Tetra Tech **INTERNAL CORRESPONDENCE**

TO:	**J. ORIENT**	**DATE:**	**February 5, 2013**
FROM:	**M. CARSON**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION – PFOA/PFOS** **NAS BRUNSWICK, CTO 432** **SDG 280-36837-1**		

SAMPLES: 4/Soil/

NASB-B611-SB03-0304 NASB-B611-SB04-0910
NASB-B611-SB05-0708 NASB-B611-SB06-0910

1/Water/
NASB-B611-RB120712

Overview

The sample set for NAS Brunswick, CTO 432, SDG 280-36837-1 consisted of four (4) soil environmental samples and one rinsate blank. All of the samples were analyzed for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). This SDG contained no field duplicate pairs.

The samples were collected by Tetra Tech on December 5th, 6th, and 7th, 2012 and analyzed by TestAmerica. All analyses were conducted in accordance with TestAmerica method DV-LC-0012. The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • GC/MS Instrument Tuning and System Performance
* • Blank Results
* • Initial and Continuing Calibration
* • Blank Spike Results
* • Surrogate Spike Recoveries
* • Internal Standard Recoveries
* • Matrix Spike/Matrix Spike Duplicate Results
* • Field Duplicate Precision
* • Detection Limits

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains the documentation to support the findings as discussed in this data validation report. A Tier II validation was performed on the data in this SDG. The text of this report has been formulated to address only those problem areas affecting data quality.

PFOA/PFOS

All sample results were acceptable for validation purposes.

Notes:

Non-detected results were reported to the Limit of Detection (LOD).

Positive results less than the Limit of Quantitation (LOQ) and less than the Method Detection limit (MDL) were reported as estimated (J).

EXECUTIVE SUMMARY

Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the criteria in the project specific SAP, the "USEPA Region 1 Laboratory Data Validation Functional Guidelines – Part II" (12/96), and the Department of Defense (DOD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (October 2010).

Tetra Tech
Megan Carson
Chemist/Data Validator

Tetra Tech
Joseph A. Samchuck
Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C –Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A	=	Lab Blank Contamination
B	=	Field Blank Contamination
C	=	Calibration Noncompliance (i.e., % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01	=	GC/MS Tuning Noncompliance
D	=	MS/MSD Recovery Noncompliance
E	=	LCS/LCSD Recovery Noncompliance
F	=	Lab Duplicate Imprecision
G	=	Field Duplicate Imprecision
H	=	Holding Time Exceedance
I	=	ICP Serial Dilution Noncompliance
J	=	ICP PDS Recovery Noncompliance; MSA's $r < 0.995$
K	=	ICP Interference - includes ICS % R Noncompliance
L	=	Instrument Calibration Range Exceedance
M	=	Sample Preservation Noncompliance
N	=	Internal Standard Noncompliance
N01	=	Internal Standard Recovery Noncompliance Dioxins
N02	=	Recovery Standard Noncompliance Dioxins
N03	=	Clean-up Standard Noncompliance Dioxins
O	=	Poor Instrument Performance (i.e., base-time drifting)
P	=	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q	=	Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R	=	Surrogates Recovery Noncompliance
S	=	Pesticide/PCB Resolution
T	=	% Breakdown Noncompliance for DDT and Endrin
U	=	RPD between columns/detectors >40% for positive results determined via GC/HPLC
V	=	Non-linear calibrations; correlation coefficient $r < 0.995$
W	=	EMPC result
X	=	Signal to noise response drop
Y	=	Percent solids <30%
Z	=	Uncertainty at 2 sigma deviation is less than sample activity
Z1	=	Tentatively Identified Compound considered presumptively present
Z2	=	Tentatively Identified Compound column bleed

PROJ_NO: 00958	NSAMPLE	NASB-B611-SB03-0304			NASB-B611-SB04-0910			NASB-B611-SB05-0708			NASB-B611-SB06-0910		
SDG: 280-36837-1	LAB_ID	280-36837-4			280-36837-1			280-36837-2			280-36837-3		
FRACTION: MISC	SAMP_DATE	12/6/2012			12/5/2012			12/5/2012			12/6/2012		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	93.8			91.7			93.2			88.2		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		0.59	U		0.91			0.62	U		0.65	U	
PERFLUOROOCTANE SULFONIC ACID		0.52	J	P	220			0.62	U		1.8		

PROJ_NO: 00958	NSAMPLE	NASB-B611-RB120712		
SDG: 280-36837-1	LAB_ID	280-36837-5		
FRACTION: MISC	SAMP_DATE	12/7/2012		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		0.0079	U	
PERFLUOROOCTANE SULFONIC ACID		0.02	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Client: Tetra Tech, Inc

Job Number: 280-36837-1

Client Sample ID: **NASB-B611-RB120712**

Lab Sample ID: 280-36837-5
Client Matrix: Water

Date Sampled: 12/07/2012 0900
Date Received: 12/08/2012 0900

PFOA/PFOS PFOA/PFOS LC/MS/MS

Analysis Method:	PFOA/PFOS	Analysis Batch:	280-152065	Instrument ID:	LC_LCMS5
Prep Method:	3535	Prep Batch:	280-151664	Lab File ID:	PC512I13020.d
Dilution:	1.0			Initial Weight/Volume:	254.4 mL
Analysis Date:	12/13/2012 1150			Final Weight/Volume:	5 mL
Prep Date:	12/11/2012 1709			Injection Volume:	20 uL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Perfluorooctanoic acid (PFOA)	0.0079	U	0.0044	0.020
Perfluorooctane Sulfonate (PFOS)	0.020	U	0.0096	0.029

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	104		60 - 155
13C8 PFOS	104		45 - 130

Client: Tetra Tech, Inc

Job Number: 280-36837-1

Client Sample ID: **NASB-B611-SB03-0304**

Lab Sample ID: 280-36837-4
Client Matrix: Solid
% Moisture: 6.2

Date Sampled: 12/06/2012 0840
Date Received: 12/08/2012 0900

PFOA/PFOS PFOA/PFOS LC/MS/MS

Analysis Method:	PFOA/PFOS	Analysis Batch:	280-152065	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-151533	Lab File ID:	PC512I13015.d
Dilution:	1.0			Initial Weight/Volume:	10.80 g
Analysis Date:	12/13/2012 1112			Final Weight/Volume:	20 mL
Prep Date:	12/11/2012 1000			Injection Volume:	20 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
Perfluorooctanoic acid (PFOA)		0.59	U	0.21	0.79
Perfluorooctane Sulfonate (PFOS)		0.52	J	0.19	0.79

