Matthew Calacone
Senior Project Manager

GE
Global Operations – Environment Health and Safety
1 River Road – Building 5-7W
Schenectady, NY 12345

T 413-553-6614
Matthew.Calacone@ge.com

VIA ELECTRONIC MAIL

February 19, 2019

Payson Long
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, NY 12233

Subject: Vatrano Road Site
NYSDEC Site ID #401036
Albany, NY 12205

Dear Mr. Long:

As requested by the New York State Department of Environmental Conservation (NYSDEC), the General Electric Company (GE) submitted a response letter and Sampling and Analysis Plan (SAP) to the NYSDEC on May 2, 2018 for the collection of samples for 1,4-dioxane and per- and polyfluoroalkyl substances (PFAS) analysis at the Vatrano Road Site (Site). In response to comments from NYSDEC, the SAP was revised and re-submitted to NYSDEC on July 27, 2018, and was subsequently approved by NYSDEC on August 24, 2018.

The commercial Site is serviced by municipal water and sewer and is located at Vatrano Road in Albany, New York. **Figure 1** shows the Site and identifies the four monitoring wells that were selected for sampling. The Site currently provides leased commercial facilities and the general area is zoned for mixed commercial and industrial properties. The public drinking water supply has previously been tested for 1,4-dioxane and PFAS.

O'Brien & Gere Engineers, Inc. (OBG) implemented the SAP on October 3 and 4, 2018. Groundwater samples were collected from monitoring wells MW-1, MW-2, MW-4, and MW-7 for 1,4-dioxane and PFAS analyses. Field quality assurance/quality control (QA/QC) samples were collected per the SAP and consisted of one blind field duplicate sample, one set of matrix spike (MS) and matrix spike duplicate (MSD) samples, and one equipment blank sample, all of which were submitted for 1,4-dioxane and PFAS analyses. Per the SAP, one

field reagent blank (FRB) was also collected and submitted for PFAS analysis. The blind field duplicate sample was collected from monitoring well MW-2, and the MS/MSD sample pair was collected from monitoring well MW-4.

In accordance with the SAP, the monitoring wells were purged at low-flow rates using a bladder pump with dedicated, low density polyethylene (LDPE) tubing. The monitoring wells were purged until field parameters stabilized. Groundwater field parameter data consisting of temperature, pH, specific conductivity, oxidation-reduction potential, dissolved oxygen, and turbidity, were collected and documented on field forms prior to sample collection. The completed field forms are included as **Attachment A**.

TestAmerica's laboratories in Buffalo, New York and Sacramento, California analyzed the groundwater samples for 1,4-dioxane and PFAS, respectively. The 1,4-dioxane analyses were performed using United States Environmental Protection Agency (USEPA) Method 8270 in selective ion monitoring (SIM) mode and achieved a reporting limit of 0.28 parts per billion (ppb) or less. The PFAS analyses were performed using USEPA Method 537, Revision 1.1, modified, and achieved a reporting limit of 2 parts per trillion (ppt) or less for perfluorooctanesulfonic acid (PFOS), perfluorooctanoic acid (PFOA) and several (but not all) of the other PFAS analytes. The 1,4-dioxane and PFAS result forms are included as **Attachment B**.

As requested by NYSDEC, the analytical results were validated and a Data Validation Report was prepared by OBG. The Data Validation Report (DVR) is included as **Attachment C**.

One of the four monitoring wells had a detectable concentration of 1,4-dioxane (0.20 ppb in MW-7, which is less than the NYSDEC-required reporting limit of 0.28 ppb). 1,4-Dioxane was not detected in the equipment blank. There is currently no state groundwater standard for 1,4-dioxane

PFOS and PFOA were detected in three of the four monitoring wells (MW-2, MW-4, and MW-7). As presented in the DVR, PFOS was tentatively identified at an estimated concentration of 100 ppt in the sample from MW-2, and was tentatively identified at 22 and 7.9 ppt in the samples from MW-4 and MW-7, respectively. PFOA was detected in the sample from MW-2 at a concentration of 14 ppt, and was tentatively identified at estimated concentrations of 25 and 14 ppt in the samples from MW-4 and MW-7, respectively. Up to nine other PFAS were detected. Note that perfluorohexanesulfonic acid (PFHxS) was detected at similar, estimated concentrations in the equipment blank, field reagent blank, and laboratory method blank. There is currently no state groundwater standard for PFAS (including PFOS and PFOA). The groundwater is not used at the property and the property will be subject to a groundwater use restriction.

Should you have any questions, please contact me.

Sincerely,

Matthew Calacone
Senior Project Manager

attachment

cc: Justin Deming, NYSDOH (via email)
Scarlett McLaughlin, NYSDOH (via email)
Paul Hare, OBG (via email)
Paul D'Annibale, OBG (via email)
Mike Noel, TetraTech (via email)

VATRANO ROAD

BENCH MARK
SPIKE IN UTP
NM 7 1/2 NYT 7-5
ELEV=215.54'

EXISTING CONTOUR

PLACE FILL TO THE LIMITS INDICATED AND IN ACCORDANCE WITH SPECIFICATION SECTION 02200

LIMITS OF SITE REMEDIATION AND COVER SYSTEM

AREA 15

AREA 14

MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
MW-7
MW-8
MW-9

MON PNT 1 ELEV=219.35
MON PNT 2 ELEV=219.48
MON PNT 3 ELEV=219.55
MON PNT 4 ELEV=217.1'
MON PNT 5 ELEV=217.2'
MON PNT 6 ELEV=217.3'
MON PNT 7 ELEV=219.48'
MON PNT 8 ELEV=219.52'
MON PNT 9 ELEV=219.62'

FF BLDG 8 ELEV=219.88'
FF ELEV=219.95'

BUILDING # 8
BUILDING # 10
BUILDING # 12
BUILDING # 14
BUILDING # 16
BUILDING # 19

CONCRETE STAIRS
WOOD STEPS AND 14'x12' WOOD DECK
WOOD DECK
DOOR
GATE
SEWER CLEANOUT
SEWER LINE APPROXIMATE LOCATION
PROPOSED GRADE (TYP)
SLOPE
MOUNDED SAND PLATFORM
NEW NIAGARA MOHAWK POWER POLE
CONRAIL UTILITY POLE
CONRAIL UTILITY POLE
UNDERGROUND BELL ATLANTIC LINE APPROXIMATE LOCATION
APPROX LOCATION UNDERGROUND ELECTRIC
TRANS
POLE
CB TF=215.26 IN OUT=211.91
12" DIA
APPROXIMATE PROPERTY LINE
RAILROAD TRACKS
RAILROAD TRACK

GRAPHIC SCALE
20 0 10 20 40 80

SCALE: 1" = 40'

Adapted from Site Management Plan - Vatrano Road Site
Clough Harbour & Associates LLP, 2014

CLOUGH HARBOUR & ASSOCIATES LLP
III Winners Circle, PO Box 5269, Albany, NY 12205
Main: (518) 453-4500 • www.cloughharbour.com

DWG. NO. 7899.1000.1102 | DATE MAY, 2008

Figure 1
1,4-Dioxane and PFC Sampling Location

REMEDIATION OF THE VATRANO ROAD SITE
NYSDEC ID #401036, ALBANY, NEW YORK

File: M:\7899\ACAD\POSTREM.dwg User: 330 6/8/2005 03:08 PM

Attachment A – Completed Field Forms

Low Flow Groundwater Sampling Log

Well ID: MW-1
Northing:
Easting:

Site Name: Vatrano Rd | Sampling Method: Low flow | Field Personnel: JAM
Site Location: Albany, NY | Equipment Used: Bladder pump | Date: 10/3/18
Project #: 69645 | Pump/Controller ID#: 3028 / 12674 | Weather: 55° Sun

Well information:
Installed Depth of Well*: ft. bmp.
Measured Depth of Well*: 11.10 ft. bmp.
Depth to Water*: 4.40 ft.
Length of Water Column (LWC): in.
Well Diameter: in.

Well Volume Multipliers:
☐ 1 in. = 0.041 gal/ft
☐ 2 in. = 0.163 gal/ft
☐ 4 in. = 0.653 gal/ft
☐ 6 in. = 1.469 gal/ft
☐ 8 in. = 2.611 gal/ft

* Measurement Point:
☐ Well Casing
☐ Protective Casing
☐ Other:
Well Volume: gal.
Pump Intake Depth*: ft. bmp.

Start Purge Time: ~~1300~~ 1345
Initial Observations: *Color* Black *Odor* none *Sheen/Free Product* none

indicate units

Elapsed Time (minutes)	Depth to Water (ft bmp)	Temperature (Celsius)	pH (SU)	Specific Conductivity ( )	ORP (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (ml/min)	Other ( )
5	4.24	21.74	7.31	615.3	-122.6	0.04	NR	100	
10	4.59	21.25	7.28	670.8	-124.3	0.02	NR	100	
15	4.87	21.18	7.27	720.4	-120.4	0.03	NR	100	
20	4.89	21.08	7.21	990.9	-118.4	0.04	NR	100	
25	4.91	21.01	7.18	1124.7	-119.1	0.05	711	100	
30	4.92	20.99	7.17	1289.9	-117.0	0.05	689	100	
35	4.92	20.98	7.16	1304.6	-116.2	0.05	651	100	
40	4.92	20.98	7.15	1312.7	-114.6	0.05	642	100	
45	4.91	20.97	7.15	1322.7	-112.3	0.05	236	100	
50	4.92	20.97	7.17	1328.4	-106.7	0.06	100.9	100	
55	4.92	20.97	7.17	1333.1	-101.2	0.06	108.8	100	
60	4.92	20.96	7.16	1339.9	-99.1	0.07	107.7	100	
Stabilization	Δ ≤ 0.3'	± 3%	± 0.1	± 3%	± 10 mV	± 10% if > 2.0 mg/L	± 10% if > 5 NTU	100 ≤ X ≤ 500	

End Purge Time: 1445
Total volume of groundwater purged: 3 gal.
Final Observations: *Color* Black *Odor* none *Sheen/Free Product* none

Sample ID: **Sample Time:** 1450

Analytical Parameters:

Container Size	Container Type	# Collected	Field Filtered?	Preservative	Laboratory
250 mL	Clear Plastic	2	N	None	TestAmerica
1 L	Amber Glass	2	N	None	TestAmerica

Notes:

Low Flow Groundwater Sampling Log

Well ID: MW-2
Northing:
Easting:

Site Name: Vatrano Rd | Sampling Method: Low Flow | Field Personnel: JAM
Site Location: Albany, NY | Equipment Used: Bladder Pump | Date: 10/4/18
Project #: 69645 | Pump/Controller ID#: 3028 2674 | Weather: 60° Sun

Well information:
Installed Depth of Well*: ft. bmp.
Measured Depth of Well*: 21.10 ft. bmp.
Depth to Water*: 10.00 ft.
Length of Water Column (LWC): in.
Well Diameter: 2 in.

Well Volume Multipliers:
☐ 1 in. = 0.041 gal/ft
☐ 2 in. = 0.163 gal/ft
☐ 4 in. = 0.653 gal/ft
☐ 6 in. = 1.469 gal/ft
☐ 8 in. = 2.611 gal/ft

* Measurement Point:
☒ Well Casing
☐ Protective Casing
☐ Other:
Well Volume: gal.
Pump Intake Depth*: ft. bmp.

Start Purge Time: 1320
Initial Observations: *Color* Yellow *Odor* none *Sheen/Free Product* None

indicate units

Elapsed Time (minutes)	Depth to Water (ft bmp)	Temperature (Celsius)	pH (SU)	Specific Conductivity ( )	ORP (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (ml/min)	Other ( )
5	10.01	20.50	7.33	522.6	47.3	5.36	86.4	100	
10	10.01	19.92	7.32	526.0	46.3	5.23	80.1	100	
15	10.02	19.59	7.31	528.8	46.4	5.13	26.9	100	
20	10.03	19.49	7.31	529.1	46.3	5.09	23.9	100	
25	10.03	19.47	7.31	529.3	46.2	5.08	23.3	100	
30	10.03	19.48	7.31	529.4	46.6	5.08	22.3	100	
Stabilization	Δ ≤ 0.3'	± 3%	± 0.1	± 3%	± 10 mV	± 10% if > 2.0 mg/L	± 10% if > 5 NTU	100 ≤ X ≤ 500	

End Purge Time: 1350
Total volume of groundwater purged: ~1.5 gal.

Final Observations: *Color* *Odor* *Sheen/Free Product*

Sample ID: MW-2-100418 **Sample Time:** 1355

Analytical Parameters:

Container Size	Container Type	# Collected	Field Filtered?	Preservative	Laboratory
250 mL	Clear Plastic	2	N	None	TestAmerica
1 L	Amber Glass	2	N	None	TestAmerica

Notes:
X-1

Low Flow Groundwater Sampling Log

Well ID: MW-4
Northing:
Easting:

Site Name: Vatrano Rd | Sampling Method: Low Flow | Field Personnel: JAM
Site Location: Albany, NY | Equipment Used: Bladder | Date: 10/4/18
Project #: 69645 | Pump/Controller ID#: 30281 B674 | Weather: 60° Rain

Well information:
Installed Depth of Well*: ft. bmp.
Measured Depth of Well*: 18.80 ft. bmp.
Depth to Water*: 4.35 ft.
Length of Water Column (LWC): in.
Well Diameter: 2 in.

Well Volume Multipliers:
☐ 1 in. = 0.041 gal/ft
☒ 2 in. = 0.163 gal/ft
☐ 4 in. = 0.653 gal/ft
☐ 6 in. = 1.469 gal/ft
☐ 8 in. = 2.611 gal/ft

* Measurement Point:
☒ Well Casing
☐ Protective Casing
☐ Other:
Well Volume: gal.
Pump Intake Depth*: ft. bmp.

Start Purge Time: 0930
Initial Observations: *Color* Brown *Odor* none *Sheen/Free Product* non

indicate units

Elapsed Time (minutes)	Depth to Water (ft bmp)	Temperature (Celsius)	pH (SU)	Specific Conductivity ( )	ORP (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (ml/min)	Other ( )
5	8.36	18.63	7.13	893.6	-24.8	0.72	89.6		
10	8.39	18.72	7.10	898.4	-16.4	0.64	44.7		
15	8.38	18.47	7.08	893.7	-8.9	0.48	33.7		
20	8.37	18.33	7.07	892.9	-5.8	0.44	32.1		
25	8.38	18.34	7.06	889.4	-0.8	0.43	30.8		
30	8.39	18.32	7.07	887.9	-1.4	0.43	31.1		
35	8.40	18.33	7.06	885.2	-0.9	0.43	30.4		
Stabilization	Δ ≤ 0.3'	± 3%	± 0.1	± 3%	± 10 mV	± 10% if > 2.0 mg/L	± 10% if > 5 NTU	100 ≤ X ≤ 500	

End Purge Time: 1005
Total volume of groundwater purged: ~2 gal.
Final Observations: *Color* clear/Yellow *Odor* none *Sheen/Free Product* none

Sample ID: MW-4-100418 **Sample Time:** 1015

Analytical Parameters:

Container Size	Container Type	# Collected	Field Filtered?	Preservative	Laboratory
250 mL	Clear Plastic	2	N	None	TestAmerica
1 L	Amber Glass	2	N	None	TestAmerica

Notes:
MS/MSD

Low Flow Groundwater Sampling Log

Well ID: MW-7
Northing:
Easting:

Site Name: Vatrano Rd | Sampling Method: Bladder pump | Field Personnel: JAM
Site Location: Albany, NY | Equipment Used: Low Flow | Date: 10/3/18
Project #: 69645 | Pump/Controller ID#: 3098/2674 | Weather: 55° Sun

Well information:
Installed Depth of Well*: ft. bmp.
Measured Depth of Well*: 15.60 ft. bmp.
Depth to Water*: 2.35 ft.
Length of Water Column (LWC): in.
Well Diameter: 2 in.

Well Volume Multipliers:
☐ 1 in. = 0.041 gal/ft
☒ 2 in. = 0.163 gal/ft
☐ 4 in. = 0.653 gal/ft
☐ 6 in. = 1.469 gal/ft
☐ 8 in. = 2.611 gal/ft

* Measurement Point:
☒ Well Casing
☐ Protective Casing
☐ Other:
Well Volume: gal.
Pump Intake Depth*: ft. bmp.

Start Purge Time: 1035
Initial Observations: *Color* Clear w/ some particles *Odor* none *Sheen/Free Product* none

indicate units

Elapsed Time (minutes)	Depth to Water (ft bmp)	Temperature (Celsius)	pH (SU)	Specific Conductivity ( )	ORP (mV)	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Flow Rate (ml/min)	Other ( )
5	3.52	15.49	7.09	688.7	76.1	~~7~~ 0.52	11.0	100	
10	3.69	15.43	7.01	651.6	61.3	0.55	10.1	100	
15	3.81	15.41	6.97	685.4	53.6	0.57	9.86	100	
20	3.95	15.42	6.95	694.6	53.1	0.57	9.45	100	
25	4.10	15.42	6.94	699.7	52.4	0.57	9.00	100	
30	4.23	15.41	6.94	702.4	51.1	0.56	9.06	100	
35	4.39	15.41	6.93	705.4	49.4	0.55	8.98	100	
Stabilization	Δ ≤ 0.3'	± 3%	± 0.1	± 3%	± 10 mV	± 10% if > 2.0 mg/L	± 10% if > 5 NTU	100 ≤ X ≤ 500	

End Purge Time: 1110
Total volume of groundwater purged: ~1.5 gal.
Final Observations: *Color* Clear *Odor* none *Sheen/Free Product* none

Sample ID: MW-7-101018 **Sample Time:** 1115

Analytical Parameters:

Container Size	Container Type	# Collected	Field Filtered?	Preservative	Laboratory
250 mL	Clear Plastic	2	N	None	TestAmerica
1 L	Amber Glass	2	N	None	TestAmerica

Notes:

PFAS SAMPLING CHECKLIST

Site Name: Vatrano Road
Task: EC Sampling
Weather (temp/precip): 60± Clear
Date: 10/3/18

***Field Clothing and PPE*:**

☑ No clothing or boots containing Gore-Tex™

☑ No clothing or boots treated with water-resistant spray

☑ Safety boots made from polyurethane and PVC

☑ No materials containing Tyvek®

☑ Field crew has not used fabrics softener on clothing

☑ Field crew has not used cosmetics, moisturizers, hand cream, or other related products this morning

☑ Field crew has not applied unauthorized sunscreen or insect repellant

***Field Equipment*:**

☑ No Teflon® or LDPE containing materials

☑ All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene

☑ No waterproof field books, waterproof paper or waterproof bottle labels, waterproof markers/Sharpies®

☑ No plastic clipboards, binders, or spiral hard cover notebooks

☑ No Post-It Notes®

☑ Coolers filled with regular ice only; no chemical (blue) ice packs in possession

***Sample Containers*:**

☑ Sample containers made of HDPE or polypropylene

☑ Caps are unlined and made of HDPE or polypropylene

***Wet Weather (as applicable)*:**

NA ☐ Wet weather gear made of polyurethane and PVC only

***Equipment Decontamination*:**

☑ "PFAS-free" water on-site for decontamination of sample equipment; no other water sources to be used

☐ Alconox® and Liquinox® to be used as decontamination cleaning agents

***Food Considerations*:**

☑ No food or drink on-site with exception of bottled water and/or hydration drinks (*i.e.*, Gatorade® and Powerade®) that is available for consumption only in the staging area

***Vehicle Considerations*:**

☑ Avoid utilizing areas inside vehicle as sample staging areas

If any applicable boxes cannot be checked, the field team leader shall describe the deviations below and work with field personnel to address issues prior to commencement of that day's work. If possible, materials identified as potentially containing PFAS (*i.e.*, Tyvek® coveralls, spare equipment) should be relocated to a separate area of the site as far away as possible from the sampling location(s) and containerized if practicable. To assist in the assessment of QC data, the field team leader should document the presence of such items, their location, whether they have been containerized, and, if containerized, what type of container.

Describe any deviation(s) and the action/outcome and document the presence of any potential PFAS-containing materials:

Field Team Leader Name: John McDougall
Field Team Leader Signature: John McDougall
Time: 0930

EC Sampling - GE Vatrano Rd Site

Page ___ of ___

Lab Use Only

TestAmerica

Client: Site Name / Location	Vatrano Rd Site / Albany, NY
Sampling Program:	EC Sampling - GE Vatrano Rd Site
Sampler(s):	T. McDougal
Project Number:	

O'Brien & Gere Office: Albany
Address: O'Brien & Gere
94 New Karner Rd, Suite 106, Albany, N.Y. 12203
Phone: (518) 724-7256
Fax: (518) 869-2945
Project Contact: Paul D'Annibale/ Maureen Garnder
Email: Paul.D'Annibale@obg.com / Maureen.Gardner@obg.com

Laboratory:
Marie Meichof

TestAmerica	TestAmerica
880 Riverside Pkwy	10 Hazelwood Dr
W. Sacramento, CA	Amherst, NY
95605-1500	14228-2223

Phone: 732-593-2554
Fax: 732-549-3679

Analysis Holding Time from Sample Date:
14 days to extraction, 28 dys from extraction to analysis

Package Requirement:
Full NYSDEC ASP Cat B Level Pkg w/standard 20 BD TAT

Project Number: 69645
EDD Format: EQuIS 4-File

Lab ID:

Job Number:

Sample Identification									Grab (G) or Composite (C)	Field Filtered? (Y / N)	Chemical Preservatives: (see key at bottom)													
	Unique Field Sample ID	Sample Location	Sample Date (mm/dd/yy)	Sample Time (hh:mm)	Sample Type (see key)	Sample Matrix (see key)	# of Containers	Reporting Units			0	0	0	0	0	0	0	0	0	0	0	0		Lab Sample ID
											PFAS by USEPA Modified Method 537	1,4-dioxane by USEPA Method 8270 SIM												
											ng/L	ug/L												
1	MW-7-100318	MW-7	10/03/18	1115	N	WG	4	G	N		X	X												
2	MW-1-100318	MW-1	↓	1450	N	WG	4	G	N		X	X												
3								G	N															
4								G	N															
5								G	N															
6								G	N															
7								G	N															
8								G	N															
9								G	N															
10																								

Special Instructions:

Relinquished by: J. McDougal	Date 10/3/18	Received by: Karl Fochs	Date 10-3-18	Condition:	Comments or Notes:
of: OBG	Time 1420	of: Test America	Time 1620		Standard 20 business day TAT for Full NYSDEC ASP Cat B Level Pkg (PDF) and EQuIS 4-file EDD.
Relinquished by:	Date	Received by:	Date	Custody Seals intact? Y N	
of:	Time	of:	Time		
Relinquished by:	Date	Received by:	Date	Cooler Temperature:	
of:	Time	of:	Time		

Sample Type: N = Normal environmental sample, FD = field duplicate, EB = Equipment Blank, FB = Field Blank, TB = Trip Blank, MS = Lab MatSpike, Other (Specify):
Sample Matrix: SE = Sediment, SO = Soil, WG = Groundwater, WS = Surface Water, WW = Waste Water, WQ = Water Quality, TA = Animal Tissue, TP = Plant Tissue, AA = Ambient Air, Other (Specify):
Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Asorbic Acid, 6 = MeOH, 7 = NaHSO4, 8 = Na2S2O3: 9 = H3PO4

Page 1 of 1

EC Sampling - GE Vatrano Rd Site

TestAmerica

Lab Use Only

Project Number:

Lab ID:

Job Number:

Client: Site Name / Location: Vatrano Rd Site / Albany, NY

Sampling Program: EC Sampling - GE Vatrano Rd Site

Sampler(s): J. McDougall

O'Brien & Gere Office: Albany
Address: O'Brien & Gere
94 New Karner Rd, Suite 106, Albany, N.Y. 12203
Phone: (518) 724-7256
Fax: (518) 869-2945
Project Contact: Paul D'Annibale/ Maureen Garnder
Email: Paul.D'Annibale@obg.com / Maureen.Gardner@obg.com

Laboratory:
Marie Meidhof

TestAmerica	TestAmerica
880 Riverside Pkwy	10 Hazelwood Dr
W. Sacramento, CA	Amherst, NY
95605-1500	14228-2223

Phone: 732-593-2554
Fax: 732-549-3679

Analysis Holding Time from Sample Date: 14 days to extraction, 28 days from extraction to analysis

Package Requirement: Full NYSDEC ASP Cat B Level Pkg w/standard 20 BD TAT

Project Number: 69645

EDD Format: EQuIS 4-File

Chemical Preservatives: (see key at bottom): 0 0 0 0 0 0 0 0 0 0 0 0

Sample Identification

#	Unique Field Sample ID	Sample Location	Sample Date (mm/dd/yy)	Sample Time (hh:mm)	Sample Type (see key)	Sample Matrix (see key)	# of Containers	Grab (G) or Composite (C)	Field Filtered? (Y / N)	PFAS by USEPA Modified Method 537 (ng/L)	1,4-dioxane by USEPA Method 8270 SIM (ug/L)	Lab Sample ID
1	MW-4-100418	MW-4	10/4/18	1015	N	WG	4	G	N	X	X	
2	MW-4-MS/MSD-100418	MW-4	↓	1015	MS	WG	8	G	N	X	X	
3	MW-2-100418	MW-2	↓	1355	N	WG	4	G	N	X	X	
4	EB-100418	—	↓	1045	EB	WQ	4	G	N	X	X	
5	FRB-100418	—	↓	1020	FB	WQ	2	G	N	X		
6	X-1-100418	—	↓	—	FD	WG	4	G	N	X	X	
7								G	N			
8								G	N			
9								G	N			
10												

Special Instructions:

Relinquished by:	Date	Received by:	Date	
J. McDougall of: OBG	Date 10/4/18 Time 1445	Ral Leader of: TA	Date 10-4-18 Time 1445	Condition:
Relinquished by: of:	Date Time	Received by: of:	Date Time	Custody Seals intact? Y N
Relinquished by: of:	Date Time	Received by: of:	Date Time	Cooler Temperature:

Comments or Notes:

Standard 20 business day TAT for Full NYSDEC ASP Cat B Level Pkg (PDF) and EQuIS 4-file EDD.

