongoing Precision Recovery Samples

Ongoing precision recovery (OPR) samples were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples DUP06_161031 and M14-09D_161031 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Compound	Concentration (ug/L)		RPD (Limits)	Differences (Limits)	Flag	A or P
	DUP06_161031	M14-09D_161031				
PFBS	1190	1200	-	10 (≤320)	-	-
PFOS	43900	39200	11 (≤30)	-	-	-
PFOA	19500	24600	23 (≤30)	-	-	-

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
M14-09D_161031	$^{13}C_2$-PFOA	152 (60-150)	All compounds	J (all detects)	P
M14-09S_161031	$^{13}C_2$-PFOA $^{13}C_2$-PFBS	1010 (60-150) 258 (60-150)	All compounds	J (all detects)	P
M14-22_161031	$^{13}C_2$-PFOA	322 (60-150)	All compounds	J (all detects)	P
M14-23_161031	$^{13}C_2$-PFOA	192 (60-150)	All compounds	J (all detects)	P
M14-24_161031	$^{13}C_2$-PFOA	181 (60-150)	All compounds	J (all detects)	P

XI. Compound Quantitation

All compound quantitations met validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
M14-09S_161031 M14-22_161031 M14-24_161031	PFOS	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	P

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 initial calibration r^2, internal standard area and results exceeding range, data were qualified as estimated in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Data Qualification Summary - SDG 1601391

Sample	Compound	Flag	A or P	Reason
DUP06_161031 M14-09D_161031 M14-09S_161031 M14-14_161031 M14-22_161031 M14-23_161031 M14-24_161031	PFBS PFOS	J (all detects) J (all detects)	A	Initial calibration (r^2)
M14-09D_161031 M14-09S_161031 M14-22_161031 M14-23_161031 M14-24_161031	All compounds	J (all detects)	P	Internal standards (area)
M14-09S_161031 M14-22_161031 M14-24_161031	PFOS	J (all detects)	P	Compound quantitation (exceeded range)

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Laboratory Blank Data Qualification Summary - SDG 1601391

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Perfluorinated Alkyl Acids - Field Blank Data Qualification Summary - SDG 1601391

No Sample Data Qualified in this SDG

LDC #: 37601P96
SDG #: 1601391
Laboratory: Vista Analytical Laboratory

VALIDATION COMPLETENESS WORKSHEET

Stage ~~2B~~ 4

Date: 12/9/16
Page: 1 of 2
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: LC/MS Perfluorinated Alkyl Acids (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	
II.	GC/MS Instrument performance check	N	
III.	Initial calibration/ICV	A	r^2/~~25~~ 70 labeled ICV ≤ ~~25~~ 30%
IV.	Continuing calibration	A	±CCV ≤ ~~25~~ 30% QC limits for labeled
V.	Laboratory Blanks	A	SB02_161024 (1601348)
VI.	Field blanks	SW	EB=2-4. 12-15. FB=5-7. 16-18.
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	LCS (OPR)
X.	Field duplicates	SW	D=1+8
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:

	Client ID	Lab ID	Matrix	Date
1	DUP06_161031 D1	1601391-01	Water	10/31/16
~~2~~	~~EB-M14-09D_161031~~	~~1601391-02~~	~~Water~~	~~10/31/16~~
~~3~~	~~EB-M14-09S_161031~~	~~1601391-03~~	~~Water~~	~~10/31/16~~
~~4~~	~~EB-M14-14_161031~~	~~1601391-04~~	~~Water~~	~~10/31/16~~
~~5~~	~~FB-M14-09D_161031~~	~~1601391-05~~	~~Water~~	~~10/31/16~~
~~6~~	~~FB-M14-09S_161031~~	~~1601391-06~~	~~Water~~	~~10/31/16~~
~~7~~	~~FB-M14-14_161031~~	~~1601391-07~~	~~Water~~	~~10/31/16~~
8	M14-09D_161031 D1	1601391-08	Water	10/31/16
9	M14-09S_161031	1601391-09	Water	10/31/16
10	M14-14_161031	1601391-10	Water	10/31/16
11	M14-22_161031	1601391-11	Water	10/31/16
~~12~~	~~EB17_161031~~	~~1601391-12~~	~~Water~~	~~10/31/16~~
~~13~~	~~EB-M14-22_161031~~	~~1601391-13~~	~~Water~~	~~10/31/16~~
~~14~~	~~EB-M14-23_161031~~	1601391-14	Water	10/31/16

LDC #: 37601P96

SDG #: 1601391

Laboratory: Vista Analytical Laboratory

VALIDATION COMPLETENESS WORKSHEET

Stage 2B

Date: 12/9/16

Page: 2 of 2

Reviewer:

2nd Reviewer:

METHOD: LC/MS Perfluorinated Alkyl Acids (EPA Method 537)

	Client ID	Lab ID	Matrix	Date
~~15~~	~~EB-M14-24_161031~~	~~1601391-15~~	~~Water~~	~~10/31/16~~
~~16~~	~~FB-M14-22_161031~~	~~1601391-16~~	~~Water~~	~~10/31/16~~
~~17~~	~~FB-M14-23_161031~~	~~1601391-17~~	~~Water~~	~~10/31/16~~
~~18~~	~~FB-M14-24_161031~~	~~1601391-18~~	~~Water~~	~~10/31/16~~
19	M14-23_161031	1601391-19	Water	10/31/16
20	M14-24_161031	1601391-20	Water	10/31/16
21	M14-09D_161031MS	1601391-08MS	Water	10/31/16
22	M14-09D_161031MSD	1601391-08MSD	Water	10/31/16
23	M14-22_161031MS	1601391-11MS	Water	10/31/16
24	M14-22_161031MSD	1601391-11MSD	Water	10/31/16
25				
26				
27				
28				
29				

Notes:

	#BGK0052-BK1						

LDC #: 36196

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: 9
2nd Reviewer: M

Method: LCMS (EPA Method 537)

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 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%~~ 30%?			✓	
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit 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) ≤ ~~15%~~ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) of the continuing calibration ≤ ~~15%~~ 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? 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?	✓			
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 extraction batch?	✓			

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. Internal standards				
Were internal standard area counts within ~~± 50%~~ RC of the associated calibration standard?		✓		
Were retention times within ± 30 seconds from 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.	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 3T601P96

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC ✓ HPLC [illegible]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a 5 point calibration curve performed?
Y N N/A Was a linear fit used for evaluation? If yes, the acceptance criteria for each compound is %RSD less than or equal to 20.0%.
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? _____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Was initial calibration performed at the required frequency?

Level IV Only

Y N N/A Were the retention time windows properly established for all compounds?
Y N N/A Were compounds run at the required concentrations in the initial calibrations?

#	Date	Standard ID	Column / Detector	Compound	Finding RSD Limit ≤20%	Associated Samples	Qualifications
	11/11/16	ICAL		PFBS	r^2=0.977505	[illegible] (dets)	✓ / [illegible] / A
				PFOS	=0.972067		✓

Comments_____

INICALNew.wpd

LDC #: 3T601P96

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: 8
2nd Reviewer: K

METHOD: GC

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?

Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/31/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB Associated Samples: All

Compound	Blank ID	Sample Identification								
	12									
PFOA	20.1									
PFOS	21.7									

Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/31/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB/FB Associated Samples: 19

Compound	Blank ID	Blank	Sample Identification							
	14	17								
PFOS	3.11	1.61								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 3T601796

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Q
2nd Reviewer: KL

METHOD: GC

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?

Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/31/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB/FD Associated Samples: 20

Compound	Blank ID	Blank	Sample Identification							
	15	18								
PFOS	1.70	1.61								

Blank units: _____ **Associated sample units:** _____
Sampling date: _____
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 3T601

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC

SB02_161024 (1601348)

Y N N/A Field blanks were identified in this SDG.
Y N N/A Were target compounds detected in the field blanks?

Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/24/16
Field blank type: (circle one) Field Blank / Rinsate / Other: SB Associated Samples: All

Compound	Blank ID	Sample Identification								
SB02_161024										
PFOA	1.31									

Blank units: NS/L **Associated sample units:** NS/L
Sampling date: 10/31/16
Field blank type: (circle one) Field Blank / Rinsate / Other: EB/FD Associated Samples: 9

Compound	Blank ID	Blank	Sample Identification							
	3	6								
PFOS	3.12	1.58								
PFOA		0.676								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 37601P96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: 9
2nd Reviewer: M

METHOD: __ GC √ HPLC MS

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?

Y N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?