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	95		57 - 153
13C8 PFOS	107		70 - 130

Client: Tetra Tech, Inc

Job Number: 280-36837-1

Client Sample ID: **NASB-B611-SB04-0910**

Lab Sample ID: 280-36837-1
Client Matrix: Solid
% Moisture: 8.3

Date Sampled: 12/05/2012 1445
Date Received: 12/08/2012 0900

PFOA/PFOS PFOA/PFOS LC/MS/MS

Analysis Method:	PFOA/PFOS	Analysis Batch:	280-152065	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-151533	Lab File ID:	PC512I13010.d
Dilution:	1.0			Initial Weight/Volume:	10.47 g
Analysis Date:	12/13/2012 1033			Final Weight/Volume:	20 mL
Prep Date:	12/11/2012 1000			Injection Volume:	20 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
Perfluorooctanoic acid (PFOA)		0.91		0.22	0.83
Perfluorooctane Sulfonate (PFOS)		220		0.20	0.83

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	104		57 - 153
13C8 PFOS	102		70 - 130

Client: Tetra Tech, Inc

Job Number: 280-36837-1

Client Sample ID: **NASB-B611-SB05-0708**

Lab Sample ID: 280-36837-2
Client Matrix: Solid

% Moisture: 6.8

Date Sampled: 12/05/2012 0940
Date Received: 12/08/2012 0900

PFOA/PFOS PFOA/PFOS LC/MS/MS

Analysis Method:	PFOA/PFOS	Analysis Batch:	280-152065	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-151533	Lab File ID:	PC512I13011.d
Dilution:	1.0			Initial Weight/Volume:	10.46 g
Analysis Date:	12/13/2012 1041			Final Weight/Volume:	20 mL
Prep Date:	12/11/2012 1000			Injection Volume:	20 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
Perfluorooctanoic acid (PFOA)		0.62	U	0.22	0.82
Perfluorooctane Sulfonate (PFOS)		0.62	U	0.19	0.82

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	101		57 - 153
13C8 PFOS	103		70 - 130

Client: Tetra Tech, Inc

Job Number: 280-36837-1

Client Sample ID: **NASB-B611-SB06-0910**

Lab Sample ID: 280-36837-3
Client Matrix: Solid
% Moisture: 11.8

Date Sampled: 12/06/2012 0900
Date Received: 12/08/2012 0900

PFOA/PFOS PFOA/PFOS LC/MS/MS

Analysis Method:	PFOA/PFOS	Analysis Batch:	280-152065	Instrument ID:	LC_LCMS5
Prep Method:	PFC leach	Prep Batch:	280-151533	Lab File ID:	PC512I13014.d
Dilution:	1.0			Initial Weight/Volume:	10.39 g
Analysis Date:	12/13/2012 1104			Final Weight/Volume:	20 mL
Prep Date:	12/11/2012 1000			Injection Volume:	20 uL

Analyte	DryWt Corrected: Y	Result (ug/Kg)	Qualifier	DL	LOQ
Perfluorooctanoic acid (PFOA)		0.65	U	0.23	0.87
Perfluorooctane Sulfonate (PFOS)		1.8		0.21	0.87

Surrogate	%Rec	Qualifier	Acceptance Limits
13C8 PFOA	102		57 - 153
13C8 PFOS	104		70 - 130

General Chemistry

Client Sample ID: **NASB-B611-SB03-0304**

Lab Sample ID: 280-36837-4

Client Matrix: Solid

Date Sampled: 12/06/2012 0840

Date Received: 12/08/2012 0900

Analyte	Result	Qual	Units	DL	LOQ	Dil	Method
Percent Moisture	6.2		%	0.10	0.10	1.0	Moisture

Analysis Batch: 280-151646 Analysis Date: 12/11/2012 1441 DryWt Corrected: N

General Chemistry

Client Sample ID: **NASB-B611-SB04-0910**

Lab Sample ID: 280-36837-1
Client Matrix: Solid

Date Sampled: 12/05/2012 1445
Date Received: 12/08/2012 0900

Analyte	Result	Qual	Units	DL	LOQ	Dil	Method
Percent Moisture	8.3		%	0.10	0.10	1.0	Moisture

Analysis Batch: 280-151646 Analysis Date: 12/11/2012 1441 DryWt Corrected: N

General Chemistry

Client Sample ID: **NASB-B611-SB05-0708**

Lab Sample ID: 280-36837-2

Client Matrix: Solid

Date Sampled: 12/05/2012 0940

Date Received: 12/08/2012 0900

Analyte	Result	Qual	Units	DL	LOQ	Dil	Method
Percent Moisture	6.8		%	0.10	0.10	1.0	Moisture

Analysis Batch: 280-151646 Analysis Date: 12/11/2012 1441 DryWt Corrected: N

General Chemistry

Client Sample ID: **NASB-B611-SB06-0910**

Lab Sample ID: 280-36837-3

Client Matrix: Solid

Date Sampled: 12/06/2012 0900

Date Received: 12/08/2012 0900

Analyte	Result	Qual	Units	DL	LOQ	Dil	Method
Percent Moisture	12		%	0.10	0.10	1.0	Moisture

Analysis Batch: 280-151646 Analysis Date: 12/11/2012 1441 DryWt Corrected: N

APPENDIX C

REGIONAL WORKSHEETS

APPENDIX D

SUPPORT DOCUMENTATION

Chain of Custody Record

Sampler ID _____

Temperature on Receipt 1.2 @ IR1 12812

Drinking Water? Yes ☐ No ☐

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124-280 (0508)