Sample Type: N = Normal environmental sample, FD = field duplicate, EB = Equipment Blank, FB = Field Blank, TB = Trip Blank, MS = Lab MatSpike, Other (Specify):
Sample Matrix SE = Sediment, SO = Soil, WG = Groundwater, WS = Surface Water, WW = Waste Water, WQ = Water Quality, TA = Animal Tissue, TP = Plant Tissue, AA = Ambient Air, Other (Specify):
Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Ascorbic Acid, 6 = MeOH, 7 = NaHSO4, 8 = Na2S2O3: 9 = H3PO4

Attachment B – Analytical Result Forms

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-142905-1
Client Project/Site: GE Vatrano Rd Site

For:
O'Brien & Gere Inc of North America
94 New Karner Rd., Suite 106
Albany, New York 12203

Attn: Mr. Paul D'Annibale

Authorized for release by:
10/24/2018 2:05:16 PM

Marie Meidhof, Senior Project Manager
(732)549-3900
marie.meidhof@testamericainc.com

Table of Contents

Definitions/Glossary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142905-1

Qualifiers

LCMS

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-142905-1

Laboratory: TestAmerica Buffalo

Narrative

CASE NARRATIVE

Client: O'Brien & Gere Inc of North America

Project: GE Vatrano Rd Site

Report Number: 480-142905-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

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.

RECEIPT

The samples were received on 10/5/2018 1:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.7º C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

1,4 DIOXANE BY 8270D SIM, ISOTOPE DILUTION

Samples MW-7-100318 (480-142905-1) and MW-1-100318 (480-142905-2) were analyzed for 1,4 Dioxane by 8270D SIM, Isotope Dilution in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 10/09/2018 and analyzed on 10/11/2018 and 10/13/2018.

No difficulties were encountered during the 1,4 Dioxane analysis.

All quality control parameters were within the acceptance limits.

PERFLUORINATED HYDROCARBONS (PFC)

Samples MW-7-100318 (480-142905-1) and MW-1-100318 (480-142905-2) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with PFC. The samples were prepared on 10/12/2018 and analyzed on 10/16/2018 and 10/21/2018.

The following samples had non-settleable particulate matter which plugged the SPE extraction disk. The amount of sample remaining plus the weight of the bottle are recorded in the "Notes" field of the prep batch. The "Tare Weight" recorded is the weight of the emptied bottle.: MW-1-100318 (480-142905-2). The reporting limits (RLs) have been adjusted proportionately.

Perfluorohexanesulfonic acid (PFHxS) and Perfluorononanoic acid (PFNA) were detected in method blank MB 320-251680/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

The matrix spike (MS) recoveries for Perfluoropentanoic acid (PFPeA) and Perfluorohexanoic acid (PFHxA) in preparation batch

Job ID: 480-142905-1 (Continued)

Laboratory: TestAmerica Buffalo (Continued)

320-251680 and analytical batch 320-252417 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Refer to the QC report for details.

No other difficulties were encountered during the Perfluorinated Hydrocarbons (PFC) analysis.

All other quality control parameters were within the acceptance limits.

Detection Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142905-1

Client Sample ID: MW-7-100318 — Lab Sample ID: 480-142905-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.20		0.19	0.096	ug/L	1		8270D SIM ID	Total/NA
Perfluorobutanoic acid (PFBA)	3.4		1.7	0.30	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.9		1.7	0.42	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	3.0		1.7	0.50	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.4		1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	14		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	1.3	J B	1.7	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.7		1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	6.8	B	1.7	0.15	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.49	J	1.7	0.16	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	7.9		1.7	0.47	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-1-100318 — Lab Sample ID: 480-142905-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	10		1.8	0.31	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.8		1.8	0.44	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	1.2	J	1.8	0.52	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	0.92	J	1.8	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	1.4	J	1.8	0.76	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	0.48	J B	1.8	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	1.0	J	1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	5.6		1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	1.9	B	1.8	0.15	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	1.7	J	1.8	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonamide (FOSA)	0.43	J	1.8	0.31	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-7-100318
Date Collected: 10/03/18 11:15
Date Received: 10/05/18 01:00

Lab Sample ID: 480-142905-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**0.20**		0.19	0.096	ug/L		10/09/18 07:33	10/11/18 23:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*29*		*15 - 110*	*10/09/18 07:33*	*10/11/18 23:38*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**3.4**		1.7	0.30	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoropentanoic acid (PFPeA)	**2.9**		1.7	0.42	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorohexanoic acid (PFHxA)	**3.0**		1.7	0.50	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroheptanoic acid (PFHpA)	**3.4**		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanoic acid (PFOA)	**14**		1.7	0.74	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorononanoic acid (PFNA)	**1.3**	**J B**	1.7	0.23	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.95	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.48	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.25	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorobutanesulfonic acid (PFBS)	**1.7**		1.7	0.17	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorohexanesulfonic acid (PFHxS)	**6.8**	**B**	1.7	0.15	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.49**	**J**	1.7	0.16	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanesulfonic acid (PFOS)	**7.9**		1.7	0.47	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.28	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.30	ng/L		10/12/18 11:11	10/16/18 00:28	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		17	2.7	ng/L		10/12/18 11:11	10/16/18 00:28	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		17	1.6	ng/L		10/12/18 11:11	10/16/18 00:28	1
6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 00:28	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 00:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*84*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C5 PFPeA	*88*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C2 PFHxA	*89*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C4 PFHpA	*97*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C4 PFOA	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C5 PFNA	*102*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C2 PFDA	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C2 PFUnA	*101*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C2 PFDoA	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C2 PFTeDA	*103*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C3 PFBS	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
18O2 PFHxS	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C4 PFOS	*99*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C8 FOSA	*100*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
d3-NMeFOSAA	*109*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
d5-NEtFOSAA	*110*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*

Client Sample ID: MW-7-100318

Lab Sample ID: 480-142905-1
Matrix: Water
Date Collected: 10/03/18 11:15
Date Received: 10/05/18 01:00

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	142		25 - 150	10/12/18 11:11	10/16/18 00:28	1
M2-8:2 FTS	106		25 - 150	10/12/18 11:11	10/16/18 00:28	1

Client Sample ID: MW-1-100318

Lab Sample ID: 480-142905-2
Matrix: Water
Date Collected: 10/03/18 14:50
Date Received: 10/05/18 01:00

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		10/09/18 07:33	10/13/18 03:58	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	20		15 - 110	10/09/18 07:33	10/13/18 03:58	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**10**		1.8	0.31	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoropentanoic acid (PFPeA)	**2.8**		1.8	0.44	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorohexanoic acid (PFHxA)	**1.2**	**J**	1.8	0.52	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroheptanoic acid (PFHpA)	**0.92**	**J**	1.8	0.22	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanoic acid (PFOA)	**1.4**	**J**	1.8	0.76	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorononanoic acid (PFNA)	**0.48**	**J B**	1.8	0.24	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorodecanoic acid (PFDA)	**1.0**	**J**	1.8	0.28	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.98	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.49	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.26	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorobutanesulfonic acid (PFBS)	**5.6**		1.8	0.18	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorohexanesulfonic acid (PFHxS)	**1.9**	**B**	1.8	0.15	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.17	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanesulfonic acid (PFOS)	**1.7**	**J**	1.8	0.48	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.28	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanesulfonamide (FOSA)	**0.43**	**J**	1.8	0.31	ng/L		10/12/18 11:11	10/21/18 07:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/21/18 07:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	1.7	ng/L		10/12/18 11:11	10/21/18 07:10	1
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/21/18 07:10	1
8:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/21/18 07:10	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	42		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C5 PFPeA	45		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C2 PFHxA	48		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C4 PFHpA	52		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C4 PFOA	53		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C5 PFNA	54		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C2 PFDA	56		25 - 150	10/12/18 11:11	10/21/18 07:10	1

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142905-1

Client Sample ID: MW-1-100318
Date Collected: 10/03/18 14:50
Date Received: 10/05/18 01:00

Lab Sample ID: 480-142905-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	59		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C2 PFDoA	57		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C2 PFTeDA	49		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C3 PFBS	47		25 - 150	10/12/18 11:11	10/21/18 07:10	1
18O2 PFHxS	56		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C4 PFOS	58		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C8 FOSA	53		25 - 150	10/12/18 11:11	10/21/18 07:10	1
d3-NMeFOSAA	76		25 - 150	10/12/18 11:11	10/21/18 07:10	1
d5-NEtFOSAA	75		25 - 150	10/12/18 11:11	10/21/18 07:10	1
M2-6:2 FTS	135		25 - 150	10/12/18 11:11	10/21/18 07:10	1
M2-8:2 FTS	147		25 - 150	10/12/18 11:11	10/21/18 07:10	1

Isotope Dilution Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142905-1

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DXE (15-110)
480-142905-1	MW-7-100318	29
480-142905-2	MW-1-100318	20
480-142994-C-1-A MS	Matrix Spike	30
480-142994-C-1-B MSD	Matrix Spike Duplicate	27
LCS 480-438341/2-A	Lab Control Sample	35
MB 480-438341/1-A	Method Blank	37

Surrogate Legend

DXE = 1,4-Dioxane-d8

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	PFHpA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
480-142905-1	MW-7-100318	84	88	89	97	92	102	95	101
480-142905-2	MW-1-100318	42	45	48	52	53	54	56	59
480-142994-A-1-B MS	Matrix Spike	58	61	66	67	70	67	67	66
480-142994-A-1-C MSD	Matrix Spike Duplicate	53	55	63	63	64	67	60	56
LCS 320-251680/2-A	Lab Control Sample	83	86	90	85	93	89	85	93
MB 320-251680/1-A	Method Blank	89	90	93	99	92	95	97	106

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFDoA (25-150)	PFTDA (25-150)	3C3-PFBS (25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (25-150)	-NMeFOSA (25-150)	-NEtFOSA (25-150)
480-142905-1	MW-7-100318	93	103	90	95	99	100	109	110
480-142905-2	MW-1-100318	57	49	47	56	58	53	76	75
480-142994-A-1-B MS	Matrix Spike	59	56	65	69	71	64	72	72
480-142994-A-1-C MSD	Matrix Spike Duplicate	50	51	58	61	62	57	62	57
LCS 320-251680/2-A	Lab Control Sample	87	83	83	86	93	79	97	111
MB 320-251680/1-A	Method Blank	104	92	92	93	100	90	112	114

		Percent Isotope Dilution Recovery (Acceptance Limits)	
Lab Sample ID	Client Sample ID	M262FTS (25-150)	M282FTS (25-150)
480-142905-1	MW-7-100318	142	106
480-142905-2	MW-1-100318	135	147
480-142994-A-1-B MS	Matrix Spike	84	79
480-142994-A-1-C MSD	Matrix Spike Duplicate	90	62
LCS 320-251680/2-A	Lab Control Sample	108	104
MB 320-251680/1-A	Method Blank	121	100

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
PFHxA = 13C2 PFHxA
PFHpA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA

Isotope Dilution Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142905-1

PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
13C3-PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
PFOSA = 13C8 FOSA
d3-NMeFOSAA = d3-NMeFOSAA
d5-NEtFOSAA = d5-NEtFOSAA
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Lab Sample ID: MB 480-438341/1-A
Matrix: Water
Analysis Batch: 438984

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438341

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		10/09/18 07:33	10/11/18 19:44	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*37*		*15 - 110*	*10/09/18 07:33*	*10/11/18 19:44*	*1*

Lab Sample ID: LCS 480-438341/2-A
Matrix: Water
Analysis Batch: 438984

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438341

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	1.00	1.10		ug/L		110	40 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8	*35*		*15 - 110*

Lab Sample ID: 480-142994-C-1-A MS
Matrix: Water
Analysis Batch: 438984

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 438341

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	ND		0.952	1.09		ug/L		114	40 - 140

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
1,4-Dioxane-d8	*30*		*15 - 110*

Lab Sample ID: 480-142994-C-1-B MSD
Matrix: Water
Analysis Batch: 438984

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 438341

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	ND		1.00	1.13		ug/L		113	40 - 140	4	20

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,4-Dioxane-d8	*27*		*15 - 110*

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-251680/1-A
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 251680

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		2.0	0.35	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoropentanoic acid (PFPeA)	ND		2.0	0.49	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorononanoic acid (PFNA)	0.314	J	2.0	0.27	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		10/12/18 11:11	10/16/18 00:13	1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-251680/1-A
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 251680

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.29	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorohexanesulfonic acid (PFHxS)	0.346	J	2.0	0.17	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.19	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.32	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanesulfonamide (FOSA)	ND		2.0	0.35	ng/L		10/12/18 11:11	10/16/18 00:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		20	3.1	ng/L		10/12/18 11:11	10/16/18 00:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		20	1.9	ng/L		10/12/18 11:11	10/16/18 00:13	1
6:2 FTS	ND		20	2.0	ng/L		10/12/18 11:11	10/16/18 00:13	1
8:2 FTS	ND		20	2.0	ng/L		10/12/18 11:11	10/16/18 00:13	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*89*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C5 PFPeA	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C2 PFHxA	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C4 PFHpA	*99*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C4 PFOA	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C5 PFNA	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C2 PFDA	*97*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C2 PFUnA	*106*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C2 PFDoA	*104*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C2 PFTeDA	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C3 PFBS	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
18O2 PFHxS	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C4 PFOS	*100*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C8 FOSA	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
d3-NMeFOSAA	*112*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
d5-NEtFOSAA	*114*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
M2-6:2 FTS	*121*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
M2-8:2 FTS	*100*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*

Lab Sample ID: LCS 320-251680/2-A
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 251680

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	39.9		ng/L		100	70 - 130
Perfluoropentanoic acid (PFPeA)	40.0	40.2		ng/L		100	66 - 126
Perfluorohexanoic acid (PFHxA)	40.0	39.0		ng/L		98	66 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	41.0		ng/L		102	66 - 126
Perfluorooctanoic acid (PFOA)	40.0	39.0		ng/L		97	64 - 124
Perfluorononanoic acid (PFNA)	40.0	43.5		ng/L		109	68 - 128

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-251680/2-A
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 251680

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorodecanoic acid (PFDA)	40.0	38.3		ng/L		96	69 - 129
Perfluoroundecanoic acid (PFUnA)	40.0	39.0		ng/L		98	60 - 120
Perfluorododecanoic acid (PFDoA)	40.0	37.9		ng/L		95	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	38.2		ng/L		96	72 - 132
Perfluorotetradecanoic acid (PFTeA)	40.0	41.0		ng/L		103	68 - 128
Perfluorobutanesulfonic acid (PFBS)	35.4	35.9		ng/L		101	73 - 133
Perfluorohexanesulfonic acid (PFHxS)	36.4	34.2		ng/L		94	63 - 123
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.6		ng/L		99	68 - 128
Perfluorooctanesulfonic acid (PFOS)	37.1	33.1		ng/L		89	67 - 127
Perfluorodecanesulfonic acid (PFDS)	38.6	37.6		ng/L		98	68 - 128
Perfluorooctanesulfonamide (FOSA)	40.0	44.4		ng/L		111	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	35.5		ng/L		89	67 - 127
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	34.9		ng/L		87	65 - 125
6:2 FTS	37.9	32.7		ng/L		86	66 - 126
8:2 FTS	38.3	30.7		ng/L		80	67 - 127

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFBA	*83*		*25 - 150*
13C5 PFPeA	*86*		*25 - 150*
13C2 PFHxA	*90*		*25 - 150*
13C4 PFHpA	*85*		*25 - 150*
13C4 PFOA	*93*		*25 - 150*
13C5 PFNA	*89*		*25 - 150*
13C2 PFDA	*85*		*25 - 150*
13C2 PFUnA	*93*		*25 - 150*
13C2 PFDoA	*87*		*25 - 150*
13C2 PFTeDA	*83*		*25 - 150*
13C3 PFBS	*83*		*25 - 150*
18O2 PFHxS	*86*		*25 - 150*
13C4 PFOS	*93*		*25 - 150*
13C8 FOSA	*79*		*25 - 150*
d3-NMeFOSAA	*97*		*25 - 150*
d5-NEtFOSAA	*111*		*25 - 150*
M2-6:2 FTS	*108*		*25 - 150*
M2-8:2 FTS	*104*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 480-142994-A-1-B MS
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 251680

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	18	F1 F2	35.4	52.1		ng/L		96	70 - 130
Perfluoropentanoic acid (PFPeA)	65	F1	35.4	87.8	F1	ng/L		63	66 - 126
Perfluorohexanoic acid (PFHxA)	87	F1	35.4	105	F1	ng/L		52	66 - 126
Perfluoroheptanoic acid (PFHpA)	6.9		35.4	41.7		ng/L		98	66 - 126
Perfluorooctanoic acid (PFOA)	25		35.4	54.7		ng/L		83	64 - 124
Perfluorononanoic acid (PFNA)	2.0	B	35.4	36.3		ng/L		97	68 - 128
Perfluorodecanoic acid (PFDA)	0.35	J	35.4	35.3		ng/L		99	69 - 129
Perfluoroundecanoic acid (PFUnA)	ND		35.4	34.0		ng/L		96	60 - 120
Perfluorododecanoic acid (PFDoA)	ND		35.4	38.3		ng/L		108	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		35.4	36.6		ng/L		104	72 - 132
Perfluorotetradecanoic acid (PFTeA)	ND		35.4	36.6		ng/L		103	68 - 128
Perfluorobutanesulfonic acid (PFBS)	5.8		31.3	35.2		ng/L		94	73 - 133
Perfluorohexanesulfonic acid (PFHxS)	5.9	B	32.2	33.9		ng/L		87	63 - 123
Perfluoroheptanesulfonic Acid (PFHpS)	0.66	J	33.7	35.8		ng/L		104	68 - 128
Perfluorooctanesulfonic acid (PFOS)	22		32.8	49.4		ng/L		84	67 - 127
Perfluorodecanesulfonic acid (PFDS)	ND		34.1	27.1		ng/L		79	68 - 128
Perfluorooctanesulfonamide (FOSA)	ND		35.4	39.4		ng/L		111	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		35.4	32.7		ng/L		92	67 - 127
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		35.4	33.3		ng/L		94	65 - 125
6:2 FTS	ND		33.5	31.0		ng/L		92	66 - 126
8:2 FTS	ND		33.9	26.5		ng/L		78	67 - 127

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFBA	*58*		*25 - 150*
13C5 PFPeA	*61*		*25 - 150*
13C2 PFHxA	*66*		*25 - 150*
13C4 PFHpA	*67*		*25 - 150*
13C4 PFOA	*70*		*25 - 150*
13C5 PFNA	*67*		*25 - 150*
13C2 PFDA	*67*		*25 - 150*
13C2 PFUnA	*66*		*25 - 150*
13C2 PFDoA	*59*		*25 - 150*
13C2 PFTeDA	*56*		*25 - 150*
13C3 PFBS	*65*		*25 - 150*
18O2 PFHxS	*69*		*25 - 150*
13C4 PFOS	*71*		*25 - 150*
13C8 FOSA	*64*		*25 - 150*
d3-NMeFOSAA	*72*		*25 - 150*
d5-NEtFOSAA	*72*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 480-142994-A-1-B MS
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 251680

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
M2-6:2 FTS	*84*		*25 - 150*
M2-8:2 FTS	*79*		*25 - 150*

Lab Sample ID: 480-142994-A-1-C MSD
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 251680

