City of Salem Water
E60345

L2430630

SEVERN TRENT STL

STL Denver
4955 Yarrow Street
Arvada, CO 80002

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ANALYTICAL REPORT

PFOA/PFOS Analysis

Lot #: D7H290308

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Southampton, PA 18966

TestAmerica Denver

Gail DeRuzzo
Project Manager

September 8, 2007

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Standard Deliverables

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Standard Deliverables

*The **Cover Letter** and the **Report Cover** page are considered integral parts of this Standard Deliverable package. This report is incomplete unless all pages indicated in this Table of Contents are included.*

Case Narrative
D7H290308

TestAmerica Denver utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the methods summary page in accordance with the methods indicated. Dilution factors and footnotes are provided on each datasheet to assist in the interpretation of the results.

The results relate only to the samples in this report and meet all requirements of NELAC. All data have been reviewed for compliance with the laboratory QA/QC plan and have found to be compliant with laboratory protocols with any exceptions noted below.

Please note that Non-Detect (ND) results have been evaluated down to the Method Detection Limit (MDL) and should be considered ND at the MDL. Unless otherwise noted, results for solids have been dry weight corrected.

This report shall not be reproduced except in full, without the written approval of the laboratory.

Sample Arrival and Receipt
The following report contains the analytical results for one sample received 8/29/07, according to documented sample acceptance procedures. The samples were received in good condition at a temperature of 2.6°C. No custody seals were present on the cooler. The client was notified. No other anomalies were encountered during sample receipt.

Standards
Analytical standards were prepared using the acid form of the compound perfluorooctanoic acid (PFOA). PFOS is a commercial prepared and certified solution.

Perfluoro-n-[1,2,3,4-$^{13}C_4$]octanoic acid was introduced at the extraction step and was used as an internal standard for quantitation of PFOA. Perfluoro-1-[1,2,3,4-$^{13}C_4$]octanatesulfonate was introduced at the extraction step and was used as an internal standard for quantitation of PFOS.

Sample Extraction and Analysis
The samples presented in this report were analyzed for the target analyte by TestAmerica Denver's SOP DEN-LC-0012A.

For water samples a 250 mL aliquot of each sample is acidified with 1 mL of 6N HCl solution and it is extracted using solid phase extraction technique with methanol conditioned C18 cartridges. Each sample is spiked with the internal standard, prior to extraction. After the sample is passed through the cartridge, the analytes are eluted with 4 mL of methanol. The final volume is brought to 5 mL using methanol and the extract is analyzed by LC/MS/MS.

Method QC Samples
The Method Blank is processed reagent water spiked with surrogate and prepared with each batch of 20 samples of the same matrix. The method blank was non-detect at the reporting limit.

Each batch is prepared with a Laboratory Control Sample (LCS). The recoveries of two concentration levels of Laboratory Control Samples were within control limits. The MS/MSD performed on sample L2430630-1 had recoveries within control limits.

Analytical Comments
No anomalies were observed.

EXECUTIVE SUMMARY - Detection Highlights

D7H290308

PARAMETER	RESULT	REPORTING LIMIT	UNITS	ANALYTICAL METHOD
NO DETECTABLE PARAMETERS				

METHODS SUMMARY

D7H290308

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
LC/MS/MS, PFOA	DEN -LC-0012	

References:

DEN Severn Trent Laboratores, Denver, Facility Standard Operating Procedure.

METHOD / ANALYST SUMMARY

D7H290308

ANALYTICAL METHOD	ANALYST	ANALYST ID
DEN -LC-0012	Jaqueline Bonnett	003601

References:

DEN Severn Trent Laboratores, Denver, Facility Standard Operating Procedure.

SAMPLE SUMMARY

D7H290308

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
J5V4X	001	L2430630-1	08/27/07	07:30

NOTE (S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

QC Laboratories

Client Sample ID: L2430630-1

HPLC

Lot-Sample #...: D7H290308-001 Work Order #...: J5V4X1AA Matrix.....: WATER
Date Sampled...: 08/27/07 07:30 Date Received..: 08/29/07
Prep Date.....: 08/31/07 Analysis Date..: 09/02/07
Prep Batch #...: 7243489 Analysis Time..: 19:10
Dilution Factor: 1
Method.....: DEN-LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS
PFOA	ND	0.010	ug/L
PFOS	ND	0.010	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	67	(50 - 200)
13C4 PFOS	78	(50 - 200)

QC DATA ASSOCIATION SUMMARY

D7H290308

Sample Preparation and Analysis Control Numbers

SAMPLE#	MATRIX	ANALYTICAL METHOD	LEACH BATCH #	PREP BATCH #	MS RUN#
001	WATER	DEN -LC-0012		7243489	7243293

METHOD BLANK REPORT

HPLC

Client Lot #...: D7H290308
MB Lot-Sample #: R7H310000-489

Work Order #...: J53L51AA
Prep Date.....: 08/31/07
Prep Batch #...: 7243489

Matrix.....: WATER
Analysis Time..: 18:22

Analysis Date..: 09/02/07
Dilution Factor: 1

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
PFOA	ND	0.010	ug/L	DEN -LC-0012
PFOS	ND	0.010	ug/L	DEN -LC-0012

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	60	(50 - 200)
13C4 PFOS	58	(50 - 200)

NOTE(S):

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

LABORATORY CONTROL SAMPLE EVALUATION REPORT

HPLC

Client Lot #...: D7H290308 Work Order #...: J53L51AC Matrix.....: WATER
LCS Lot-Sample#: R7H310000-489
Prep Date.....: 08/31/07 Analysis Date..: 09/02/07
Prep Batch #...: 7243489 Analysis Time..: 18:38
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
PFOA	**114**	**(70 - 130)**	**DEN -LC-0012**
PFOS	**111**	**(39 - 120)**	**DEN -LC-0012**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	63	(50 - 200)
13C4 PFOS	75	(50 - 200)

NOTE(S):

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

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

HPLC

Client Lot #...: D7H290308 Work Order #...: J53L51AC Matrix.....: WATER
LCS Lot-Sample#: R7H310000-489
Prep Date.....: 08/31/07 Analysis Date..: 09/02/07
Prep Batch #...: 7243489 Analysis Time..: 18:38
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
PFOA	**0.200**	**0.228**	**ug/L**	**114**	DEN -LC-0012
PFOS	**0.200**	**0.221**	**ug/L**	**111**	DEN -LC-0012

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	63	(50 - 200)
13C4 PFOS	75	(50 - 200)

NOTE(S):

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

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE EVALUATION REPORT

HPLC

Client Lot #...: D7H290308 Work Order #...: J53L51AD Matrix.....: WATER
LCS Lot-Sample#: R7H310000-489
Prep Date.....: 08/31/07 Analysis Date..: 09/02/07
Prep Batch #...: 7243489 Analysis Time..: 18:54
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD
PFOA	**112**	**(70 - 130)**	**DEN -LC-0012**
PFOS	**107**	**(39 - 120)**	**DEN -LC-0012**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	70	(50 - 200)
13C4 PFOS	79	(50 - 200)

NOTE(S) :

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

Bold print denotes control parameters

LABORATORY CONTROL SAMPLE DATA REPORT

HPLC

Client Lot #...: D7H290308 Work Order #...: J53L51AD Matrix.....: WATER
LCS Lot-Sample#: R7H310000-489
Prep Date.....: 08/31/07 Analysis Date..: 09/02/07
Prep Batch #...: 7243489 Analysis Time..: 18:54
Dilution Factor: 1

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
PFOA	**0.0200**	**0.0223**	**ug/L**	**112**	**DEN -LC-0012**
PFOS	**0.0200**	**0.0213**	**ug/L**	**107**	**DEN -LC-0012**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	70	(50 - 200)
13C4 PFOS	79	(50 - 200)

NOTE(S):

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

Bold print denotes control parameters

MATRIX SPIKE SAMPLE EVALUATION REPORT

HPLC

Client Lot #...: D7H290308 Work Order #...: J5V4X1AC-MS Matrix.....: WATER
MS Lot-Sample #: D7H290308-001 J5V4X1AD-MSD
Date Sampled...: 08/27/07 07:30 Date Received..: 08/29/07
Prep Date.....: 08/31/07 Analysis Date..: 09/02/07
Prep Batch #...: 7243489 Analysis Time..: 19:27
Dilution Factor: 1

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD
PFOA	110	(70 - 130)			DEN -LC-0012
	113	(70 - 130)	1.2	(0-20)	DEN -LC-0012
PFOS	111	(39 - 120)			DEN -LC-0012
	110	(39 - 120)	2.2	(0-20)	DEN -LC-0012

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	69	(50 - 200)
	68	(50 - 200)
13C4 PFOS	71	(50 - 200)
	78	(50 - 200)

NOTE(S) :

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

Bold print denotes control parameters

MATRIX SPIKE SAMPLE DATA REPORT

HPLC

Client Lot #...: D7H290308 Work Order #...: J5V4X1AC-MS Matrix.....: WATER
MS Lot-Sample #: D7H290308-001 J5V4X1AD-MSD
Date Sampled...: 08/27/07 07:30 Date Received..: 08/29/07
Prep Date.....: 08/31/07 Analysis Date..: 09/02/07
Prep Batch #...: 7243489 Analysis Time..: 19:27
Dilution Factor: 1

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
PFOA	ND	0.200	0.220	ug/L	110		DEN -LC-0012
	ND	0.198	0.223	ug/L	113	1.2	DEN -LC-0012
PFOS	ND	0.200	0.222	ug/L	111		DEN -LC-0012
	ND	0.198	0.217	ug/L	110	2.2	DEN -LC-0012

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
13C4 PFOA	69	(50 - 200)
	68	(50 - 200)
13C4 PFOS	71	(50 - 200)
	78	(50 - 200)

NOTE(S):

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

Bold print denotes control parameters

STL Denver

2.6°C 8/28/07 EM

QC Laboratories

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Southampton, PA 18966-0514
Phone: 215-355-3900
Fax: 215-355-7231

CHAIN OF CUSTODY

Page 1 of 1

Lab LIMS No:

Client/Acct. No. QC Laboratories
Address see above
City/State/Zip
Phone/Fax ext. 3360
Client Contact Nicki Smith

Bill to/Report to: (if different)
Sampling Site Address: (if different)
P.O. No.
QC Contact

LAB USE ONLY:

- # ___ Ascorbic/HCl Vials # ___ HCl Vials
- # ___ $Na_2S_2O_3$
- # ___ NaOH/Zn acetate pH
- # ___ HNO_3 pH
- # ___ H_2SO_4 pH
- # ___ NaOH pH
- # ___ unpreserved
- # ___ HCl pH
- # ___ Temp control ___ ID# ___

MATRIX CODES

DW: DRINKING WATER
GW: GROUND WATER
WW: WASTEWATER
SO: SOIL
SL: SLUDGE
OIL: OIL
SOL: NON SOIL SOLID
MI: MISCELLANEOUS
X: OTHER

PROJECT

FIELD ID	Collection Date	Collection Military Time	GRAB	COMP	Matrix Code	Number of Containers Total	H_2SO_4	HCl	HNO_3	NaOH	ZnAc	Unpres	Bact
L2430630-1	8/27/07	0730			DW	1							1

ANALYSIS REQUESTED

PFOA/PFOS

Field pH, Temp (C or F), DO, Cl_2, S. Cond. etc.

LABUSEONLY

FINAL REPORT

SAMPLED BY: (Name/Company)

Verbal/fax data due: ___/___/___
Hardcopy due: ___/___/___

Report Format: ☑ Standard ☐ Forms ☐ Standard + QC ☐ NJ Reduced ☐ Disk

Please call for pricing and availability on rush (<14-21 day) turnaround and on all but standard format.

Field Parameters Analyzed By:
Sig:
Date/Time:

SAMPLE CUSTODY EXCHANGES MUST BE DOCUMENTED BELOW. USE FULL LEGAL SIGNATURE, DATE AND MILITARY TIME (24 HOUR CLOCK, I.E. 8AM IS 0800, 4 PM IS 1600)

RELINQUISHED BY SAMPLER 1	DATE	TIME	RECEIVED BY 1	DATE	TIME
RELINQUISHED BY 2 Eric Dougherty	DATE 8/28/07	TIME 1630	RECEIVED BY 2 UPS	DATE	TIME
RELINQUISHED BY 3	DATE	TIME	RECEIVED BY 3	DATE 8/29/07	TIME 0945
RELINQUISHED BY 4	DATE	TIME	RECEIVED BY 4	DATE	TIME
RELINQUISHED BY 5	DATE	TIME	RECEIVED BY 5	DATE	TIME

DELIVERY METHOD: ☐ QC COURIER ☐ CLIENT ☑ UPS ☐ FEDEX ☐ OTHER ___

Custody Seal Number

COMMENTS:
2 Copies

Hazardous: yes / no

For example to aid completion, see reverse side.