Y N N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	21/22	All	%R and RPD ( )	( )	( )		No Qual
			( )	( )	( )		>4x
			( )	( )	( )		
			( )	( )	( )		
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LDC#: 37601P96

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: PG
2nd Reviewer: VT

METHOD: LC/MS (EPA Method 537)

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%)	Difference (ug/L)	Limits (ug/L)	Qualifications (Parent Only)
	1	8				
PFBS	1190	1200		10	≤320	
PFOS	43900	39200	11			
PFOA	19500	24600	23			

V:\FIELD DUPLICATES\37601P96_Amec.wpd

LDC #: 36096

VALIDATION FINDINGS WORKSHEET
Internal Standards

Reviewer: 9
2nd Reviewer: MV

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 53% - 130% of the associated calibration standard?

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
		8	13C2-PFOA	152 (60-150)		J/UJ/P (dets)
		21 (MS)		157		No Cmail
		22 (MSD)		162		↓
		9	↓	1010		J/UJ/P (dets)
			13C3-PFBS	258		↓
		11	13C2-PFOA	322		(dets)
		23 (MS)		312		No Cmail
		24 (MSD)		309		↓
		19		192		J/UJ/P (dets)
		20	↓	181		↓

Privileged and Confidential

LDC #3T601P96

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 9

METHOD: __ GC ✓ HPLC/MS

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	Finding	Associated Samples	Qualifications
	20, 9, #11	PFOS exceeded calib range		J det/P

Comments: See sample calculation verification worksheet for recalculations

LDC #: 36041796

Validation Findings Worksheet
Initial Calibration Calculation Verification

Reviewer: 9
2nd Reviewer: DL

Method: PFCs (EPA Method 537)

Calibration Date	Instrument/Column	Compound	Standard	(Y) Response	(X) Conc.	(X^2) Conc.
11/11/2016	Q2	PFOA	0	0.8683425	0.5	0.25
			s1	1.4901612	1	1
			s2	2.2186137	2	4
			s3	5.0480762	5	25
			s4	13.830376	10	100
			s5	33.467201	25	625
			s6	58.504565	50	2500
			s7	82.193653	75	5625
			s8	107.54824	100	10000

Regression Output	Calculated		*Reported*	
Constant	c	0.22465	c	0.04715
Std Err of Y Est				
R Squared		0.9988348		0.9969310
Degrees of Freedom				
	b	a	b	a
X Coefficient(s)	1.285667731	-0.00222743	1.31994	-0.0025112
Std Err of Coef.				
Correlation Coefficient		0.999417		
Coefficient of Determination (r^2)		0.998835		

LDC #: 37601-96

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

METHOD: GC ___V___ HPLC MS

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF - CF)/ave. CF
CF = A/C

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(Ical)/ CCV Conc.	Reported CF/Conc. CCV	Recalculated CF/Conc. CCV	Reported %D	Recalculated %D
1	161114L02	11/14/16	PFOA	25.0	28.3	28.3	13	13
2	161114L22	11/14/16 (49=40)	PFOA	25.0	26.7	26.7	6.7	6.7
3	161115L02	11/15/16	PFOA	25.0	25.0	25.13	0	0.1
4	161115L20	11/15/16	PFOA	25.0	26.3	26.3	5.3	5.3

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 #: 3T601D96

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC ✓ HPLC [illegible]

The percent recoveries (%R) and relative percent differences (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; MS = Matrix spike; SC = Sample concentration; MSD = Matrix spike duplicate

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

MS/MSD samples: 23/24

Compound	Spike Added (US/L)		Sample Conc. (US/L)	Spike Sample Concentration (US/L)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
PFOA	79.9	79.0	35200	501,900	35942	-1600	0	909	939	726	173

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 #: 3T601P96

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: __ GC ✓ HPLC / VLS

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* (SSC-SC)/SA

RPD = I SSCLCS - SSCLCSD I * 2/(SSCLCS + SSCLCSD)

Where: SSC = Spiked sample concentration
SA = Spike added
LCS = Laboratory control sample percent recovery
SC = Concentration
LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: B6K0052-BS1

Compound	Spike Added (US/L)		Spiked Sample Concentration (US/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
PFOA	80.0	NA	82.7	NA	103	103				

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 3T601P96

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ___ GC ✓ HPLC [illegible]

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% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. 1 Compound Name ~~PFOA~~ PFOS

Concentration = $\frac{\left(\frac{7.415e4}{2.453e2} - 0.123067\right)(12.5)}{(1.25111)(0.12492)}$

= 24166.81 ng/L

#	Sample ID	Compound	Reported Concentrations ( )	Recalculated Results Concentrations ( )	Qualifications
	Total PFOS = 24166.81 + 6008.7 + 11994.9 + 1723.7 = 43894.1 ng/L				

omments: _____

SAMPCALew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 30, 2016

Parameters: Gross Alpha & Beta

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19638-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	160-19638-1	Water	10/24/16
M002A-R_161024	160-19638-2	Water	10/24/16
M001E-R_161024	160-19638-3	Water	10/24/16
M026A-R_161024	160-19638-4	Water	10/24/16
M028A-R_161024	160-19638-5	Water	10/24/16
M028E-R_161024	160-19638-6	Water	10/24/16
DUP01_161024	160-19638-7	Water	10/24/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Gross Alpha and Beta by Environmental Protection Agency (EPA) Method 900.0

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Self absorption curves were generated for each sample when applicable.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 was identified as a source blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicates (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples M028E-R_161024 and DUP01_161024 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Isotope	Activity (pCi/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024	DUP01_161024				
Gross beta	78.2	79.7	2 (≤30)	-	-	-

X. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL) with the following exceptions:

Sample	Isotope	MDA (pCi/L)	RL (pCi/L)
M001A-R_161024	Gross alpha Gross beta	26.5 9.51	3.00 4.00
M002A-R_161024	Gross alpha Gross beta	77.5 35.7	3.00 4.00
M001E-R_161024	Gross alpha Gross beta	41.9 18.4	3.00 4.00
M026A-R_161024	Gross alpha Gross beta	56.3 29.2	3.00 4.00
M028A-R_161024	Gross alpha	8.14	3.00
M028E-R_161024	Gross alpha Gross beta	38.2 17.3	3.00 4.00
DUP01_161024	Gross alpha Gross beta	34.9 14.9	3.00 4.00

The MDA was greater than the RL as listed above.

XI. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Gross Alpha & Beta - Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Gross Alpha & Beta - Laboratory Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Gross Alpha & Beta - Field Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

LDC #: 37601Q22 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19638-1 Stage 2B Page: 1 of 1
Laboratory: Test America Reviewer: G
2nd Reviewer: CF

METHOD: Gross Alpha & Beta (EPA Method 900.0)

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.	Initial calibration	A	✓ Self-absorption curve
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	SB=8 EB=9,10
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicates	N	↓
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	(6,7)
X.	Minimum detectable activity (MDA)	SW	
XI.	Sample result verification	N	
XII.	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	M001A-R_161024	160-19638-1	Water	10/24/16
2	M002A-R_161024	160-19638-2	Water	10/24/16
3	M001E-R_161024	160-19638-3	Water	10/24/16
4	M026A-R_161024	160-19638-4	Water	10/24/16
5	M028A-R_161024	160-19638-5	Water	10/24/16
6	M028E-R_161024	160-19638-6	Water	10/24/16
7	DUP01_161024	160-19638-7	Water	10/24/16
8	SB01_161024	160-19638-8	Water	10/24/16
9	EB01_161024	160-19638-9	Water	10/24/16
10	EB02_161024	160-19638-10	Water	10/24/16
11				
12				
13				
14				

Notes:

LDC#: 37601Q22

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

METHOD: Radiochemistry (Method: see cover)

Isotope	Activity (pCi/L) 6	Activity (pCi/L) 7	(≤30) RPD	Difference	Limits	
Gross Beta	78.2	79.7	2			

LDC #: 37601Q22

VALIDATION FINDINGS WORKSHEET
Minimum Detectable Activities

Reviewer: a
2nd Reviewer: a

METHOD: Radiochemistry (Method: See Cover)

The following sample MDAs are above the RDL:

#	Sample ID	Isotope	MDA (pCi/L)	RL (pCi/L)	Qualifications
	1	Gross Alpha	26.5	3.00	Text (MDA>RL)
		Gross Beta	9.51	4.00	
	2	Gross Alpha	77.5	3.00	
		Gross Beta	35.7	4.00	
	3	Gross Alpha	41.9	3.00	
		Gross Beta	18.4	4.00	
	4	Gross Alpha	56.3	3.00	
		Gross Beta	29.2	4.00	
	5	Gross Alpha	8.14	3.00	
	6	Gross Alpha	38.2	3.00	
		Gross Beta	17.3	4.00	
	7	Gross Alpha	34.9	3.00	
		Gross Beta	14.9	4.00	

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 30, 2016

Parameters: Radium-226

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19638-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	160-19638-1	Water	10/24/16
M002A-R_161024	160-19638-2	Water	10/24/16
M001E-R_161024	160-19638-3	Water	10/24/16
M026A-R_161024	160-19638-4	Water	10/24/16
M028A-R_161024	160-19638-5	Water	10/24/16
M028E-R_161024	160-19638-6	Water	10/24/16
DUP01_161024	160-19638-7	Water	10/24/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Radium-226 by Environmental Protection Agency (EPA) Method 903.0

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Self absorption curves were generated for each sample when applicable.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Sampling Date	Isotope	Activity	Associated Samples
EB01_161024	10/24/16	Radium-226	0.367 pCi/L	All samples in SDG 160-19638-1

Sample SB01_161024 was identified as a source blank. No contaminants were found.