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	18	F1 F2	36.5	55.9		ng/L		103	70 - 130	7	30
Perfluoropentanoic acid (PFPeA)	65	F1	36.5	98.8		ng/L		91	66 - 126	12	30
Perfluorohexanoic acid (PFHxA)	87	F1	36.5	118		ng/L		84	66 - 126	11	30
Perfluoroheptanoic acid (PFHpA)	6.9		36.5	42.7		ng/L		98	66 - 126	2	30
Perfluorooctanoic acid (PFOA)	25		36.5	53.2		ng/L		77	64 - 124	3	30
Perfluorononanoic acid (PFNA)	2.0	B	36.5	37.1		ng/L		96	68 - 128	2	30
Perfluorodecanoic acid (PFDA)	0.35	J	36.5	38.7		ng/L		105	69 - 129	9	30
Perfluoroundecanoic acid (PFUnA)	ND		36.5	37.1		ng/L		102	60 - 120	9	30
Perfluorododecanoic acid (PFDoA)	ND		36.5	36.5		ng/L		100	71 - 131	5	30
Perfluorotridecanoic acid (PFTriA)	ND		36.5	36.6		ng/L		100	72 - 132	0	30
Perfluorotetradecanoic acid (PFTeA)	ND		36.5	37.2		ng/L		102	68 - 128	2	30
Perfluorobutanesulfonic acid (PFBS)	5.8		32.3	38.8		ng/L		102	73 - 133	10	30
Perfluorohexanesulfonic acid (PFHxS)	5.9	B	33.2	38.9		ng/L		99	63 - 123	14	30
Perfluoroheptanesulfonic Acid (PFHpS)	0.66	J	34.7	37.6		ng/L		106	68 - 128	5	30
Perfluorooctanesulfonic acid (PFOS)	22		33.9	56.5		ng/L		102	67 - 127	13	30
Perfluorodecanesulfonic acid (PFDS)	ND		35.2	28.2		ng/L		80	68 - 128	4	30
Perfluorooctanesulfonamide (FOSA)	ND		36.5	38.9		ng/L		107	70 - 130	1	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		36.5	32.7		ng/L		90	67 - 127	0	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		36.5	34.2		ng/L		94	65 - 125	3	30
6:2 FTS	ND		34.6	31.8		ng/L		92	66 - 126	3	30
8:2 FTS	ND		35.0	35.9		ng/L		103	67 - 127	30	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C4 PFBA	*53*		*25 - 150*
13C5 PFPeA	*55*		*25 - 150*
13C2 PFHxA	*63*		*25 - 150*
13C4 PFHpA	*63*		*25 - 150*
13C4 PFOA	*64*		*25 - 150*
13C5 PFNA	*67*		*25 - 150*
13C2 PFDA	*60*		*25 - 150*
13C2 PFUnA	*56*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 480-142994-A-1-C MSD
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 251680

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFDoA	50		25 - 150
13C2 PFTeDA	51		25 - 150
13C3 PFBS	58		25 - 150
18O2 PFHxS	61		25 - 150
13C4 PFOS	62		25 - 150
13C8 FOSA	57		25 - 150
d3-NMeFOSAA	62		25 - 150
d5-NEtFOSAA	57		25 - 150
M2-6:2 FTS	90		25 - 150
M2-8:2 FTS	62		25 - 150

QC Association Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142905-1

GC/MS Semi VOA

Prep Batch: 438341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-1	MW-7-100318	Total/NA	Water	3510C	
480-142905-2	MW-1-100318	Total/NA	Water	3510C	
MB 480-438341/1-A	Method Blank	Total/NA	Water	3510C	
LCS 480-438341/2-A	Lab Control Sample	Total/NA	Water	3510C	
480-142994-C-1-A MS	Matrix Spike	Total/NA	Water	3510C	
480-142994-C-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	3510C	

Analysis Batch: 438984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-1	MW-7-100318	Total/NA	Water	8270D SIM ID	438341
MB 480-438341/1-A	Method Blank	Total/NA	Water	8270D SIM ID	438341
LCS 480-438341/2-A	Lab Control Sample	Total/NA	Water	8270D SIM ID	438341
480-142994-C-1-A MS	Matrix Spike	Total/NA	Water	8270D SIM ID	438341
480-142994-C-1-B MSD	Matrix Spike Duplicate	Total/NA	Water	8270D SIM ID	438341

Analysis Batch: 439196

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-2	MW-1-100318	Total/NA	Water	8270D SIM ID	438341

LCMS

Prep Batch: 251680

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-1	MW-7-100318	Total/NA	Water	3535	
480-142905-2	MW-1-100318	Total/NA	Water	3535	
MB 320-251680/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-251680/2-A	Lab Control Sample	Total/NA	Water	3535	
480-142994-A-1-B MS	Matrix Spike	Total/NA	Water	3535	
480-142994-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	3535	

Analysis Batch: 252417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-1	MW-7-100318	Total/NA	Water	537 (modified)	251680
MB 320-251680/1-A	Method Blank	Total/NA	Water	537 (modified)	251680
LCS 320-251680/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	251680
480-142994-A-1-B MS	Matrix Spike	Total/NA	Water	537 (modified)	251680
480-142994-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	537 (modified)	251680

Analysis Batch: 253765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142905-2	MW-1-100318	Total/NA	Water	537 (modified)	251680

Lab Chronicle

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142905-1

Client Sample ID: MW-7-100318

Lab Sample ID: 480-142905-1

Date Collected: 10/03/18 11:15

Matrix: Water

Date Received: 10/05/18 01:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	438984	10/11/18 23:38	DMR	TAL BUF
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 00:28	CBW	TAL SAC

Client Sample ID: MW-1-100318

Lab Sample ID: 480-142905-2

Date Collected: 10/03/18 14:50

Matrix: Water

Date Received: 10/05/18 01:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	439196	10/13/18 03:58	DMR	TAL BUF
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	253765	10/21/18 07:10	S1M	TAL SAC

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142905-1

Laboratory: TestAmerica Buffalo

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
New York	NELAP	2	10026	03-31-19

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18 *
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142905-1

Method	Method Description	Protocol	Laboratory
8270D SIM ID	Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)	SW846	TAL BUF
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL BUF
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

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

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142905-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-142905-1	MW-7-100318	Water	10/03/18 11:15	10/05/18 01:00
480-142905-2	MW-1-100318	Water	10/03/18 14:50	10/05/18 01:00

EC Sampling - GE Vatrano Rd Site

TestAmerica

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Lab Use Only

Project Number:

Lab ID:

Job Number:

Client: Site Name / Location	Sampling Program:	Sampler(s):
Vatrano Rd Site / Albany, NY	EC Sampling - GE Vatrano RdSite	J. McDougal (JM)

O'Brien & Gere Office: Albany
Address: O'Brien & Gere
94 New Karner Rd, Suite 106, Albany, N.Y. 12203
Phone: (518) 724-7256
Fax: (518) 869-2945
Project Contact: Paul D'Annibale/ Maureen Garnder
Email: Paul.D'Annibale@obg.com / Maureen.Gardner@obg.com

Laboratory:
Marie Meidhof
TestAmerica — 880 Riverside Pkwy, W. Sacramento, CA 95605-1500
TestAmerica — 10 Hazelwood Dr, Amherst, NY 14228-2223
Phone: 732-593-2554
Fax: 732-549-3679

Analysis Holding Time from Sample Date:
14 days to extraction, 28 days from extraction to analysis

Package Requirement: Full NYSDEC ASP Cat B Level Pkg w/standard 20 BD TAT
Project Number: 69645
EDD Format: EQuIS 4-File

Chemical Preservatives: (see key at bottom)

Sample Identification

#	Unique Field Sample ID	Sample Location	Sample Date (mm/dd/yy)	Sample Time (hh:mm)	Sample Type (see key)	Sample Matrix (see key)	# of Containers	Grab (G) or Composite (C)	Field Filtered? (Y / N)	PFAS by USEPA Modified Method 537 (0)	1,4-dioxane by USEPA Method 8270 SIM (0)	0	0	0	0	0	0	0	0	0	0	Lab Sample ID
							Reporting Units			ug/L	ug/L											
1	MW-7-100318	MW-7	10/03/18	1115	N	WG	4	G	N	X	X											
2	MW-1-100318	MW-1	↓	1450	N	WG	4	G	N	X	X											
3								G	N													
4								G	N													
5								G	N													
6								G	N													
7								G	N													
8								G	N													
9								G	N													
10																						

480-142905 COC

Special Instructions:

Relinquished by	Date / Time	Received by	Date / Time
J. McDougal (JM) of: OBG	Date 10/3/18 Time 1420	Karl Foder of: Test America	Date 10-3-18 Time 1620
Karl Foder of: TA	Date 10-3-18 Time 1800	[illegible signature] of:	Date 10/4/18 Time 0700
Relinquished by: of:	Date Time	Received by: of:	Date Time

Condition:
Custody Seals intact? (Y) N
Cooler Temperature: 1.7°C #3

Comments or Notes:
Standard 20 business day TAT for Full NYSDEC ASP Cat B Level Pkg (PDF) and EQuIS 4-file EDD.

Sample Type: N = Normal environmental sample, FD = field duplicate, EB = Equipment Blank, FB = Field Blank, TB = Trip Blank, MS = Lab MatSpike, Other (Specify):
Sample Matrix SE = Sediment, SO = Soil, WG = Groundwater, WS = Surface Water, WW = Waste Water, WQ = Water Quality, TA = Animal Tissue, TP = Plant Tissue, AA = Ambient Air, Other (Specify):
Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Asorbic Acid, 6 = MeOH, 7 = NaHSO4, 8 = Na2S2O3: 9 = H3PO4

EC Sampling - GE Vatrano Rd Site

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Lab Use Only

TestAmerica

Client: Site Name / Location: Vatrano Rd Site / Albany, NY

Sampling Program: EC Sampling - GE Vatrano RdSite

Sampler(s): T. McDougal

Project Number:

O'Brien & Gere Office: Albany
Address: O'Brien & Gere
94 New Karner Rd, Suite 106, Albany, N.Y. 12203
Phone: (518) 724-7256
Fax: (518) 869-2945
Project Contact: Paul D'Annibale/ Maureen Gardner
Email: Paul.D'Annibale@obg.com / Maureen.Gardner@obg.com

Laboratory:
Marie Meichof
TestAmerica — 880 Riverside Pkwy — W. Sacramento, CA — 95605-1500
TestAmerica — 10 Hazelwood Dr — Amherst, NY — 14228-2223
Phone: 732-593-2554
Fax: 732-549-3679

Analysis Holding Time from Sample Date:
14 days to extraction, 28 dys from extraction to analysis

Package Requirement:
Full NYSDEC ASP Cat B Level Pkg w/standard 20 BD TAT

Project Number: 69645

EDD Format: EQuIS 4-File

Lab ID:

Job Number:

Sample Identification									Grab (G) or Composite (C)	Field Filtered? (Y / N)	Chemical Preservatives: (see key at bottom) 0	0	0	0	0	0	0	0	0	0	0	0	
	Unique Field Sample ID	Sample Location	Sample Date (mm/dd/yy)	Sample Time (hh:mm)	Sample Type (see key)	Sample Matrix (see key)	# of Containers	Reporting Units			PFAS by USEPA Modified Method 537	1,4-dioxane by USEPA Method 8270 SIM											Lab Sample ID
											ng/L	ng/L											
1	MW-7-100318	MW-7	10/03/18	1115	N	WG	4		G	N	X	X											
2	MW-1-100318	MW-1	↓	1450	N	WG	4		G	N	X	X											
3									G	N													
4									G	N													
5									G	N													
6									G	N													
7									G	N													
8									G	N													
9									G	N													
10																							

480-142905 Chain of Custody

Special Instructions:

Relinquished by: J. McDougal	Date 10/3/18	Received by: Karl Jodin	Date 10-3-18	Condition: Intact	Comments or Notes: Standard 20 business day TAT for Full NYSDEC ASP Cat B Level Pkg (PDF) and EQuIS 4-file EDD.
of: OBG	Time 1420	of: Test America	Time 1620		
Relinquished by: Karl Jodin	Date 10-4-18	Received by:	Date 10/5/18	Custody Seals intact? Y N 743159	
of: TA	Time 1800	of:	Time 950		
Relinquished by:	Date	Received by:	Date	Cooler Temperature: 0.5°C	
of:	Time	of:	Time		

Sample Type: N = Normal environmental sample, FD = field duplicate, EB = Equipment Blank, FB = Field Blank, TB = Trip Blank, MS = Lab MaSpike, Other (Specify):
Sample Matrix SE = Sediment, SO = Soil, WG = Groundwater, WS = Surface Water, WW = Waste Water, WQ = Water Quality, TA = Animal Tissue, TP = Plant Tissue, AA = Ambient Air, Other (Specify):
Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Ascbic Acid, 6 = MeOH, 7 = NaHSO4, 8 = Na2S2O3: 9 = H3PO4

0.5°C

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Sample Receiving Notes

Job: 480-142905 Field Sheet

Tracking # 4635 9988 8726 SO / PO / FO / 2-Day / SAT / Ground / UPS / Courier / Drop Off / GSO / OnTrac / Goldstreak / USPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes:

480/8837

480-142905

Therm. ID: ~~AK-2~~ / AK-3 / AK-5 / AK-6 / HACCP / Other _____ (+0.7°C)

Ice X Wet X Gel _____ Other _____

Cooler Custody Seal: 743159

Sample Custody Seal: _____

Cooler ID: _____

Temp: Observed 0.5 Corrected 0.5

From: Temp Blank ☒ Sample ☐

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
Alkalinity has no headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☒	☐	☐
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐
Sample temp OK?	☒	☐	☐
Sample out of temp?	☐	☒	☐

Initials: DH Date: 10/5/18

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

5D

Login Sample Receipt Checklist

Client: O'Brien & Gere Inc of North America

Job Number: 480-142905-1

Login Number: 142905
List Number: 1
Creator: Hulbert, Michael J

List Source: TestAmerica Buffalo

Question	Answer	Comment
Radioactivity either was not measured or, if measured, is at or below background	True	
The cooler's custody seal, if present, is 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 sample IDs on the containers and the COC.	True	
Samples are received within Holding Time (Excluding tests with immediate HTs)..	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	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	N/A	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Sampling Company provided.	True	
Samples received within 48 hours of sampling.	True	
Samples requiring field filtration have been filtered in the field.	N/A	
Chlorine Residual checked.	N/A	

Login Sample Receipt Checklist

Client: O'Brien & Gere Inc of North America

Job Number: 480-142905-1

Login Number: 142905
List Number: 2
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento
List Creation: 10/06/18 01:36 PM

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	743159
Sample custody seals, if present, are intact.	N/A	
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	0.5C
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 (excluding tests with immediate HTs)	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.	N/A	
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Buffalo
10 Hazelwood Drive
Amherst, NY 14228-2298
Tel: (716)691-2600

TestAmerica Job ID: 480-142994-1
Client Project/Site: GE Vatrano Rd Site

For:
O'Brien & Gere Inc of North America
94 New Karner Rd., Suite 106
Albany, New York 12203

Attn: Mr. Paul D'Annibale

Authorized for release by:
10/24/2018 2:24:28 PM

Marie Meidhof, Senior Project Manager
(732)549-3900
marie.meidhof@testamericainc.com

Table of Contents

Definitions/Glossary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Qualifiers

LCMS

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 480-142994-1

Laboratory: TestAmerica Buffalo

Narrative

CASE NARRATIVE

Client: O'Brien & Gere Inc of North America

Project: GE Vatrano Rd Site

Report Number: 480-142994-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes or interferences which exceed the calibration range of the instrument.

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.

RECEIPT

The samples were received on 10/5/2018 1:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.7º C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

1,4 DIOXANE BY 8270D SIM, ISOTOPE DILUTION

Samples MW-4-100418 (480-142994-1), MW-2-100418 (480-142994-2), EB-100418 (480-142994-3) and X-1-100418 (480-142994-5) were analyzed for 1,4 Dioxane by 8270D SIM, Isotope Dilution in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 10/09/2018 and analyzed on 10/11/2018 and 10/12/2018.

No difficulties were encountered during the 1,4 Dioxane analysis.

All quality control parameters were within the acceptance limits.

PERFLUORINATED HYDROCARBONS (PFC)

Samples MW-4-100418 (480-142994-1), MW-2-100418 (480-142994-2), EB-100418 (480-142994-3), FRB-100418 (480-142994-4) and X-1-100418 (480-142994-5) were analyzed for Perfluorinated Hydrocarbons (PFC) in accordance with PFC. The samples were prepared on 10/12/2018 and analyzed on 10/16/2018.

The following samples had non-settleable particulate matter which plugged the SPE extraction disk. The amount of sample remaining plus the weight of the bottle are recorded in the "Notes" field of the prep batch. The "Tare Weight" recorded is the weight of the emptied bottle: MW-4-100418 (480-142994-1), MW-4-100418 (480-142994-1[MS]) and MW-4-100418 (480-142994-1[MSD]). The reporting limits (RLs) have been adjusted proportionately.

Perfluorohexanesulfonic acid (PFHxS) and Perfluorononanoic acid (PFNA) were detected in method blank MB 320-251680/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Job ID: 480-142994-1 (Continued)

Laboratory: TestAmerica Buffalo (Continued)

The matrix spike (MS) recoveries for Perfluoropentanoic acid (PFPeA) and Perfluorohexanoic acid (PFHxA) forpreparation batch 320-251680 and analytical batch 320-252417 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Refer to the QC report for details.

No other difficulties were encountered during the Perfluorinated Hydrocarbons (PFC) analysis.All other quality control parameters were within the acceptance limits.

Detection Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Client Sample ID: MW-4-100418 — Lab Sample ID: 480-142994-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	18	F1 F2	1.8	0.32	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	65	F1	1.8	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	87	F1	1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	6.9		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	25		1.8	0.77	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	2.0	B	1.8	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.35	J	1.8	0.28	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	5.8		1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	5.9	B	1.8	0.15	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.66	J	1.8	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	22		1.8	0.49	ng/L	1		537 (modified)	Total/NA

Client Sample ID: MW-2-100418 — Lab Sample ID: 480-142994-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.9		1.8	0.32	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.7		1.8	0.45	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	2.3		1.8	0.53	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	3.0		1.8	0.23	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	14		1.8	0.78	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	5.6	B	1.8	0.25	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.3	J	1.8	0.18	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	4.0	B	1.8	0.16	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanesulfonic Acid (PFHpS)	0.93	J	1.8	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	100		1.8	0.49	ng/L	1		537 (modified)	Total/NA

Client Sample ID: EB-100418 — Lab Sample ID: 480-142994-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.23	J B	1.7	0.14	ng/L	1		537 (modified)	Total/NA

Client Sample ID: FRB-100418 — Lab Sample ID: 480-142994-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorohexanesulfonic acid (PFHxS)	0.23	J B	1.8	0.16	ng/L	1		537 (modified)	Total/NA

Client Sample ID: X-1-100418 — Lab Sample ID: 480-142994-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanoic acid (PFBA)	2.3		1.7	0.31	ng/L	1		537 (modified)	Total/NA
Perfluoropentanoic acid (PFPeA)	2.2		1.7	0.43	ng/L	1		537 (modified)	Total/NA
Perfluorohexanoic acid (PFHxA)	2.2		1.7	0.51	ng/L	1		537 (modified)	Total/NA
Perfluoroheptanoic acid (PFHpA)	2.9		1.7	0.22	ng/L	1		537 (modified)	Total/NA
Perfluorooctanoic acid (PFOA)	15		1.7	0.74	ng/L	1		537 (modified)	Total/NA
Perfluorononanoic acid (PFNA)	5.4	B	1.7	0.24	ng/L	1		537 (modified)	Total/NA
Perfluorodecanoic acid (PFDA)	0.37	J	1.7	0.27	ng/L	1		537 (modified)	Total/NA
Perfluorododecanoic acid (PFDoA)	0.63	J	1.7	0.48	ng/L	1		537 (modified)	Total/NA
Perfluorobutanesulfonic acid (PFBS)	1.2	J	1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	3.9	B	1.7	0.15	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Client Sample ID: X-1-100418 (Continued)

Lab Sample ID: 480-142994-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	J	1.7	0.17	ng/L	1		537 (modified)	Total/NA
Perfluorooctanesulfonic acid (PFOS)	110		1.7	0.47	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-4-100418
Date Collected: 10/04/18 10:15
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		10/09/18 07:33	10/11/18 21:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*31*		*15 - 110*	*10/09/18 07:33*	*10/11/18 21:17*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**18**	**F1 F2**	1.8	0.32	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluoropentanoic acid (PFPeA)	**65**	**F1**	1.8	0.45	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorohexanoic acid (PFHxA)	**87**	**F1**	1.8	0.53	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluoroheptanoic acid (PFHpA)	**6.9**		1.8	0.23	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorooctanoic acid (PFOA)	**25**		1.8	0.77	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorononanoic acid (PFNA)	**2.0**	**B**	1.8	0.25	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorodecanoic acid (PFDA)	**0.35**	**J**	1.8	0.28	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.26	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorobutanesulfonic acid (PFBS)	**5.8**		1.8	0.18	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorohexanesulfonic acid (PFHxS)	**5.9**	**B**	1.8	0.15	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.66**	**J**	1.8	0.17	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorooctanesulfonic acid (PFOS)	**22**		1.8	0.49	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorooctanesulfonamide (FOSA)	ND		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 00:43	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/16/18 00:43	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	1.7	ng/L		10/12/18 11:11	10/16/18 00:43	1
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 00:43	1
8:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 00:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*70*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C5 PFPeA	*75*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C2 PFHxA	*79*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C4 PFHpA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C4 PFOA	*81*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C5 PFNA	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C2 PFDA	*85*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C2 PFUnA	*78*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C2 PFDoA	*70*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C2 PFTeDA	*67*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C3 PFBS	*84*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
18O2 PFHxS	*89*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C4 PFOS	*94*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C8 FOSA	*82*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
d3-NMeFOSAA	*96*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
d5-NEtFOSAA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*

Client Sample ID: MW-4-100418

Date Collected: 10/04/18 10:15
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	*118*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
M2-8:2 FTS	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*

Client Sample ID: MW-2-100418

Date Collected: 10/04/18 13:55
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.096	ug/L		10/09/18 07:33	10/12/18 00:25	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	*30*		*15 - 110*	*10/09/18 07:33*	*10/12/18 00:25*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.9**		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoropentanoic acid (PFPeA)	**2.7**		1.8	0.45	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorohexanoic acid (PFHxA)	**2.3**		1.8	0.53	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoroheptanoic acid (PFHpA)	**3.0**		1.8	0.23	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorooctanoic acid (PFOA)	**14**		1.8	0.78	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorononanoic acid (PFNA)	**5.6**	**B**	1.8	0.25	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.27	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorobutanesulfonic acid (PFBS)	**1.3**	**J**	1.8	0.18	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorohexanesulfonic acid (PFHxS)	**4.0**	**B**	1.8	0.16	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoroheptanesulfonic Acid (PFHpS)	**0.93**	**J**	1.8	0.17	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorooctanesulfonic acid (PFOS)	**100**		1.8	0.49	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorooctanesulfonamide (FOSA)	ND		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/16/18 01:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	1.7	ng/L		10/12/18 11:11	10/16/18 01:05	1
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:05	1
8:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:05	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	*73*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C5 PFPeA	*80*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C2 PFHxA	*85*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C4 PFHpA	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C4 PFOA	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C5 PFNA	*91*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C2 PFDA	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C2 PFUnA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*

Client Sample ID: MW-2-100418

Date Collected: 10/04/18 13:55
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDoA	83		25 - 150	10/12/18 11:11	10/16/18 01:05	1
13C2 PFTeDA	81		25 - 150	10/12/18 11:11	10/16/18 01:05	1
13C3 PFBS	88		25 - 150	10/12/18 11:11	10/16/18 01:05	1
18O2 PFHxS	91		25 - 150	10/12/18 11:11	10/16/18 01:05	1
13C4 PFOS	95		25 - 150	10/12/18 11:11	10/16/18 01:05	1
13C8 FOSA	91		25 - 150	10/12/18 11:11	10/16/18 01:05	1
d3-NMeFOSAA	102		25 - 150	10/12/18 11:11	10/16/18 01:05	1
d5-NEtFOSAA	104		25 - 150	10/12/18 11:11	10/16/18 01:05	1
M2-6:2 FTS	131		25 - 150	10/12/18 11:11	10/16/18 01:05	1
M2-8:2 FTS	93		25 - 150	10/12/18 11:11	10/16/18 01:05	1

Client Sample ID: EB-100418

Date Collected: 10/04/18 10:45
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-3
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.096	ug/L		10/09/18 07:33	10/12/18 00:48	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	31		15 - 110	10/09/18 07:33	10/12/18 00:48	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		1.7	0.29	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoropentanoic acid (PFPeA)	ND		1.7	0.41	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorohexanoic acid (PFHxA)	ND		1.7	0.48	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroheptanoic acid (PFHpA)	ND		1.7	0.21	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanoic acid (PFOA)	ND		1.7	0.71	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.26	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.91	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.46	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.24	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorohexanesulfonic acid (PFHxS)	**0.23**	**J B**	1.7	0.14	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.7	0.16	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.7	0.45	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.27	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.29	ng/L		10/12/18 11:11	10/16/18 01:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		17	2.6	ng/L		10/12/18 11:11	10/16/18 01:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		17	1.6	ng/L		10/12/18 11:11	10/16/18 01:13	1
6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:13	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:13	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	85		25 - 150	10/12/18 11:11	10/16/18 01:13	1

Client Sample ID: EB-100418

Lab Sample ID: 480-142994-3

Date Collected: 10/04/18 10:45

Matrix: Water

Date Received: 10/05/18 01:15

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C5 PFPeA	86		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFHxA	87		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C4 PFHpA	92		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C4 PFOA	90		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C5 PFNA	91		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFDA	87		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFUnA	95		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFDoA	86		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C2 PFTeDA	86		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C3 PFBS	85		25 - 150	10/12/18 11:11	10/16/18 01:13	1
18O2 PFHxS	91		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C4 PFOS	95		25 - 150	10/12/18 11:11	10/16/18 01:13	1
13C8 FOSA	84		25 - 150	10/12/18 11:11	10/16/18 01:13	1
d3-NMeFOSAA	102		25 - 150	10/12/18 11:11	10/16/18 01:13	1
d5-NEtFOSAA	106		25 - 150	10/12/18 11:11	10/16/18 01:13	1
M2-6:2 FTS	103		25 - 150	10/12/18 11:11	10/16/18 01:13	1
M2-8:2 FTS	95		25 - 150	10/12/18 11:11	10/16/18 01:13	1

Client Sample ID: FRB-100418

Lab Sample ID: 480-142994-4

Date Collected: 10/04/18 10:20

Matrix: Water

Date Received: 10/05/18 01:15

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoropentanoic acid (PFPeA)	ND		1.8	0.45	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorohexanoic acid (PFHxA)	ND		1.8	0.53	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.23	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorooctanoic acid (PFOA)	ND		1.8	0.78	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.25	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.27	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.8	0.18	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorohexanesulfonic acid (PFHxS)	**0.23**	**J B**	1.8	0.16	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.17	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.8	0.49	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorooctanesulfonamide (FOSA)	ND		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:20	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/16/18 01:20	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	1.7	ng/L		10/12/18 11:11	10/16/18 01:20	1
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:20	1
8:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:20	1

Client Sample ID: FRB-100418

Lab Sample ID: 480-142994-4

Date Collected: 10/04/18 10:20

Matrix: Water

Date Received: 10/05/18 01:15

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	86		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C5 PFPeA	86		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFHxA	90		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C4 PFHpA	88		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C4 PFOA	88		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C5 PFNA	90		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFDA	90		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFUnA	93		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFDoA	80		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFTeDA	78		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C3 PFBS	92		25 - 150	10/12/18 11:11	10/16/18 01:20	1
18O2 PFHxS	88		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C4 PFOS	99		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C8 FOSA	85		25 - 150	10/12/18 11:11	10/16/18 01:20	1
d3-NMeFOSAA	91		25 - 150	10/12/18 11:11	10/16/18 01:20	1
d5-NEtFOSAA	99		25 - 150	10/12/18 11:11	10/16/18 01:20	1
M2-6:2 FTS	118		25 - 150	10/12/18 11:11	10/16/18 01:20	1
M2-8:2 FTS	108		25 - 150	10/12/18 11:11	10/16/18 01:20	1

Client Sample ID: X-1-100418

Lab Sample ID: 480-142994-5

Date Collected: 10/04/18 00:00

Matrix: Water

Date Received: 10/05/18 01:15

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.097	ug/L		10/09/18 07:33	10/12/18 01:12	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	28		15 - 110	10/09/18 07:33	10/12/18 01:12	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	**2.3**		1.7	0.31	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoropentanoic acid (PFPeA)	**2.2**		1.7	0.43	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorohexanoic acid (PFHxA)	**2.2**		1.7	0.51	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoroheptanoic acid (PFHpA)	**2.9**		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorooctanoic acid (PFOA)	**15**		1.7	0.74	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorononanoic acid (PFNA)	**5.4**	**B**	1.7	0.24	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorodecanoic acid (PFDA)	**0.37**	**J**	1.7	0.27	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.96	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorododecanoic acid (PFDoA)	**0.63**	**J**	1.7	0.48	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.25	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorobutanesulfonic acid (PFBS)	**1.2**	**J**	1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorohexanesulfonic acid (PFHxS)	**3.9**	**B**	1.7	0.15	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoroheptanesulfonic Acid (PFHpS)	**1.0**	**J**	1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorooctanesulfonic acid (PFOS)	**110**		1.7	0.47	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.28	ng/L		10/12/18 11:11	10/16/18 01:35	1

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Client Sample ID: X-1-100418
Date Collected: 10/04/18 00:00
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.31	ng/L		10/12/18 11:11	10/16/18 01:35	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		17	2.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*71*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C5 PFPeA	*81*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C2 PFHxA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C4 PFHpA	*94*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C4 PFOA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C5 PFNA	*99*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C2 PFDA	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C2 PFUnA	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C2 PFDoA	*91*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C2 PFTeDA	*82*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C3 PFBS	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
18O2 PFHxS	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C4 PFOS	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C8 FOSA	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
d3-NMeFOSAA	*103*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
d5-NEtFOSAA	*110*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
M2-6:2 FTS	*148*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
M2-8:2 FTS	*110*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*

Isotope Dilution Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	DXE (15-110)							
480-142994-1	MW-4-100418	31							
480-142994-1 MS	MW-4-100418	30							
480-142994-1 MSD	MW-4-100418	27							
480-142994-2	MW-2-100418	30							
480-142994-3	EB-100418	31							
480-142994-5	X-1-100418	28							
LCS 480-438341/2-A	Lab Control Sample	35							
MB 480-438341/1-A	Method Blank	37							

Surrogate Legend

DXE = 1,4-Dioxane-d8

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFBA (25-150)	PFPeA (25-150)	PFHxA (25-150)	PFHpA (25-150)	PFOA (25-150)	PFNA (25-150)	PFDA (25-150)	PFUnA (25-150)
480-142994-1	MW-4-100418	70	75	79	87	81	90	85	78
480-142994-1 MS	MW-4-100418	58	61	66	67	70	67	67	66
480-142994-1 MSD	MW-4-100418	53	55	63	63	64	67	60	56
480-142994-2	MW-2-100418	73	80	85	93	95	91	90	87
480-142994-3	EB-100418	85	86	87	92	90	91	87	95
480-142994-4	FRB-100418	86	86	90	88	88	90	90	93
480-142994-5	X-1-100418	71	81	87	94	87	99	93	93
LCS 320-251680/2-A	Lab Control Sample	83	86	90	85	93	89	85	93
MB 320-251680/1-A	Method Blank	89	90	93	99	92	95	97	106

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	PFDoA (25-150)	PFTDA (25-150)	3C3-PFB((25-150)	PFHxS (25-150)	PFOS (25-150)	PFOSA (25-150)	-NMeFOS/ (25-150)	-NEtFOSA (25-150)
480-142994-1	MW-4-100418	70	67	84	89	94	82	96	87
480-142994-1 MS	MW-4-100418	59	56	65	69	71	64	72	72
480-142994-1 MSD	MW-4-100418	50	51	58	61	62	57	62	57
480-142994-2	MW-2-100418	83	81	88	91	95	91	102	104
480-142994-3	EB-100418	86	86	85	91	95	84	102	106
480-142994-4	FRB-100418	80	78	92	88	99	85	91	99
480-142994-5	X-1-100418	91	82	87	93	93	92	103	110
LCS 320-251680/2-A	Lab Control Sample	87	83	83	86	93	79	97	111
MB 320-251680/1-A	Method Blank	104	92	92	93	100	90	112	114

		Percent Isotope Dilution Recovery (Acceptance Limits)							
Lab Sample ID	Client Sample ID	M262FTS (25-150)	M282FTS (25-150)						
480-142994-1	MW-4-100418	118	93						
480-142994-1 MS	MW-4-100418	84	79						
480-142994-1 MSD	MW-4-100418	90	62						
480-142994-2	MW-2-100418	131	93						
480-142994-3	EB-100418	103	95						
480-142994-4	FRB-100418	118	108						
480-142994-5	X-1-100418	148	110						

Isotope Dilution Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Matrix: Water **Prep Type: Total/NA**

		Percent Isotope Dilution Recovery (Acceptance Limits)									
Lab Sample ID	Client Sample ID	M262FTS (25-150)	M282FTS (25-150)								
LCS 320-251680/2-A	Lab Control Sample	108	104								
MB 320-251680/1-A	Method Blank	121	100								

Surrogate Legend

PFBA = 13C4 PFBA
PFPeA = 13C5 PFPeA
PFHxA = 13C2 PFHxA
PFHpA = 13C4 PFHpA
PFOA = 13C4 PFOA
PFNA = 13C5 PFNA
PFDA = 13C2 PFDA
PFUnA = 13C2 PFUnA
PFDoA = 13C2 PFDoA
PFTDA = 13C2 PFTeDA
13C3-PFBS = 13C3 PFBS
PFHxS = 18O2 PFHxS
PFOS = 13C4 PFOS
PFOSA = 13C8 FOSA
d3-NMeFOSAA = d3-NMeFOSAA
d5-NEtFOSAA = d5-NEtFOSAA
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Lab Sample ID: MB 480-438341/1-A
Matrix: Water
Analysis Batch: 438984

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 438341

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		10/09/18 07:33	10/11/18 19:44	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*37*		*15 - 110*	*10/09/18 07:33*	*10/11/18 19:44*	*1*

Lab Sample ID: LCS 480-438341/2-A
Matrix: Water
Analysis Batch: 438984

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 438341

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	1.00	1.10		ug/L		110	40 - 140

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,4-Dioxane-d8	*35*		*15 - 110*

Lab Sample ID: 480-142994-1 MS
Matrix: Water
Analysis Batch: 438984

Client Sample ID: MW-4-100418
Prep Type: Total/NA
Prep Batch: 438341

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	ND		0.952	1.09		ug/L		114	40 - 140

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
1,4-Dioxane-d8	*30*		*15 - 110*

Lab Sample ID: 480-142994-1 MSD
Matrix: Water
Analysis Batch: 438984

Client Sample ID: MW-4-100418
Prep Type: Total/NA
Prep Batch: 438341

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	ND		1.00	1.13		ug/L		113	40 - 140	4	20

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,4-Dioxane-d8	*27*		*15 - 110*

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-251680/1-A
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 251680

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		2.0	0.35	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoropentanoic acid (PFPeA)	ND		2.0	0.49	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorohexanoic acid (PFHxA)	ND		2.0	0.58	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.25	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanoic acid (PFOA)	ND		2.0	0.85	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorononanoic acid (PFNA)	0.314	J	2.0	0.27	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorodecanoic acid (PFDA)	ND		2.0	0.31	ng/L		10/12/18 11:11	10/16/18 00:13	1

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-251680/1-A
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 251680

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	ND		2.0	1.1	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorododecanoic acid (PFDoA)	ND		2.0	0.55	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorotridecanoic acid (PFTriA)	ND		2.0	1.3	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.29	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.20	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorohexanesulfonic acid (PFHxS)	0.346	J	2.0	0.17	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.19	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.54	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.32	ng/L		10/12/18 11:11	10/16/18 00:13	1
Perfluorooctanesulfonamide (FOSA)	ND		2.0	0.35	ng/L		10/12/18 11:11	10/16/18 00:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		20	3.1	ng/L		10/12/18 11:11	10/16/18 00:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		20	1.9	ng/L		10/12/18 11:11	10/16/18 00:13	1
6:2 FTS	ND		20	2.0	ng/L		10/12/18 11:11	10/16/18 00:13	1
8:2 FTS	ND		20	2.0	ng/L		10/12/18 11:11	10/16/18 00:13	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*89*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C5 PFPeA	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C2 PFHxA	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C4 PFHpA	*99*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C4 PFOA	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C5 PFNA	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C2 PFDA	*97*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C2 PFUnA	*106*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C2 PFDoA	*104*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C2 PFTeDA	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C3 PFBS	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
18O2 PFHxS	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C4 PFOS	*100*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
13C8 FOSA	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
d3-NMeFOSAA	*112*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
d5-NEtFOSAA	*114*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
M2-6:2 FTS	*121*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*
M2-8:2 FTS	*100*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:13*	*1*

Lab Sample ID: LCS 320-251680/2-A
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 251680

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	40.0	39.9		ng/L		100	70 - 130
Perfluoropentanoic acid (PFPeA)	40.0	40.2		ng/L		100	66 - 126
Perfluorohexanoic acid (PFHxA)	40.0	39.0		ng/L		98	66 - 126
Perfluoroheptanoic acid (PFHpA)	40.0	41.0		ng/L		102	66 - 126
Perfluorooctanoic acid (PFOA)	40.0	39.0		ng/L		97	64 - 124
Perfluorononanoic acid (PFNA)	40.0	43.5		ng/L		109	68 - 128

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-251680/2-A
Matrix: Water
Analysis Batch: 252417

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 251680

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorodecanoic acid (PFDA)	40.0	38.3		ng/L		96	69 - 129
Perfluoroundecanoic acid (PFUnA)	40.0	39.0		ng/L		98	60 - 120
Perfluorododecanoic acid (PFDoA)	40.0	37.9		ng/L		95	71 - 131
Perfluorotridecanoic acid (PFTriA)	40.0	38.2		ng/L		96	72 - 132
Perfluorotetradecanoic acid (PFTeA)	40.0	41.0		ng/L		103	68 - 128
Perfluorobutanesulfonic acid (PFBS)	35.4	35.9		ng/L		101	73 - 133
Perfluorohexanesulfonic acid (PFHxS)	36.4	34.2		ng/L		94	63 - 123
Perfluoroheptanesulfonic Acid (PFHpS)	38.1	37.6		ng/L		99	68 - 128
Perfluorooctanesulfonic acid (PFOS)	37.1	33.1		ng/L		89	67 - 127
Perfluorodecanesulfonic acid (PFDS)	38.6	37.6		ng/L		98	68 - 128
Perfluorooctanesulfonamide (FOSA)	40.0	44.4		ng/L		111	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	35.5		ng/L		89	67 - 127
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	34.9		ng/L		87	65 - 125
6:2 FTS	37.9	32.7		ng/L		86	66 - 126
8:2 FTS	38.3	30.7		ng/L		80	67 - 127

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C4 PFBA	*83*		*25 - 150*
13C5 PFPeA	*86*		*25 - 150*
13C2 PFHxA	*90*		*25 - 150*
13C4 PFHpA	*85*		*25 - 150*
13C4 PFOA	*93*		*25 - 150*
13C5 PFNA	*89*		*25 - 150*
13C2 PFDA	*85*		*25 - 150*
13C2 PFUnA	*93*		*25 - 150*
13C2 PFDoA	*87*		*25 - 150*
13C2 PFTeDA	*83*		*25 - 150*
13C3 PFBS	*83*		*25 - 150*
18O2 PFHxS	*86*		*25 - 150*
13C4 PFOS	*93*		*25 - 150*
13C8 FOSA	*79*		*25 - 150*
d3-NMeFOSAA	*97*		*25 - 150*
d5-NEtFOSAA	*111*		*25 - 150*
M2-6:2 FTS	*108*		*25 - 150*
M2-8:2 FTS	*104*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 480-142994-1 MS
Matrix: Water
Analysis Batch: 252417

Client Sample ID: MW-4-100418
Prep Type: Total/NA
Prep Batch: 251680

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorobutanoic acid (PFBA)	18	F1 F2	35.4	52.1		ng/L		96	70 - 130
Perfluoropentanoic acid (PFPeA)	65	F1	35.4	87.8	F1	ng/L		63	66 - 126
Perfluorohexanoic acid (PFHxA)	87	F1	35.4	105	F1	ng/L		52	66 - 126
Perfluoroheptanoic acid (PFHpA)	6.9		35.4	41.7		ng/L		98	66 - 126
Perfluorooctanoic acid (PFOA)	25		35.4	54.7		ng/L		83	64 - 124
Perfluorononanoic acid (PFNA)	2.0	B	35.4	36.3		ng/L		97	68 - 128
Perfluorodecanoic acid (PFDA)	0.35	J	35.4	35.3		ng/L		99	69 - 129
Perfluoroundecanoic acid (PFUnA)	ND		35.4	34.0		ng/L		96	60 - 120
Perfluorododecanoic acid (PFDoA)	ND		35.4	38.3		ng/L		108	71 - 131
Perfluorotridecanoic acid (PFTriA)	ND		35.4	36.6		ng/L		104	72 - 132
Perfluorotetradecanoic acid (PFTeA)	ND		35.4	36.6		ng/L		103	68 - 128
Perfluorobutanesulfonic acid (PFBS)	5.8		31.3	35.2		ng/L		94	73 - 133
Perfluorohexanesulfonic acid (PFHxS)	5.9	B	32.2	33.9		ng/L		87	63 - 123
Perfluoroheptanesulfonic Acid (PFHpS)	0.66	J	33.7	35.8		ng/L		104	68 - 128
Perfluorooctanesulfonic acid (PFOS)	22		32.8	49.4		ng/L		84	67 - 127
Perfluorodecanesulfonic acid (PFDS)	ND		34.1	27.1		ng/L		79	68 - 128
Perfluorooctanesulfonamide (FOSA)	ND		35.4	39.4		ng/L		111	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		35.4	32.7		ng/L		92	67 - 127
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		35.4	33.3		ng/L		94	65 - 125
6:2 FTS	ND		33.5	31.0		ng/L		92	66 - 126
8:2 FTS	ND		33.9	26.5		ng/L		78	67 - 127

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C4 PFBA	*58*		*25 - 150*
13C5 PFPeA	*61*		*25 - 150*
13C2 PFHxA	*66*		*25 - 150*
13C4 PFHpA	*67*		*25 - 150*
13C4 PFOA	*70*		*25 - 150*
13C5 PFNA	*67*		*25 - 150*
13C2 PFDA	*67*		*25 - 150*
13C2 PFUnA	*66*		*25 - 150*
13C2 PFDoA	*59*		*25 - 150*
13C2 PFTeDA	*56*		*25 - 150*
13C3 PFBS	*65*		*25 - 150*
18O2 PFHxS	*69*		*25 - 150*
13C4 PFOS	*71*		*25 - 150*
13C8 FOSA	*64*		*25 - 150*
d3-NMeFOSAA	*72*		*25 - 150*
d5-NEtFOSAA	*72*		*25 - 150*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 480-142994-1 MS
Matrix: Water
Analysis Batch: 252417

Client Sample ID: MW-4-100418
Prep Type: Total/NA
Prep Batch: 251680

Isotope Dilution	MS %Recovery	MS Qualifier	Limits
M2-6:2 FTS	84		25 - 150
M2-8:2 FTS	79		25 - 150

Lab Sample ID: 480-142994-1 MSD
Matrix: Water
Analysis Batch: 252417

Client Sample ID: MW-4-100418
Prep Type: Total/NA
Prep Batch: 251680

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorobutanoic acid (PFBA)	18	F1 F2	36.5	55.9		ng/L		103	70 - 130	7	30
Perfluoropentanoic acid (PFPeA)	65	F1	36.5	98.8		ng/L		91	66 - 126	12	30
Perfluorohexanoic acid (PFHxA)	87	F1	36.5	118		ng/L		84	66 - 126	11	30
Perfluoroheptanoic acid (PFHpA)	6.9		36.5	42.7		ng/L		98	66 - 126	2	30
Perfluorooctanoic acid (PFOA)	25		36.5	53.2		ng/L		77	64 - 124	3	30
Perfluorononanoic acid (PFNA)	2.0	B	36.5	37.1		ng/L		96	68 - 128	2	30
Perfluorodecanoic acid (PFDA)	0.35	J	36.5	38.7		ng/L		105	69 - 129	9	30
Perfluoroundecanoic acid (PFUnA)	ND		36.5	37.1		ng/L		102	60 - 120	9	30
Perfluorododecanoic acid (PFDoA)	ND		36.5	36.5		ng/L		100	71 - 131	5	30
Perfluorotridecanoic acid (PFTriA)	ND		36.5	36.6		ng/L		100	72 - 132	0	30
Perfluorotetradecanoic acid (PFTeA)	ND		36.5	37.2		ng/L		102	68 - 128	2	30
Perfluorobutanesulfonic acid (PFBS)	5.8		32.3	38.8		ng/L		102	73 - 133	10	30
Perfluorohexanesulfonic acid (PFHxS)	5.9	B	33.2	38.9		ng/L		99	63 - 123	14	30
Perfluoroheptanesulfonic Acid (PFHpS)	0.66	J	34.7	37.6		ng/L		106	68 - 128	5	30
Perfluorooctanesulfonic acid (PFOS)	22		33.9	56.5		ng/L		102	67 - 127	13	30
Perfluorodecanesulfonic acid (PFDS)	ND		35.2	28.2		ng/L		80	68 - 128	4	30
Perfluorooctanesulfonamide (FOSA)	ND		36.5	38.9		ng/L		107	70 - 130	1	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		36.5	32.7		ng/L		90	67 - 127	0	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		36.5	34.2		ng/L		94	65 - 125	3	30
6:2 FTS	ND		34.6	31.8		ng/L		92	66 - 126	3	30
8:2 FTS	ND		35.0	35.9		ng/L		103	67 - 127	30	30

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C4 PFBA	53		25 - 150
13C5 PFPeA	55		25 - 150
13C2 PFHxA	63		25 - 150
13C4 PFHpA	63		25 - 150
13C4 PFOA	64		25 - 150
13C5 PFNA	67		25 - 150
13C2 PFDA	60		25 - 150
13C2 PFUnA	56		25 - 150

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: 480-142994-1 MSD
Matrix: Water
Analysis Batch: 252417

Client Sample ID: MW-4-100418
Prep Type: Total/NA
Prep Batch: 251680

Isotope Dilution	MSD %Recovery	MSD Qualifier	Limits
13C2 PFDoA	50		25 - 150
13C2 PFTeDA	51		25 - 150
13C3 PFBS	58		25 - 150
18O2 PFHxS	61		25 - 150
13C4 PFOS	62		25 - 150
13C8 FOSA	57		25 - 150
d3-NMeFOSAA	62		25 - 150
d5-NEtFOSAA	57		25 - 150
M2-6:2 FTS	90		25 - 150
M2-8:2 FTS	62		25 - 150

GC/MS Semi VOA

Prep Batch: 438341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142994-1	MW-4-100418	Total/NA	Water	3510C	
480-142994-2	MW-2-100418	Total/NA	Water	3510C	
480-142994-3	EB-100418	Total/NA	Water	3510C	
480-142994-5	X-1-100418	Total/NA	Water	3510C	
MB 480-438341/1-A	Method Blank	Total/NA	Water	3510C	
LCS 480-438341/2-A	Lab Control Sample	Total/NA	Water	3510C	
480-142994-1 MS	MW-4-100418	Total/NA	Water	3510C	
480-142994-1 MSD	MW-4-100418	Total/NA	Water	3510C	

Analysis Batch: 438984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142994-1	MW-4-100418	Total/NA	Water	8270D SIM ID	438341
480-142994-2	MW-2-100418	Total/NA	Water	8270D SIM ID	438341
480-142994-3	EB-100418	Total/NA	Water	8270D SIM ID	438341
480-142994-5	X-1-100418	Total/NA	Water	8270D SIM ID	438341
MB 480-438341/1-A	Method Blank	Total/NA	Water	8270D SIM ID	438341
LCS 480-438341/2-A	Lab Control Sample	Total/NA	Water	8270D SIM ID	438341
480-142994-1 MS	MW-4-100418	Total/NA	Water	8270D SIM ID	438341
480-142994-1 MSD	MW-4-100418	Total/NA	Water	8270D SIM ID	438341

LCMS

Prep Batch: 251680

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142994-1	MW-4-100418	Total/NA	Water	3535	
480-142994-2	MW-2-100418	Total/NA	Water	3535	
480-142994-3	EB-100418	Total/NA	Water	3535	
480-142994-4	FRB-100418	Total/NA	Water	3535	
480-142994-5	X-1-100418	Total/NA	Water	3535	
MB 320-251680/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-251680/2-A	Lab Control Sample	Total/NA	Water	3535	
480-142994-1 MS	MW-4-100418	Total/NA	Water	3535	
480-142994-1 MSD	MW-4-100418	Total/NA	Water	3535	

Analysis Batch: 252417

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-142994-1	MW-4-100418	Total/NA	Water	537 (modified)	251680
480-142994-2	MW-2-100418	Total/NA	Water	537 (modified)	251680
480-142994-3	EB-100418	Total/NA	Water	537 (modified)	251680
480-142994-4	FRB-100418	Total/NA	Water	537 (modified)	251680
480-142994-5	X-1-100418	Total/NA	Water	537 (modified)	251680
MB 320-251680/1-A	Method Blank	Total/NA	Water	537 (modified)	251680
LCS 320-251680/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	251680
480-142994-1 MS	MW-4-100418	Total/NA	Water	537 (modified)	251680
480-142994-1 MSD	MW-4-100418	Total/NA	Water	537 (modified)	251680

Lab Chronicle

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Client Sample ID: MW-4-100418
Date Collected: 10/04/18 10:15
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	438984	10/11/18 21:17	DMR	TAL BUF
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 00:43	CBW	TAL SAC

Client Sample ID: MW-2-100418
Date Collected: 10/04/18 13:55
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	438984	10/12/18 00:25	DMR	TAL BUF
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 01:05	CBW	TAL SAC

Client Sample ID: EB-100418
Date Collected: 10/04/18 10:45
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	438984	10/12/18 00:48	DMR	TAL BUF
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 01:13	CBW	TAL SAC

Client Sample ID: FRB-100418
Date Collected: 10/04/18 10:20
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 01:20	CBW	TAL SAC

Client Sample ID: X-1-100418
Date Collected: 10/04/18 00:00
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			438341	10/09/18 07:33	JMP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	438984	10/12/18 01:12	DMR	TAL BUF
Total/NA	Prep	3535			251680	10/12/18 11:11	TWL	TAL SAC
Total/NA	Analysis	537 (modified)		1	252417	10/16/18 01:35	CBW	TAL SAC

Lab Chronicle

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Laboratory: TestAmerica Buffalo

The accreditations/certifications listed below are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
New York	NELAP	2	10026	03-31-19

Laboratory: TestAmerica Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska (UST)	State Program	10	17-020	01-20-21
ANAB	DoD ELAP		L2468	01-20-21
Arizona	State Program	9	AZ0708	08-11-19
Arkansas DEQ	State Program	6	88-0691	06-17-19
California	State Program	9	2897	01-31-19
Colorado	State Program	8	CA00044	08-31-19
Connecticut	State Program	1	PH-0691	06-30-19
Florida	NELAP	4	E87570	06-30-19
Georgia	State Program	4	N/A	01-28-19
Hawaii	State Program	9	N/A	01-29-19
Illinois	NELAP	5	200060	03-17-19
Kansas	NELAP	7	E-10375	10-31-18 *
Louisiana	NELAP	6	30612	06-30-19
Maine	State Program	1	CA0004	04-14-20
Michigan	State Program	5	9947	01-31-20
Nevada	State Program	9	CA00044	07-31-19
New Hampshire	NELAP	1	2997	04-18-19
New Jersey	NELAP	2	CA005	06-30-19
New York	NELAP	2	11666	03-31-19
Oregon	NELAP	10	4040	01-29-19
Pennsylvania	NELAP	3	68-01272	03-31-19
Texas	NELAP	6	T104704399	05-31-19
US Fish & Wildlife	Federal		LE148388-0	07-31-19
USDA	Federal		P330-18-00239	01-17-21
USEPA UCMR	Federal	1	CA00044	12-31-20
Utah	NELAP	8	CA00044	02-28-19
Vermont	State Program	1	VT-4040	04-30-19
Virginia	NELAP	3	460278	03-14-19
Washington	State Program	10	C581	05-05-19
West Virginia (DW)	State Program	3	9930C	12-31-18
Wyoming	State Program	8	8TMS-L	01-28-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Method	Method Description	Protocol	Laboratory
8270D SIM ID	Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)	SW846	TAL BUF
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL BUF
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

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

Laboratory References:

TAL BUF = TestAmerica Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600

TAL SAC = TestAmerica Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: O'Brien & Gere Inc of North America
Project/Site: GE Vatrano Rd Site

TestAmerica Job ID: 480-142994-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-142994-1	MW-4-100418	Water	10/04/18 10:15	10/05/18 01:15
480-142994-2	MW-2-100418	Water	10/04/18 13:55	10/05/18 01:15
480-142994-3	EB-100418	Water	10/04/18 10:45	10/05/18 01:15
480-142994-4	FRB-100418	Water	10/04/18 10:20	10/05/18 01:15
480-142994-5	X-1-100418	Water	10/04/18 00:00	10/05/18 01:15

EC Sampling - GE Vatrano Rd Site

Lab Use Only

TestAmerica

Client: Site Name / Location: Vatrano Rd Site / Albany, NY

Sampling Program: EC Sampling - GE Vatrano Rd Site

Sampler(s): J. McDougall

Project Number:

480-142994 COC

Job Number:

O'Brien & Gere Office: Albany
Address: O'Brien & Gere
94 New Karner Rd, Suite 106, Albany, N.Y. 12203
Phone: (518) 724-7256
Fax: (518) 869-2945
Project Contact: Paul D'Annibale/ Maureen Garnder
Email: Paul.D'Annibale@obg.com / Maureen.Gardner@obg.com

Laboratory:
Marie Meidhof
TestAmerica — 880 Riverside Pkwy — W. Sacramento, CA — 95605-1500
TestAmerica — 10 Hazelwood Dr — Amherst, NY — 14228-2223
Phone: 732-593-2554
Fax: 732-549-3679

Analysis Holding Time from Sample Date: 14 days to extraction, 28 days from extraction to analysis

Package Requirement: Full NYSDEC ASP Cat B Level Pkg w/standard 20 BD TAT

Project Number: 69645

EDD Format: EQuIS 4-File

Chemical Preservatives: (see key at bottom)

Sample Identification								Grab (G) or Composite (C)	Field Filtered? (Y / N)	PFAS by USEPA Modified Method 537	1,4-dioxane by USEPA Method 8270 SIM													
	Unique Field Sample ID	Sample Location	Sample Date (mm/dd/yy)	Sample Time (hh:mm)	Sample Type (see key)	Sample Matrix (see key)	# of Containers	Reporting Units		ng/L	ug/L													Lab Sample ID
										0	0	0	0	0	0	0	0	0	0	0	0	0		
1	MW-4-100418	MW-4	10/4/18	1015	N	WG	4	G	N	X	X													
2	MW-4-MS/MSD-100418	MW-4		1015	MS	WG	8	G	N	X	X													
3	MW-2-100418	MW-2		1355	N	WG	4	G	N	X	X													
4	EB-100418	—		1045	EB	WQ	4	G	N	X	X													
5	FRB-100418	—		1020	FB	WQ	2	G	N	X														
6	X-1-100418	—	↓	—	FD	WG	4	G	N	X	X													
7								G	N															
8								G	N															
9								G	N															
10																								

Special Instructions:

Relinquished by: J. McDougall	Date 10/4/18	Received by: Karl Zoda	Date 10-4-18	Condition: OK	Comments or Notes:
of: OBG	Time 1445	of: TA	Time 1445		Standard 20 business day TAT for Full NYSDEC ASP Cat B Level Pkg (PDF) and EQuIS 4-file EDD.
Relinquished by: Karl Zoda	Date 10-4-18	Received by:	Date 10/5/18	Custody Seals intact? Y N	
of: TA	Time 1800	of: TA	Time 0115		
Relinquished by:	Date	Received by:	Date	Cooler Temperature: 2.7°C #3	
of:	Time	of:	Time		

Sample Type: N = Normal environmental sample, FD = field duplicate, EB = Equipment Blank, FB = Field Blank, TB = Trip Blank, MS = Lab Matrix Spike, Other (Specify):
Sample Matrix SE = Sediment, SO = Soil, WG = Groundwater, WS = Surface Water, WW = Waste Water, WQ = Water Quality, TA = Animal Tissue, TP = Plant Tissue, AA = Ambient Air, Other (Specify):
Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Ascorbic Acid, 6 = MeOH, 7 = NaHSO4, 8 = Na2S2O3: 9 = H3PO4

480501-Albany

TestAmerica

EC Sampling - GE Vatrano Rd Site

Page 1 of 1

Lab Use Only

Client: Site Name / Location	Vatrano Rd Site / Albany, NY
Sampling Program:	EC Sampling - GE Vatrano RdSite
Sampler(s):	J. McDougall
Project Number:	

O'Brien & Gere Office: Albany
Address: O'Brien & Gere
94 New Karner Rd, Suite 106, Albany, N.Y. 12203
Phone: (518) 724-7256
Fax: (518) 869-2945
Project Contact: Paul D'Annibale/ Maureen Garnder
Email: Paul.D'Annibale@obg.com / Maureen.Gardner@obg.com

Laboratory:
Marie Meidhof
TestAmerica | TestAmerica
880 Riverside Pkwy | 10 Hazelwood Dr
W. Sacramento, CA | Amherst, NY
95605-1500 | 14228-2223
Phone: 732-593-2554
Fax: 732-549-3679

Analysis Holding Time from Sample Date:
14 days to extraction, 28 days from extraction to analysis

Package Requirement:
Full NYSDEC ASP Cat B Level Pkg w/standard 20 BD TAT
Project Number: 69645
EDD Format: EQuIS 4-File

Chemical Preservatives: (see key at bottom)

Lab ID:

Job Number:

Sample Identification

#	Unique Field Sample ID	Sample Location	Sample Date (mm/dd/yy)	Sample Time (hh:mm)	Sample Type (see key)	Sample Matrix (see key)	# of Containers	Grab (G) or Composite (C)	Field Filtered? (Y / N)	PFAS by USEPA Modified Method 537 (ng/L)	1,4-dioxane by USEPA Method 8270 SIM (ug/L)	Lab Sample ID
								Reporting Units		ng/L	ug/L	
										0	0	
1	MW-4-100418	MW-4	10/4/18	1015	N	WG	4	G	N	X	X	
2	MW-4-MS/MSD-100418	MW-4	↓	1015	MS	WG	8	G	N	X	X	
3	MW-2-100418	MW-2	↓	1355	N	WG	4	G	N	X	X	
4	EB-100418	—	↓	1045	EB	WQ	4	G	N	X	X	
5	FRB-100418	—	↓	1020	FB	WQ	2	G	N	X		
6	X-1-100418	—	↓	—	FD	WG	4	G	N	X	X	
7								G	N			
8								G	N			
9								G	N			
10												

Special Instructions:

480-142994 Chain of Custody

Relinquished by	Date / Time	Received by	Date / Time
J. McDougall, of: OBG	Date 10/4/18, Time 1445	Karl Zoeller, of: TA	Date 10-4-18, Time 1445
Karl Zoeller, of: TA	Date 10-5-18, Time 1800	[signature], of: TA-SHC	Date 10/6/18, Time 0900
Relinquished by: , of:	Date , Time	Received by: , of:	Date , Time

Condition:
Custody Seals intact? (Y) N 511855 511836 511838
Cooler Temperature: 0.6 0.8 0.8

Comments or Notes:
Standard 20 business day TAT for Full NYSDEC ASP Cat B Level Pkg (PDF) and EQuIS 4 file EDD.

Sample Type: N = Normal environmental sample, FD = field duplicate, EB = Equipment Blank, FB = Field Blank, TB = Trip Blank, MS = Lab MatSpike, Other (Specify):
Sample Matrix: SE = Sediment, SO = Soil, WG = Groundwater, WS = Surface Water, WW = Waste Water, WQ = Water Quality, TA = Animal Tissue, TP = Plant Tissue, AA = Ambient Air, Other (Specify):
Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Ascorbic Acid, 6 = MeOH, 7 = NaHSO4, 8 = Na2S2O3: 9 = H3PO4

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sacramento

Sample Receiving Notes

480-142994 Field Sheet

Job:_____

Tracking # 4635 9988 8807 SO / PO / FO / 2-Day / SAT / Ground / UPS / Courier /

Drop Off / GSO / OnTrac / Goldstreak / USPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes:

480-142994

Therm. ID: **AK-2** / **AK-3** / **AK-5** / **AK-6** / **HACCP** / **O**ther____ (+0.7°C)

Ice X Wet X Gel _____ Other _____

Cooler Custody Seal: 511835

Sample Custody Seal: _____

Cooler ID: 1 of 3

Temp: Observed 0.6 Corrected 0.6

From: Temp Blank ☒ Sample ☐

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☐
Alkalinity has no headspace?	☐	☐	☐
CoC is complete w/o discrepancies?	☐	☐	☐
Samples received within holding time?	☐	☐	☐
Sample preservatives verified?	☐	☐	☐
Cooler compromised/tampered with?	☐	☐	☐
Samples compromised/tampered with?	☐	☐	☐
Samples w/o discrepancies?	☐	☐	☐
Sample containers have legible labels?	☐	☐	☐
Containers are not broken or leaking?	☐	☐	☐
Sample date/times are provided.	☐	☐	☐
Appropriate containers are used?	☐	☐	☐
Sample bottles are completely filled?	☐	☐	☐
Zero headspace?*	☐	☐	☐
Multiphasic samples are not present?	☐	☐	☐
Sample temp OK?	☐	☐	☐
Sample out of temp?	☐	☐	☐

Initials: EC Date: 10/6/18

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

R818

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Sample Receiving Notes

Job: _____

Tracking # 4635 9988 8818 SO / PO / FO / 2-Day / SAT / Ground / UPS / Courier /

Drop Off / GSO / OnTrac / Goldstreak / USPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes: _____

Therm. ID: **AK-2** / **AK-3** / **AK-5** / **AK-6** / **HACCP** / **O**ther____ (+0.7°C)

Ice X Wet X Gel _____ Other _____

Cooler Custody Seal: 511836

Sample Custody Seal: —

Cooler ID: 2 of 3

Temp: Observed 0.8 Corrected 0.8

From: Temp Blank ☒ Sample ☐

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
Alkalinity has no headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☒	☐	☐
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐
Sample temp OK?	☒	☐	☐
Sample out of temp?	☐	☒	☐

Initials: EL Date: 10/6/18

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Sacramento
Sample Receiving Notes

Job:_____

Tracking #4635 9988 8829 SO / PO / FO / 2-Day / SAT / Ground / UPS / Courier /

Drop Off / GSO / OnTrac / Goldstreak / USPS / Other _____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations. File in the job folder with the COC.

Notes:_____

Therm. ID: **AK-2** / **AK-3** / **AK-5** / **AK-6** / **HACCP** / **O**ther_____ (+0.7°C)

Ice X Wet X Gel _____ Other _____

Cooler Custody Seal: 511838

Sample Custody Seal: —

Cooler ID: 3 of 3

Temp: Observed 0.4 Corrected 0.4

From: Temp Blank ☐ Sample ☐

NCM Filed: Yes ☐ No ☐

	Yes	No	NA
Perchlorate has headspace?	☐	☐	☒
Alkalinity has no headspace?	☐	☐	☒
CoC is complete w/o discrepancies?	☒	☐	☐
Samples received within holding time?	☒	☐	☐
Sample preservatives verified?	☐	☐	☒
Cooler compromised/tampered with?	☐	☒	☐
Samples compromised/tampered with?	☐	☒	☐
Samples w/o discrepancies?	☒	☐	☐
Sample containers have legible labels?	☒	☐	☐
Containers are not broken or leaking?	☒	☐	☐
Sample date/times are provided.	☒	☐	☐
Appropriate containers are used?	☒	☐	☐
Sample bottles are completely filled?	☒	☐	☐
Zero headspace?*	☐	☐	☒
Multiphasic samples are not present?	☒	☐	☐
Sample temp OK?	☒	☐	☐
Sample out of temp?	☐	☒	☐

Initials: EL Date: 10/16/18

*Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

ORIGIN ID:SCHA (518) 438-8140
TIM KNOLLMEYER
TESTAMERICA LAB INC
25 KRAFT AVE

ALBANY, NY 12205
UNITED STATES US

SHIP DATE: 05OCT18
ACTWGT: 82.55 LB
CAD: 0439821/CAFE3211

BILL THIRD PARTY

TO SAMPLE RECEIVING
TESTAMERICA-W. SACRAMENTO
880 RIVERSIDE PKWY

WEST SACRAMENTO CA 95605
(916) 373-5600
REF: NY PFC

FedEx Express

1 of 3

TRK# 0201 4635 9988 8807

SATURDAY 12:00P
PRIORITY OVERNIGHT

MASTER

XO BLUA

95605
CA-US SMF

testAmerica
THE LEADER IN ENVIRONMENTAL TESTING

511835

Custody Seal

DATE 10-5-18

SIGNATURE

testAmerica
THE LEADER IN ENVIRONMENTAL TESTING

511835

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
511836

Custody Seal
DATE 10-23-18
SIGNATURE

ORIGIN ID:SCHA (518) 438-8140
IM KNOLLMEYER
STAMERICA LAB INC
KRAFT AVE

BANY, NY 12205
ITED STATES US

SHIP DATE: 05OCT18
ACTWGT: 82.55 LB
CAD: 0439821/CAFE3211

BILL THIRD PARTY

SAMPLE RECEIVING
TESTAMERICA–W. SACRAMENTO
880 RIVERSIDE PKWY

WEST SACRAMENTO CA 95605
916) 373-6600
REF: NY PFC

FedEx
Express

2 of 3
WPS# 4635 9988 8818
Mstr# 4635 9988 88u7

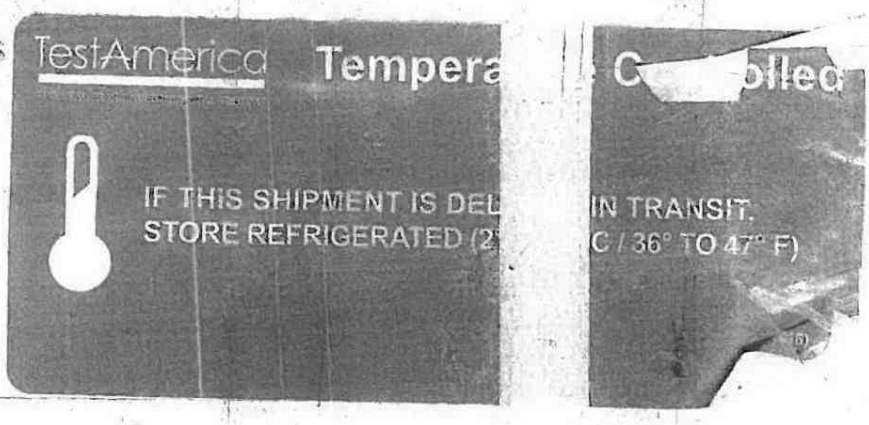
SATURDAY 12:00P
PRIORITY OVERNIGHT

0 01

XO BLUA

95605
CA- JS SMF

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
511836



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
511838

ORIGIN ID:SCHA (518) 438-8140
TIM KNOLLMEYER
TESTAMERICA LAB INC
25 KRAFT AVE

ALBANY, NY 12205
UNITED STATES US

SHIP DATE: 05OCT18
ACTWGT: 82.55 LB
CAD: 0439821/CAFE3211

BILL THIRD PARTY

TO SAMPLE RECEIVING
TESTAMERICA—W. SACRAMENTO
880 RIVERSIDE PKWY

WEST SACRAMENTO CA 95605
(916) 373-5600
REF: NY PFC

FedEx Express

3 of 3
MPS# 0263 4635 9988 8829
Mstr# 4635 9988 8807
0201

SATURDAY 12:00P
PRIORITY OVERNIGHT

XO BLUA

95605
CA-US SMF

Custody Seal
DATE 10-5-18
SIGNATURE

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
511838

Login Sample Receipt Checklist

Client: O'Brien & Gere Inc of North America

Job Number: 480-142994-1

Login Number: 142994
List Number: 2
Creator: Nelson, Kym D

List Source: TestAmerica Sacramento
List Creation: 10/06/18 03:57 PM

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	511835, 511836, 511838
Sample custody seals, if present, are intact.	N/A	
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	0.6C, 0.8C, 0.8C
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 (excluding tests with immediate HTs)	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.	N/A	
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").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Attachment C – Data Validation Report

DATA VALIDATION MEMORANDUM

TO: Paul D'Annibale **cc:**
FROM: KA Storne
RE: Vatrano Road Site Data Validation Report

FILE: 69645.001.016
DATE: January 3, 2019

This report presents the results of data validation performed for samples collected as the part of the Vatrano Road Site sampling in Albany, New York. Sample collection activities were conducted by O'Brien & Gere Engineers, Inc. (OBG) in October 2018.

TestAmerica Laboratories, Inc. of Sacramento, California (TA Sacramento) and TestAmerica Laboratories, Inc. of Amherst, New York (TA Buffalo) performed the laboratory analyses for the sampling event. The laboratory packages contain summary forms for quality control analysis and supportive raw data.

Table 1 below summarizes the sample analysis submitted for data validation.

Table 1. ***Analytical Methods and References***

Analysis and Laboratory	Method	Reference
Pre- and Polyfluorinated Substances (PFAS) performed by TA Sacramento	Laboratory SOP based on Modified USEPA Method 537, Version 1.1 (TestAmerica Sacramento. 2017. Per- and Polyfluorinated Substances (PFAS) in Water, Soils, Sediments and Tissue (Method 537 Modified), SOP No. WS-LC-0025, Rev 2.2, 02/02/2017)	1
1,4-Dioxane performed by TA Buffalo	USEPA Methods 3510C/8000C/8270D/SIM	2

Notes:

1. USEPA. 2009. Modified - Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction (SPE) and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS), Version 1.1, Cincinnati, Ohio.
2. USEPA. 2007. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, 3rd Edition, Update IV. Washington D.C.

The samples submitted for data validation are summarized in the attached Table 2. Table 3, attached, presents the specific data validation approach applied to data generated for this investigation. Table 4, also attached, presents the laboratory quality assurance/quality control (QA/QC) analyses definitions.

Full validation was performed on the samples collected for this investigation. The analytical data generated for this investigation were evaluated by OBG using the QA/QC criteria established in the laboratory standard operating procedures (SOPs), the methods and professional judgement.

Since data validation guidelines for USEPA Method 537 are not available, application of qualifiers for excursions from the laboratory SOP and the method was based on the general approach used to qualify samples described in the following document:

- USEPA. 2016. *National Functional Guidelines for High Resolution Superfund Methods Data Review. EPA-542-B-16-001.* Washington, D.C.

Application of qualifiers to the 1,4-dioxane data affected by excursions from the method criteria was based on guidance provided in the following document and professional judgment:

- USEPA. 2008. *USEPA Region II Validating Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry SW-846 Method 8270D, SOP HW-22 Revision 4.*

The following qualifiers are used in this type of data validation:

- "R" Indicates that the reporting limit (RL) or sample result has been identified as unusable due to a major deficiency in the data generation process. The data were rejected and should not be used for any qualitative or quantitative purposes.
- "U" Indicates that the analyte was not detected and the sample RL is presented. This qualifier is also used to signify blank excursions.
- "J" Indicates that the concentration should be considered approximate. The target analyte was positively identified and the associated numerical value is the approximate concentration; either the data quality criteria were not met or the concentration of the target analyte was greater than the method detection limit (MDL) and below the RL.
- "UJ" Indicates that the analyte was analyzed for and was not detected; however, the RL is presented and should be considered approximate. This qualifier is used when data quality criteria were not met.
- "JN" – Indicates that the target analyte has been "tentatively identified" as present and the associated numerical value is the estimated concentration in the sample. This qualifier may be applied due to data interpretation issues.

The data quality evaluation results in only one type of qualifier for each analyte; in a case when several qualifiers are applicable to the same analyte, the cumulative effect of the various QA/QC excursions is employed in assigning the final data qualifiers. For example, if a sample result is affected by low LCS recovery, for which the "UJ" qualifier is applied, but low MS/MSD recoveries result in the rejection of the sample result (application of the "R" qualifier), the final data qualifier is the "R" qualifier. QA/QC excursions that do not result in the qualification of an analyte are not discussed, with the exception of those excursions that provide useful information to the data user.

The data validation included an evaluation of the following parameters, where applicable:

- Chain-of-custody records
- Sample collection and sample preservation
- Holding times
- Instrument performance
- Calibration
- Blank analysis
- Surrogate recovery
- Matrix spike (MS)/matrix spike duplicate (MSD) analysis
- Laboratory control sample (LCS) /Laboratory control sample duplicate (LCSD) analysis
- Field duplicate samples analysis
- Isotopic Dilution Analyte (IDA) performance
- Internal standards performance
- Target compound identification, quantitation, and reporting limits (RLs)
- Documentation completeness

The following sections of this memorandum present the results of the comparison of the analytical data to the QA/QC criteria specified above.

CHAIN OF CUSTODY RECORD AND SAMPLE COLLECTION

Samples submitted for PFAS and 1,4-dioxane analyses were collected by the OBG field representative at the sampling location using containers that were provided by TA. After receiving the samples from the OBG field representative, TA then shipped the samples to TA Sacramento and TA Buffalo for sample analysis.

For the samples collected for this sampling event, the sample transfers from TA to the courier and from the courier to TA Sacramento and to TA Buffalo were incomplete on the chain-of-custody records; the courier name and tracking numbers were not listed on the records.

For samples submitted for PFAS analysis, the laboratory indicated that samples contained non-settleable particulate matter, which plugged the Solid Phase Extraction (SPE) disk. The aqueous portion of the sample that passed through the SPE disk was analyzed. The following samples were impacted:

- MW-1-100318 and MW-4-100418

Although TA's laboratory policy includes contacting the client to discuss the actions to be taken when particulates are found in samples, the laboratory did not contact OBG for these samples.

PFAS DATA EVALUATION SUMMARY

The following QA/QC parameters were found to meet validation criteria or did not result in additional qualification of sample results:

- Sample preservation
- Holding times
- Instrument performance
- Calibration
- MS/MSD analysis
- LCS /LCSD analysis
- IDA performance
- Internal standards performance

Deviations from QA/QC criteria that resulted in qualified data and additional observations are summarized below.

I. Blank Analysis

Target analytes were detected in the field blank (FRB-100418), equipment blank (EB-100418) and method blanks for PFAS. The following samples were qualified as non-detected (U) for the minor representativeness blank excursions:

- Perfluorononanoic acid (PFNA) in samples MW-1-100318 and MW-7-100318.

II. Field Duplicate Analysis

The following samples were qualified as approximate (UJ, J) for minor field duplicate precision excursions:

- Perfluorodecanoic acid (PFDA) and perfluorododecanoic acid (PFDoA) in samples X-1-100418[MW-2-100418] and MW-2-100418.

III. Target Analyte Quantitation, Identification and RLs

The validation approach utilized for this data set is presented in Table 3.

The following observations pertain to the laboratory target analyte quantitation and identification process applied to data:

- The laboratory analyst's experience and judgement are used to evaluate and report target analyte identification and concentrations, based on interpretation of target analyte peak shape, the chromatography baseline, target analyte retention time and signal strength.
- During data validation, peak integration and identification interpretation performed by the laboratory analysts was reviewed. Validation qualifiers were applied to sample results when chromatography, retention times or peak shapes may have impacted sample identifications and/or concentrations.
- For this analysis, the isotope dilution technique is applied, which includes the utilization of IDAs, which are added to samples in the sample extraction process. Since IDAs respond in the same manner as target analytes, the IDA is used for target analyte identification and for calculating sample concentrations for the volume of sample analyzed.
- Although generated and reported by the laboratory for some target analytes, the laboratory did not utilize the results for ion ratios in identifying detected target analytes. Ion ratio results were evaluated during data validation for target analyte identification and confirmation.
- For this method, branched-chain isomers may be identified for perfluorooctanoic acid (PFOA), perfluorohexanesulfonic acid (PFHxS) perfluorooctanesulfonic acid (PFOS), perfluorobutanesulfonic acid (PFBS), n-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA) and n-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA).
- The laboratory indicated that reference data is inconsistent as to whether PFBS will have both branched and linear isomers present in the environment.
- The laboratory only processes and evaluates PFOS, PFHxS, NMeFOSAA and NEtFOSAA for both linear and branched isomers based on the linear and branched isomers in the calibration standards.
- The laboratory does not have established retention times for branched isomers. Areas for target analytes in samples with linear and branched isomers are integrated as the total response and quantitated against the associated labeled linear isomer. The calibration standard retention time is evaluated for the beginning of the branched through the linear isomer as a visual tool to use in target analyte identification.
- The results for PFBS are quantitated based on a single linear isomer peak, defined by the calibration solutions.
- The laboratory utilized a qualitative/technical mixture for the PFOA standard to determine retention times only for the PFOA branch-chain isomers. A separate, certified quantitation/calibration-quality standard source, which only includes the linear isomer, was used for calibration.
- Samples results are qualified as approximate (JN) but bias is not assigned to sample results with branch-chain isomers when quantitated using linear calibration standards or standards with chromatography that may differ from the branch chromatography present in the samples.
- Although peak fronting was observed for PFBA chromatography in several samples, sample results were not qualified for this peak shape excursion. The laboratory indicated that the peak shape in the samples is consistent with the peak shape in the associated calibration standards.

Revised laboratory data:

During validation, excursions from the signal-to-noise ratio criterion of 3:1 were identified for target analytes reported as detected by TA Sacramento. As a result of re-evaluation of these signal-to-noise excursions, the following sample results for MW-1 100318 were revised by TA Sacramento:

- Perfluorobutanoic acid (PFBA) was revised from 10 ng/L to non-detected (U#) at 10 ng/L.
- Perfluoropentanoic acid (PFPeA) was revised from 2.8 ng/L to non-detected (U#) at 3 ng/L.
- Perfluorohexanoic acid (PFHxA) was revised from 1.2 ng/L J to non-detected (U#) at 1.8 ng/L.
- Perfluoroheptanoic acid (PFHpA) was revised from 0.92 ng/L J to non-detected (U#) at 1.8 ng/L.
- Perfluorooctanoic acid (PFOA) was revised from 1.4 ng/L J to non-detected (U#) at 1.8 ng/L.
- Perfluorononanoic acid (PFNA) was revised from 0.48 ng/L J to non-detected (U#) at 1.8 ng/L.
- Perfluorodecanoic acid (PFDA) was revised from 1.6 ng/L J to non-detected (U#) at 1.8 ng/L
- Perfluorohexanesulfonic acid (PFHxS) was revised from 1.9 ng/L to non-detected (U#) at 1.8 ng/L.
- Perfluorooctanesulfonic acid (PFOS) was revised from 1.7 ng/L J to non-detected (U#) at 1.8 ng/L.

Data validation qualifiers were applied to the following sample results:

Linear and Branched Isomers

- The laboratory utilized a qualitative/technical mixture for the PFOA standard to determine retention times only for the PFOA branch-chain isomers. A separate, certified quantitation/calibration-quality standard source, which only includes the linear isomer, was used for calibration. The results for perfluorooctanoic acid (PFOA) in the following samples were qualified as approximate (JN) since a PFOA branched-chain isomer was identified in the samples and the associated PFOA calibration standard did not include the branched isomer or interferences may be present: MW-7-100318 and MW-4-100418.
- The results for perfluorooctanesulfonic acid (PFOS) in the following samples were qualified as approximate (JN) since a PFOS branched-chain isomer was identified in the samples and the chromatography in the associated calibration standard differs from the branch chromatography present in the samples or interferences may be present: MW-7-100318, MW-1-100318, MW-4-100418, MW-2-100418 and X-1-100418[MW-2-100418].

Ion Ratio Excursion

- The result for perfluorononanoic acid (PFNA) in the following samples were qualified as approximate (JN) since the reported ion ratios were outside of the laboratory control limits: MW-7-100318 and MW-1-100318.
- The result for perfluorononanoic acid (PFNA) in the following samples were qualified as approximate (JN) since the reported ion ratio was outside of the laboratory control limits: MW-7-100318 and MW-1-100318.
- The result for perfluorobutanesulfonic acid (PFBS) in the following sample was qualified as approximate (JN) since the reported ion ratio was outside of the laboratory control limits: MW-1-100318.

Peak Integration and Matrix Interference

- The result for perfluorobutanoic acid (PFBA) in the following sample was qualified as approximate (JN) based on peak integration evaluation or possible matrix interferences: MW-1-100318,

Document Completeness

Supplemental laboratory information and clarifications addressing the laboratory analysis and data interpretation were requested during the validation process. The supplemental laboratory information was necessary to complete the validation process. Data were revised by TA Sacramento as a result of requests during data validation.

1, 4-DIOXANE DATA EVALUATION SUMMARY

The following QA/QC parameters were found to meet validation criteria or did not require additional comments:

- Sample preservation
- Holding times
- Instrument performance
- Calibration
- Blank analysis
- Surrogate recovery
- MS/MSD analysis
- LCS /LCSD analysis
- Field duplicate samples analysis
- Internal standards performance
- Target compound identification, quantitation and RLs
- Documentation completeness

Deviations from QA/QC criteria were not identified during data validation.

DATA USABILITY

The data from the samples presented in Table 2 were evaluated based on QA/QC criteria established by the laboratory SOP and methods. Data validation qualifiers were applied to data based on the general approach presented in Table 3.

Major deficiencies that would have resulted in rejected data were not identified for data from this sampling event. Minor deficiencies in the data generation process resulted in approximation of some sample data and data qualified as non-detected.

This section summarizes the adherence of the analytical data to precision, accuracy, representativeness, comparability, completeness, and sensitivity data quality objectives. Data quality was evaluated using percent usability, defined as the percentage of sample results that are usable for qualitative and quantitative purposes.

Precision: Data usability with respect to precision is 100 percent.

Sensitivity: Sensitivity is established by RLs, which represent measurable concentrations of analytes that can be quantified with a designated level of confidence and are less than the project action limits established for the project. Dilutions were not performed for sample analyses. Data usability with respect to sensitivity is 100 percent.

Accuracy: Data usability with respect to accuracy is 100 percent.

Representativeness: Data usability with respect to representativeness is 100 percent.

Comparability: Comparability is not compromised provided that the analytical method approach did not change over time. A major component of comparability is the use of standard reference materials for calibration and QC. Since the modified analytical method approach and reporting procedures were consistently used by the laboratory, the comparability criteria for the analytical data were met.

Completeness: Overall, considering the complete data set, 100 percent of the data were usable for quantitative and quantitative purposes based on the data validation performed.

Table 2. Sample Cross Reference Table

Samples collected and submitted for data validation

Laboratory Name	Sample Delivery Group	Date Collected	Laboratory Identification	Client Identification	Matrix	Analysis Requested
TA	480-142905	10/3/2018	480-142905-1	MW-7-100318	Groundwater	1,4-Dioxane and PFAS
TA	480-142905	10/3/2018	480-142905-2	MW-1-100318	Groundwater	1,4-Dioxane and PFAS
TA	480-142994	10/4/2018	480-142994-1	MW-4-100418, MS/MSD	Groundwater	1,4-Dioxane and PFAS
TA	480-142994	10/4/2018	480-142994-2	MW-2-100418	Groundwater	1,4-Dioxane and PFAS
TA	480-142994	10/4/2018	480-142994-3	EB-100418	Groundwater	1,4-Dioxane and PFAS
TA	480-142994	10/4/2018	480-142994-4	FRB-100418	Groundwater	PFAS
TA	480-142994	10/4/2018	480-142994-5	X-1-100418[MW-2-100418]	Groundwater	1,4-Dioxane and PFAS

Notes:
TA indicates TestAmerica Buffalo located in Amherst, New York (performing 1,4-dioxane analysis) and TA Sacramento located in West Sacramento California (performing PFAS analysis).
PFAS indicates perfluoroalkyl and polyfluoroalkyl substances.
FRB indicates field reagant blank.
EB indicates equipment blank.
MS/MSD indicates matrix spike/matrix spike duplicate.
FD indicates field duplicate.
The sample identification utilized for field duplicate is shown in brackets.

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General Validation Approach	The validation approach taken by O'Brien & Gere is a conservative one; qualifiers are applied to sample data to indicate both major and minor excursions so that data associated with any type of excursion are identified to the data user. Major excursions result in data being rejected (R), indicating that the data are considered unusable for either quantitative or qualitative purposes. Minor excursions result in sample data being qualified as approximate (J, UJ, JN) or non-detected (U) that is otherwise usable for quantitative or qualitative purposes.
	Excursions are subdivided into excursions that are within the laboratory's control and those that are out of the laboratory's control. Excursions involving laboratory control sample recovery, calibration response, method blank excursions, low or high spike recovery due to inaccurate spiking solutions or poor instrument response, holding times, interpretation errors, and quantitation errors are within the control of the laboratory. Excursions resulting from poor spike recovery due to interference from the sample matrix is an example of an excursion that is not within the laboratory's control if the laboratory has followed proper method procedures, including applying appropriate sample preparation techniques.
Applying professional judgment	USEPA data validation directs professional judgment to be used when applying qualifiers in some cases, considering the laboratory analysis approach and method requirements.
Validation Guidelines- PFAS	TestAmerica Sacramento's Laboratory standard operating procedure (SOP) reflects a modified version of USEPA Method 537, since Method 537 applies to only drinking water sample matrices. Therefore, evaluation of other aqueous and solid data is based on the laboratory SOP's requirements. Since data validation guidelines for Method 537 are not available at this time, application of qualifiers for excursions from the laboratory SOP is based on the general approach used to qualify data described in the National Functional Guidelines for High Resolution Superfund Methods Data Review, April 2016.
Validation Guidelines- Remaining Analyses	O'Brien & Gere data validation approach for the remaining analyses is based on current Region II guidelines for SW-846 methods. Since Region II guidelines available for metals apply only to the CLP method, only the general approach to applying qualifiers is utilized for metals and inorganics.
Validation Qualifiers	"R" Indicates that the reporting limit (RL) or sample result has been identified as unusable due to a major deficiency in the data generation process. The data were rejected and should not be used for any qualitative or quantitative purposes. "U" Indicates that the analyte was not detected and the sample RL is presented. This qualifier is also used to signify blank excursions. "J" Indicates that the concentration should be considered approximate. The target analyte was positively identified and the associated numerical value is the approximate concentration; either the data quality criteria were not met or the concentration of the target analyte was greater than the method detection limit (MDL) and below the RL. "J+" Indicates that the concentration should be considered approximate and biased high. This qualifier identifies a deficiency in the data generation process. "J-" Indicates that the concentration should be considered approximate and biased low. This qualifier identifies a deficiency in the data generation process.

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	"UJ" Indicates that the analyte was analyzed for and was not detected; however, the RL is presented and should be considered approximate. This qualifier is used when data quality criteria were not met. "JN" – Indicates that the target analyte has been "tentatively identified" as present and the associated numerical value is the estimated concentration in the sample. This qualifier may be applied due to data interpretation issues.
Overall PFAS Method Summary	The TA Sacramento SOP, based on a modified Method 537, utilizes liquid chromatography/ tandem mass spectrometry (LC/MS/MS) and isotope dilution technique to analyze environmental samples for per- and polyfluorinated substances (PFAS). This includes the utilization of Isotope Dilution Analytes (IDAs) which are added to samples in the sample extraction process. Since IDAs respond in the same manner as target analytes, the IDA is used for target analyte identification and for calculating sample concentrations.
Cooler Temperature	Results for samples submitted analyses that are impacted by coolers that did not contain ice, or if the ice melted upon receipt and the cooler temperatures are greater than 10°C, are qualified as approximate (UJ, J). If samples are delivered to the laboratory the same day as sample collection and samples did not have sufficient time to reach 10°C, samples are not qualified, unless proper preservation was not provided for samples between sample collection and sample receipt at the laboratory. Results for samples received at ambient temperature involved in extended shipment-day issues may be rejected, applying professional judgment.
Percent Solids	Results for samples submitted for organic analyses that are impacted by percent solids of 50 percent or less are qualified as approximate (UJ, J).
Soil sample collection for VOCs	Soil samples for VOCs submitted for low level analyses must be collected in accordance with EPA Method 5035A. If samples are not collected in encores or weighed/preserved containers in the field, the VOC data are qualified as approximate (UJ, J).
Holding Time for PFAS	Samples are stored at 4±2°C. Aqueous samples must be extracted within 14 days of collection and extracts analyzed within 40 days of extraction. Results for samples properly preserved and analyzed outside of but less than two times the holding time window for preparation and/or analysis are qualified as approximate (UJ, J). Non-detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are rejected (R). Detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are qualified as approximate (J).
Holding Time for Organics	Results for samples properly preserved and analyzed outside of but less than two times the holding time window established in the QAPP for preparation and/or analysis are qualified as approximate (UJ, J). Non-detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are rejected (R). Detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are qualified as approximate (J). The entire sample target list for a VOC sample impacted by a holding time excursion is qualified.

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Holding Time for Inorganics	Results for samples properly preserved and analyzed outside of but less than two times the holding time window established in the method or the QAPP for preparation and/or analysis are qualified as approximate (UJ, J-). Non-detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are rejected (R). Detected results for samples properly preserved and analyzed greater than two times the holding time window for preparation and/or analysis are qualified as approximate (J-).
Calibration Evaluation for PFAS	A minimum of five to six calibration standards are analyzed to generate average response factors, linear or quadratic fit calibration curves. The calibrations are evaluated using the criteria of less than 35 percent relative standard deviation (%RSD) for target analytes quantitated by isotope dilution analytes (IDAs), less than 50 %RSD for target analytes quantitated by internal standards (without IDAs) or a correlation coefficient (r) greater than 0.995 for a linear fit. Initial calibration verification (ICV) mid-range standard (from a separate source) must be within 60 to 140 percent recovery (%R) for target analytes associated with IDAs and within 50 to 150%R for target analytes without IDAs. IDAs in the ICV must be greater than or equal to 50%R and less than or equal to 150%R. Mid-level continuing calibration verifications (CCVs) are analyzed at the beginning of the analysis sequence, at the end, and after every 10 samples. The CCV recovery must be within 60 to 140 percent recovery (%R) for target analytes associated with IDAs and within 50 to 150%R for target analytes without IDAs. IDAs must be greater than or equal to 50%R and less than or equal to 150%R.
Calibration Actions for PFAS	Due to relative standard deviation (RSD) calibration excursions, detected results for analytes in samples associated with the calibration are qualified as approximate (J). Non-detected results associated with RSD excursions may be qualified as approximate (UJ) based on professional judgment. If the RSD calibration excursion is greater than 90, detected results for analytes in samples associated with the calibration are qualified as approximate (J) and non-detected results may be rejected (R), applying professional judgment. For ICV excursions, detected and non-detected results for analytes in samples associated with the calibration are qualified as approximate (J, UJ). Due to %D CCV excursions, detected and non-detected results for analytes in samples associated with the calibration are qualified as approximate (J, UJ).
Calibration Evaluation for VOCs	VOC target analytes are evaluated using the criteria of <20% percent relative standard deviation (%RSD) or correlation coefficient of 0.990 for initial calibration curves. Calibration verifications are evaluated using a criterion of 20 percent difference (%D) for target analytes. Initial calibrations and calibration verifications are also evaluated using the response factor (RF) criteria described in Table 4, Method 8260C. The following exceptions may be allowed: RFs ≥ 0.010 for poor purging target analytes such as ketones, acetonitrile, acrolein, propionitrile, vinyl acetate, 1,4-dioxane, alcohols, tetrahydrofuran, and cyclohexanone. Other target analytes not listed on Table 4 the RFs must be ≥ 0.050. For Ketones or other poor purging target analytes listed in Table 4 with RFs ≥ 0.010 and less than 0.100 results, data will be qualified as approximate (UJ, J). ICV recoveries are evaluated using laboratory control limits if available or 70 to 130%.

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Modified USEPA Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides (8081B), PCBs (8082A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the validation report	
Calibration Evaluation for SVOCs	SVOC target analytes are evaluated using the criteria of <20% RSD or correlation coefficient of 0.990 for initial calibration curves. Calibration verifications are evaluated using a criterion of 20 %D for the target analytes. Initial calibrations and calibration verifications are also evaluated using the criterion for RFs listed in the method. ICV recoveries are evaluated using laboratory control limits if available or 70 to 130%.
Calibration Evaluation for Pesticides, PCBs and Herbicides	Pesticide and herbicide target analytes are evaluated using the criteria of 20 %RSD or correlation coefficient of 0.990 for initial calibration curves. Calibration verifications are evaluated using a criterion of 20%D for target analytes. ICV recoveries are evaluated using laboratory control limits if available or 70 to 130%.
Calibration Actions for Organics	Due to relative standard deviation (RSD) calibration excursions, detected results for analytes in samples associated with the calibration are qualified as approximate (J). Non-detected results associated with RSD excursions may be qualified as approximate (UJ) based on professional judgment. If the RSD calibration excursion is greater than 90, detected results for analytes in samples associated with the calibration are qualified as approximate (J) and non-detected results may be rejected (R), applying professional judgment. Due to %D calibration verification excursions, detected and non-detected results for analytes in samples associated with the calibration are qualified as approximate (J, UJ). The response direction and detection of target analytes in associated sample may be considered in applying qualifiers. For response factor excursions, detected results are qualified as approximate (J) and non-detected results are rejected (R). For initial calibration verifications (ICV) excursions, detected and non-detected results for analytes in samples associated with the calibration are qualified as approximate (J, UJ). The response direction and detection of target analytes in associated sample may be considered in applying qualifiers.
Associating samples with Field and Laboratory QC Samples	Equipment blanks (Rinsate blanks) are associated with samples collected in the same day (or sampling event) using the same sample collection equipment and decontamination solutions. When sampling equipment or decontamination solutions are changed, a new equipment blank should be collected. Each sample should be associated with one equipment blank, which is collected as close to the sample collection date/time as possible.
	Field blanks are associated with the sample containers used to collect samples. When sampling container lots are changed, a new field blank should be collected.
	Method blanks are associated with samples prepared at the same time as the samples. Method blanks should reflect the sample matrix type.
	Laboratory Control Samples (LCSs) are solutions containing known amounts of target analytes, analyzed within the laboratory to evaluate recovery of target analytes without sample matrix impacts. The LCSs are associated with samples prepared at the same time as the samples.
	MS/MSD samples are collected in the field and spiked with known amounts of target analytes, analyzed in the laboratory to evaluate recovery and precision of target analytes. MS/MSDs measure the impact of matrix interference on target analytes. The MS/MSDs must be prepared using project samples and are associated with samples prepared at the same time with the same matrix type.

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Modified USEPA Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides (8081B), PCBs (8082A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the validation report	
	Field duplicates and collocated samples are duplicate samples collected in the field to measure field precision and are associated with samples of the same matrix type.
	In the case that insufficient QC samples are provided due to field or laboratory problems, professional judgment is used to associate each sample with a QC sample that reflects the sample matrix and analysis conditions.
Evaluation and Actions for MS/MSD, LCS, Surrogate and Field Duplicate for Organic Data	The laboratory control limit (CL) provided in the laboratory SOP is used to assess MS/MSD, LCS, surrogate and IDA data.
	In the case that excursions are identified in more than one quality control sample of the same matrix within one sample delivery group, samples are batched according to sample preparation or analysis date and qualified accordingly.
	In general, if percent recoveries are less than laboratory CLs but greater than 10%, non-detected and detected results are qualified as approximate (UJ, J).
	If percent recoveries are greater than laboratory CLs, detected results are qualified as approximate (J).
	If percent recoveries are less than 10%, detected results are qualified as approximate (J) and non-detected results may be rejected (R), applying professional judgement.
	If RPDs for MSDs are outside of laboratory CLs, detected results are qualified as approximate (J). Non-detected results may not be qualified, applying professional judgment.
	Qualification is performed only when both MS and MSD recoveries are outside of laboratory CLs.
	Qualification is not performed for MS/MSD results if the sample concentration is greater than 4 times the MS or MSD spike concentration.
	Non-detected data are rejected (R) in the case that both MS/MSD recoveries are less than 10%.
	Qualification is not performed if MS/MSD are outside of laboratory CLs if the analysis was performed using a dilution factor of 10 times or more, applying professional judgment.
	Qualification of data associated with MS/MSD or field duplicate excursions is limited to the un-spiked sample or the field duplicate pair, respectively.
	Field duplicate data are evaluated against relative percent difference (RPD) criteria of less than 50 percent for aqueous samples and less than 100 percent for soils when results are greater than or equal to five times the RL. When a field duplicate result is less than five times the RL, a control limit of plus or minus two times the RL (difference criterion) is applied. If RPDs or differences are outside of criterion, detected and non-detected results are qualified as approximate (UJ, J).
Evaluation Field Duplicate Data for PFAS	Field duplicate data are evaluated against relative percent difference (RPD) criteria of less than 30 percent when results are greater than or equal to five times the RL. When a field duplicate result is less than two times the RL, a control limit of 50 RPD is applied. If RPDs are outside of criterion, detected and non-detected results are qualified as approximate (UJ, J).
Evaluation and Actions for Blank Results (Method, Field, Equipment) for PFAS	If a PFAS target analyte is detected in a blank at a concentration greater than the MDL, for samples with concentrations less than five times the blank concentration, the sample is qualified as non-detected (U) and reported or reported at the RL.

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Modified USEPA Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides (8081B), PCBs (8082A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the validation report	
Evaluation and Actions for Blank Results (Trip, Method, Field, Equipment)	Blanks are analyzed to evaluate laboratory and/or field contamination of project samples. Method blanks evaluate potential laboratory contamination and field and equipment blanks evaluate potential field contamination. Blanks are not qualified due to contamination of another blank. Sample results qualified as non-detected (U) are treated as detected results when qualifying for other excursions. 1. For blank results less than the RL, samples with concentrations less than the RL are reported at the RL and qualified as non-detected (U). Samples with concentrations greater than or equal to the RL are not qualified or the Blank Rule Option may be applied. 2. For blank results greater than the RL, samples with concentrations less than the RL are reported at the RL and qualified as non-detected (U). Samples with concentrations greater than or equal to the RL and less than the blank contamination level are reported and qualified as non-detected (U). Samples with concentrations greater than or equal to the RL and greater than or equal to the blank contamination level are not qualified or the Blank Rule Option may be applied. 3. For blank results equal to the RL, sample concentrations less than the RL are reported at the RL value and qualified as non-detected (U). Samples greater than or equal to the RL are not qualified or the Blank Rule Option may be applied. 4. For gross contamination in blanks (interference peaks, poor baselines), all associated sample detected results may be rejected (R) or qualified as non-detected (U), applying professional judgment.
	Blank Rule Option- If a target analyte is detected in a blank at a concentration greater than the MDL, for samples with concentrations less than five times the blank concentration, the sample is qualified as non-detected (U) and reported at the RL. If methylene chloride, acetone, 2-butanone, or phthalates are detected in the sample at a concentration that is less than ten times the concentration in the associated blank, the sample result is qualified as "U". If other target analytes are detected in the sample at a concentration that is less than five times the concentration detected in the associated blank, the sample result is qualified as "U".
Evaluation and Actions for Surrogate Data for PCB, Pesticides and Herbicides	The following approach is utilized for applying qualifiers when both surrogate recoveries from the primary column are outside of laboratory CLs (also considering confirmation column results): Detected result associated with recovery of greater than upper laboratory CLs is qualified as approximate (J). Non-detected result is not qualified. Detected result associated with recovery of greater than or equal to 10% but less than the lower laboratory CL is qualified as approximate (J). Non-detected result is qualified as approximate (UJ). Detected result associated with recoveries of less than 10% is qualified as approximate (J). Non-detected result is rejected (R). If the sample was diluted using a dilution factor of 10 times or more, detected and non-detected results are not qualified since the surrogate concentration is diluted, using professional judgment. If the retention times of the surrogates are outside of the laboratory retention time window, associated sample results are qualified as approximate (UJ, J) or rejected (R), using professional judgment.

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Modified USEPA Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides (8081B), PCBs (8082A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the validation report	
Evaluation of LCS Data for PCB, Pesticides and Herbicides	The following approach is utilized for applying qualifiers when one LCS result (including all primary and confirmation column results) is outside of laboratory CLs for recovery: 1. Detected result associated with recovery of greater than upper laboratory CL is qualified as approximate (J). Non-detected result is not qualified. 2. Detected result associated with recovery of less than lower laboratory CL is qualified as approximate (J). 3. Non-detected result associated with a recovery of less than 10% is rejected (R).
Evaluation of MS/MSD Data for PCB, Pesticides and Herbicides	The following approach is utilized for applying qualifiers when both MS and MSD results are outside of laboratory CLs for recovery or RPD criteria: 1. Detected result associated with recoveries of greater than or equal to 10% is qualified as approximate (J). Non-detected result is qualified as approximate (UJ). 2. Detected result associated with recoveries of greater than the upper laboratory CL and outside of RPD criterion is qualified as approximate (J). Non-detected result is not qualified. 3. Detected result associated with recoveries of less than 10% is qualified as approximate (J). Non-detected result is rejected (R).
Evaluation of Isotope Dilution Analytes (IDAs) and Internal Standards for PFAS	The isotope dilution technique includes the utilization of IDAs, which are carbon-13 labeled analogs, oxygen-18 labeled analogs or deuterated analogs of target analytes which are added to samples in the sample extraction process. Since IDAs respond in the same manner as target analytes, the IDA is used for target analyte identification and for calculating sample concentrations. The IDAs are evaluated in sample results using control limits of 25% to 150%. Based on the laboratory SOP, low recoveries of IDAs are acceptable as long as the signal-to-noise (S/N) ratio is greater than 10:1. The Internal Standard (IS) used is 13C2 PFOA. Results for target analytes associated with IDAs/IS with recoveries greater than or less than 10% with a S/N of greater than 10:1 are qualified as approximate (J, UJ). Results for target analytes associated with IDA/IS with recoveries less than 10% with a S/N of less than 10:1 are rejected (R), using professional judgment.
Evaluation of Internal Standards for Organics	Internal standard recoveries are evaluated using control limits of from 50% of the lower standard area to 100% of the upper standard area of the associated calibration verification standard. The results associated with internal standard area recoveries 25% or greater but less than 50% are qualified as approximate (J, UJ). Non-detected results associated with internal standard area recoveries less than 25% are rejected (R), using professional judgment.
Evaluation of Dual Column Results for Pesticide, Herbicides and PCB Data	RPD value, calculated for the positive results from the primary and confirmation chromatographic columns, is defined as the difference between the columns divided by the average of the two columns, times 100. The following approach is utilized for applying qualifiers: 1. For detected result greater than the method detection limit (MDL) and less than the QL, with a RPD greater than 50, replace result with the QL and qualify as non-detected (U). 2. For detected result greater than the QL with a RPD >40%%: a. With a RPD of 41 to 70, result is qualified as approximate (J). b. With a RPD > 71, result is qualified as approximate and tentative (JN).
Target Analyte Identifications	If incorrect target analyte identifications were made due to laboratory errors, the associated result will be corrected or rejected (R), applying professional judgment.

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Modified USEPA Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides (8081B), PCBs (8082A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the validation report	
Target Analyte Identification and Quantitation for PFAS (TA Sacramento SOP)	1. The laboratory is performing identification and quantitation for sample data using the guidance presented in the USEPA Technical Advisory – Laboratory Analysis of Drinking Water Samples for PFOA using EPA Method 537 Rev. 1.1. 2. The laboratory analyst's experience and judgement are used to report both target analyte identification and concentrations, which are based on interpretation of peak shape, chromatography baseline, retention time and signal strength. The laboratory did not utilize ion ratios for target analyte identification for this method. 3. During data validation, peak integration and identification interpretation performed by the laboratory analysts is reviewed. Validation qualifiers are applied to sample results when overall chromatography, retention times or peak shapes may have impacted sample identifications and/or concentrations. 4. IDAs are utilized to identify target analytes (TAs), where certified quantitation/calibration- quality IDA standards are available for inclusion in the calibration. For target analytes without IDAs, an IDA is assigned for retention time identification and quantitation and are presented in the laboratory SOP. 5. Branched-chain isomers for perfluorooctanoic acid (PFOA), perfluorohexanesulfonic acid (PFHxS) perfluorooctane sulfonic acid (PFOS), perfluorobutanesulfonic acid (PFBS), n-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA) and n-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA) may be identified in samples. The calibration standards used by the laboratory includes linear and branched isomers for only these target analytes based on current literature. Other target analytes are quantitated based on a single linear isomer peak, defined by the calibration solutions in the initial calibration. 6. The laboratory may utilize a qualitative/technical mixture for the PFOA standard to determine retention times only for the PFOA branch-chain isomers. A separate, certified quantitation/calibration-quality standard source, which only includes the linear isomer, may be used for calibration. 7. Samples results are qualified as approximate (J) but bias is not assigned to sample results with branch-chain isomers when quantitated using linear calibration standards or standards that do not include the branches present in the samples. 8. Target analytes are identified using TA and IDA comparisons of retention time (RT) and relative retention time (RRT - defined as the RT of the target analyte/RT of the IDA), as applicable based on laboratory experience. 9. Target analytes are identified as detected using the signal-to-noise ratio criterion of 3:1. 10. According to the laboratory, the data system's integration parameters are optimized for minimal manual intervention. Laboratory analyst's experience and judgement are used to evaluate TA peaks. Should there be any issue with the data system's integration the analyst will overwrite the data report with a manual integration. This manual integration will take into account TA signal strength, overall chromatography and baseline determinations, which can vary from sample to sample, especially for low level detections.
Target Analyte Identifications for Organics	If incorrect target analyte identifications were made due to data interpretation or laboratory transcription errors, the associated result will be corrected or rejected (R), applying professional judgment.
Evaluation of Initial (ICV) and	Metals are evaluated using the criteria for ICV and CCV of 90% to 110% of the expected value.

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Modified USEPA Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides (8081B), PCBs (8082A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the validation report	
Calibration Verification (CCV) for Metals, Mercury and Inorganics	Mercury is evaluated using the criteria for ICV of 90% to 110% of the expected value and 80% to 120% of the expected value for the CCV. Cyanide are evaluated using the criteria for ICV of 90% to 110% of the expected value and 85%-115% of the expected value for the CCV. For analyses utilizing a calibration curve, the correlation coefficient for the first or second order curve must be ≥ 0.995.
ICV and CCV Actions for Metals, Mercury and Inorganics	For ICV and CCV recoveries outside of laboratory CLs: 1. Detected result associated with recovery of greater than upper CLs is qualified as approximate, biased high (J^+). Non-detected result is not qualified. 2. Detected result associated with recovery of greater than or equal to 75% but less than the lower laboratory CL is qualified as approximate, biased low (J^-). Non-detected result is qualified as approximate (UJ). 3. Detected result associated with recovery of less than 75% is qualified as approximate, biased low (J^-). Non-detected result is rejected (R).
Metals, Mercury, and Inorganic MS/MSD, Laboratory/Field Duplicate, Serial Dilution	Qualification of sample results associated with MS/MSD, laboratory duplicate and field duplicate excursions is performed on samples for the same matrix, within the same preparation batch, within the same SDG group. [Region II only qualifies the Field Duplicate and associated sample.]
Evaluation of LCS Data for Metals and Inorganics	To apply qualifiers if LCS result is outside of laboratory CLs or 80 to 120%: Aqueous sample: 1. Detected and non-detected result associated with a recovery of less than 50% is rejected (R). 2. Detected result associated with recovery between 50 and 79%, is qualified as approximate (J-). Non-detected result is qualified as approximate (UJ). 3. Detected result associated with recoveries of between 121 and 150% is qualified as approximate (J+). 4. Detected result associated with recoveries of greater than 150% is rejected (R), applying professional judgment. Soil sample: 1. Detected result associated with recovery greater than the upper CL is qualified as approximate (J+). 2. Detected result associated with recovery less than the lower CL is qualified as approximate (J-) and non-detected result is qualified as approximate (UJ). 3. Detected and non-detected result associated with a recovery of less than 10% is rejected (R).
Evaluation of MS/MSD Data for Metals and Inorganics	To apply qualifiers if either MS or MSD result is outside of laboratory CL or 75 to 125%: Aqueous sample: 1. Detected and non-detected result associated with a recovery of less than 30% is rejected (R). 2. Detected result associated with recoveries between 30 and 74%, is qualified as approximate (J, or J-). Non-detected result is qualified as approximate (UJ). 3. Detected result associated with recoveries >126% are qualified as approximate (J, or J+). Soil sample:

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Modified USEPA Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides (8081B), PCBs (8082A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the validation report	
	1. Detected and non-detected result associated with a recovery of less than 10% is rejected (R). 2. Detected result associated with recovery of between 10 and 74%, is qualified as approximate (J, or J-). Non-detected result is qualified as approximate (UJ). 3. Detected result associated with recoveries > 126 are qualified as approximate (J, or J+).
Evaluation of Laboratory Duplicate for Metals and Inorganics	To apply qualifiers if laboratory duplicate results are outside of laboratory RPD control limits (or 20%) or difference criteria: Aqueous sample with sample and duplicate values both greater than or equal to 5 times the QL: 1. Detected result greater than or equal to the QL, associated with an RPD of greater than 20 is qualified as approximate (J). Aqueous sample when either detected sample or duplicate value is less than 5 times the QL: 1. Detected results with absolute difference greater than the QL are qualified as approximate (J). Non-detected results are qualified as approximate (UJ). Soil sample for sample and duplicate values both greater than or equal to 5 times the QL: 1. Detected result greater than or equal to the QL, associated with an RPD of greater than or equal to 20 is qualified as approximate (J). Soil sample when either detected sample or duplicate value is less than 5 times the QL: 1. Sample results with absolute difference greater than 2 times the QL are qualified as approximate (J). Non-detected results are qualified as approximate (UJ).
Evaluation of Blank Data for Metals and Inorganics	For calibration blanks and preparation blanks at concentrations greater than laboratory MDLs but less than or equal to QLs: 1. Concentration in the associated samples of greater than or equal to the MDLs but less than or equal to QLs are revised to the QL level and qualified as non-detected (U).
Evaluation of Blank Data for Metals and Inorganics	For calibration blanks, preparation blanks and field blanks at concentrations greater than laboratory QLs: 1. Concentration in the associated samples of greater than the blank concentration and less than ten times the blank concentration are qualified as approximate (J or J+).2. Concentrations in the associated samples of greater than or equal to the MDLs but less than or equal to QLs are revised to the QL level and are qualified as non-detected (U). 3. Data may be rejected based on 2006 guidelines for sample results with concentrations greater than the QL but less than the blank value. For calibration blanks and preparation blanks at concentrations less than the negative value of the QLs: 1. Concentration in the associated samples of less than ten times the QLs are qualified as approximate (J). 2. Non-detected concentrations in the associated samples are qualified as approximate (UJ).
Evaluation of Serial Dilution Data for Metals	Serial dilution results are evaluated for data with initial sample concentrations that are greater than 50 times the MDL. If the percent difference is greater than 10%, associated sample results greater than or equal to the MDL are qualified as approximate (J). If the percent difference is greater than or equal to 100%, associated sample results greater than or equal to the MDL are rejected (R), applying professional judgment. The response direction and concentration of target analytes in associated sample may be considered in applying qualifiers.

O'Brien & Gere Data validation approach for PFAS in Aqueous Samples by TestAmerica Sacramento Laboratory - Modified USEPA Method 537 and SW-846 analytical methods including VOCs (8260C), SVOCs (8270D), Pesticides (8081B), PCBs (8082A), Metals (200.7/200.8), Mercury, (245.1), Cyanide (335.4) and other methods listed in the validation report

Source O'Brien & Gere

Laboratory QA/QC analyses definitions	
QA/QC Term	**Definition**
Reporting limit (RL) or Quantitation limit (QL)	The level above which numerical results may be obtained with a specified degree of confidence; the minimum concentration of an analyte in a specific matrix that can be identified and quantified above the method detection limit and within specified limits of precision and bias during routine analytical operating conditions.
Method detection limit (MDL)	The minimum concentration of an analyte that undergoes preparation similar to the environmental samples and can be reported with a stated level of confidence that the analyte concentration is greater than zero.
Calibration	Compliance requirements for satisfactory instrument calibration are established to verify that the instrument is capable of producing acceptable quantitative data. Initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of analysis and calibration verifications document satisfactory maintenance and adjustment of the instrument on a day-to-day basis.
Relative standard deviation (RSD)	The standard deviation divided by the mean; a unit-free measure of variability.
Correlation coefficient	A measure of the strength of the relationship between two variables.
Relative Percent Difference (RPD)	Used to compare two values; the relative percent difference is based on the mean of the two values, and is reported as an absolute value, i.e., always expressed as a positive number or zero.
Percent Difference (%D)	Used to compare two values; the percent difference indicates both the direction and the magnitude of the comparison, i.e., the percent difference may be either negative, positive, or zero.
Percent Recovery (%R)	The act of determining whether or not the methodology measures all of the target analytes contained in a sample.
Calibration blank	Consists of acids and reagent water used to prepare samples for analysis. This type of blank is analyzed to evaluate whether contamination is occurring during the preparation and analysis of the sample.
Method blank	A water or soil blank that undergoes the preparation procedures applied to a sample (i.e., extraction, digestion, clean-up). These samples are analyzed to examine whether sample preparation, clean-up, and analysis techniques result in sample contamination.
Field/equipment blank	Collected and submitted for laboratory analysis, where appropriate. Field/equipment blanks are handled in the same manner as environmental samples. Equipment/field blanks are analyzed to assess contamination introduced during field sampling procedures.
Internal standards performance	Compounds not found in environmental samples which are spiked into samples and quality control samples at the time of sample preparation for organic analyses. Internal standards must meet retention time and recovery criteria specified in the analytical method. Internal standards are used as the basis for quantitation of the target analytes.
Surrogate recovery	Compounds similar in nature to the target analytes but not expected to be detected in the environmental media which are spiked into environmental samples, blanks, and quality control samples prior to sample preparation for organic analyses. Surrogates are used to evaluate analytical efficiency by measuring recovery.
Laboratory control sample (LCS)	Standard solutions that consist of known concentrations of the target analytes spiked into laboratory analyte-free water or sand. They are prepared or purchased from a certified manufacturer from a source independent from the calibration standards to provide an independent verification of the calibration procedure. They are prepared

Laboratory QA/QC analyses definitions	
QA/QC Term	**Definition**
	and analyzed following the same procedures employed for environmental sample analysis to assess method accuracy independently of sample matrix effects.
Matrix	The material of which the sample is composed or the substrate containing the analyte of interest, such as drinking water, waste water, air, soil/sediment, biological material.
Retention time (RT)	The time a target analyte is retained on a chromatography column before elution. The identification of a target analyte is dependent on a target compound's retention time falling within the specified retention time window established for that compound.
Relative retention time (RRT)	The ratio of the retention time of a compound to that of a standard.
Source O'Brien & Gere	

Client Sample ID: MW-7-100318
Date Collected: 10/03/18 11:15
Date Received: 10/05/18 01:00

Lab Sample ID: 480-142905-1
Matrix: Water

Method: 8270D SIM ID Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.20		0.19	0.096	ug/L		10/09/18 07:33	10/11/18 23:38	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*29*		*15 - 110*	*10/09/18 07:33*	*10/11/18 23:38*	*1*

Method: 537 (modified) Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	3.4		1.7	0.30	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoropentanoic acid (PFPeA)	2.9		1.7	0.42	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorohexanoic acid (PFHxA)	3.0		1.7	0.50	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroheptanoic acid (PFHpA)	3.4		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanoic acid (PFOA)	**14**	JN	1.7	0.74	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorononanoic acid (PFNA)	**1.3**	~~JB~~ JN	1.7 U	0.23	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.27	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.95	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.48	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.25	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorobutanesulfonic acid (PFBS)	1.7		1.7	0.17	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorohexanesulfonic acid (PFHxS)	6.8	~~B~~	1.7	0.15	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.49	J	1.7	0.16	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanesulfonic acid (PFOS)	**7.9**	JN	1.7	0.47	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.28	ng/L		10/12/18 11:11	10/16/18 00:28	1
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.30	ng/L		10/12/18 11:11	10/16/18 00:28	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		17	2.7	ng/L		10/12/18 11:11	10/16/18 00:28	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		17	1.6	ng/L		10/12/18 11:11	10/16/18 00:28	1
6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 00:28	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 00:28	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*84*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C5 PFPeA	*88*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C2 PFHxA	*89*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C4 PFHpA	*97*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C4 PFOA	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C5 PFNA	*102*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C2 PFDA	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C2 PFUnA	*101*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C2 PFDoA	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C2 PFTeDA	*103*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C3 PFBS	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
18O2 PFHxS	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C4 PFOS	*99*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
13C8 FOSA	*100*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
d3-NMeFOSAA	*109*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
d5-NEtFOSAA	*110*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*

Client Sample ID: MW-7-100318

Lab Sample ID: 480-142905-1

Date Collected: 10/03/18 11:15
Matrix: Water
Date Received: 10/05/18 01:00

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
M2-6:2 FTS	*142*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*
M2-8:2 FTS	*106*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:28*	*1*

Client Sample ID: MW-1-100318

Lab Sample ID: 480-142905-2

Date Collected: 10/03/18 14:50
Matrix: Water
Date Received: 10/05/18 01:00

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		10/09/18 07:33	10/13/18 03:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*20*		*15 - 110*	*10/09/18 07:33*	*10/13/18 03:58*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	10		1.8	0.31	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoropentanoic acid (PFPeA)	2.8		1.8	0.44	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorohexanoic acid (PFHxA)	1.2 J		1.8	0.52	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroheptanoic acid (PFHpA)	0.92 J		1.8	0.22	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanoic acid (PFOA)	1.4 J		1.8	0.76	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorononanoic acid (PFNA)	0.48 J B		1.8	0.24	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorodecanoic acid (PFDA)	1.0 J		1.8	0.28	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.98	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.49	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.26	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorobutanesulfonic acid (PFBS)	5.6		1.8	0.18	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorohexanesulfonic acid (PFHxS)	1.9 B		1.8	0.15	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.17	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanesulfonic acid (PFOS)	1.7 J		1.8	0.48	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.28	ng/L		10/12/18 11:11	10/21/18 07:10	1
Perfluorooctanesulfonamide (FOSA)	0.43	J	1.8	0.31	ng/L		10/12/18 11:11	10/21/18 07:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/21/18 07:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	1.7	ng/L		10/12/18 11:11	10/21/18 07:10	1
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/21/18 07:10	1
8:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/21/18 07:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*42*		*25 - 150*	*10/12/18 11:11*	*10/21/18 07:10*	*1*
13C5 PFPeA	*45*		*25 - 150*	*10/12/18 11:11*	*10/21/18 07:10*	*1*
13C2 PFHxA	*48*		*25 - 150*	*10/12/18 11:11*	*10/21/18 07:10*	*1*
13C4 PFHpA	*52*		*25 - 150*	*10/12/18 11:11*	*10/21/18 07:10*	*1*
13C4 PFOA	*53*		*25 - 150*	*10/12/18 11:11*	*10/21/18 07:10*	*1*
13C5 PFNA	*54*		*25 - 150*	*10/12/18 11:11*	*10/21/18 07:10*	*1*
13C2 PFDA	*56*		*25 - 150*	*10/12/18 11:11*	*10/21/18 07:10*	*1*

U # lab revision

Client Sample ID: MW-1-100318
Date Collected: 10/03/18 14:50
Date Received: 10/05/18 01:00

Lab Sample ID: 480-142905-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFUnA	59		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C2 PFDoA	57		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C2 PFTeDA	49		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C3 PFBS	47		25 - 150	10/12/18 11:11	10/21/18 07:10	1
18O2 PFHxS	56		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C4 PFOS	58		25 - 150	10/12/18 11:11	10/21/18 07:10	1
13C8 FOSA	53		25 - 150	10/12/18 11:11	10/21/18 07:10	1
d3-NMeFOSAA	76		25 - 150	10/12/18 11:11	10/21/18 07:10	1
d5-NEtFOSAA	75		25 - 150	10/12/18 11:11	10/21/18 07:10	1
M2-6:2 FTS	135		25 - 150	10/12/18 11:11	10/21/18 07:10	1
M2-8:2 FTS	147		25 - 150	10/12/18 11:11	10/21/18 07:10	1

Client Sample ID: MW-4-100418
Date Collected: 10/04/18 10:15
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-1
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		10/09/18 07:33	10/11/18 21:17	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*31*		*15 - 110*	*10/09/18 07:33*	*10/11/18 21:17*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	18	FF2	1.8	0.32	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluoropentanoic acid (PFPeA)	65	F1	1.8	0.45	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorohexanoic acid (PFHxA)	87	F1	1.8	0.53	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluoroheptanoic acid (PFHpA)	6.9		1.8	0.23	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorooctanoic acid (PFOA)	**25**	JN	1.8	0.77	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorononanoic acid (PFNA)	2.0	B	1.8	0.25	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorodecanoic acid (PFDA)	0.35	J	1.8	0.28	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.26	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorobutanesulfonic acid (PFBS)	5.8		1.8	0.18	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorohexanesulfonic acid (PFHxS)	5.9	B	1.8	0.15	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.66	J	1.8	0.17	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorooctanesulfonic acid (PFOS)	**22**	JN	1.8	0.49	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L		10/12/18 11:11	10/16/18 00:43	1
Perfluorooctanesulfonamide (FOSA)	ND		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 00:43	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/16/18 00:43	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	1.7	ng/L		10/12/18 11:11	10/16/18 00:43	1
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 00:43	1
8:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 00:43	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*70*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C5 PFPeA	*75*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C2 PFHxA	*79*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C4 PFHpA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C4 PFOA	*81*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C5 PFNA	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C2 PFDA	*85*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C2 PFUnA	*78*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C2 PFDoA	*70*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C2 PFTeDA	*67*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C3 PFBS	*84*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
18O2 PFHxS	*89*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C4 PFOS	*94*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
13C8 FOSA	*82*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
d3-NMeFOSAA	*96*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
d5-NEtFOSAA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*

Client Sample ID: MW-4-100418

Date Collected: 10/04/18 10:15
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
M2-6:2 FTS	*118*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*
M2-8:2 FTS	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 00:43*	*1*

Client Sample ID: MW-2-100418

Date Collected: 10/04/18 13:55
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-2
Matrix: Water

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.096	ug/L		10/09/18 07:33	10/12/18 00:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*30*		*15 - 110*	*10/09/18 07:33*	*10/12/18 00:25*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.9		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoropentanoic acid (PFPeA)	2.7		1.8	0.45	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorohexanoic acid (PFHxA)	2.3		1.8	0.53	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoroheptanoic acid (PFHpA)	3.0		1.8	0.23	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorooctanoic acid (PFOA)	14		1.8	0.78	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorononanoic acid (PFNA)	5.6	B	1.8	0.25	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorodecanoic acid (PFDA)	ND	UJ	1.8	0.28	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorododecanoic acid (PFDoA)	ND	UJ	1.8	0.50	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.27	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorobutanesulfonic acid (PFBS)	1.3	J	1.8	0.18	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorohexanesulfonic acid (PFHxS)	4.0	B	1.8	0.16	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluoroheptanesulfonic Acid (PFHpS)	0.93	J	1.8	0.17	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorooctanesulfonic acid (PFOS)	**100**	JN	1.8	0.49	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L		10/12/18 11:11	10/16/18 01:05	1
Perfluorooctanesulfonamide (FOSA)	ND		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:05	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/16/18 01:05	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	1.7	ng/L		10/12/18 11:11	10/16/18 01:05	1
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:05	1
8:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:05	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*73*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C5 PFPeA	*80*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C2 PFHxA	*85*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C4 PFHpA	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C4 PFOA	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C5 PFNA	*91*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C2 PFDA	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C2 PFUnA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*

Client Sample ID: MW-2-100418

Lab Sample ID: 480-142994-2

Date Collected: 10/04/18 13:55
Matrix: Water
Date Received: 10/05/18 01:15

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDoA	*83*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C2 PFTeDA	*81*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C3 PFBS	*88*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
18O2 PFHxS	*91*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C4 PFOS	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
13C8 FOSA	*91*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
d3-NMeFOSAA	*102*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
d5-NEtFOSAA	*104*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
M2-6:2 FTS	*131*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*
M2-8:2 FTS	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:05*	*1*

Client Sample ID: EB-100418

Lab Sample ID: 480-142994-3

Date Collected: 10/04/18 10:45
Matrix: Water
Date Received: 10/05/18 01:15

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.096	ug/L		10/09/18 07:33	10/12/18 00:48	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*31*		*15 - 110*	*10/09/18 07:33*	*10/12/18 00:48*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		1.7	0.29	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoropentanoic acid (PFPeA)	ND		1.7	0.41	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorohexanoic acid (PFHxA)	ND		1.7	0.48	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroheptanoic acid (PFHpA)	ND		1.7	0.21	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanoic acid (PFOA)	ND		1.7	0.71	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.26	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.91	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.46	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.24	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorohexanesulfonic acid (PFHxS)	**0.23**	**J B**	1.7	0.14	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.7	0.16	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.7	0.45	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.27	ng/L		10/12/18 11:11	10/16/18 01:13	1
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.29	ng/L		10/12/18 11:11	10/16/18 01:13	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		17	2.6	ng/L		10/12/18 11:11	10/16/18 01:13	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		17	1.6	ng/L		10/12/18 11:11	10/16/18 01:13	1
6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:13	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:13	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*65*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*

Client Sample ID: EB-100418

Date Collected: 10/04/18 10:45
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-3

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C5 PFPeA	*86*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C2 PFHxA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C4 PFHpA	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C4 PFOA	*90*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C5 PFNA	*91*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C2 PFDA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C2 PFUnA	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C2 PFDoA	*86*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C2 PFTeDA	*86*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C3 PFBS	*85*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
18O2 PFHxS	*91*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C4 PFOS	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
13C8 FOSA	*84*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
d3-NMeFOSAA	*102*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
d5-NEtFOSAA	*106*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
M2-6:2 FTS	*103*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*
M2-8:2 FTS	*95*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:13*	*1*

Client Sample ID: FRB-100418

Date Collected: 10/04/18 10:20
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-4

Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoropentanoic acid (PFPeA)	ND		1.8	0.45	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorohexanoic acid (PFHxA)	ND		1.8	0.53	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.23	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorooctanoic acid (PFOA)	ND		1.8	0.78	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.25	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.28	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	1.0	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.50	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	1.2	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.27	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.8	0.18	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorohexanesulfonic acid (PFHxS)	**0.23**	**J B**	1.8	0.16	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.17	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.8	0.49	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.29	ng/L		10/12/18 11:11	10/16/18 01:20	1
Perfluorooctanesulfonamide (FOSA)	ND		1.8	0.32	ng/L		10/12/18 11:11	10/16/18 01:20	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	2.8	ng/L		10/12/18 11:11	10/16/18 01:20	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	1.7	ng/L		10/12/18 11:11	10/16/18 01:20	1
6:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:20	1
8:2 FTS	ND		18	1.8	ng/L		10/12/18 11:11	10/16/18 01:20	1

Client Sample ID: FRB-100418

Lab Sample ID: 480-142994-4

Date Collected: 10/04/18 10:20
Matrix: Water
Date Received: 10/05/18 01:15

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	86		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C5 PFPeA	86		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFHxA	90		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C4 PFHpA	88		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C4 PFOA	88		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C5 PFNA	90		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFDA	90		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFUnA	93		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFDoA	80		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C2 PFTeDA	78		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C3 PFBS	92		25 - 150	10/12/18 11:11	10/16/18 01:20	1
18O2 PFHxS	88		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C4 PFOS	99		25 - 150	10/12/18 11:11	10/16/18 01:20	1
13C8 FOSA	85		25 - 150	10/12/18 11:11	10/16/18 01:20	1
d3-NMeFOSAA	91		25 - 150	10/12/18 11:11	10/16/18 01:20	1
d5-NEtFOSAA	99		25 - 150	10/12/18 11:11	10/16/18 01:20	1
M2-6:2 FTS	118		25 - 150	10/12/18 11:11	10/16/18 01:20	1
M2-8:2 FTS	108		25 - 150	10/12/18 11:11	10/16/18 01:20	1

Client Sample ID: X-1-100418 (MW2)

Lab Sample ID: 480-142994-5

Date Collected: 10/04/18 00:00
Matrix: Water
Date Received: 10/05/18 01:15

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.19	0.097	ug/L		10/09/18 07:33	10/12/18 01:12	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	28		15 - 110	10/09/18 07:33	10/12/18 01:12	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	2.3		1.7	0.31	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoropentanoic acid (PFPeA)	2.2		1.7	0.43	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorohexanoic acid (PFHxA)	2.2		1.7	0.51	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoroheptanoic acid (PFHpA)	2.9		1.7	0.22	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorooctanoic acid (PFOA)	15		1.7	0.74	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorononanoic acid (PFNA)	5.4	B	1.7	0.24	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorodecanoic acid (PFDA)	**0.37**	J	1.7	0.27	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.96	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorododecanoic acid (PFDoA)	**0.63**	J	1.7	0.48	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	1.1	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.25	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorobutanesulfonic acid (PFBS)	1.2	J	1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorohexanesulfonic acid (PFHxS)	3.9	B	1.7	0.15	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluoroheptanesulfonic Acid (PFHpS)	1.0	J	1.7	0.17	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorooctanesulfonic acid (PFOS)	**110**	JN	1.7	0.47	ng/L		10/12/18 11:11	10/16/18 01:35	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.28	ng/L		10/12/18 11:11	10/16/18 01:35	1

Client Sample ID: X-1-100418
Date Collected: 10/04/18 00:00
Date Received: 10/05/18 01:15

Lab Sample ID: 480-142994-5
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonamide (FOSA)	ND		1.7	0.31	ng/L		10/12/18 11:11	10/16/18 01:35	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		17	2.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
6:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1
8:2 FTS	ND		17	1.7	ng/L		10/12/18 11:11	10/16/18 01:35	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C4 PFBA	*71*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C5 PFPeA	*81*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C2 PFHxA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C4 PFHpA	*94*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C4 PFOA	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C5 PFNA	*99*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C2 PFDA	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C2 PFUnA	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C2 PFDoA	*91*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C2 PFTeDA	*82*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C3 PFBS	*87*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
18O2 PFHxS	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C4 PFOS	*93*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
13C8 FOSA	*92*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
d3-NMeFOSAA	*103*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
d5-NEtFOSAA	*110*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
M2-6:2 FTS	*148*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*
M2-8:2 FTS	*110*		*25 - 150*	*10/12/18 11:11*	*10/16/18 01:35*	*1*

EC Sampling - GE Vatrano Rd Site

Page ___of___

Lab Use Only

TestAmerica

Client: Site Name / Location: Vatrano Rd Site / Albany, NY

Sampling Program: EC Sampling - GE Vatrano Rd Site

Sampler(s): T. McDonough

Project Number:

O'Brien & Gere Office: Albany
Address: O'Brien & Gere
54 New Karner Rd, Suite 106, Albany, N.Y. 12203
Phone: (518) 724-7256
Fax: (518) 869-2945
Project Contact: Paul D'Annibale/ Maureen Gardner
Email: Paul.D'Annibale@obg.com / Maureen.Gardner@obg.com

Laboratory:
Marie Medhof
TestAmerica
880 Riverside Pkwy
W. Sacramento, CA
95605-1500
Phone: 732-593-2554
Fax: 732-549-3679

TestAmerica
10 Hazelwood Dr
Amherst, NY
14228-2223

Analysis Holding Time from Sample Date:
14 days to extraction, 28 days from extraction to analysis

Package Requirement:
Full NYSDEC ASP Cat B Level Pkg w/standard TAT

Project Number: 69645
EDD Format: EQuIS 4 File

Grab (G) or Composite (C)

Field Filtered (Y / N)

Chemical Preservatives: (see key at bottom)

	Unique Field Sample ID	Sample Location	Sample Date (mm/dd/yy)	Sample Time (hh:mm)	Sample Type (see key)	Sample Matrix (see key)	# of Containers	Reporting Units	G	N	PFAS by USEPA Modified Method 537 ng/L	1,4 dioxane by USEPA Method 8270 SIM ng/L	0	0	0	0	0	0	0	0	0	0	0	0	Lab Sample ID
1	MW-7-100318	MW-7	10/03/18	1115	N	WG	4		G	N	X	X													
2	MW-1-100318	MW-1	↓	1450	N	WG	4		G	N	X	X													
3									G	N															
4									G	N															
5									G	N															
6									G	N															
7									G	N															
8									G	N															
9									G	N															
10																									

Lab ID:

Job Number:

480-142905 COC

Special Instructions:

Relinquished by: T. McDonough	Date: 10/3/18	Received by: Karl Fowler	Date: 10-3-18	Condition:	Comments or Notes:
of: OBG	Time: 1420	of: TestAmerica	Time: 1420		Standard 20 business day TAT for Full NYSDEC ASP Cat B Level Pkg (PDF) and EQuIS 4-file EDD.
Relinquished by: Karl Fowler TA	Date: 10-3-18	Received by:	Date: 10/4/18	Custody Seals intact? Y N	
of:	Time: 1800	of: TMS	Time: 0900		
Relinquished by:	Date:	Received by:	Date:	Cooler Temperature: 1.7°C #3	
of:	Time:	of:	Time:		

Sample Type: N = Normal environmental sample, FD = field duplicate, EB = Equipment Blank, FB = Field Blank, TB = Trip Blank, MS = Lab Matrspike, Other (Specify).
Sample Matrix: SE = Sediment, SO = Soil, WG = Groundwater, WS = Surface Water, WW = Waste Water, WQ = Water Quality, TA = Animal Tissue, TP = Plant Tissue, AA = Ambient Air, Other (Specify).
Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Ascorbic Acid, 6 = MeOH, 7 = NaHSO4, 8 = Na2S2O3, 9 = H3PO4

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo Job No.: 480-142905-1

SDG No.:

Client Sample ID: MW-7-100318 Lab Sample ID: 480-142905-1

Matrix: Water Lab File ID: U3312331.D

Analysis Method: 8270D SIM ID Date Collected: 10/03/2018 11:15

Extract. Method: 3510C Date Extracted: 10/09/2018 07:33

Sample wt/vol: 1040(mL) Date Analyzed: 10/11/2018 23:38

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

Injection Volume: 1(uL) Level: (low/med) Low

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

Analysis Batch No.: 438984 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	0.20		0.19	0.096

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8	29		15-110

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo Job No.: 480-142905-1

SDG No.:

Client Sample ID: MW-1-100318 Lab Sample ID: 480-142905-2

Matrix: Water Lab File ID: U3312394.D

Analysis Method: 8270D SIM ID Date Collected: 10/03/2018 14:50

Extract. Method: 3510C Date Extracted: 10/09/2018 07:33

Sample wt/vol: 1000(mL) Date Analyzed: 10/13/2018 03:58

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

Injection Volume: 1(uL) Level: (low/med) Low

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

Analysis Batch No.: 439196 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	ND		0.20	0.10

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8	20		15-110

EC Sampling - GE Vatrano Rd Site

Lab Use Only

TestAmerica

Client: Site Name / Location	Vatrano Rd Site / Albany, NY
Sampling Program:	EC Sampling - GE Vatrano Rd Site
Sampler(s):	T McDonnell
Project Number:	480-142994 COC
Job Number:	

O'Brien & Gere Office: Albany
Address: O'Brien & Gere
94 New Karner Rd, Suite 106, Albany, N.Y. 12203
Phone: (518) 724-7256
Fax: (518) 869-2945
Project Contact: Paul D'Annibale/ Maureen Gardner
Email: Paul.D'Annibale@obg.com / Maureen.Gardner@obg.com

Laboratory:
Marie Meichof
TestAmerica — 880 Riverside Pkwy — W. Sacramento, CA — 95605-1500
TestAmerica — 10 Hazelwood Dr — Amherst, NY — 14228-2223
Phone: 732-593-2554
Fax: 732-549-3679

Analysis Holding Time from Sample Date:
14 days to extraction, 28 days from extraction to analysis

Package Requirement:
Full NYSDEC ASP Cat B Level Pkg w/Attached 20 BD TAT
Project Number: 69645
EDD Format: EQuIS 4-File

Chemical Preservatives: (see key at bottom)

Sample Identification	Unique Field Sample ID	Sample Location	Sample Date (mm/dd/yy)	Sample Time (hh:mm)	Sample Type (see key)	Sample Matrix (see key)	# of Containers	Reporting Units	Grab (G) or Composite (C)	Field Filtered? (Y / N)	PFAS by USEPA Modified Method 537 (ng/L)	1,4-dioxane by USEPA Method 8270 SIM (ug/L)	Lab Sample ID
									0	0	0	0	
1	MW-4-100418	MW-4	10/4/18	1015	N	WG	4		G	N	X	X	
2	MW-4-MSMSD-100418	MW-4		1015	MS	WG	8		G	N	X	X	
3	MW-2-100418	MW-2		1355	N	WG	4		G	N	X	X	
4	EB-100418	—		1075	EB	WQ	4		G	N	X	X	
5	FRB-100418	—		1020	FB	WQ	2		G	N	X		
6	X-1-100418	—	↓	—	FD	WG	4		G	N	X	X	
7									G	N			
8									G	N			
9									G	N			
10													

Special Instructions:

Relinquished by: T McDonnell of OBG	Date 10/4/18 Time 1445	Received by: Karl Zoeller of TA	Date 10-4-18 Time 1445	Condition: OK	Comments or Notes: Standard 20 business day TAT for Full NYSDEC ASP Cat B Level Pkg (PDF) and EQuIS 4-file EDD.
Relinquished by: Karl Zoeller of TA	Date 10-4-18 Time 1800	Received by: of TA	Date 10/5/18 Time 0115	Custody Seals intact? Y N	
Relinquished by: of	Date Time	Received by: of	Date Time	Cooler Temperature: 2.7°c #3	

Sample Type: N = Normal environmental sample, FD = field duplicate, EB = Equipment Blank, FB = Field Blank, TB = Trip Blank, MS = Lab MaSpike, Other (Specify):
Sample Matrix SE = Sediment, SO = Soil, WG = Groundwater, WS = Surface Water, WW = Waste Water, WQ = Water Quality, TA = Animal Tissue, TP = Plant Tissue, AA = Ambient Air, Other (Specify):
Preservatives Code: 0 = none, 1 = HCL, 2 = HNO3, 3 = H2SO4, 4 = NaOH, 5 = Ascorbic Acid, 6 = MeOH, 7 = NaHSO4, 8 = Na2S2O3; 9 = H3PO4

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-142994-1

SDG No.:

Client Sample ID: MW-4-100418 | Lab Sample ID: 480-142994-1

Matrix: Water | Lab File ID: U3312325.D

Analysis Method: 8270D SIM ID | Date Collected: 10/04/2018 10:15

Extract. Method: 3510C | Date Extracted: 10/09/2018 07:33

Sample wt/vol: 1000(mL) | Date Analyzed: 10/11/2018 21:17

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

Injection Volume: 1(uL) | Level: (low/med) Low

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

Analysis Batch No.: 438984 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	ND		0.20	0.10

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8	31		15-110

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo | Job No.: 480-142994-1

SDG No.:

Client Sample ID: MW-2-100418 | Lab Sample ID: 480-142994-2

Matrix: Water | