

7/25/07
STL

N30327001
Runnede
Somerville
Murray

STL Denver
4955 Yarrow Street
Arvada, CO 80002

Tel: 303 736 0100 Fax: 303 431 7171
www.stl-inc.com

ANALYTICAL REPORT

PFOA/PFOS Analysis

Lot #: D7G270329

Laura Vancho/Jane Hanuszczyk

NJ American Water
213 Carriage Lane
Delran, NJ 08075

TestAmerica Denver



Gail DeRuzzo
Project Manager

August 12, 2007

METHODS SUMMARY

D7G270329

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

References:

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

METHOD / ANALYST SUMMARY

D7G270329

<u>ANALYTICAL METHOD</u>	<u>ANALYST</u>	<u>ANALYST ID</u>
DEN -LC-0012	Jaqueline Bonnett	003601

References:

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

SAMPLE SUMMARY

D7G270329

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
J3QWX	001	MURRAY AVE POE	07/25/07	09:25
J3QW1	002	RUNNEMEDE POE	07/25/07	11:20
J3QW3	003	SOMERDALE POE	07/26/07	13:00

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.

American Water Company

Client Sample ID: MURRAY AVE POE

HPLC

Lot-Sample #....: D7G270329-001 Work Order #....: J3QWX1AA Matrix.....: WATER
 Date Sampled....: 07/25/07 09:25 Date Received...: 07/27/07
 Prep Date.....: 07/31/07 Analysis Date...: 08/03/07
 Prep Batch #....: 7212191 Analysis Time...: 04:23
 Dilution Factor: 1

Method.....: DEN -LC-0012

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
PFOS	0.0089 J	0.010	ug/L	0.0020
PFOA	0.013 J	0.015	ug/L	0.0026
SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS		
13C4 PFOA	68	(50 - 200)		
13C4 PFOS	38 *	(50 - 200)		

NOTE(S) :

- * Surrogate recovery is outside stated control limits.
- J Estimated result. Result is less than RL.

American Water Company

Client Sample ID: RUNNEMEKE POE

HPLC

Lot-Sample #....: D7G270329-002 Work Order #....: J3QW11AA Matrix.....: WATER
Date Sampled....: 07/25/07 11:20 Date Received...: 07/27/07
Prep Date.....: 07/31/07 Analysis Date...: 08/03/07
Prep Batch #....: 7212191 Analysis Time...: 04:39
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
PFOS	ND	0.010	ug/L	0.0020
PFOA	ND	0.015	ug/L	0.0026

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
13C4 PFOA	80	(50 - 200)
13C4 PFOS	64	(50 - 200)

American Water Company

Client Sample ID: SOMERDALE POB

HPLC

Lot-Sample #....: D7G270329-003 Work Order #....: J3QW31AA Matrix.....: WATER
Date Sampled....: 07/26/07 13:00 Date Received...: 07/27/07
Prep Date.....: 07/31/07 Analysis Date...: 08/03/07
Prep Batch #....: 7212191 Analysis Time...: 04:56
Dilution Factor: 1
Method.....: DEN -LC-0012

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>MDL</u>
PFOS	ND	0.010	ug/L	0.0020
PFOA	ND	0.015	ug/L	0.0026

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
13C4 PFOA	71	(50 - 200)
13C4 PFOS	45 *	(50 - 200)

NOTE(S) :

* Surrogate recovery is outside stated control limits.

QC DATA ASSOCIATION SUMMARY

D7G270329

Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	WATER	DEN -LC-0012		7212191	
002	WATER	DEN -LC-0012		7212191	
003	WATER	DEN -LC-0012		7212191	

METHOD BLANK REPORT

HPLC

Client Lot #....: D7G270329 Work Order #....: J3WKQ1AA Matrix.....: WATER
 MB Lot-Sample #: R7G310000-191 Prep Date.....: 07/31/07 Analysis Time...: 03:35
 Analysis Date...: 08/03/07 Prep Batch #....: 7212191
 Dilution Factor: 1

PARAMETER	RESULT	REPORTING		
		LIMIT	UNITS	METHOD
PFOA	ND	0.015	ug/L	DEN -LC-0012
PFOS	ND	0.010	ug/L	DEN -LC-0012
SURROGATE	PERCENT	RECOVERY		
	RECOVERY	LIMITS		
13C4 PFOA	73	(50 - 200)		
13C4 PFOS	47 *	(50 - 200)		

NOTE (S) :

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

- * Surrogate recovery is outside stated control limits.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

HPLC

Client Lot #....: D7G270329 Work Order #....: J3WKQ1AC Matrix.....: WATER
 LCS Lot-Sample#: R7G310000-191
 Prep Date.....: 07/31/07 Analysis Date...: 08/03/07
 Prep Batch #....: 7212191 Analysis Time...: 03:51
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
PFOA	110	(70 - 130)	DEN -LC-0012
PFOS	112	(39 - 120)	DEN -LC-0012

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA	64	(50 - 200)
13C4 PFOS	52	(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 #....: D7G270329 Work Order #....: J3WKQ1AC Matrix.....: WATER
 LCS Lot-Sample#: R7G310000-191
 Prep Date.....: 07/31/07 Analysis Date...: 08/03/07
 Prep Batch #....: 7212191 Analysis Time...: 03:51
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
PFOA	0.203	0.224	ug/L	110	DEN -LC-0012
PFOS	0.203	0.227	ug/L	112	DEN -LC-0012

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
13C4 PFOA	64	(50 - 200)
13C4 PFOS	52	(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 #...: D7G270329 Work Order #...: J3WKQ1AD Matrix.....: WATER
 LCS Lot-Sample#: R7G310000-191
 Prep Date.....: 07/31/07 Analysis Date...: 08/03/07
 Prep Batch #...: 7212191 Analysis Time...: 04:07
 Dilution Factor: 1

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>
PFOA	118	(70 - 130)	DEN -LC-0012
PFOS	120	(39 - 120)	DEN -LC-0012

<u>SURROGATE</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>
13C4 PFOA	77	(50 - 200)
13C4 PFOS	72	(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 #....: D7G270329 Work Order #....: J3WKQ1AD Matrix.....: WATER
 LCS Lot-Sample#: R7G310000-191
 Prep Date.....: 07/31/07 Analysis Date...: 08/03/07
 Prep Batch #....: 7212191 Analysis Time...: 04:07
 Dilution Factor: 1

<u>PARAMETER</u>	<u>SPIKE</u> <u>AMOUNT</u>	<u>MEASURED</u> <u>AMOUNT</u>	<u>UNITS</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>METHOD</u>
PFOA	0.0201	0.0238	ug/L	118	DEN -LC-0012
PFOS	0.0201	0.0242	ug/L	120	DEN -LC-0012

<u>SURROGATE</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>
13C4 PFOA	77	(50 - 200)
13C4 PFOS	72	(50 - 200)

NOTE(S) :

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

Bold print denotes control parameters

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Chain of Custody Record

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Table Of Contents

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Standard Deliverables

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Case Narrative

D7G270329

The results included in this report have been reviewed for compliance with the Laboratory Quality Manual. All results have been found to meet all requirements of NELAC and any exceptions are noted below.

This report shall not be reproduced except in full, without the written approval of the laboratory or sponsor. Dilution factors and footnotes have been provided on each datasheet to assist in the interpretation of the results.

Sample Arrival and Receipt

The three water samples presented in this report was received at the TestAmerica Denver laboratory at a temperature of 5.1°C on July 27, 2007.

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-[1,2,3,4-¹³C₄]octanoic acid was introduced at the extraction step and was used as an internal standard for quantitation of PFOA. Perfluoro-1-[1,2,3,4-¹³C₄]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 analytes by TestAmerica Denver's SOP DEN-LC-0012.

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 for the target analytes.

Each batch is prepared with Laboratory Control Samples (LCS). The LCS recoveries for both levels were within established control limits.

Analytical Comments

The internal standard recovery for 13C4 PFOS was below the lower control limit in samples MURRAY AVE POE and SOMERDALE POE. Because the control limits for the 13C4 PFOS have not yet been determined, no corrective action was taken.

The internal standard recovery for 13C4 PFOS for the method blank associated with QC batch 7212191 was below the lower control limit. The control limit for the internal standard has not been established.

There was insufficient sample volume to provide MS/MSD analysis in the analytical batch 7212191. However, two laboratory control samples met all method criteria, indicating the analytical system was in control.

No other anomalies were noted.

EXECUTIVE SUMMARY - Detection Highlights

D7G270329

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
MURRAY AVE POB 07/25/07 09:25 001				
PFOS	0.0089 J	0.010	ug/L	DEN -LC-0012
PFOA	0.013 J	0.015	ug/L	DEN -LC-0012