Sample activities were compared to activities detected in the field blanks. The sample activities were either not detected or were significantly greater (>5X blank activity) than the activities found in the associated field blanks with the following exceptions:

Sample	Isotope	Reported Activity	Modified Final Activity
M001E-R_161024	Radium-226	1.70 pCi/g	1.70U pCi/g
M026A-R_161024	Radium-226	0.817 pCi/g	0.817U pCi/g

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples M028E-R_161024 and DUP01_161024 were identified as field duplicates. No results were detected in any of the samples.

X. Carrier Recovery

All carrier recoveries were within validation criteria.

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL) with the following exceptions:

Sample	Isotope	MDA (pCi/L)	RL (pCi/L)
M001A-R_161024	Radium-226	1.87	1.00

The MDA was greater than the RL as listed above.

XII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to equipment blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Radium-226 - Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Radium-226 - Laboratory Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Radium-226 - Field Blank Data Qualification Summary - SDG 160-19638-1

Sample	Isotope	Modified Final Activity	A or P
M001E-R_161024	Radium-226	1.70U pCi/g	A
M026A-R_161024	Radium-226	0.817U pCi/g	A

LDC #: 37601Q29a **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19638-1 Stage 2B Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Radium 226 (EPA Method 903.0)

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.	Initial calibration	A	✓self absorption curve
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	SW	SB=8 EB=9,10
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	ND	(6,7)
X.	Carrier recovery	A	
XI.	Minimum detectable activity (MDA)	SW	
XII.	Sample result verification	N	
XIII.	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	M001A-R_161024	160-19638-1	Water	10/24/16
2	M002A-R_161024	160-19638-2	Water	10/24/16
3	M001E-R_161024	160-19638-3	Water	10/24/16
4	M026A-R_161024	160-19638-4	Water	10/24/16
5	M028A-R_161024	160-19638-5	Water	10/24/16
6	M028E-R_161024	160-19638-6	Water	10/24/16
7	DUP01_161024	160-19638-7	Water	10/24/16
8	~~SB01_161024~~	~~160-19638-8~~	~~Water~~	~~10/24~~/16
9	EB01_161024	160-19638-9	Water	10/24/16
10	~~EB02_161024~~	~~160-19638-10~~	~~Water~~	~~10/24/16~~
11				
12				
13				

Notes:

LDC #: 37601Q29a

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: Radiochemistry, Method See Cover
Blank units: pCi/L **Associated sample units:** pCi/g
Sampling date: 10/24/16 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: All

Analyte	Blank ID	Action Limit	Sample Identification							
	9		3	4						
Ra-226	0.367	1.835	1.70	0.817						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 37601Q29a

VALIDATION FINDINGS WORKSHEET
Minimum Detectable Activities

Reviewer: a
2nd Reviewer: a

METHOD: Radiochemistry (Method: See Cover)

The following sample MDAs are above the RDL:

#	Sample ID	Isotope	MDA (pCi/L)	RL (pCi/L)	Qualifications
	1	Ra-226	1.87	1.00	Text (MDA>RL)

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 30, 2016

Parameters: Radium-228

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19638-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	160-19638-1	Water	10/24/16
M002A-R_161024	160-19638-2	Water	10/24/16
M001E-R_161024	160-19638-3	Water	10/24/16
M026A-R_161024	160-19638-4	Water	10/24/16
M028A-R_161024	160-19638-5	Water	10/24/16
M028E-R_161024	160-19638-6	Water	10/24/16
DUP01_161024	160-19638-7	Water	10/24/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Radium-228 by Environmental Protection Agency (EPA) Method 904.0

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Self absorption curves were generated for each sample when applicable.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 was identified as a source blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was not required by the method.

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

Samples M028E-R_161024 and DUP01_161024 were identified as field duplicates. No results were detected in any of the samples.

X. Carrier Recovery

All carrier recoveries were within validation criteria.

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL) with the following exceptions:

Sample	Isotope	MDA	RL
M001A-R_161024	Radium-228	1.94	1.00

The MDA was greater than the RL as listed above.

XII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Radium-228 - Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Radium-228 - Laboratory Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Radium-228 - Field Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

LDC #: 37601Q29b **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19638-1 Stage 2B Page: 1 of 1
Laboratory: Test America Reviewer: a
2nd Reviewer: a

METHOD: Radium 228 (EPA Method 904.0)

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.	Initial calibration	A	✓ self absorption curve
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	SB=8 EB=9,10
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicates	N	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	ND	(6,7)
X.	Carrier recovery	A	
XI.	Minimum detectable activity (MDA)	SW	
XII.	Sample result verification	N	
XIII.	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	M001A-R_161024	160-19638-1	Water	10/24/16
2	M002A-R_161024	160-19638-2	Water	10/24/16
3	M001E-R_161024	160-19638-3	Water	10/24/16
4	M026A-R_161024	160-19638-4	Water	10/24/16
5	M028A-R_161024	160-19638-5	Water	10/24/16
6	M028E-R_161024	160-19638-6	Water	10/24/16
7	DUP01_161024	160-19638-7	Water	10/24/16
~~8~~	~~SB01_161024~~	~~160-19638-8~~	~~Water~~	~~10/24/16~~
9	EB01_161024	160-19638-9	Water	10/24/16
10	~~EB02_161024~~	160-19638-10	Water	~~10/24/16~~
11				
12				
13				

Notes:

LDC #: 37601Q29b

VALIDATION FINDINGS WORKSHEET
Minimum Detectable Activities

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Radiochemistry (Method: See Cover)

The following sample MDAs are above the RDL:

#	Sample ID	Isotope	MDA (pCi/L)	RL (pCi/L)	Qualifications
	1	Ra-228	1.94	1.00	Text (MDA>RL)

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 30, 2016

Parameters: Tritium

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19638-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	160-19638-1	Water	10/24/16
M002A-R_161024	160-19638-2	Water	10/24/16
M001E-R_161024	160-19638-3	Water	10/24/16
M026A-R_161024	160-19638-4	Water	10/24/16
M028A-R_161024	160-19638-5	Water	10/24/16
M028E-R_161024	160-19638-6	Water	10/24/16
DUP01_161024	160-19638-7	Water	10/24/16
M001A-R_161024MS	160-19638-1MS	Water	10/24/16
M001A-R_161024DUP	160-19638-1DUP	Water	10/24/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Tritium by Environmental Protection Agency (EPA) Method 906.0

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Self absorption curves were generated for each sample when applicable.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 was identified as a source blank. No contaminants were found.

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) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples M028E-R_161024 and DUP01_161024 were identified as field duplicates. No results were detected in any of the samples.

X. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL).

