



Tetra Tech

INTERNAL CORRESPONDENCE

TO: J. ORIENT **DATE:** FEBRUARY 6, 2013
FROM: TERRI L. SOLOMON **COPIES:** DV FILE
SUBJECT: ORGANIC DATA VALIDATION – PFOA / PFOS
CTO 432 NAS BRUNSWICK
SAMPLE DELIVERY GROUP (SDG) – 280-37085-1
SAMPLES: 12/Aqueous/

NASB-B611-GW-RB01-121312	NASB-B611-MW01D-1212
NASB-B611-MW01S-1212	NASB-B611-MW02-1212
NASB-B611-MW03-1212	NASB-B611-MW04D-1212
NASB-B611-MW04S-1212	NASB-B611-MW05D-1212
NASB-B611-MW05S-1212	NASB-B611-MW06D-1212
NASB-B611-MW06S-1212	NASB-B611-MWDUP01-1212

Overview

The sample set for NAS Brunswick, CTO 432, SDG 280-37085-1, consists of twelve (12) aqueous environmental samples. One (1) field duplicate pair (NASB-B611-MW02-1212 / NASB-B611-MWDUP01-1212) was included within this SDG.

The samples were analyzed for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). The samples were collected by Tetra Tech on December 11, 12 and 13, 2012 and analyzed by Test America - Denver. The samples were analyzed for PFOA and PFOS in accordance with laboratory SOP DV-LC-0012.

These data were evaluated based on the following parameters:

- * • Data Completeness
- * • Holding Times
- * • GC/MS Tuning
- * • Initial / Continuing Calibration Results
- * • Laboratory Method Blank Analyses
- * • Surrogate Recoveries
- Matrix Spike / Matrix Spike Duplicate Recoveries
- * • Laboratory Control Sample / Laboratory Control Sample Duplicate Recoveries
- * • Field Duplicate Results
- * • Internal Standard Recoveries
- * • Detection Limits

* - 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. An EPA Region 1 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.

MEMO TO: J. ORIENT - PAGE 2
DATE: FEBRUARY 6, 2013

Notes

Positive results less than the limit of quantitation (LOQ) but greater than the method detection limit (MDL) were qualified as estimated, "J".

Nondetected results were reported to the limit of detection (LOD).

The matrix spike duplicate percent recovery for PFOS was greater than the laboratory control limit for sample NASB-B611-MW03-1212. No validation action was required as the laboratory control sample recovery and matrix spike recovery were within quality control limits.

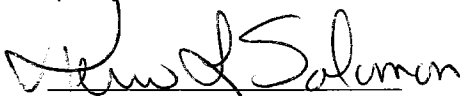
Executive Summary

Laboratory Performance: None.

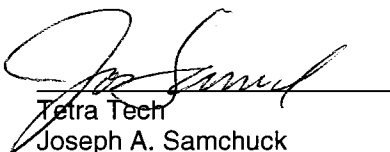
Other Factors Affecting Data Quality: Positive results less than the LOQ but greater than the MDL were qualified as estimated.

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

The text of this report has been formulated to address only those problem areas affecting data quality.



Tetra Tech
Terri L. Solomon
Environmental Scientist



Tetra Tech
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
4. 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 ($< 2 \times \text{IDL}$ for inorganics and $< \text{CRQL}$ 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 deviations is greater than sample activity
- Z1 = Tentatively Identified Compound considered presumptively present
- Z2 = Tentatively Identified Compound column bleed

PROJ_NO: 00958 SDG: 280-37085-1 FRACTION: MISC MEDIA: WATER	NSAMPLE	NASB-B611-GW-RB01-121312			NASB-B611-MW01D-1212			NASB-B611-MW01S-1212			NASB-B611-MW02-1212		
	LAB_ID	280-37085-12			280-37085-10			280-37085-1			280-37085-2		
	SAMP_DATE	12/13/2012			12/13/2012			12/11/2012			12/11/2012		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		0.0078	U		0.0082	U		0.033			0.015	J	P
PERFLUOROOCTANE SULFONIC ACID		0.02	U		0.021	U		0.065			0.077		

PROJ_NO: 00958 SDG: 280-37085-1 FRACTION: MISC MEDIA: WATER	NSAMPLE	NASB-B611-MW03-1212			NASB-B611-MW04D-1212			NASB-B611-MW04S-1212			NASB-B611-MW05D-1212		
	LAB_ID	280-37085-4			280-37085-7			280-37085-6			280-37085-11		
	SAMP_DATE	12/11/2012			12/12/2012			12/12/2012			12/13/2012		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		0.0078	J	P	0.0051	J	P	0.1			0.008	U	
PERFLUOROOCTANE SULFONIC ACID		0.081	J	P	0.014	J	P	0.3			0.02	U	

PROJ_NO: 00958 SDG: 280-37085-1 FRACTION: MISC MEDIA: WATER	NSAMPLE	NASB-B611-MW05S-1212			NASB-B611-MW06D-1212			NASB-B611-MW06S-1212			NASB-B611-MWDUP01-1212		
	LAB_ID	280-37085-5			280-37085-9			280-37085-8			280-37085-3		
	SAMP_DATE	12/11/2012			12/12/2012			12/12/2012			12/11/2012		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF										NASB-B611-MW02-1212		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
PENTADECAFLUOROOCTANOIC ACID		0.0079	U		0.01	J	P	0.053			0.013	J	P
PERFLUOROOCTANE SULFONIC ACID		0.02	U		0.02	U		0.36			0.083		

APPENDIX B
RESULTS AS REPORTED BY THE LABORATORY

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: NASB-B611-GW-RB01-121312 Lab Sample ID: 280-37085-12
 Matrix: Water Lab File ID: PC512L28070.d
 Analysis Method: PFOA/PFOS Date Collected: 12/13/2012 11:15
 Extraction Method: 3535 Date Extracted: 12/18/2012 18:20
 Sample wt/vol: 255.5 (mL) Date Analyzed: 12/28/2012 23:50
 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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0078	U	0.020	0.0078	0.0044
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.029	0.020	0.0096

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	104		60-155
STL01054	13C8 PFOS	94		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: NASB-B611-MW01D-1212 Lab Sample ID: 280-37085-10
 Matrix: Water Lab File ID: PC512L28068.d
 Analysis Method: PFOA/PFOS Date Collected: 12/13/2012 10:05
 Extraction Method: 3535 Date Extracted: 12/18/2012 18:20
 Sample wt/vol: 243.8 (mL) Date Analyzed: 12/28/2012 23:35
 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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0082	U	0.021	0.0082	0.0046
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.021	U	0.031	0.021	0.010

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	100		60-155
STL01054	13C8 PFOS	95		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: NASB-B611-MW01S-1212 Lab Sample ID: 280-37085-1
 Matrix: Water Lab File ID: PC512L28057.d
 Analysis Method: PFOA/PFOS Date Collected: 12/11/2012 10:35
 Extraction Method: 3535 Date Extracted: 12/18/2012 18:20
 Sample wt/vol: 243.5(mL) Date Analyzed: 12/28/2012 22:10
 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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.033		0.021	0.0082	0.0046
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.065		0.031	0.021	0.010

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	97		60-155
STL01054	13C8 PFOS	96		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: NASB-B611-MW02-1212 Lab Sample ID: 280-37085-2
 Matrix: Water Lab File ID: PC512L28058.d
 Analysis Method: PFOA/PFOS Date Collected: 12/11/2012 14:05
 Extraction Method: 3535 Date Extracted: 12/18/2012 18:20
 Sample wt/vol: 227.7(mL) Date Analyzed: 12/28/2012 22:17
 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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.015	J	0.022	0.0088	0.0049
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.077	M	0.033	0.022	0.011

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	99		60-155
STL01054	13C8 PFOS	92		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: NASB-B611-MW03-1212 Lab Sample ID: 280-37085-4
 Matrix: Water Lab File ID: PC512L28059.d
 Analysis Method: PFOA/PFOS Date Collected: 12/11/2012 11:30
 Extraction Method: 3535 Date Extracted: 12/18/2012 18:20
 Sample wt/vol: 254.8 (mL) Date Analyzed: 12/28/2012 22:25
 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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0078	J	0.020	0.0078	0.0044
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.081	J	0.029	0.020	0.0096

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	98		60-155
STL01054	13C8 PFOS	92		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: NASB-B611-MW04D-1212 Lab Sample ID: 280-37085-7
 Matrix: Water Lab File ID: PC512L28064.d
 Analysis Method: PFOA/PFOS Date Collected: 12/12/2012 12:05
 Extraction Method: 3535 Date Extracted: 12/18/2012 18:20
 Sample wt/vol: 242.6 (mL) Date Analyzed: 12/28/2012 23:04
 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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0051	J	0.021	0.0082	0.0046
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.014	J	0.031	0.021	0.010

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	99		60-155
STL01054	13C8 PFOS	93		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1

SDG No.: _____

Client Sample ID: NASB-B611-MW04S-1212 Lab Sample ID: 280-37085-6

Matrix: Water Lab File ID: PC512L28063.d

Analysis Method: PFOA/PFOS Date Collected: 12/12/2012 09:50

Extraction Method: 3535 Date Extracted: 12/18/2012 18:20

Sample wt/vol: 235.8 (mL) Date Analyzed: 12/28/2012 22:56

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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.10		0.021	0.0085	0.0048
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.30		0.032	0.021	0.010

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	97		60-155
STL01054	13C8 PFOS	93		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: NASB-B611-MW05D-1212 Lab Sample ID: 280-37085-11
 Matrix: Water Lab File ID: PC512L28069.d
 Analysis Method: PFOA/PFOS Date Collected: 12/13/2012 09:20
 Extraction Method: 3535 Date Extracted: 12/18/2012 18:20
 Sample wt/vol: 249.5(mL) Date Analyzed: 12/28/2012 23:43
 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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0080	U	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	101		60-155
STL01054	13C8 PFOS	98		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Denver</u>	Job No.: <u>280-37085-1</u>
SDG No.: _____	
Client Sample ID: <u>NASB-B611-MW05S-1212</u>	Lab Sample ID: <u>280-37085-5</u>
Matrix: <u>Water</u>	Lab File ID: <u>PC512L28062.d</u>
Analysis Method: <u>PFOA/PFOS</u>	Date Collected: <u>12/11/2012 14:45</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>12/18/2012 18:20</u>
Sample wt/vol: <u>253.8 (mL)</u>	Date Analyzed: <u>12/28/2012 22:48</u>
Con. Extract Vol.: <u>5 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>20 (uL)</u>	GC Column: <u>Gemini-NX</u> ID: _____
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>154190</u>	Units: <u>ug/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0079	U	0.020	0.0079	0.0044
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.030	0.020	0.0097

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	100		60-155
STL01054	13C8 PFOS	94		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: NASB-B611-MW06D-1212 Lab Sample ID: 280-37085-9
 Matrix: Water Lab File ID: PC512L28067.d
 Analysis Method: PFOA/PFOS Date Collected: 12/12/2012 11:50
 Extraction Method: 3535 Date Extracted: 12/18/2012 18:20
 Sample wt/vol: 244.9(mL) Date Analyzed: 12/28/2012 23:27
 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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.010	J	0.020	0.0082	0.0046
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.020	U	0.031	0.020	0.010

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	101		60-155
STL01054	13C8 PFOS	92		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: NASB-B611-MW06S-1212 Lab Sample ID: 280-37085-8
 Matrix: Water Lab File ID: PC512L28066.d
 Analysis Method: PFOA/PFOS Date Collected: 12/12/2012 09:50
 Extraction Method: 3535 Date Extracted: 12/18/2012 18:20
 Sample wt/vol: 233.1 (mL) Date Analyzed: 12/28/2012 23:19
 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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.053		0.021	0.0086	0.0048
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.36		0.032	0.021	0.011

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	100		60-155
STL01054	13C8 PFOS	95		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: NASB-B611-MWDUP01-1212 Lab Sample ID: 280-37085-3
 Matrix: Water Lab File ID: PC512L28074.d
 Analysis Method: PFOA/PFOS Date Collected: 12/11/2012 00:00
 Extraction Method: 3535 Date Extracted: 12/17/2012 17:27
 Sample wt/vol: 240.5 (mL) Date Analyzed: 12/29/2012 00:21
 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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.013	J	0.021	0.0083	0.0047
1763-23-1	Perfluorooctane Sulfonate (PFOS)	0.083		0.031	0.021	0.010

CAS NO.	SURROGATE	%REC	Q	LIMITS
STL01052	13C8 PFOA	99		60-155
STL01054	13C8 PFOS	93		45-130

APPENDIX C
SUPPORT DOCUMENTATION

**NAS BRUNSWICK
WATER DATA
280-37085-1**

FRACTION	CHEMICAL	NASB-B611-MW02-1212	UNITS	ASB-B611-MWDUP01-12	RPD	D
MISC	PENTADECAFLUOROOCTANOIC ACID	0.015 J	UG/L	0.013 J	14.29	0.00
MISC	PERFLUOROOCTANE SULFONIC ACID	0.077	UG/L	0.083	7.50	0.01

Current RPD Quality Control Limit: 30 %.

Shaded cells indicate RPDs that exceed the applicable quality control limit.

CASE NARRATIVE
Client: Tetra Tech
Project: NAS Brunswick
Contract Task Order: WE49 / N62470-08-D-1001
Project Manager: Jeff Orient
Report Number: 280-37085-1

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 twelve samples received at TestAmerica Denver on December 14, 2012, according to documented sample acceptance procedures. The samples were received in good condition at a temperature of 2.0°C. No anomalies were encountered during sample receipt.

PFOA & PFOS

Samples NASB-B611-MW01S-1212 (280-37085-1), NASB-B611-MW02-1212 (280-37085-2), NASB-B611-MWDUP01-1212 (280-37085-3), NASB-B611-MW03-1212 (280-37085-4), NASB-B611-MW05S-1212 (280-37085-5), NASB-B611-MW04S-1212 (280-37085-6), NASB-B611-MW04D-1212 (280-37085-7), NASB-B611-MW06S-1212 (280-37085-8), NASB-B611-MW06D-1212 (280-37085-9), NASB-B611-MW01D-1212 (280-37085-10), NASB-B611-MW05D-1212 (280-37085-11) and NASB-B611-GW-RB01-121312 (280-37085-12) were analyzed for PFC in accordance with SOP DV-LC-0012. The samples were prepared on 12/17/2012 and 12/18/2012 and analyzed on 12/28/2012 and 12/29/2012.

The MS/MSD associated with prep batch 280-152683 was performed on sample NASB-B611-MW03-1212 (280-37085-4). The MS/MSD exhibited a spike compound recovery outside the control limits for Perfluorooctane Sulfonate (PFOS). The acceptable LCS/LCSD analysis data indicated that the analytical system was operating within control; therefore, corrective action is deemed unnecessary. The associated data in the parent sample has been flagged "J" in accordance with the DoD QSM.

MS/MSD analyses for prep batch 280-152604 were not requested.

No other difficulties were encountered during the PFC analyses.

All other quality control parameters were within the acceptance limits.

HOLDTIME

SDG 280-37085-1

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
ACID	UG/L	NASB-B611-MWDUP01-1	280-37085-3	NM	12/11/2012	12/17/2012	12/29/2012	6	12	18
ACID	UG/L	NASB-B611-MW06S-1212	280-37085-8	NM	12/12/2012	12/18/2012	12/28/2012	6	10	16
ACID	UG/L	NASB-B611-MW06D-1212	280-37085-9	NM	12/12/2012	12/18/2012	12/28/2012	6	10	16
ACID	UG/L	NASB-B611-MW05S-1212	280-37085-5	NM	12/11/2012	12/18/2012	12/28/2012	7	10	17
ACID	UG/L	NASB-B611-MW05D-1212	280-37085-11	NM	12/13/2012	12/18/2012	12/28/2012	5	10	15
ACID	UG/L	NASB-B611-MW04S-1212	280-37085-6	NM	12/12/2012	12/18/2012	12/28/2012	6	10	16
ACID	UG/L	NASB-B611-MW04D-1212	280-37085-7	NM	12/12/2012	12/18/2012	12/28/2012	6	10	16
ACID	UG/L	NASB-B611-MW03-1212	280-37085-4	NM	12/11/2012	12/18/2012	12/28/2012	7	10	17
ACID	UG/L	NASB-B611-MW02-1212	280-37085-2	NM	12/11/2012	12/18/2012	12/28/2012	7	10	17
ACID	UG/L	NASB-B611-MW01S-1212	280-37085-1	NM	12/11/2012	12/18/2012	12/28/2012	7	10	17
ACID	UG/L	NASB-B611-MW01D-1212	280-37085-10	NM	12/13/2012	12/18/2012	12/28/2012	5	10	15
ACID	UG/L	NASB-B611-GW-RB01-12	280-37085-12	NM	12/13/2012	12/18/2012	12/28/2012	5	10	15

SAMPLE SUMMARY

Client: Tetra Tech, Inc

Job Number: 280-37085-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
280-37085-1	NASB-B611-MW01S-1212	Water	12/11/2012 1035	12/14/2012 1000
280-37085-2	NASB-B611-MW02-1212	Water	12/11/2012 1405	12/14/2012 1000
280-37085-3	NASB-B611-MWDUP01-1212	Water	12/11/2012 0000	12/14/2012 1000
280-37085-4	NASB-B611-MW03-1212	Water	12/11/2012 1130	12/14/2012 1000
280-37085-4MS	NASB-B611-MW03-1212	Water	12/11/2012 1130	12/14/2012 1000
280-37085-4MSD	NASB-B611-MW03-1212	Water	12/11/2012 1130	12/14/2012 1000
280-37085-5	NASB-B611-MW05S-1212	Water	12/11/2012 1445	12/14/2012 1000
280-37085-6	NASB-B611-MW04S-1212	Water	12/12/2012 0950	12/14/2012 1000
280-37085-7	NASB-B611-MW04D-1212	Water	12/12/2012 1205	12/14/2012 1000
280-37085-8	NASB-B611-MW06S-1212	Water	12/12/2012 0950	12/14/2012 1000
280-37085-9	NASB-B611-MW06D-1212	Water	12/12/2012 1150	12/14/2012 1000
280-37085-10	NASB-B611-MW01D-1212	Water	12/13/2012 1005	12/14/2012 1000
280-37085-11	NASB-B611-MW05D-1212	Water	12/13/2012 0920	12/14/2012 1000
280-37085-12RB	NASB-B611-GW-RB01-121312	Water	12/13/2012 1115	12/14/2012 1000

METHOD SUMMARY

Client: Tetra Tech, Inc

Job Number: 280-37085-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
PFOA/PFOS LC/MS/MS	TAL DEN	TestAmerica SOP PFOA/PFOS	
Solid-Phase Extraction (SPE)	TAL DEN		SW846 3535

Lab References:

TAL DEN = TestAmerica Denver

Method References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TestAmerica SOP = TestAmerica, Inc., Standard Operating Procedure

FORM VI
LCMS INITIAL CALIBRATION DATA
INTERNAL STANDARD CURVE EVALUATION

Lab Name: TestAmerica Denver Job No.: 280-37085-1 Analy Batch No.: 154190

SDG No.: _____

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

Calibration Start Date: 12/28/2012 20:14 Calibration End Date: 12/28/2012 21:16 Calibration ID: 12257

Calibration Files:

LEVEL:	LAB SAMPLE ID:	LAB FILE ID:
Level 1	STD0002 280-154190/3	PC512L28042.d
Level 2	STD0005 280-154190/4	PC512L28043.d
Level 3	STD0010 280-154190/5	PC512L28044.d
Level 4	STD0020 280-154190/6	PC512L28045.d
Level 5	STD0050 280-154190/7	PC512L28046.d
Level 6	STD0100 280-154190/8	PC512L28047.d
Level 7	STD0200 280-154190/9	PC512L28048.d
Level 8	STD0500 280-154190/10	PC512L28049.d
Level 9	STD1250 280-154190/11	PC512L28050.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)	1.2179 0.9700	1.1081 0.9653	1.1010 0.9022	1.0405 0.7653	0.9930	Lin2	0.0654	0.9450							0.9910		0.9800
Perfluorooctanoic acid (PFOA)	1.2673 1.0094	1.1531 1.0045	1.1457 0.9388	1.0827 0.7963	1.0334	Lin2	0.0654	0.9834							0.9910		0.9800
Perfluorooctane Sulfonate (PFOS)	1.4774 1.1434	1.3074 1.1760	1.1861 1.1095	1.1942 0.9203	1.2096	Lin2	0.0733	1.1160							0.9940		0.9800
13C8 PFOA	1.1263 0.9963	1.0414 0.9275	0.9877 0.8906	0.9708 0.7545	0.9397	Lin2	0.0477	0.9124							0.9930		0.9800
13C8 PFOS	1.0328 0.9062	0.9758 0.9002	1.0234 0.8689	0.9268 0.7666	0.9804	Lin2	0.0306	0.8997							0.9940		0.9800

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

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Lab Sample ID: ICV 280-154190/13 Calibration Date: 12/28/2012 21:31
 Instrument ID: LC_LCMS5 Calib Start Date: 12/28/2012 20:14
 GC Column: Gemini-NX ID: _____ Calib End Date: 12/28/2012 21:16
 Lab File ID: PC512L28052.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		1.014		2.16	2.08	4.0	30.0
Perfluorooctanoic acid (PFOA)	Lin2		1.055		2.08	2.00	4.0	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.312		2.31	2.02	14.3	30.0
13C8 PFOA	Lin2		0.9462		2.02	2.00	1.1	30.0
13C8 PFOS	Lin2		0.9198		1.92	1.91	0.5	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Lab Sample ID: CCV 280-154190/29 Calibration Date: 12/28/2012 23:12
 Instrument ID: LC_LCMS5 Calib Start Date: 12/28/2012 20:14
 GC Column: Gemini-NX ID: _____ Calib End Date: 12/28/2012 21:16
 Lab File ID: PC512L28065.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.9718		10.6	10.4	2.2	30.0
Perfluorooctanoic acid (PFOA)	Lin2		1.011		10.2	10.0	2.2	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.152		9.81	9.56	2.6	30.0
13C8 PFOA	Lin2		1.020		11.1	10.0	11.3	30.0
13C8 PFOS	Lin2		0.9509		10.1	9.56	5.3	30.0

FORM VII
LCMS CONTINUING CALIBRATION DATA

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Lab Sample ID: CCV 280-154190/42 Calibration Date: 12/29/2012 00:29
 Instrument ID: LC_LCMS5 Calib Start Date: 12/28/2012 20:14
 GC Column: Gemini-NX ID: _____ Calib End Date: 12/28/2012 21:16
 Lab File ID: PC512L28075.d Conc. Units: ug/L

ANALYTE	CURVE TYPE	AVE RRF	RRF	MIN RRF	CALC AMOUNT	SPIKE AMOUNT	%D	MAX %D
Ammonium Perfluorooctanoate (APFO)	Lin2		0.997		5.42	5.20	4.1	30.0
Perfluorooctanoic acid (PFOA)	Lin2		1.037		5.21	5.00	4.1	30.0
Perfluorooctane Sulfonate (PFOS)	Lin2		1.289		5.46	4.78	14.2	30.0
13C8 PFOA	Lin2		0.9614		5.22	5.00	4.3	30.0
13C8 PFOS	Lin2		0.9259		4.89	4.78	2.2	30.0

FORM III
LCMS DETECTION LIMIT CHECK STANDARD RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-37085-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: PC512L28053.d
Lab ID: DLCK 280-154190/14 Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	DLCK CONCENTRATION (ug/L)	DLCK % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.200	0.218 J	109	70-130	
Perfluorooctane Sulfonate (PFOS)	0.191	0.137 J	72	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.: 280-37085-1
SDG No.: _____
Lab File ID: PC512L28071.d Lab Sample ID: MB 280-152604/1-A
Matrix: Water Date Extracted: 12/17/2012 17:27
Instrument ID: LC_LCMS5 Date Analyzed: 12/28/2012 23:58
Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-152604/2-A	PC512L28072 .d	12/29/2012 00:06
	LCS 280-152604/3-A	PC512L28073 .d	12/29/2012 00:13
NASB-B611-MWDUP01-1212	280-37085-3	PC512L28074 .d	12/29/2012 00:21

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1

SDG No.: _____

Client Sample ID: _____ Lab Sample ID: MB 280-152604/1-A

Matrix: Water Lab File ID: PC512L28071.d

Analysis Method: PFOA/PFOS Date Collected: _____

Extraction Method: 3535 Date Extracted: 12/17/2012 17:27

Sample wt/vol: 250 (mL) Date Analyzed: 12/28/2012 23:58

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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0080	U	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	102		60-155
STL01054	13C8 PFOS	96		45-130

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Lab File ID: PC512L28055.d Lab Sample ID: MB 280-152683/1-A
 Matrix: Water Date Extracted: 12/18/2012 18:20
 Instrument ID: LC_LCMS5 Date Analyzed: 12/28/2012 21:54
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 280-152683/2-A	PC512L28056 .d	12/28/2012 22:02
NASB-B611-MW01S-1212	280-37085-1	PC512L28057 .d	12/28/2012 22:10
NASB-B611-MW02-1212	280-37085-2	PC512L28058 .d	12/28/2012 22:17
NASB-B611-MW03-1212	280-37085-4	PC512L28059 .d	12/28/2012 22:25
NASB-B611-MW03-1212 MS	280-37085-4 MS	PC512L28060 .d	12/28/2012 22:33
NASB-B611-MW03-1212 MSD	280-37085-4 MSD	PC512L28061 .d	12/28/2012 22:41
NASB-B611-MW05S-1212	280-37085-5	PC512L28062 .d	12/28/2012 22:48
NASB-B611-MW04S-1212	280-37085-6	PC512L28063 .d	12/28/2012 22:56
NASB-B611-MW04D-1212	280-37085-7	PC512L28064 .d	12/28/2012 23:04
NASB-B611-MW06S-1212	280-37085-8	PC512L28066 .d	12/28/2012 23:19
NASB-B611-MW06D-1212	280-37085-9	PC512L28067 .d	12/28/2012 23:27
NASB-B611-MW01D-1212	280-37085-10	PC512L28068 .d	12/28/2012 23:35
NASB-B611-MW05D-1212	280-37085-11	PC512L28069 .d	12/28/2012 23:43
NASB-B611-GW-RB01-121312	280-37085-12	PC512L28070 .d	12/28/2012 23:50

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1

SDG No.: _____

Client Sample ID: _____ Lab Sample ID: MB 280-152683/1-A

Matrix: Water Lab File ID: PC512L28055.d

Analysis Method: PFOA/PFOS Date Collected: _____

Extraction Method: 3535 Date Extracted: 12/18/2012 18:20

Sample wt/vol: 250 (mL) Date Analyzed: 12/28/2012 21:54

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.: 154190 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	LOD	DL
335-67-1	Perfluorooctanoic acid (PFOA)	0.0080	U	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	102		60-155
STL01054	13C8 PFOS	94		45-130

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Denver Job No.: 280-37085-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: CCB 280-154190/12
 Matrix: Water Lab File ID: PC512L28051.d
 Analysis Method: PFOA/PFOS Date Collected: _____
 Extraction Method: _____ Date Extracted: _____
 Sample wt/vol: 1 (mL) Date Analyzed: 12/28/2012 21:23
 Con. Extract Vol.: _____ Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: Gemini-NX ID: _____
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 154190 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 II
LCMS SURROGATE RECOVERY

Lab Name: TestAmerica Denver

Job No.: 280-37085-1

SDG No.: _____

Matrix: Water

Level: Low

GC Column (1): Gemini-NX ID: _____

Client Sample ID	Lab Sample ID	PFOA #	PFOS #
NASB-B611-MW01S-12 12	280-37085-1	97	96
NASB-B611-MW02-121 2	280-37085-2	99	92
NASB-B611-MWDUP01- 1212	280-37085-3	99	93
NASB-B611-MW03-121 2	280-37085-4	98	92
NASB-B611-MW05S-12 12	280-37085-5	100	94
NASB-B611-MW04S-12 12	280-37085-6	97	93
NASB-B611-MW04D-12 12	280-37085-7	99	93
NASB-B611-MW06S-12 12	280-37085-8	100	95
NASB-B611-MW06D-12 12	280-37085-9	101	92
NASB-B611-MW01D-12 12	280-37085-10	100	95
NASB-B611-MW05D-12 12	280-37085-11	101	98
NASB-B611-GW-RB01- 121312	280-37085-12	104	94
	MB 280-152604/1-A	102	96
	MB 280-152683/1-A	102	94
	LCS 280-152604/2-A	102	94
	LCS 280-152683/2-A	101	95
	LCSD 280-152604/3-A	103	93
NASB-B611-MW03-121 2 MS	280-37085-4 MS	100	99
NASB-B611-MW03-121 2 MSD	280-37085-4 MSD	100	96
	DLCK 280-154190/14	83	104

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 III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-37085-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: PC512L28072.d
Lab ID: LCS 280-152604/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.200	0.203	101	70-130	
Perfluorooctane Sulfonate (PFOS)	0.191	0.203	106	60-128	

Column to be used to flag recovery and RPD values

FORM III PFOA/PFOS

FORM III
LCMS LAB CONTROL SAMPLE RECOVERY

Lab Name: TestAmerica Denver Job No.: 280-37085-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: PC512L28056.d
Lab ID: LCS 280-152683/2-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.200	0.200	100	70-130	
Perfluorooctane Sulfonate (PFOS)	0.191	0.194	101	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.: 280-37085-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: PC512L28073.d
 Lab ID: LCSD 280-152604/3-A Client ID: _____

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	LCSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanoic acid (PFOA)	0.200	0.204	102	1	20	70-130	
Perfluorooctane Sulfonate (PFOS)	0.191	0.189	99	7	20	60-128	

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.: 280-37085-1
SDG No.: _____
Matrix: Water Level: Low Lab File ID: PC512L28060.d
Lab ID: 280-37085-4 MS Client ID: NASB-B611-MW03-1212 MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC	QC LIMITS REC	#
Perfluorooctanoic acid (PFOA)	0.211	0.0078 J	0.222	101	70-130	
Perfluorooctane Sulfonate (PFOS)	0.202	0.081	0.322	119	60-128	

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.: 280-37085-1
 SDG No.: _____
 Matrix: Water Level: Low Lab File ID: PC512L28061.d
 Lab ID: 280-37085-4 MSD Client ID: NASB-B611-MW03-1212 MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC	% RPD	QC LIMITS		#
					RPD	REC	
Perfluorooctanoic acid (PFOA)	0.196	0.214	105	3	20	70-130	
Perfluorooctane Sulfonate (PFOS)	0.187	0.331	133	3	20	60-128	J

Column to be used to flag recovery and RPD values

FORM III PFOA/PFOS

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Denver

Job No.: 280-37085-1

SDG No.: _____

Instrument ID: LC_LCMS5

Calibration Start Date: 12/28/2012 20:14

GC Column: Gemini-NX

ID: _____

Calibration End Date: 12/28/2012 21:16

Calibration ID: 12257

		OA		PFOS			
		AREA #	RT #	AREA #	RT #	AREA #	RT #
INITIAL CALIBRATION MEAN AREA AND MEAN RT		12694547	4.31	3458528	4.44		
UPPER LIMIT		19676548	4.81	4496086	4.94		
LOWER LIMIT		7616728	3.81	1556338	3.94		
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCB 280-154190/12		14970184	4.32	4092375	4.45		
ICV 280-154190/13		14108832	4.32	3769886	4.45		
DLCK 280-154190/14		13381359	4.32	3735260	4.45		
MB 280-152683/1-A		13389550	4.30	3623485	4.43		
LCS 280-152683/2-A		13084571	4.30	3141164	4.43		
280-37085-1	NASB-B611-MW01S-1212	11362718	4.29	2367756	4.42		
280-37085-2	NASB-B611-MW02-1212	11813226	4.29	2437796	4.42		
280-37085-4	NASB-B611-MW03-1212	14709481	4.29	2769448	4.41		
280-37085-4 MS	NASB-B611-MW03-1212 MS	14022156	4.29	2350785	4.42		
280-37085-4 MSD	NASB-B611-MW03-1212 MSD	14825900	4.28	2674590	4.41		
280-37085-5	NASB-B611-MW05S-1212	14454294	4.28	3209102	4.40		
280-37085-6	NASB-B611-MW04S-1212	14592035	4.28	2742297	4.41		
280-37085-7	NASB-B611-MW04D-1212	15809103	4.27	3049455	4.40		
CCV 280-154190/29		13973470	4.29	3948166	4.41		
280-37085-8	NASB-B611-MW06S-1212	13355846	4.28	2370037	4.41		
280-37085-9	NASB-B611-MW06D-1212	13601932	4.28	3249620	4.41		
280-37085-10	NASB-B611-MW01D-1212	14576197	4.28	2977800	4.41		
280-37085-11	NASB-B611-MW05D-1212	13569812	4.28	2941284	4.40		
280-37085-12	NASB-B611-GW-RB01-121 312	13505347	4.28	3507150	4.41		
MB 280-152604/1-A		12938253	4.28	3041754	4.40		
LCS 280-152604/2-A		13099615	4.27	3354259	4.40		
LCSD 280-152604/3-A		12230208	4.27	3015681	4.40		
280-37085-3	NASB-B611-MWDUP01-121 2	11401346	4.27	2663134	4.40		
CCV 280-154190/42		11125861	4.28	2988917	4.40		

OA = 13C4 PFOA (IS)

PFOS = 13C4 PFOS (IS)

Area Limit = 60%-155% of internal standard area

RT Limit = $\pm$ 0.5 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII PFOA/PFOS

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	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW01S	Monitoring well	3015059.27	384392.01	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW01S-1212	Ground water	Normal (Regular)	11-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW06D	Monitoring well	3015006.28	384544.4	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW06D-1212	Ground water	Normal (Regular)	12-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW01D	Monitoring well	3015060.51	384391.96	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW01D-1212	Ground water	Normal (Regular)	13-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW02	Monitoring well	3015020.33	384370.14	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW02-1212	Ground water	Normal (Regular)	11-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1							N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-GW-RB01-121312	Water for QC samples	Equipment blank	13-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW04D	Monitoring well	3015075.88	384292.46	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW04D-1212	Ground water	Normal (Regular)	12-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW05D	Monitoring well	3015174.88	384333.82	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW05D-1212	Ground water	Normal (Regular)	13-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW05S	Monitoring well	3015172.62	384333.52	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW05S-1212	Ground water	Normal (Regular)	11-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW06S	Monitoring well	3015002.2	384544.72	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW06S-1212	Ground water	Normal (Regular)	12-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW02	Monitoring well	3015020.33	384370.14	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW02-1212-D	Ground water	Field duplicate	11-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW04S	Monitoring well	3015078.21	384292.54	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW04S-1212	Ground water	Normal (Regular)	12-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds
MID_ATLANTIC	BRUNSWICK_NAS	280-37085-1	RCRA CLOSURE	SITE 00011	B611-MW03	Monitoring well	3015019.34	384335.35	N6246704D0055	432	TETRA TECH NUS, INC.	NASB-B611-MW03-1212	Ground water	Normal (Regular)	11-Dec-12	TA_WS-LC-0025	Perfluoroalkyl Compounds