

LABORATORY REPORT

If you have any questions concerning this report, please do not hesitate to call us at (800) 332-4345 or (574) 233-4777.

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STATE CERTIFICATION LIST

State	Certification	State	Certification
Alabama	40700	Montana	CERT0026
Alaska	IN00035	Nebraska	NE-OS-05-04
Arizona	AZ0432	Nevada	IN00035
Arkansas	IN00035	New Hampshire*	2124
California	2920	New Jersey*	IN598
Colorado	IN035	New Mexico	IN00035
Colorado Radiochemistry	IN035	New York*	11398
Connecticut	PH-0132	North Carolina	18700
Delaware	IN035	North Dakota	R-035
Florida*	E87775	Ohio	87775
Georgia	929	Oklahoma	D9508
Hawaii	IN035	Oregon (Primary AB)*	4074-001
Idaho	IN00035	Pennsylvania*	68-00466
Illinois*	200001	Puerto Rico	IN00035
Illinois Microbiology	17767	Rhode Island	LAO00343
Indiana Chemistry	C-71-01	South Carolina	95005
Indiana Microbiology	M-76-07	South Dakota	IN00035
Iowa	098	Tennessee	TN02973
Kansas*	E-10233	Texas*	T104704187-15-8
Kentucky	90056	Texas/TCEQ	TX207
Louisiana*	LA170006	Utah*	IN00035
Maine	IN00035	Vermont	VT-8775
Maryland	209	Virginia*	460275
Massachusetts	M-IN035	Washington	C837
Michigan	9926	West Virginia	9927 C
Minnesota*	018-999-338	Wisconsin	999766900
Mississippi	IN035	Wyoming	IN035
Missouri	880		

[*NELAP/TNI Recognized Accreditation Bodies](#)

110 South Hill Street
 South Bend, IN 46617
 Tel: (574) 233-4777
 Fax: (574) 233-8207
 1 800 332 4345

Laboratory Report

Client: Charleston Water System

 Attn: Stefanie Smith
 1104 Hanahan Road
 Hanahan, SC 29410

Report: 394643
 Priority: Immediate Written
 Status: Final
 PWS ID: Not Supplied
 Lab ID #: 95005

Sample Information					
EEA ID #	Client ID	Method	Collected Date / Time	Collected By:	Received Date / Time
3747946	Finished AB21418	537	08/02/17 13:55	Client	08/03/17 09:45
3747947	Bushy Park AB21419	537	08/02/17 14:00	Client	08/03/17 09:45
3747948	S22 AB21420	537	08/02/17 14:10	Client	08/03/17 09:45
3747949	FTB	537	08/02/17 13:55	Client	08/03/17 09:45

Report Summary

Detailed quantitative results are presented on the following pages. The results presented relate only to the samples provided for analysis.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call Joseph Mattheis at (574) 233-4777.

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 Account Manager

Authorized Signature

Title

08/07/2017

Date

Client Name: Charleston Water System

Report #: 394643

Sampling Point: Finished AB21418

PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid (NETFC)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid (NMe)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
2801	Perfluorobutanesulfonic acid (PFBS)	537	---	2.0	3.4	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
335-76-2	Perfluorodecanoic acid (PFDA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
2802	Perfluoroheptanoic acid (PFHpA)	537	---	2.0	2.9	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
2803	Perfluorohexanesulfonic acid (PFHxS)	537	---	2.0	3.2	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
307-24-4	Perfluorohexanoic acid (PFHxA)	537	---	2.0	5.5	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
307-55-1	Perfluorolauric acid (PFDoA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
376-06-7	Perfluoromyristic acid (PFTA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
2804	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
2805	Perfluorooctane sulfonate (PFOS)	537	---	2.0	6.8	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
2806	Perfluorooctanoic acid (PFOA)	537	---	2.0	3.9	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
72629-94-8	Perfluorotridecanoic acid (PFTTrDA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 06:35	3747946
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 06:35	3747946

Sampling Point: Bushy Park AB21419

PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid (NETFC)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid (NMe)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
2801	Perfluorobutanesulfonic acid (PFBS)	537	---	2.0	3.9	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
335-76-2	Perfluorodecanoic acid (PFDA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
2802	Perfluoroheptanoic acid (PFHpA)	537	---	2.0	3.3	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
2803	Perfluorohexanesulfonic acid (PFHxS)	537	---	2.0	3.9	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
307-24-4	Perfluorohexanoic acid (PFHxA)	537	---	2.0	6.0	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
307-55-1	Perfluorolauric acid (PFDoA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
376-06-7	Perfluoromyristic acid (PFTA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
2804	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
2805	Perfluorooctane sulfonate (PFOS)	537	---	2.0	9.0	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
2806	Perfluorooctanoic acid (PFOA)	537	---	2.0	4.4	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
72629-94-8	Perfluorotridecanoic acid (PFTTrDA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:25	3747947
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:25	3747947

Sampling Point: S22 AB21420

PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid (NETFC)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid (NME)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
2801	Perfluorobutanesulfonic acid (PFBS)	537	---	2.0	2.7	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
335-76-2	Perfluorodecanoic acid (PFDA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
2802	Perfluoroheptanoic acid (PFHpA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
2803	Perfluorohexanesulfonic acid (PFHxS)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
307-24-4	Perfluorohexanoic acid (PFHxA)	537	---	2.0	2.5	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
307-55-1	Perfluorolauric acid (PFDoA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
376-06-7	Perfluoromyristic acid (PFTA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
2804	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
2805	Perfluorooctane sulfonate (PFOS)	537	---	2.0	10	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
2806	Perfluorooctanoic acid (PFOA)	537	---	2.0	3.8	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
72629-94-8	Perfluorotridecanoic acid (PFTTrDA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:42	3747948
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:42	3747948

Sampling Point: FTB

PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid (NETFC)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid (NME)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
2801	Perfluorobutanesulfonic acid (PFBS)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
335-76-2	Perfluorodecanoic acid (PFDA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
2802	Perfluoroheptanoic acid (PFHpA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
2803	Perfluorohexanesulfonic acid (PFHxS)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
307-24-4	Perfluorohexanoic acid (PFHxA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
307-55-1	Perfluorolauric acid (PFDoA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
376-06-7	Perfluoromyristic acid (PFTA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
2804	Perfluorononanoic acid (PFNA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
2805	Perfluorooctane sulfonate (PFOS)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
2806	Perfluorooctanoic acid (PFOA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
72629-94-8	Perfluorotridecanoic acid (PFTTrDA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537	---	2.0	< 2.0	ng/L	08/04/17 06:55	08/05/17 07:59	3747949

† EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices.

Reg Limit Type:	MCL	SMCL	AL
Symbol:	*	^	!

Lab Definitions

Continuing Calibration Check Standard (CCC) / Continuing Calibration Verification (CCV) / Initial Calibration Verification Standard (ICV) / Initial Performance Check (IPC) - is a standard containing one or more of the target analytes that is prepared from the same standards used to calibrate the instrument. This standard is used to verify the calibration curve at the beginning of each analytical sequence, and may also be analyzed throughout and at the end of the sequence. The concentration of continuing standards may be varied, when prescribed by the reference method, so that the range of the calibration curve is verified on a regular basis. CCL, CCM, and CCH are the CCC standards at low, mid, and high concentration levels, respectively.

Internal Standards (IS) - are pure compounds with properties similar to the analytes of interest, which are added to field samples or extracts, calibration standards, and quality control standards at a known concentration. They are used to measure the relative responses of the analytes of interest and surrogates in the sample, calibration standard or quality control standard.

Laboratory Duplicate (LD) - is a field sample aliquot taken from the same sample container in the laboratory and analyzed separately using identical procedures. Analysis of laboratory duplicates provides a measure of the precision of the laboratory procedures.

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) - is an aliquot of reagent water to which known concentrations of the analytes of interest are added. The LFB is analyzed exactly the same as the field samples. LFBs are used to determine whether the method is in control. FBL, FBM, and FBH are the LFB samples at low, mid, and high concentration levels, respectively.

Laboratory Method Blank (LMB) / Laboratory Reagent Blank (LRB) - is a sample of reagent water included in the sample batch analyzed in the same way as the associated field samples. The LMB is used to determine if method analytes or other background contamination have been introduced during the preparation or analytical procedure. The LMB is analyzed exactly the same as the field samples.

Laboratory Trip Blank (LTB) / Field Reagent Blank (FRB) - is a sample of laboratory reagent water placed in a sample container in the laboratory and treated as a field sample, including storage, preservation, and all analytical procedures. The FRB/LTB container follows the collection bottles to and from the collection site, but the FRB/LTB is not opened at any time during the trip. The FRB/LTB is primarily a travel blank used to verify that the samples were not contaminated during shipment.

Matrix Spike Duplicate Sample (MSD) / Laboratory Fortified Sample Matrix Duplicate (LFSMD) - is a sample aliquot taken from the same field sample source as the Matrix Spike Sample to which known quantities of the analytes of interest are added in the laboratory. The MSD is analyzed exactly the same as the field samples. Analysis of the MSD provides a measure of the precision of the laboratory procedures in a specific matrix. SDL, SDM, and SDH / LFSMDL, LFSMDM, and LFSMDH are the MSD or LFSMD at low, mid, and high concentration levels, respectively.

Matrix Spike Sample (MS) / Laboratory Fortified Sample Matrix (LFSM) - is a sample aliquot taken from field sample source to which known quantities of the analytes of interest are added in the laboratory. The MS is analyzed exactly the same as the field samples. The purpose is to demonstrate recovery of the analytes from a sample matrix to determine if the specific matrix contributes bias to the analytical results. MSL, MSM, and MSH / LFSML, LFSMM, and LFSMH are the MS or LFSM at low, mid, and high concentration levels, respectively.

Quality Control Standard (QCS) / Second Source Calibration Verification (SSCV) - is a solution containing known concentrations of the analytes of interest prepared from a source different from the source of the calibration standards. The solution is obtained from a second manufacturer or lot if the lot can be demonstrated by the manufacturer as prepared independently from other lots. The QCS sample is analyzed using the same procedures as field samples. The QCS is used as a check on the calibration standards used in the method on a routine basis.

Reporting Limit Check (RLC) / Initial Calibration Check Standard (ICCS) - is a procedural standard that is analyzed each day to evaluate instrument performance at or below the minimum reporting limit (MRL).

Surrogate Standard (SS) / Surrogate Analyte (SUR) - is a pure compound with properties similar to the analytes of interest, which is highly unlikely to be found in any field sample, that is added to the field samples, calibration standards, blanks and quality control standards before sample preparation. The SS is used to evaluate the efficiency of the sample preparation process.

Sample Analysis Report

Client: Charleston Water System
Contact: Stefanie Smith
 1104 Hanahan Road
 Hanahan, SC 29410
 Voice: (843) 863-4035
smithsm@charlestoncpw.com

Order No.: 323996
Receipt Batch No.: 394643

Analytical Method Summary for RD100:

Solid Phase Extraction LC/MS/MS – The client samples were extracted and analyzed for perfluoro-2-propoxypropanoic acid (GenX), CAS# 13252-13-6 and dodecafluoro-3H-4,8-dioxanonanoic acid (ADONA), CAS# 958445-44-8 (as ammonium salt). 250 mL of sample was extracted by following EPA method 537. The EPA method 537 surrogate standards (SS1-¹³C₂-PFHxA and SS2-¹³C₂-PFDA) were used. The final extracts were spiked with the internal standard (isotopically labeled ¹³C₃-GenX).

The analysis batch included a set of initial calibration standards in a concentration range of 2-500 ng/L, a laboratory reagent blank (LRB), a laboratory fortified blank (LFB) at 100 ng/L, and a continuing calibration check (CCC) at 100 ng/L. A matrix spike (MS) at 100 ng/L and a field duplicate (FD) were also performed. The linear calibration correlation coefficients (r^2) were 0.998 or greater for both GenX and ADONA. The minimum reporting limit (MRL) was set at 2 ng/L for both analytes.

Sample Results:

All quality control and sample results are reported in the following tables:

Quality Control Results:

Analyte	LRB (ng/L)	LFB Recovery (%)	Closing CCC Recovery (%)
GenX	< 2	87	105
ADONA	< 2	95	106

Sample Lab ID: 3747950

Sample Site: Finished AB21418

Analyte	Result (ng/L)	SS1 Recovery (%)	SS2 Recovery (%)	IS Recovery (%)	MS or FD
GenX	< 2	111	105	93	N/A
ADONA	< 2	111	105	93	N/A

Sample Lab ID: 3747951


Sample Site: Bushy Park AB21419

Analyte	Result (ng/L)	SS1 Recovery (%)	SS2 Recovery (%)	IS Recovery (%)	MS or FD
GenX	< 2	111	103	93	N/A
ADONA	< 2	111	103	93	N/A

Sample Lab ID: 3747952

Sample Site: S22 AB21420

Analyte	Result (ng/L)	SS1 Recovery (%)	SS2 Recovery (%)	IS Recovery (%)	MS or FD
GenX	< 2	108	99	104	N/A
ADONA	< 2	108	99	104	N/A


Analyst signature

08-05-2017
Date


Reviewer signature

08/07/2017
Date

Kellie DePriest

From: Joe Mattheis
Sent: Thursday, August 03, 2017 10:21 AM
To: Kellie DePriest
Subject: RE: Charleston Water 08032017

Yes IW

Sent from my Verizon Wireless 4G LTE smartphone

----- Original message -----
From: Kellie DePriest <KellieDePriest@eurofinsUS.com>
Date: 08/03/2017 9:15 AM (GMT-06:00)
To: Joe Mattheis <JosephMattheis@eurofinsUS.com>
Cc: Heather Stevens <HeatherStevens@eurofinsUS.com>, Sheri Spurgeon <SheriSpurgeon@eurofinsUS.com>
Subject: Charleston Water 08032017

Please verify TAT