XI. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Tritium - Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Tritium - Laboratory Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Tritium - Field Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

LDC #: 37601Q34 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19638-1 Stage 2B Page: 1 of 1
Laboratory: Test America Reviewer:
2nd Reviewer:

METHOD: Tritium (EPA Method 906.0)

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.	Initial calibration	A	✓ quench curve
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	SB=8 EB=9,10
VI.	Matrix Spike/Matrix Spike Duplicates	A	
VII.	Duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	ND	(6,7)
X.	Minimum detectable activity (MDA)	A	
XI.	Sample result verification	N	
XII.	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	M001A-R_161024	160-19638-1	Water	10/24/16
2	M002A-R_161024	160-19638-2	Water	10/24/16
3	M001E-R_161024	160-19638-3	Water	10/24/16
4	M026A-R_161024	160-19638-4	Water	10/24/16
5	M028A-R_161024	160-19638-5	Water	10/24/16
6	M028E-R_161024	160-19638-6	Water	10/24/16
7	DUP01_161024	160-19638-7	Water	10/24/16
~~8~~	~~SB01_161024~~	~~160-19638-8~~	~~Water~~	~~10/24/16~~
9	EB01_161024	160-19638-9	Water	10/24/16
10	~~EB02_161024~~	~~160-19638-10~~	~~Water~~	~~10/24/16~~
11	M001A-R_161024MS	160-19638-1MS	Water	10/24/16
12	M001A-R_161024DUP	160-19638-1DUP	Water	10/24/16
13				
14				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 30, 2016

Parameters: Isotopic Uranium

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19638-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	160-19638-1	Water	10/24/16
M002A-R_161024	160-19638-2	Water	10/24/16
M001E-R_161024	160-19638-3	Water	10/24/16
M026A-R_161024	160-19638-4	Water	10/24/16
M028A-R_161024	160-19638-5	Water	10/24/16
M028E-R_161024	160-19638-6	Water	10/24/16
DUP01_161024	160-19638-7	Water	10/24/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Isotopic Uranium by EML A-01-R Modified

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 was identified as a source blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples M028E-R_161024 and DUP01_161024 were identified as field duplicates. No results were detected in any of the samples.

X. Tracer Recovery

All tracer recoveries were within validation criteria with the following exceptions:

Sample ID	Tracer Isotope	%R (Limits)	Affected Isotope	Flag	A or P
DUP01_161024	Uranium-232	26.4 (30-110)	All isotopic uranium	UJ (all non-detects)	A

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL) with the following exceptions:

Sample	Isotope	MDA (pCi/L)	RL (pCi/L)
M001A-R_161024	Uranium-233/234 Uranium-235/236 Uranium-238	4.74 3.20 4.73	1.00 1.00 1.00
M002A-R_161024	Uranium-233/234 Uranium-235/236 Uranium-238	8.96 6.37 5.11	1.00 1.00 1.00
DUP01_161024	Uranium-233/234	1.50	1.00

The MDA was greater than the RL as listed above.

XII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to tracer recovery %R, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Isotopic Uranium - Data Qualification Summary - SDG 160-19638-1

Sample	Isotope	Flag	A or P	Reason
DUP01_161024	All isotopic uranium	UJ (all non-detects)	A	Tracer recovery (%R)

NAS Alameda Point, BGMP
Isotopic Uranium - Laboratory Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Isotopic Uranium - Field Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

LDC #: 37601Q59 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19638-1 Stage 2B Page: 1 of 1
Laboratory: Test America Reviewer: 2
2nd Reviewer: 1

METHOD: Isotopic Uranium (EML A-01-R Mod.)

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.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	SB=8 EB=9,10)
VI.	Matrix Spike/Matrix Spike Duplicates	N	Not required
VII.	Duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	ND	(6,7)
X.	Tracer Recovery	SW	
XI.	Minimum detectable activity (MDA)	SW	
XII.	Sample result verification	N	
XIII.	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	M001A-R_161024	160-19638-1	Water	10/24/16
2	M002A-R_161024	160-19638-2	Water	10/24/16
3	M001E-R_161024	160-19638-3	Water	10/24/16
4	M026A-R_161024	160-19638-4	Water	10/24/16
5	M028A-R_161024	160-19638-5	Water	10/24/16
6	M028E-R_161024	160-19638-6	Water	10/24/16
7	DUP01_161024	160-19638-7	Water	10/24/16
~~8~~	~~SB01_161024~~	~~160-19638-8~~	Water	10/24/16
9	EB01_161024	160-19638-9	Water	10/24/16
10	~~EB02_161024~~	160-19638-10	Water	10/24/16
11				
12				
13				

Notes:

LDC #: 37601Q59

VALIDATION FINDINGS WORKSHEET
Sample Chemical Recovery

Page: 1 of 1
Reviewer: CR
2nd Reviewer: CR

METHOD: Radiochemistry (Method: seecaer)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a tracer/carrier added to each sample?
Y N N/A Were tracer/carrier recoveries within the control limits?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Tracer/~~Carrier~~	%R (limits)	Associated Isotopes	Associated Samples	Qualifications
	U-232	26.4 (30-110)	All	7	J (UJ/A (ND)

Comments:

LDC #: 37601Q59

VALIDATION FINDINGS WORKSHEET
Minimum Detectable Activities

Reviewer:
2nd Reviewer:

METHOD: Radiochemistry (Method: See Cover)

The following sample MDAs are above the RDL:

#	Sample ID	Isotope	MDA (pCi/L)	RL (pCi/L)	Qualifications
	1	U-233/234	4.74	1.00	Text (MDA>RL)
		U-235/236	3.20	1.00	
		U-238	4.73	1.00	
	2	U-233/234	8.96	1.00	
		U-235/236	6.37	1.00	
		U-238	5.11	1.00	
	7	U-233/234	1.50	1.00	

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 30, 2016

Parameters: Strontium-90

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19638-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	160-19638-1	Water	10/24/16
M002A-R_161024	160-19638-2	Water	10/24/16
M001E-R_161024	160-19638-3	Water	10/24/16
M026A-R_161024	160-19638-4	Water	10/24/16
M028A-R_161024	160-19638-5	Water	10/24/16
M028E-R_161024	160-19638-6	Water	10/24/16
DUP01_161024	160-19638-7	Water	10/24/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Strontium-90 by Environmental Protection Agency (EPA) Method 905

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Self absorption curves were generated for each sample when applicable.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found.

Sample SB01_161024 was identified as a source blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analysis were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples M028E-R_161024 and DUP01_161024 were identified as field duplicates. No results were detected in any of the samples.

X. Carrier Recovery

All carrier recoveries were within validation criteria.

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL).

XII. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XIII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Strontium-90 - Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Strontium-90 - Laboratory Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Strontium-90 - Field Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

LDC #: 37601Q61
SDG #: 160-19638-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/21/16
Page: 1 of 1
Reviewer: a
2nd Reviewer: a

METHOD: Strontium-90 (EPA Method 905)

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.	Initial calibration	A	✓self absorption curve
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	SB=8 EB=9,10
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	ND	(6,7)
X.	Carrier recovery	A	
XI.	Minimum detectable activity (MDA)	A	
XII.	Sample result verification	N	
XIII.	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	M001A-R_161024	160-19638-1	Water	10/24/16
2	M002A-R_161024	160-19638-2	Water	10/24/16
3	M001E-R_161024	160-19638-3	Water	10/24/16
4	M026A-R_161024	160-19638-4	Water	10/24/16
5	M028A-R_161024	160-19638-5	Water	10/24/16
6	M028E-R_161024	160-19638-6	Water	10/24/16
7	DUP01_161024	160-19638-7	Water	10/24/16
8	SB01_161024	160-19638-8	Water	10/24/16
9	EB01_161024	160-19638-9	Water	10/24/16
10	EB02_161024	160-19638-10	Water	10/24/16
11				
12				
13				

Notes:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: December 30, 2016

Parameters: Cesium-137 & Cobalt-60

Validation Level: Stage 2B

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19638-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M001A-R_161024	160-19638-1	Water	10/24/16
M002A-R_161024	160-19638-2	Water	10/24/16
M001E-R_161024	160-19638-3	Water	10/24/16
M026A-R_161024	160-19638-4	Water	10/24/16
M028A-R_161024	160-19638-5	Water	10/24/16
M028E-R_161024	160-19638-6	Water	10/24/16
DUP01_161024	160-19638-7	Water	10/24/16
M001A-R_161024DUP	160-19638-1DUP	Water	10/24/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Cesium-137 and Cobalt-60 by Environmental Protection Agency (EPA) Method 901.1

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Samples EB01_161024 and EB02_161024 were identified as equipment blanks. No contaminants were found with the following exceptions:

Blank ID	Sampling Date	Isotope	Activity	Associated Samples
EB02_161024	10/24/16	Cobalt-60	11.6 pCi/L	All samples in SDG 160-19638-1

Sample SB01_161024 was identified as a source blank. No contaminants were found.

Sample activities were compared to activities detected in the field blanks. The sample activities were either not detected or were significantly greater (>5X blank activity) than the activities found in the associated field blanks with the following exceptions:

Sample	Isotope	Reported Activity	Modified Final Activity
M001E-R_161024	Cobalt-60	6.08 pCi/g	6.08U pCi/g
DUP01_161024	Cobalt-60	6.76 pCi/g	6.76U pCi/g

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicates (MSD) analyses were not required by the method.

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) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples M028E-R_161024 and DUP01_161024 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Isotope	Activity (pCi/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	M028E-R_161024	DUP01_161024				
Cobalt-60	3.45U	6.76	-	3.31 (≤9.05)	-	-

X. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL).

XI. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to equipment blank contamination, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Cesium-137 & Cobalt-60 - Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Cesium-137 & Cobalt-60 - Laboratory Blank Data Qualification Summary - SDG 160-19638-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Cesium-137 & Cobalt-60 - Field Blank Data Qualification Summary - SDG 160-19638-1

Sample	Isotope	Modified Final Activity	A or P
M001E-R_161024	Cobalt-60	6.08U pCi/g	A
DUP01_161024	Cobalt-60	6.76U pCi/g	A

LDC #: 37601Q93
SDG #: 160-19638-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET
Stage 2B

Date: 12/21/16
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Cesium-137 & Colbalt-60 (EPA Method 901.1)

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.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	SW	SB=8 EB=9,10
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	(6,7)
X.	Minimum detectable activity (MDA)	A	
XI.	Sample result verification	N	
XII.	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	M001A-R_161024	160-19638-1	Water	10/24/16
2	M002A-R_161024	160-19638-2	Water	10/24/16
3	M001E-R_161024	160-19638-3	Water	10/24/16
4	M026A-R_161024	160-19638-4	Water	10/24/16
5	M028A-R_161024	160-19638-5	Water	10/24/16
6	M028E-R_161024	160-19638-6	Water	10/24/16
7	DUP01_161024	160-19638-7	Water	10/24/16
8	SB01_161024	160-19638-8	Water	10/24/16
9	EB01_161024	160-19638-9	Water	10/24/16
10	EB02_161024	160-19638-10	Water	10/24/16
11	M001A-R_161024DUP	160-19638-1DUP	Water	10/24/16
12				
13				
14				

Notes:

LDC #: 37601Q93

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: A
2nd Reviewer: A

METHOD: Radiochemistry, Method See Cover
Blank units: pCi/L **Associated sample units: pCi/g**
Sampling date: 10/24/16 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: All

Analyte	Blank ID	Action Limit	Sample Identification							
	10		3	7						
Co-60	11.6	58	6.08	6.76						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC#: 37601Q93

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Radiochemistry (Method: see cover)

Isotope	Activity (pCi/L) 6	Activity (pCi/L) 7	(≤30) RPD	Difference	Limits	
Co-60	3.45U	6.76		3.31	(≤9.05)	

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Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: January 3, 2017

Parameters: Gross Alpha & Beta

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19668-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M003A-R_161024	160-19668-2	Water	10/24/16
M034A-R_161025	160-19668-3	Water	10/25/16
M034A-R_161025MS	160-19668-3MS	Water	10/25/16
M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Gross Alpha and Beta by Environmental Protection Agency (EPA) Method 900.0

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Self absorption curves were generated for each sample when applicable.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Sample EB03_161025 was identified as an equipment blank. No contaminants were found.

Sample SB01_161024 (from SDG 160-19638-1) was identified as a source blank. No contaminants were found.

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 not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL) with the following exceptions:

Sample	Isotope	MDA (pCi/L)	RL (pCi/L)
M003A-R_161024	Gross alpha Gross beta	11.8 5.13	3.00 4.00
M034A-R_161025	Gross alpha Gross beta	26.8 9.45	3.00 4.00

The MDA was greater than the RL as listed above.

XI. Sample Result Verification

All sample result verifications were acceptable.

XII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Gross Alpha & Beta - Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Gross Alpha & Beta - Laboratory Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Gross Alpha & Beta - Field Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

LDC #: 37601R22 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19668-1 Stage ~~2B~~ 4 Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Gross Alpha & Beta (EPA Method 900.0)

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.	Initial calibration	A	✓self-absorption curve
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB=1 SB=SB01_161024 (160-19638-1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VII.	Duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Minimum detectable activity (MDA)	SW	
XI.	Sample result verification	A	
XII.	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	~~EB03_161025~~	~~160-19668-1~~	~~Water~~	~~10/25/16~~
2	M003A-R_161024	160-19668-2	Water	10/24/16
3	M034A-R_161025	160-19668-3	Water	10/25/16
4	M034A-R_161025MS	160-19668-3MS	Water	10/25/16
5	M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 37601R22

VALIDATION FINDINGS CHECKLIST

Reviewer: CA
2nd Reviewer: CA

Method: Radiochemistry (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) 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 percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error rations (DER) ≤1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?			✓	
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?		✓		

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 37601R22

VALIDATION FINDINGS WORKSHEET
Minimum Detectable Activities

Page: 1 of 1
Reviewer: S
2nd Reviewer: 9

METHOD: Radiochemistry (Method: See Cover)

The following sample MDAs are above the RDL:

#	Sample ID	Isotope	MDA (pCi/L)	RL (pCi/L)	Qualifications
	2	Gross Alpha	11.8	3.00	Text (MDA>RL)
		Gross Beta	5.13	4.00	
	3	Gross Alpha	26.8	3.00	
		Gross Beta	9.45	4.00	

Comments:

LDC #: 37601R22

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: CR
2nd Reviewer: CR

METHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	GrossA	43.12	49.9	86	86	Y
4	Matrix spike sample	GrossB	856	833	103	103	↓
4/5	Duplicate RPD	↓	900.4	919.6	2	2	↓
N	Chemical recovery						

Comments: _____

LDC #: 37601R22

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CR
2nd reviewer: CR

METHOD: Radiochemistry (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?

Analyte results for Gross α reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$

Recalculation: $0.24 - 0.097 / 2.22(0.038L)(0.0944) = 17.9 pCi/L$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

#	Sample ID	Analyte	Reported Concentration (pCi/L)	Calculated Concentration (pCi/L)	Acceptable (Y/N)
	2	Gross α	17.9	17.9	Y
	3	Gross β	44.4	44.4	Y

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: January 3, 2017

Parameters: Radium-226

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19668-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M003A-R_161024	160-19668-2	Water	10/24/16
M034A-R_161025	160-19668-3	Water	10/25/16
M034A-R_161025MS	160-19668-3MS	Water	10/25/16
M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Radium-226 by Environmental Protection Agency (EPA) Method 903.0

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Self absorption curves were generated for each sample when applicable.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Sample EB03_161025 was identified as an equipment blank. No contaminants were found.

Sample SB01_161024 (from SDG 160-19638-1) was identified as a source blank. No contaminants were found.

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 not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Carrier Recovery

All carrier recoveries were within validation criteria.

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL) with the following exceptions:

Sample	Isotope	MDA (pCi/L)	RL (pCi/L)
M003A-R_161024	Radium-226	1.03	1.00

The MDA was greater than the RL as listed above.

XII. Sample Result Verification

All sample result verifications were acceptable.

XIII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Radium-226 - Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Radium-226 - Laboratory Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Radium-226 - Field Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

LDC #: 37601R29a **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19668-1 Stage ~~2B~~ 4 Page: 1 of 1
Laboratory: Test America Reviewer: a
2nd Reviewer:

METHOD: Radium 226 (EPA Method 903.0)

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.	Initial calibration	A	✓self-absorption curve
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB=1 SB=SB01_161024 (160-19638-1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VII.	Duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Carrier recovery	A	
XI.	Minimum detectable activity (MDA)	SW	
XII.	Sample result verification	A	
XIII	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	~~EB03_161025~~	~~160-19668-1~~	~~Water~~	~~10/25/16~~
2	M003A-R_161024	160-19668-2	Water	10/24/16
3	M034A-R_161025	160-19668-3	Water	10/25/16
4	M034A-R_161025MS	160-19668-3MS	Water	10/25/16
5	M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

LDC #: 37601R19a

VALIDATION FINDINGS CHECKLIST

Reviewer: CA
2nd Reviewer: CA

Method: Radiochemistry (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) 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 percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error rations (DER) ≤1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓	✓		
Were the Minimum Detectable Activities (MDA) < RL?				

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 37601R29a

VALIDATION FINDINGS WORKSHEET
Minimum Detectable Activities

Reviewer:
2nd Reviewer:

METHOD: Radiochemistry (Method: See Cover)

The following sample MDAs are above the RDL:

#	Sample ID	Isotope	MDA (pCi/L)	RL (pCi/L)	Qualifications
	2	Ra-226	1.03	1.00	Text (MDA>RL)

Comments:

LDC #: 37601B29

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: CR
2nd Reviewer: Q

METHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Ra-226	12.47	11.1	112	112	Y
4	Matrix spike sample		25.81	22.2	116	116	
4/5	Duplicate RPD		25.81	27.02	5	5	
3	Chemical recovery	Ba	0.0254	0.0351	72.4	72.4	Y

Comments: _____

LDC #: 37601R2a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CR
2nd reviewer: CV

METHOD: Radiochemistry (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?

Analyte results for _____ reported with a positive detect were recalculated and verified using the following equation:

Concentration =

$$\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

Recalculation:

all ND

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: January 3, 2017

Parameters: Radium-228

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19668-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M003A-R_161024	160-19668-2	Water	10/24/16
M034A-R_161025	160-19668-3	Water	10/25/16
M034A-R_161025MS	160-19668-3MS	Water	10/25/16
M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Radium-228 by Environmental Protection Agency (EPA) Method 904.0

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Self absorption curves were generated for each sample when applicable.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Sample EB03_161025 was identified as an equipment blank. No contaminants were found with the following exceptions:

Blank ID	Sampling Date	Isotope	Activity	Associated Samples
EB03_161025	10/25/16	Radium-228	0.423 pCi/L	M034A-R_161025

Sample SB01_161024 (from SDG 160-19638-1) was identified as a source blank. No contaminants were found.

Sample activities were compared to activities detected in the field blanks. The sample activities were either not detected or were significantly greater (>5X blank activity) than the activities found in the associated field blanks with the following exceptions:

Sample	Isotope	Reported Activity	Modified Final Activity
M034A-R_161025	Radium-228	0.926 pCi/g	0.926U pCi/g

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 not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Carrier Recovery

All carrier recoveries were within validation criteria.

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL).

XII. Sample Result Verification

All sample result verifications were acceptable.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to equipment blank contamination, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Radium-228 - Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Radium-228 - Laboratory Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Radium-228 - Field Blank Data Qualification Summary - SDG 160-19668-1

Sample	Isotope	Modified Final Activity	A or P
M034A-R_161025	Radium-228	0.926U pCi/g	A

LDC #: 37601R29b **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19668-1 Stage 2B 4 Page: 1 of 1
Laboratory: Test America Reviewer: CA
2nd Reviewer: CA

METHOD: Radium 228 (EPA Method 904.0)

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.	Initial calibration	A	✓ self-absorption curve
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	SW	EB=1 SB=SB01_161024 (160-19638-1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VII.	Duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Carrier recovery	A	
XI.	Minimum detectable activity (MDA)	A	
XII.	Sample result verification	A	
XIII.	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	~~EB03_161025~~	160-19668-1	Water	10/25/16
2	M003A-R_161024	160-19668-2	Water	10/24/16
3	M034A-R_161025	160-19668-3	Water	10/25/16
4	M034A-R_161025MS	160-19668-3MS	Water	10/25/16
5	M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

LDC #: 31601R29b

VALIDATION FINDINGS CHECKLIST

Reviewer: AL
2nd Reviewer: AL

Method: Radiochemistry (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) 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 percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error rations (DER) <1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.	✓			

LDC #: 37601R29b

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Radiochemistry, Method See Cover
Blank units: pCi/L **Associated sample units:** pCi/g
Sampling date: 10/25/16 Soil factor applied NA
Field blank type: (circle one) Field Blank / Rinsate / Other: Associated Samples: 3

Analyte	Blank ID	Action Limit	Sample Identification							
	1		3							
Ra-228	0.423	2.115	0.926							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 37601R296

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: CR
2nd Reviewer: CR

METHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Ra-228	16.47	14.2	116	116	Y
4	Matrix spike sample	↓	38.774	28.5	136	136	↓
4/5	Duplicate RPD	↓	39.70	37.89	5	5	↓
2	Chemical recovery	Ba	0.0263	0.0351	74.9	74.9	↓

Comments: _____

LDC #: 37640R29b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CR
2nd reviewer: CR

METHOD: Radiochemistry (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?

Analyte results for Ra-228 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

Recalculation:

$2 = \frac{\frac{126}{200} - \frac{325}{1000}}{2.22(0.4634)(.5003)(0.749)(0.785)} \times 1.714 =$

1.773 pCi/L

#	Sample ID	Analyte	Reported Concentration (pCi/L)	Calculated Concentration (pCi/L)	Acceptable (Y/N)
	2	Ra-228	1.79	1.79	Y
	3	Ra-228	0.926	0.926	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: January 3, 2017

Parameters: Tritium

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19668-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M003A-R_161024	160-19668-2	Water	10/24/16
M034A-R_161025	160-19668-3	Water	10/25/16
M034A-R_161025MS	160-19668-3MS	Water	10/25/16
M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Tritium by Environmental Protection Agency (EPA) Method 906.0

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Self absorption curves were generated for each sample when applicable.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Sample EB03_161025 was identified as an equipment blank. No contaminants were found.

Sample SB01_161024 (from SDG 160-19638-1) was identified as a source blank. No contaminants were found.

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 not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL).

XI. Sample Result Verification

All sample result verifications were acceptable.

XII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Tritium - Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Tritium - Laboratory Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Tritium - Field Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

LDC #: 37601R34 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19668-1 Stage 2B 4 Page: 1 of 1
Laboratory: Test America Reviewer:
2nd Reviewer:

METHOD: Tritium (EPA Method 906.0)

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.	Initial calibration	A	✓Quenchcurve
III.	Calibration verification	A	
IV.	Laboratory Blanks	~~A~~A	EB=1 SB=2
V.	Field blanks	ND	↓ SB=SB01_161024(160-19638-1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VII.	Duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Minimum detectable activity (MDA)	A	
XI.	Sample result verification	A	
XII.	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	EB03_161025	160-19668-1	Water	10/25/16
2	M003A-R_161024	160-19668-2	Water	10/24/16
3	M034A-R_161025	160-19668-3	Water	10/25/16
4	M034A-R_161025MS	160-19668-3MS	Water	10/25/16
5	M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16
6				
7				
8				
9				
10				
11				
12				
13				
14				

Notes:

LDC #: 37601R34

VALIDATION FINDINGS CHECKLIST

Reviewer: CA
2nd Reviewer: CA

Method: Radiochemistry (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) 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 percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error rations (DER) ≤1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?			✓	
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 37601R34

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	H-3	3131	2980	105	105	Y
4	Matrix spike sample	↓	3325	2990	111	111	↓
4/5	Duplicate RPD	↓	3325	3383	2	2	↓
N	Chemical recovery						

Comments: _____

LDC #: 37601R31

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CR
2nd reviewer: CR

METHOD: Radiochemistry (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?

Analyte results for _____ reported with a positive detect were recalculated and verified using the following equation:

Concentration =

$$\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

Recalculation:

all ND

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: January 3, 2017

Parameters: Isotopic Uranium

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19668-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M003A-R_161024	160-19668-2	Water	10/24/16
M034A-R_161025	160-19668-3	Water	10/25/16
M034A-R_161025MS	160-19668-3MS	Water	10/25/16
M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Isotopic Uranium by EML A-01-R 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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Sample EB03_161025 was identified as an equipment blank. No contaminants were found.

Sample SB01_161024 (from SDG 160-19638-1) was identified as a source blank. No contaminants were found.

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 not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Tracer Recovery

All tracer recoveries were within validation criteria.

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL) with the following exceptions:

Sample	Isotope	MDA (pCi/L)	RL (pCi/L)
M003A-R_161024	Uranium-233/234 Uranium-235/236 Uranium-238	6.50 5.55 5.30	1.00 1.00 1.00
M034A-R_161025	Uranium-233/234 Uranium-235/236 Uranium-238	7.15 6.76 6.64	1.00 1.00 1.00

The MDA was greater than the RL as listed above.

XII. Sample Result Verification

All sample result verifications were acceptable.

XIII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Isotopic Uranium - Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Isotopic Uranium - Laboratory Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Isotopic Uranium - Field Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

LDC #: 37601R59 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19668-1 Stage ~~2B~~ 4 Page: 1 of 1
Laboratory: Test America Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Isotopic Uranium (EML A-01-R Mod.)

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.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB=1 SB= SB01_161024 (160-19638-1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VII.	Duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Tracer Recovery	A	
XI.	Minimum detectable activity (MDA)	SW	
XII.	Sample result verification	~~A~~	
XIII.	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	EB03_161025	160-19668-1	Water	10/25/16
2	M003A-R_161024	160-19668-2	Water	10/24/16
3	M034A-R_161025	160-19668-3	Water	10/25/16
4	M034A-R_161025MS	160-19668-3MS	Water	10/25/16
5	M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

LDC #: 37601R59

VALIDATION FINDINGS CHECKLIST

Reviewer: CA
2nd Reviewer: CV

Method: Radiochemistry (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) 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 percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error rations (DER) ≤1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?		✓		

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 37601R59

VALIDATION FINDINGS WORKSHEET
Minimum Detectable Activities

Reviewer: a
2nd Reviewer: a

METHOD: Radiochemistry (Method: See Cover)

The following sample MDAs are above the RDL:

#	Sample ID	Isotope	MDA (pCi/L)	RL (pCi/L)	Qualifications
	2	U-233/234	6.50	1.00	Text (MDA>RL)
		U-235/236	5.55	1.00	
		U-238	5.30	1.00	
	3	U-233/234	7.15	1.00	
		U-235/236	6.76	1.00	
		U-238	6.64	1.00	

Comments:

LDC #: 37601R59

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: CR
2nd Reviewer:

METHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True Where, Found = activity of each analyte measured in the analysis of the sample. True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2 Where, S = Original sample activity, D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
~~U2~~ LCS	Laboratory control sample	U-233/4	65.6	63.7	103	103	Y
4	Matrix spike sample	U-238	554.4	621	89	89	
~~4~~/5	Duplicate RPD	U-233/4	549.5	553.2	1	1	
2	Chemical recovery	U-232	382.476	737	51.9	51.9	

Comments: _____

LDC #: 37601R59

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CR
2nd reviewer:

METHOD: Radiochemistry (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?

Analyte results for U-233/234 reported with a positive detect were recalculated and verified using the following equation:

Concentration = $\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

Recalculation:

2= 11-1.6667 / 2.22(0.998)(0.0101L)(0.2682)(0.5188)(400.0 min) = 7.49 pCi/L

#	Sample ID	Analyte	Reported Concentration (pCi/L)	Calculated Concentration (pCi/L)	Acceptable (Y/N)
	2	U-233/234	7.53	7.49	Y

Note:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: January 3, 2017

Parameters: Strontium-90

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19668-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M003A-R_161024	160-19668-2	Water	10/24/16
M034A-R_161025	160-19668-3	Water	10/25/16
M034A-R_161025MS	160-19668-3MS	Water	10/25/16
M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Strontium-90 by Environmental Protection Agency (EPA) Method 905

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

Self absorption curves were generated for each sample when applicable.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Sample EB03_161025 was identified as an equipment blank. No contaminants were found.

Sample SB01_161024 (from SDG 160-19638-1) was identified as a source blank. No contaminants were found.

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 not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Carrier Recovery

All carrier recoveries were within validation criteria.

XI. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL).

XII. Sample Result Verification

All sample result verifications were acceptable.

XIII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Strontium-90 - Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Strontium-90 - Laboratory Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Strontium-90 - Field Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

LDC #: 37601R61 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/21/16
SDG #: 160-19668-1 Stage ~~2B~~ 4 Page: 1 of 1
Laboratory: Test America Reviewer:
2nd Reviewer:

METHOD: Strontium-90 (EPA Method 905)

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.	Initial calibration	A	✓self-absorption curve
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB=1 SB=SB01_161024(160-19638-1)
VI.	Matrix Spike/Matrix Spike Duplicates	A	MS/D
VII.	Duplicates	N	
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Carrier recovery	A	
XI.	Minimum detectable activity (MDA)	A	
XII.	Sample result verification	A	
XIII.	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~~	EB03_161025	~~160-19668-1~~	~~Water~~	~~10/25/16~~
2	M003A-R_161024	160-19668-2	Water	10/24/16
3	M034A-R_161025	160-19668-3	Water	10/25/16
4	M034A-R_161025MS	160-19668-3MS	Water	10/25/16
5	M034A-R_161025MSD	160-19668-3MSD	Water	10/25/16
6				
7				
8				
9				
10				
11				
12				
13				

Notes:

LDC #: 37601R61

VALIDATION FINDINGS CHECKLIST

Reviewer: CA
2nd Reviewer: CA

Method: Radiochemistry (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks	✓			
Were blank analyses performed as required?				
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) 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 percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.	✓			
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?	✓			
Were all duplicate sample duplicate error rations (DER) ≤1.42?.	✓			
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?	✓			
Were tracer/carrier recoveries within the QC limits?	✓			
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 37601R61

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Page: 1 of 1
Reviewer: CR
2nd Reviewer: Q

METHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True

Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2

Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Sr-90	9.566	8.54	112	112	Y
4	Matrix spike sample		38.84	34.1	114	114		
4/5	Duplicate RPD		38.84	38.32	1	1		
3	Chemical recovery	Sr	0.0673	0.105	64.1	64.2	

Comments: _____

TOTCLC.35

LDC #: 37601R61

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CR
2nd reviewer:

METHOD: Radiochemistry (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?

Analyte results for _____ reported with a positive detect were recalculated and verified using the following equation:

Concentration =

$$\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

Recalculation:

all ND

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: January 3, 2017

Parameters: Cesium-137 & Cobalt-60

Validation Level: Stage 4

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 160-19668-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
M003A-R_161024	160-19668-2	Water	10/24/16
M034A-R_161025	160-19668-3	Water	10/25/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), the Multi Agency Radiological Laboratory Analytical Protocols (MARLAP) Manual (July 2004) and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Cesium-137 and Cobalt-60 by Environmental Protection Agency (EPA) Method 901.1

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

Counting and detector efficiency were determined for each detector and each radionuclide.

III. Continuing Calibration

Continuing calibration and background determination were performed at the required frequencies. Results were within laboratory control limits.

IV. Blanks

Laboratory blanks were analyzed as required by the method. Blank results contained less than the minimum detectable activity (MDA).

V. Field Blanks

Sample EB03_161025 was identified as an equipment blank. No contaminants were found.

Sample SB01_161024 (from SDG 160-19638-1) was identified as a source blank. No contaminants were found.

VI. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicates (MSD) analyses were not required by the method.

VII. Duplicate Sample Analysis

Duplicate (DUP) sample analysis was not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Minimum Detectable Activity

All minimum detectable activities (MDA) met reporting limits (RL).

XI. Sample Result Verification

All sample result verifications were acceptable.

XII. 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. Based upon the data validation all results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Cesium-137 & Cobalt-60 - Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Cesium-137 & Cobalt-60 - Laboratory Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Cesium-137 & Cobalt-60 - Field Blank Data Qualification Summary - SDG 160-19668-1

No Sample Data Qualified in this SDG

LDC #: 37601R93
SDG #: 160-19668-1
Laboratory: Test America

VALIDATION COMPLETENESS WORKSHEET

Stage 2B 4

Date: 12/21/16
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: Cesium-137 & Colbalt-60 (EPA Method 901.1)

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.	Initial calibration	A	
III.	Calibration verification	A	
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	EB=1 SB=SB01_161024 (160-19638-1)
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicates	N	↓
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	N	
X.	Minimum detectable activity (MDA)	A	
XI.	Sample result verification	A	
XII.	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	EB03_161025	160-19668-1	Water	10/25/16
2	M003A-R_161024	160-19668-2	Water	10/24/16
3	M034A-R_161025	160-19668-3	Water	10/25/16
4				
5				
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11				
12				
13				
14				

Notes:

LDC #: 37760IR93

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Radiochemistry (EPA Method See cover)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
II. Calibration				
Were all instruments and detectors calibration as required?	✓			
Were NIST traceable standards used for all calibrations?	✓			
Was the check source identified by activity and radionuclide?	✓			
Were check sources including background counts analyzed at the requiried frequency and within laboratory control limits?	✓			
III. Blanks				
Were blank analyses performed as required?	✓			
Were any activities detected in the blanks greater than the minimum detectable activity (MDA)? If yes, please see the Blanks validation completeness worksheet.		✓		
IV. Matrix spikes and Duplicates				
Were a matrix spike (MS) 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 percent recoveries (%R) within the QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.			✓	
Was a duplicate sample anaylzed at the required frequency of 5% in this SDG?		✓		
Were all duplicate sample duplicate error rations (DER) ≤1.42?.			✓	
V. Laboratory control samples				
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 75-125%	✓			
VI. Sample Chemical/Carrier Recovery				
Was a tracer/carrier added to each sample?			✓	
Were tracer/carrier recoveries within the QC limits?			✓	
VII. Regional Quality Assurance and Quality Control				
Were performance evaluation (PE) samples performed?		✓		
Were the performance evaluation (PE) samples within the acceptance limits?			✓	
VIII. Sample Result Verification				
Were activities adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
Were the Minimum Detectable Activities (MDA) < RL?	✓			

Validation Area	Yes	No	NA	Findings/Comments
IX. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
X. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XI. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 37760IR93

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: SR
2nd Reviewer:

METHOD: Radiochemistry (Method: see cover)

Percent recoveries (%R) for a laboratory control sample, a matrix spike and a matrix spike duplicate sample were recaluculated using the following formula:

%R = Found x 100 / True Where, Found = activity of each analyte measured in the analysis of the sample.
True = activity of each analyte in the source.

A matrix spike and matrix spike duplicate relative percent difference (RPD) was recalculated using the following formula:

RPD = |S-D| x 100 / (S+D)/2 Where, S = Original sample activity
D = Duplicate sample activity

Sample ID	Type of Analysis	Analyte	Found/S (units)	True/D (units)	Recalculated %R or RPD	Reported %R or RPD	Acceptable (Y/N)
LCS	Laboratory control sample	Co-60	39910	41300	97	97	Y
N	Matrix spike sample						
N	Duplicate RPD						
N	Chemical recovery						

Comments: _____

LDC #: 37760IR93

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: CR
2nd reviewer: CR

METHOD: Radiochemistry (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?

Analyte results for _____ reported with a positive detect were recalculated and verified using the following equation:

Concentration =

$$\frac{(cpm - background)}{2.22 \times E \times SA \times Vol}$$

E = Counter Efficiency
SA = Self-absorbance factor
Vol = Volume of sample

Recalculation:

all ND

#	Sample ID	Analyte	Reported Concentration ( )	Calculated Concentration ( )	Acceptable (Y/N)

Note: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NAS Alameda Point, BGMP

LDC Report Date: January 3, 2017

Parameters: Dechlorinating Bacteria

Validation Level: Stage 2B

Laboratory: Microbial Insights

Sample Delivery Group (SDG): 101NJ

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
DUP02_161026	N/A	Water	10/26/16
M051A_161026	N/A	Water	10/26/16
M053A_161026	N/A	Water	10/26/16
M055A_161026	N/A	Water	10/26/16
M057A_161026	N/A	Water	10/26/16

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 (Field Sampling Plan and Quality Assurance Project Plan) for Basewide Groundwater Monitoring Program, Alameda Point, Alameda, California (August 2015), the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0 (July 2013), and a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines (CLPNFG) for Inorganic Superfund Data Review (January 2010). 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:

Dechlorinating Bacteria by CENSUS

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.

NJ (Presumptive and Estimated): The analysis indicates the presence of a compound or analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

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.

II. Initial Calibration

All criteria for the initial calibration were met.

III. Continuing Calibration

Continuing calibration frequency and analysis criteria were met.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the method. 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) analyses were not required by the method.

VII. Duplicates

Duplicate (DUP) sample analysis was not required by the method.

VIII. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the method. Percent recoveries (%R) were within QC limits.

IX. Field Duplicates

Samples DUP02_161026 and M053A_161026 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026	M053A_161026				
Dehaloccoides	442	440	0 (≤30)	-	-	-

Analyte	Concentration (mg/L)		RPD (Limits)	Difference (Limits)	Flag	A or P
	DUP02_161026	M053A_161026				
tceA Reductase	4.00	3.80	5 (≤30)	-	-	-
BAV1 Vinyl Chloride Reductase	132	139	5 (≤30)	-	-	-
Vinyl Chloride Reductase	3.80	2.70	34 (≤30)	-	J (all detects)	A

X. Sample Result Verification

Raw data were not reviewed for Stage 2B validation.

XI. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to field duplicate RPD, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NAS Alameda Point, BGMP
Dechlorinating Bacteria - Data Qualification Summary - SDG 101NJ

Sample	Analyte	Flag	A or P	Reason
DUP02_161026 M053A_161026	Vinyl Chloride Reductase	J (all detects)	A	Field duplicates (RPD)

NAS Alameda Point, BGMP
Dechlorinating Bacteria - Laboratory Blank Data Qualification Summary - SDG 101NJ

No Sample Data Qualified in this SDG

NAS Alameda Point, BGMP
Dechlorinating Bacteria - Field Blank Data Qualification Summary - SDG 101NJ

No Sample Data Qualified in this SDG

LDC #: 37601S6

VALIDATION COMPLETENESS WORKSHEET

Date: 12/22/16

SDG #: 101NJ Stage 2B

Page: 1 of 1

Laboratory: ~~microbialinsights~~ Microbial Insights Dechlorinating Bacteria

Reviewer:

2nd Reviewer:

METHOD: (Analyte) ~~Dehalococcoides~~ (CENSUS)

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	Initial calibration	~~A/A~~ not required	
III.	Calibration verification	~~A/A~~ Ea	
IV	Laboratory Blanks	A	
V	Field blanks	N	
VI.	Matrix Spike/Matrix Spike Duplicates	N	not required
VII.	Duplicate sample analysis	N	J
VIII.	Laboratory control samples	A	LCS
IX.	Field duplicates	SW	(1,3)
X.	Sample result verification	N	
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	DUP02_161026	N/A	Water	10/26/16
2	M051A_161026	N/A	Water	10/26/16
3	M053A_161026	N/A	Water	10/26/16
4	M055A_161026	N/A	Water	10/26/16
5	M057A_161026	N/A	Water	10/26/16
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

LDC#: 37601S6

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer:
2nd Reviewer:

Inorganics, Method See Cover

Analyte	Concentration (mg/L)		RPD (≤30)	Difference	Limits	Qualification (Parent only)
	1	3				
Dehaloccoides	442	440	0			
tceA Reductase	4.00	3.80	5			
BAV1 Vinyl Chloride Reductace	132	139	5			
Vinyl Chloride Reductase	3.80	2.70	34			Jdet/A

\\LDCFILESERVER\Validation\FIELD DUPLICATES\FD_inorganic\37601S6.wpd

The zip file contains two files:

File	Format	Description	
1) Readme_Alameda_010317.docx	MS Word	A "Readme" file (this document).	
2) ValExport_Basewide_2017Q1_20161215.xlsx	MS Excel	A spreadsheet for the following SDGs:	
		320-22797-1	37601A
		320-22986-1	37601B
		320-23030-1	37601C
		320-23072-1	37601D
		320-23077-1	37601E
		320-23087-1	37601F
		320-23100-1	37601G
		320-23173-1	37601H
		320-23188-1	37601I
		1601348	37601J
		1601359	37601K
		1601360	37601L
		1601380	37601M
		1601381	37601N
		1601395	37601O
		1601391	37601P
		160-19638-1	37601Q
		160-19668-1	37601R
		101NJ	37601S

No discrepancies were observed between the hardcopy data packages and the electronic data deliverables during EDD population of validation qualifiers. A 100% verification of the EDD was not performed.

Please contact Pei Geng at (760) 827-1100 if you have any questions regarding this electronic data submittal.

INSTALLATION_ID	SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	SAMPLE_NAME	SAMPLE_MATRIX_DESC	COLLECT_DATE	ANALYTICAL_METHOD_GRP_DESC	SDG
ALAMEDA_NAS						EB-26SW04_161101	Water for QC samples	1-Nov-16	Perfluoroalkyl Compounds	1601395
ALAMEDA_NAS						FB-26SW04_161101	Water for QC samples	1-Nov-16	Perfluoroalkyl Compounds	1601395
ALAMEDA_NAS	SITE 00026	26SW04	Monitoring well	6038818.36	2113380.54	26SW04_161101	Ground water	1-Nov-16	Perfluoroalkyl Compounds	1601395
ALAMEDA_NAS						EB18_161101	Water for QC samples	1-Nov-16	Perfluoroalkyl Compounds	1601395
ALAMEDA_NAS	SITE 00026	26SW01	Monitoring well	6038540.36	2113499.54	26SW01_161101	Ground water	1-Nov-16	Perfluoroalkyl Compounds	1601395
ALAMEDA_NAS	SITE 00026	26MW08	Monitoring well	6038985.4	2114557.4	26MW08_161101	Ground water	1-Nov-16	Perfluoroalkyl Compounds	1601395
ALAMEDA_NAS	SITE 00026	26MW08	Monitoring well	6038985.4	2114557.4	DUP07_161101	Ground water	1-Nov-16	Perfluoroalkyl Compounds	1601395
ALAMEDA_NAS	SITE 00026	26MW06	Monitoring well	6039140.5	2114572.3	26MW06_161101	Ground water	1-Nov-16	Perfluoroalkyl Compounds	1601395