Client	Project Manager	Date	Chain of Custody Number
Tetratech	J Forelli	12/7/12	170020
Address 250 Andover ST	**Telephone Number (Area Code)/Fax Number** 9784974812	**Lab Number**	**Page** 1 of 1
City Wilmington **State** MA **Zip Code** 01887	**Site Contact**	**Lab Contact**	
Project Name and Location (State) 112G00958.1000	**Carrier/Waybill Number**		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H_2SO_4	HNO_3	HCl	NaOH	ZnAc/NaOH	Analysis: DRO/PRO	Special Instructions/ Conditions of Receipt
NASB-B611-SB04-0910	12/5/12	1445				✓	✓						✓	
NASB-B611-SB05-0708	12/5/12	0940				✓	✓						✓	Lab QC (MS/MSD
NASB-B611-SB06-0912	12/6/12	0900				✓	✓						✓	
NASB-B611-SB03-0304	12/6/12	0840				✓	✓						✓	
NASB-B611-RB120712	12/7/12	0900		✓			✓						✓	

Page 173 of 174

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
(A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required
☐ 24 Hours ☐ 48 Hours ☒ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished By	12/7/12	1500	1. Received By	12/8/12	0900
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

CASE NARRATIVE
Client: Tetra Tech
Project: NAS Brunswick
Contract Task Order: WE49 / N62470-08-D-1001
Project Manager: Jeff Orient
Report Number: 280-36837-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The PFC method DV-LC-0012 is an isotope dilution method; therefore, the internal standards are added prior to the extraction process. This technique inherently corrects for variability in the extraction efficiency due to sample matrix. Dilution of samples beyond the ability of the instrument to detect the internal standards is not recommended. Analyses performed at a dilution level requiring additional internal standard to be added after the extraction step in order to quantitate results has been shown to yield results with a significant low bias. As a result, data have been reported that exceed the calibration range and are qualified as estimated.

The PFC method is an isotope dilution method where the internal standards are added prior to extraction and used to quantitate results; therefore, the use of dilution factors is inappropriate. Application of dilution factors would yield results that are artificially high. Reporting limits and method detection limits are not adjusted for dilutions unless samples are fortified with additional internal standard, which is not recommended.

Internal standard abundances may vary depending upon both recovery and the dilution at which the analysis is performed. This is an inherent feature of the isotope dilution technique and is not indicative of bias to the reported results.

RECEIPT
The following report contains the analytical results for five samples received at TestAmerica Denver on December 8, 2012, according to documented sample acceptance procedures. The samples were received in good condition at a temperature of 1.2°C. No anomalies were encountered during sample receipt.

PFOA & PFOS
Samples NASB-B611-SB04-0910 (280-36837-1), NASB-B611-SB05-0708 (280-36837-2), NASB-B611-SB06-0910 (280-36837-3) and NASB-B611-SB03-0304 (280-36837-4) were analyzed for PFOA/PFOS LC/MS/MS in accordance with LCMS PFOA. The samples were prepared on 12/11/2012 and analyzed on 12/13/2012.

Sample NASB-B611-RB120712 (280-36837-5) was analyzed for PFC in accordance with SOP DV-LC-0012. The sample was prepared on 12/11/2012 and analyzed on 12/13/2012.

MS/MSD analyses for prep batch 280-151664 were not requested.

Internal standard responses were outside the control limits for sample NASB-B611-SB03-0304 (280-36837-4) in prep batch 280-151533. The sample shows evidence of matrix interference. The internal standards were in control for the Method Blank and LCS, indicating that the sample matrix may be causing the internal standard outages.

No difficulties were encountered during the PFC analyses.

All quality control parameters were within the acceptance limits.

PERCENT SOLIDS
No difficulties were encountered during the PFC analysis.

All quality control parameters were within the acceptance limits.

Login Sample Receipt Checklist

Client: Tetra Tech, Inc

Job Number: 280-36837-1

Login Number: 36837
List Number: 1
Creator: Laspe, Laura

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

HOLDTIME

SDG 280-36516-1

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
ACID	UG/KG	NASB-B611-SBDUP01	280-36516-3	NM	11/28/2012	12/4/2012	12/6/2012	6	2	8
ACID	UG/KG	NASB-B611-SB06-0910	280-36837-3	NM	12/6/2012	12/11/2012	12/13/2012	5	2	7
ACID	UG/KG	NASB-B611-SB05-0708	280-36837-2	NM	12/5/2012	12/11/2012	12/13/2012	6	2	8
ACID	UG/KG	NASB-B611-SB04-0910	280-36837-1	NM	12/5/2012	12/11/2012	12/13/2012	6	2	8
ACID	UG/KG	NASB-B611-SB03-0304	280-36837-4	NM	12/6/2012	12/11/2012	12/13/2012	5	2	7
ACID	UG/KG	NASB-B611-SB02-0304	280-36516-1	NM	11/29/2012	12/4/2012	12/6/2012	5	2	7
ACID	UG/KG	NASB-B611-SB01-0304	280-36516-2	NM	11/28/2012	12/4/2012	12/6/2012	6	2	8
ACID	UG/L	NASB-B611-RB120712	280-36837-5	NM	12/7/2012	12/11/2012	12/13/2012	4	2	6

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Lab File ID: PC512113017.d Lab Sample ID: MB 280-151664/1-A

Matrix: Water Date Extracted: 12/11/2012 17:09

Instrument ID: LC_LCMS5 Date Analyzed: 12/13/2012 11:27

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-151664/2-A	PC512113018.d	12/13/2012 11:35
	LCSD 280-151664/3-A	PC512113019.d	12/13/2012 11:42
NASB-B611-RB120712	280-36837-5	PC512113020.d	12/13/2012 11:50

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 280-151664/1-A

Matrix: Water Lab File ID: PC512113017.d

Analysis Method: PFOA/PFOS Date Collected:

Extraction Method: 3535 Date Extracted: 12/11/2012 17:09

Sample wt/vol: 250(mL) Date Analyzed: 12/13/2012 11:27

Con. Extract Vol.: 5(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Gemini-NX ID:

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 152065 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0080	U M	0.020	0.0080	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.030	0.020	0.0098

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	104		60-155
STL01054	13C8 PFOS	105		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Client Sample ID: Lab Sample ID: CCB 280-152065/12

Matrix: Water Lab File ID: PC512109020.d

Analysis Method: PFOA/PFOS Date Collected:

Extraction Method: Date Extracted:

Sample wt/vol: 1(mL) Date Analyzed: 12/09/2012 12:00

Con. Extract Vol.: 1.0(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Gemini-NX ID:

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 152065 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0080	U	0.55	0.0080	0.0045
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.15	0.020	0.0098

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA			
STL01054	13C8 PFOS			

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Matrix: Water Level: Low Lab File ID: PC512113018.d

Lab ID: LCS 280-151664/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.200	0.224	112	70-130	
Perfluorooctane Sulfonate (PFOS)	0.191	0.219	115	60-128	

Column to be used to flag recovery and RPD values

FORM III PFOA/PFOS

FORM III
LCMS LAB CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Matrix: Water Level: Low Lab File ID: PC512113019.d

Lab ID: LCSD 280-151664/3-A Client ID:

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.200	0.235	118	5	20	70-130	
Perfluorooctane Sulfonate (PFOS)	0.191	0.221	115	1	20	60-128	

Column to be used to flag recovery and RPD values

FORM III PFOA/PFOS

FORM III
LCMS DETECTION LIMIT CHECK STANDARD RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Matrix: Water Level: Low Lab File ID: PC512109022.d

Lab ID: DLCK 280-152065/14 Client ID:

COMPOUND	SPIKE ADDED (ug/L)	DLCK CONCENTRATION (ug/L)	DLCK % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.500	0.487 J	97	70-130	
Perfluorooctane Sulfonate (PFOS)	0.478	0.414	87	70-130	

Column to be used to flag recovery and RPD values

FORM III PFOA/PFOS

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Lab File ID: PC512113008.d Lab Sample ID: MB 280-151533/1-A

Matrix: Solid Date Extracted: 12/11/2012 10:00

Instrument ID: LC_LCMS5 Date Analyzed: 12/13/2012 10:17

Level:(Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-151533/2-A	PC512113009.d	12/13/2012 10:25
NASB-B611-SB04-0910	280-36837-1	PC512113010.d	12/13/2012 10:33
NASB-B611-SB05-0708	280-36837-2	PC512113011.d	12/13/2012 10:41
NASB-B611-SB05-0708 MS	280-36837-2 MS	PC512113012.d	12/13/2012 10:48
NASB-B611-SB05-0708 MSD	280-36837-2 MSD	PC512113013.d	12/13/2012 10:56
NASB-B611-SB06-0910	280-36837-3	PC512113014.d	12/13/2012 11:04
NASB-B611-SB03-0304	280-36837-4	PC512113015.d	12/13/2012 11:12

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Client Sample ID: Lab Sample ID: MB 280-151533/1-A

Matrix: Solid Lab File ID: PC512113008.d

Analysis Method: PFOA/PFOS Date Collected:

Extraction Method: PFC leach Date Extracted: 12/11/2012 10:00

Sample wt/vol: 10.42(g) Date Analyzed: 12/13/2012 10:17

Con. Extract Vol.: 20(mL) Dilution Factor: 1

Injection Volume: 20(uL) GC Column: Gemini-NX ID:

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 152065 Units: ug/Kg

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.58	U	0.77	0.58	0.20
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.58	U	0.77	0.58	0.18

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	110		57-153
STL01054	13C8 PFOS	108		70-130

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: PC512113009.d

Lab ID: LCS 280-151533/2-A Client ID:

COMPOUND	SPIKE ADDED (ug/Kg)	LCS CONCENTRATION (ug/Kg)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	19.2	21.8	113	70-130	
Perfluorooctane Sulfonate (PFOS)	18.4	20.5	111	74-115	

Column to be used to flag recovery and RPD values

FORM III PFOA/PFOS

FORM III
LCMS MATRIX SPIKE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: PC512113012.d

Lab ID: 280-36837-2 MS Client ID: NASB-B611-SB05-0708 MS

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	20.3	0.62 U	23.2	114	70-130	
Perfluorooctane Sulfonate (PFOS)	19.4	0.62 U	21.7	111	74-115	

Column to be used to flag recovery and RPD values

FORM III PFOA/PFOS

FORM III
LCMS MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Matrix: Solid Level: Low Lab File ID: PC512113013.d

Lab ID: 280-36837-2 MSD Client ID: NASB-B611-SB05-0708 MSD

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC	% RPD	QC LIMITS RPD	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	20.8	24.0	115	3	20	70-130	
Perfluorooctane Sulfonate (PFOS)	19.9	22.1	111	2	20	74-115	

Column to be used to flag recovery and RPD values

FORM III PFOA/PFOS

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Matrix: Solid Level: Low

GC Column (1): Gemini-NX ID:

Client Sample ID	Lab Sample ID	PFOA #	PFOS #
NASB-B611-SB04-0910	280-36837-1	104	102
NASB-B611-SB05-0708	280-36837-2	101	103
NASB-B611-SB06-0910	280-36837-3	102	104
NASB-B611-SB03-0304	280-36837-4	95	107
	MB 280-151533/1-A	110	108
	LCS 280-151533/2-A	108	109
NASB-B611-SB05-0708 MS	280-36837-2 MS	104	103
NASB-B611-SB05-0708 MSD	280-36837-2 MSD	101	105

	QC LIMITS
PFOA = 13C8 PFOA	57-153
PFOS = 13C8 PFOS	70-130

Column to be used to flag recovery values

FORM II PFOA/PFOS

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Gemini-NX ID:

Client Sample ID	Lab Sample ID	PFOA #	PFOS #
	DLCK 280-152065/14	95	100

	QC LIMITS
PFOA = 13C8 PFOA	57-153
PFOS = 13C8 PFOS	70-130

Column to be used to flag recovery values

FORM II PFOA/PFOS

FORM II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Matrix: Water Level: Low

GC Column (1): Gemini-NX ID:

Client Sample ID	Lab Sample ID	PFOA #	PFOS #
NASB-B611-RB120712	280-36837-5	104	104
	MB 280-151664/1-A	104	105
	LCS 280-151664/2-A	105	107
	LCSD 280-151664/3-A	103	102

	QC LIMITS
PFOA = 13C8 PFOA	60-155
PFOS = 13C8 PFOS	45-130

Column to be used to flag recovery values

FORM II PFOA/PFOS

FORM VI
LCMS INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 280-36837-1 Analy Batch No.: 152065

SDG No.:

Instrument ID: LC_LCMS5 GC Column: Gemini-NX ID: Heated Purge: (Y/N) N

Calibration Start Date: 12/09/2012 10:50 Calibration End Date: 12/09/2012 11:52 Calibration ID: 12022

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD0002 280-152065/3	PC512109011.d
Level 2	STD0005 280-152065/4	PC512109012.d
Level 3	STD0010 280-152065/5	PC512109013.d
Level 4	STD0020 280-152065/6	PC512109014.d
Level 5	STD0050 280-152065/7	PC512109015.d
Level 6	STD0100 280-152065/8	PC512109016.d
Level 7	STD0200 280-152065/9	PC512109017.d
Level 8	STD0500 280-152065/10	PC512109018.d
Level 9	STD1250 280-152065/11	PC512109019.d

ANALYTE	RRF					CURVE TYPE	COEFFICIENT			#	MIN RRF	%RSD	#	MAX %RSD	R^2 OR COD	#	MIN R^2 OR COD
	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5		B	M1	M2								
Ammonium Perfluorooctanoate (APFO)	1.1686 0.9029	0.9939 0.8274	0.9511 0.7656	0.8936 0.6932	0.9021	Lin2	0.0760	0.8278							0.9920		0.9800
Perfluorooctanoic acid (PFOA)	1.2160 0.9396	1.0343 0.8610	0.9897 0.7966	0.9299 0.7214	0.9388	Lin2	0.0760	0.8614							0.9920		0.9800
Perfluorooctane Sulfonate (PFOS)	1.5951 1.1241	1.2224 1.0551	1.2135 0.9560	1.1582 0.8628	1.1011	Lin2	0.1098	1.0298							0.9920		0.9800
13C8 PFOA	1.0377 0.9048	0.9603 0.8540	0.9356 0.7819	0.8948 0.6996	0.9364	Lin2	0.0435	0.8465							0.9910		0.9800
13C8 PFOS	0.9969 0.8979	0.9237 0.8335	0.9052 0.7796	0.8892 0.6839	0.8745	Lin2	0.0368	0.8269							0.9920		0.9800

Note: The m1 coefficient is the same as Ave RRF for an Ave curve type.

FORM VI
LCMS INITIAL CALIBRATION DATA
INTERNAL STANDARD RESPONSE AND CONCENTRATION

Lab Name: TestAmerica Denver Job No.: 280-36837-1 Analy Batch No.: 152065

SDG No.:

Instrument ID: LC_LCMS5 GC Column: Gemini-NX ID: Heated Purge: (Y/N) N

Calibration Start Date: 12/09/2012 10:50 Calibration End Date: 12/09/2012 11:52 Calibration ID: 12022

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD0002 280-152065/3	PC512109011.d
Level 2	STD0005 280-152065/4	PC512109012.d
Level 3	STD0010 280-152065/5	PC512109013.d
Level 4	STD0020 280-152065/6	PC512109014.d
Level 5	STD0050 280-152065/7	PC512109015.d
Level 6	STD0100 280-152065/8	PC512109016.d
Level 7	STD0200 280-152065/9	PC512109017.d
Level 8	STD0500 280-152065/10	PC512109018.d
Level 9	STD1250 280-152065/11	PC512109019.d

ANALYTE	IS REF	CURVE TYPE	RESPONSE					CONCENTRATION (UG/L)				
			LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5	LVL 1 LVL 6	LVL 2 LVL 7	LVL 3 LVL 8	LVL 4 LVL 9	LVL 5
Ammonium Perfluorooctanoate (APFO)	OA	Lin2	400336 10589228	784620 19130553	1408217 41898803	2227120 84717869	5714685	0.208 10.4	0.520 20.8	1.04 52.0	2.08 130	5.20
Perfluorooctanoic acid (PFOA)	OA	Lin2	400336 10589228	784620 19130553	1408217 41898803	2227120 84717869	5714685	0.200 10.0	0.500 20.0	1.00 50.0	2.00 125	5.00
Perfluorooctane Sulfonate (PFOS)	PFOS	Lin2	161013 4425578	298876 7742909	556009 16196013	931899 33133355	2281775	0.191 9.56	0.478 19.1	0.956 47.8	1.91 120	4.78
13C8 PFOA	OA	Lin2	341645 10197332	728517 18976027	1331196 41121393	2143077 82164324	5700115	0.200 10.0	0.500 20.0	1.00 50.0	2.00 125	5.00
13C8 PFOS	PFOS	Lin2	100628 3534982	225838 6116675	414778 13207943	715449 26263883	1812244	0.191 9.56	0.478 19.1	0.956 47.8	1.91 120	4.78

Curve Type Legend:
Lin2 = Linear 1/conc^2 ISTD

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Lab Sample ID: ICV 280-152065/13 Calibration Date: 12/09/2012 12:07

Instrument ID: LC_LCMS5 Calib Start Date: 12/09/2012 10:50

GC Column: Gemini-NX ID: Calib End Date: 12/09/2012 11:52

Lab File ID: PC512109021.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.9548		2.31	2.08	10.9	30.0
Perfluorooctanoic acid (PFOA)	Lin2		0.9936		2.22	2.00	10.9	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.179		2.21	2.02	9.2	30.0
13C8 PFOA	Lin2		0.9521		2.20	2.00	9.9	30.0
13C8 PFOS	Lin2		0.8857		2.00	1.91	4.8	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Lab Sample ID: CCV 280-152065/15 Calibration Date: 12/13/2012 10:10

Instrument ID: LC_LCMS5 Calib Start Date: 12/09/2012 10:50

GC Column: Gemini-NX ID: Calib End Date: 12/09/2012 11:52

Lab File ID: PC512113007.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.9379		5.80	5.20	11.5	30.0
Perfluorooctanoic acid (PFOA)	Lin2		0.9760		5.58	5.00	11.5	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.109		5.04	4.78	5.4	30.0
13C8 PFOA	Lin2		0.8999		5.26	5.00	5.3	30.0
13C8 PFOS	Lin2		0.8431		4.83	4.78	1.0	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Lab Sample ID: CCV 280-152065/24 Calibration Date: 12/13/2012 11:19

Instrument ID: LC_LCMS5 Calib Start Date: 12/09/2012 10:50

GC Column: Gemini-NX ID: Calib End Date: 12/09/2012 11:52

Lab File ID: PC512113016.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.8781		10.9	10.4	5.2	30.0
Perfluorooctanoic acid (PFOA)	Lin2		0.9137		10.5	10.0	5.2	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.060		9.73	9.56	1.8	30.0
13C8 PFOA	Lin2		0.7980		9.38	10.0	-6.2	30.0
13C8 PFOS	Lin2		0.8246		9.49	9.56	-0.7	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Lab Sample ID: CCV 280-152065/29 Calibration Date: 12/13/2012 11:58

Instrument ID: LC_LCMS5 Calib Start Date: 12/09/2012 10:50

GC Column: Gemini-NX ID: Calib End Date: 12/09/2012 11:52

Lab File ID: PC512113021.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.9084		5.62	5.20	8.0	30.0
Perfluorooctanoic acid (PFOA)	Lin2		0.9453		5.40	5.00	8.0	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.178		5.36	4.78	12.2	30.0
13C8 PFOA	Lin2		0.8874		5.19	5.00	3.8	30.0
13C8 PFOS	Lin2		0.8857		5.08	4.78	6.2	30.0

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Instrument ID: LC_LCMS5 Calibration Start Date: 12/09/2012 10:50

GC Column: Gemini-NX ID: Calibration End Date: 12/09/2012 11:52

Calibration ID: 12022

		OA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		12478473	4.30	4083754	4.44		
UPPER LIMIT		19341633	4.80	5308880	4.94		
LOWER LIMIT		7487084	3.80	1837689	3.94		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 280-152065/12		10667745	4.30	3571431	4.45		
ICV 280-152065/13		12606987	4.30	4266263	4.45		
DLCK 280-152065/14		13670179	4.29	4668699	4.44		
CCV 280-152065/15		10542780	4.25	3495105	4.38		
MB 280-151533/1-A		9007769	4.25	3173835	4.39		
LCS 280-151533/2-A		10425997	4.25	2649083	4.39		
280-36837-1	NASB-B611-SB04-0910	10065945	4.25	2784753	4.39		
280-36837-2	NASB-B611-SB05-0708	9200442	4.25	2420429	4.39		
280-36837-2 MS	NASB-B611-SB05-0708 MS	10072963	4.25	3226186	4.39		
280-36837-2 MSD	NASB-B611-SB05-0708 MSD	9046565	4.25	3189643	4.39		
280-36837-3	NASB-B611-SB06-0910	10130063	4.25	3268807	4.40		
280-36837-4	NASB-B611-SB03-0304	5214751Q	4.25	3275514	4.38		
CCV 280-152065/24		10654189	4.25	3500697	4.38		
MB 280-151664/1-A		11662494	4.22	3103411	4.36		
LCS 280-151664/2-A		10744400	4.21	2709317	4.35		
LCSD 280-151664/3-A		8362300	4.21	2509639	4.34		
280-36837-5	NASB-B611-RB120712	10095286	4.20	2864230	4.33		
CCV 280-152065/29		10611165	4.21	3186476	4.34		

OA = 13C4 PFOA (IS)
PFOS = 13C4 PFOS (IS)

Area Limit = 60%-155% of internal standard area
RT Limit = ± 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII PFOA/PFOS

LCMS ANALYSIS RUN LOG

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Instrument ID: LC_LCMS5 Start Date: 12/09/2012 10:42

Analysis Batch Number: 152065 End Date: 12/13/2012 11:58

LAB SAMPLE ID	CLIENT SAMPLE ID	DATE ANALYZED	DILUTION FACTOR	LAB FILE ID	COLUMN ID
ICB 280-152065/2		12/09/2012 10:42	1		Gemini-NX
STD0002 280-152065/3 IC		12/09/2012 10:50	1	PC512109011.d	Gemini-NX
STD0005 280-152065/4 IC		12/09/2012 10:58	1	PC512109012.d	Gemini-NX
STD0010 280-152065/5 IC		12/09/2012 11:05	1	PC512109013.d	Gemini-NX
STD0020 280-152065/6 ICISAV		12/09/2012 11:13	1	PC512109014.d	Gemini-NX
STD0050 280-152065/7 IC		12/09/2012 11:21	1	PC512109015.d	Gemini-NX
STD0100 280-152065/8 IC		12/09/2012 11:29	1	PC512109016.d	Gemini-NX
STD0200 280-152065/9 IC		12/09/2012 11:36	1	PC512109017.d	Gemini-NX
STD0500 280-152065/10 IC		12/09/2012 11:44	1	PC512109018.d	Gemini-NX
STD1250 280-152065/11 IC		12/09/2012 11:52	1	PC512109019.d	Gemini-NX
CCB 280-152065/12		12/09/2012 12:00	1	PC512109020.d	Gemini-NX
ICV 280-152065/13		12/09/2012 12:07	1	PC512109021.d	Gemini-NX
DLCK 280-152065/14		12/09/2012 12:15	1	PC512109022.d	Gemini-NX
CCV 280-152065/15		12/13/2012 10:10	1	PC512113007.d	Gemini-NX
MB 280-151533/1-A		12/13/2012 10:17	1	PC512113008.d	Gemini-NX
LCS 280-151533/2-A		12/13/2012 10:25	1	PC512113009.d	Gemini-NX
280-36837-1	NASB-B611-SB04-0910	12/13/2012 10:33	1	PC512113010.d	Gemini-NX
280-36837-2	NASB-B611-SB05-0708	12/13/2012 10:41	1	PC512113011.d	Gemini-NX
280-36837-2 MS	NASB-B611-SB05-0708 MS	12/13/2012 10:48	1	PC512113012.d	Gemini-NX
280-36837-2 MSD	NASB-B611-SB05-0708 MSD	12/13/2012 10:56	1	PC512113013.d	Gemini-NX
280-36837-3	NASB-B611-SB06-0910	12/13/2012 11:04	1	PC512113014.d	Gemini-NX
280-36837-4	NASB-B611-SB03-0304	12/13/2012 11:12	1	PC512113015.d	Gemini-NX
CCV 280-152065/24		12/13/2012 11:19	1	PC512113016.d	Gemini-NX
MB 280-151664/1-A		12/13/2012 11:27	1	PC512113017.d	Gemini-NX
LCS 280-151664/2-A		12/13/2012 11:35	1	PC512113018.d	Gemini-NX
LCSD 280-151664/3-A		12/13/2012 11:42	1	PC512113019.d	Gemini-NX
280-36837-5	NASB-B611-RB120712	12/13/2012 11:50	1	PC512113020.d	Gemini-NX
CCV 280-152065/29		12/13/2012 11:58	1	PC512113021.d	Gemini-NX

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Batch Number: 151533 Batch Start Date: 12/11/12 10:00 Batch Analyst: Frey, Alan C

Batch Method: PFC leach Batch End Date: 12/12/12 14:35

Lab Sample ID	Client Sample ID	Method Chain	Basis	InitialAmount	FinalAmount	CalcMsg	PFOA/S_Spike 00006	PFOA/S_Sur/IS 00005	
MB 280-151533/1		PFC leach, PFOA/PFOS		10.42 g	20 mL	CALC NOT SET TO RUN		0.4 mL	
LCS 280-151533/2		PFC leach, PFOA/PFOS		10.39 g	20.4 mL	CALC NOT SET TO RUN	0.4 mL	0.4 mL	
280-36837-A-1	NASB-B611-SB04-0910	PFC leach, PFOA/PFOS	T	10.47 g	20 mL	CALC NOT SET TO RUN		0.4 mL	
280-36837-A-2	NASB-B611-SB05-0708	PFC leach, PFOA/PFOS	T	10.46 g	20 mL	CALC NOT SET TO RUN		0.4 mL	
280-36837-A-2 MS	NASB-B611-SB05-0708	PFC leach, PFOA/PFOS	T	10.56 g	20.4 mL	CALC NOT SET TO RUN	0.4 mL	0.4 mL	
280-36837-A-2 MSD	NASB-B611-SB05-0708	PFC leach, PFOA/PFOS	T	10.31 g	20.4 mL	CALC NOT SET TO RUN	0.4 mL	0.4 mL	
280-36837-A-3	NASB-B611-SB06-0910	PFC leach, PFOA/PFOS	T	10.39 g	20 mL	CALC NOT SET TO RUN		0.4 mL	
280-36837-A-4	NASB-B611-SB03-0304	PFC leach, PFOA/PFOS	T	10.80 g	20 mL	CALC NOT SET TO RUN		0.4 mL	

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Batch Number: 151533 Batch Start Date: 12/11/12 10:00 Batch Analyst: Frey, Alan C

Batch Method: PFC leach Batch End Date: 12/12/12 14:35

Batch Notes	
Analyst	Frey A. Pip: H Reviewer:Wiggins J.
Balance ID	24750526
Batch Comment	Filtered By:Frey A.
HCl Concentration	2.4N
Lot # of hydrochloric acid	2.4N HCl_00002
HCl Pipette ID	I
MeOH Pipette #	PFC-2
Methanol Lot Number	LCMS_MeOH_00032
NaOH Concentration	0.67N
NaOH Lot #	0.67N NaOH_00002
NaOH pipette ID	PFC-1
Nominal Amount Used	10 g
Ottawa Sand Lot #	2BE0616
PVDF Filter Lot#	6658620
Perform Calculation (0=No, 1=Yes)	0
Sonication Start Time	12.11.12 @1040
Sonication Stop Time	12.11.12 @1340
SOP Number	DV-OP-0019
Tumble End Time	1355
Tumble End Date	12.12.12
Tumble Start Time	1345
Tumble Start Date	12.11.12

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Batch Number: 151664 Batch Start Date: 12/11/12 17:09 Batch Analyst: Cokley, Cheyana D

Batch Method: 3535 Batch End Date: 12/11/12 19:39

Lab Sample ID	Client Sample ID	Method Chain	Basis	GrossWeight	TareWeight	InitialAmount	FinalAmount	Initial pH	PFOA/S_Spike 00006
MB 280-151664/1		3535, PFOA/PFOS				250 mL	5 mL	7 SU	
LCS 280-151664/2		3535, PFOA/PFOS				250 mL	5 mL	7 SU	0.1 mL
LCSD 280-151664/3		3535, PFOA/PFOS				250 mL	5 mL	7 SU	0.1 mL
280-36837-B-5	NASB-B611-RB120712	3535, PFOA/PFOS	T	276.44 g	22.01 g	254.4 mL	5 mL	7 SU	

Lab Sample ID	Client Sample ID	Method Chain	Basis	PFOA/S_Sur/IS 00005					
MB 280-151664/1		3535, PFOA/PFOS		0.1 mL					
LCS 280-151664/2		3535, PFOA/PFOS		0.1 mL					
LCSD 280-151664/3		3535, PFOA/PFOS		0.1 mL					
280-36837-B-5	NASB-B611-RB120712	3535, PFOA/PFOS	T	0.1 mL					

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

LCMS BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Batch Number: 151664 Batch Start Date: 12/11/12 17:09 Batch Analyst: Cokley, Cheyana D

Batch Method: 3535 Batch End Date: 12/11/12 19:39

Batch Notes	
Acid Lot	2%FormicAci_00017
Acid Name	2% Formic Acid
Balance ID	24750836
First End time	12.11.12@1745
H2O Lot used	HPLC_Water_00194
Pipette ID	H, SPE-1
Analyst who added reagent	CokleyC
SU Reagent Drop Witness	Reviewer:FlynnS
Reagent ID	10% NH4OH
Reagent Lot Number	10%NH4OH_00011
Solvent Lot #	LCMS_MeOH_00035
Solvent Name	LCMS_MeOH
SOP Number	DV-OP-0019
SPE Cartridge Type	Oasis WAX 6cc (186002493)
Solid Phase Extraction Disk Lot Number	014032201A
First Start time	12.11.12@1715

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

9-IN
DETECTION LIMITS
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job Number: 280-36837-1

SDG Number:

Matrix: Solid Instrument ID: NoEquip

Method: Moisture LOQ Date: 11/01/2009 00:00

Analyte	Wavelength/ Mass	LOQ (%)	
Percent Moisture		0.1	

13-IN
ANALYSIS RUN LOG
GENERAL CHEMISTRY

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Instrument ID: NoEquip Method: Moisture

Start Date: 12/11/2012 14:41 End Date: 12/11/2012 14:41

Lab Sample ID	D / F	Type	Time	Analytes																				
				Moist																				
ZZZZZZ			14:41																					
ZZZZZZ			14:41																					
ZZZZZZ			14:41																					
ZZZZZZ			14:41																					
ZZZZZZ			14:41																					
ZZZZZZ			14:41																					
ZZZZZZ			14:41																					
280-36837-1	1	T	14:41	X																				
280-36837-2	1	T	14:41	X																				
280-36837-3	1	T	14:41	X																				
280-36837-4	1	T	14:41	X																				
ZZZZZZ			14:41																					
ZZZZZZ			14:41																					

Prep Types
T = Total/NA

Wet Chemistry Data Review Checklist For Gravimetric Methods

Test Name/Method #: Moisture Analysis Date: 12/11/12

SOP #: DV-WC-0023 Analyst: Alex Benson Instrument: BAL

Lot / Sample Number		Matrix	Prep Batch	Batch	Method	Special Inst
36826	12-31	solid	—	151527	—	—
36796	12-31	solid	—	151553	—	—
36823	12-31	solid	—	151596	—	—
36773	12-31	solid	—	↓	—	—
34950	12-18	solid	—	151646	—	—
36837	12-17	solid	—	↓	—	—
36843	12-17	solid	—	↓	—	—

A. Balance, Oven, and DI Water QC Checks	Yes	No	N/A	2nd Level
1. Was the balance calibration verified before and after processing samples and noted in the "Balance Calibration Log" for the date(s) the samples were processed?	X			—
2. Was the oven temperature within method requirements and recorded in the "Oven Temperature" logbook for the date(s) the samples were processed?	X			—
3. Was the daily conductivity check of the deionized water recorded in the "Conductivity Logbook"?			X	—
B. Method Requirements				
1. If sample is visibly oily, was this noted on the benchsheet?		X		—
2. Was final residue weight within minimum/maximum requirements?	X			—
3. Were the initial and final drying dates and times recorded on the benchsheet and were all samples dried for at least one hour?	X			—
C. Sample Results				
1. TDS/Conductivity ratio or historical data checked?			X	—
2. For % Moisture, was the Final Dried Weight < the Initial Pan Weight or is the result greater than 100%?		X		—
3. Were sample analyses done within holding time?	X			—
4. Were special client requirements met?	X			—
5. Were data that were manually transcribed from instrument printouts into TALS verified 100% including significant figures and units?	X			—
6. Do the prep and analysis dates in TALS reflect the actual dates? Lots/Dates report checked?	X			—
7. STD/True Value information is updated and included?			X	—
8. Are raw data copies prepared, scanned, and uploaded?			X	—
D. Preparation/Matrix QC				
1. Method blank < RL or all reported samples > 10 X RL?			X	—
2. Method blank < ½ RL or NCM provided?			X	—
3. LCS/LCSD run for batch and within QC limits?			X	—
4. DUP run for batch and RPD < 20% for samples >5 X RL?	X			—

Analyst: Alexander Benson Date: 12/12/12

Comments: _____

2nd Level Reviewer : [signature] Date: 12/12/12

Comments: _____

Test Name/ Method #: Moisture SOP # DN-WC-0023

Instrument: BAL Analyst: Alex Benson Analysis Date: 12/12/12

Lot / Sample Numbers	Matrix	Batch	Method	Special Inst
368600 12-12	solid	151657	—	—

GENERAL CHEMISTRY BATCH WORKSHEET

Lab Name: TestAmerica Denver Job No.: 280-36837-1

SDG No.:

Batch Number: 151646 Batch Start Date: 12/11/12 13:41 Batch Analyst: Benson, Alex F

Batch Method: Moisture Batch End Date:

Lab Sample ID	Client Sample ID	Method Chain	Basis	DISH#	DishWeight	SampleMassWet	SampleMassDry		
280-36837-A-1	NASB-B611-SB04-0910	Moisture	T	8	1.32 g	17.42 g	16.09 g		
280-36837-A-2	NASB-B611-SB05-0708	Moisture	T	9	1.33 g	17.43 g	16.33 g		
280-36837-A-3	NASB-B611-SB06-0910	Moisture	T	10	1.32 g	17.47 g	15.57 g		
280-36837-A-4	NASB-B611-SB03-0304	Moisture	T	11	1.33 g	17.55 g	16.54 g		

Batch Notes	
Balance ID	24650239 No Unit
Date samples were placed in the oven	12/11/2012
Oven Temp when samples are put in oven	104 Degrees C
Time samples were place in the oven	13:55
Date samples were removed from oven	12/12/2012
Oven Temp when samples removed from oven	103 Degrees C
Time Samples were removed from oven	8:15
Oven ID	moisture oven
ID number of the thermometer	E
Uncorrected In Temperature	104 Celsius
Uncorrected Out Temperature	103 Celsius

Basis	Basis Description
T	Total/NA

The pound sign (#) in the amount added field denotes that the reagent was used undiluted. All calculations are performed using the stated concentration for this reagent.

DODCMD_ID	INSTALLATION_ID	SDG	SITE_NAME	NORM_SITE_NAME	LOCATION_NAME	LOCATION_TYPE_DESC	COORD_X	COORD_Y	CONTRACT_ID	DO_CTO_NUMBER	CONTR_NAME	SAMPLE_NAME	SAMPLE_MATRIX_DESC	SAMPLE_TYPE_DESC	COLLECT_DATE	ANALYTICAL_METHOD	ANALYTICAL_METHOD_GRP_DESC
MID_ATLANTIC	BRUNSWICK_NAS	280-36837-1	RCRA CLOSURE	SITE 00011	B611-MW05S	Monitoring well	3015172.62	384333.52	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-SB05-0708	Soil	Normal (Regular)	5-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-36837-1	RCRA CLOSURE	SITE 00011	B611-MW06S	Monitoring well	3015002.2	384544.72	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-SB06-0910	Soil	Normal (Regular)	6-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-36837-1							N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-RB120712	Water for QC samples	Equipment blank	7-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-36837-1	RCRA CLOSURE	SITE 00011	B611-MW04S	Monitoring well	3015078.21	384292.54	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-SB04-0910	Soil	Normal (Regular)	5-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-36837-1	RCRA CLOSURE	SITE 00011	B611-MW03	Monitoring well	3015019.34	384335.35	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-SB03-0304	Soil	Normal (Regular)	6-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds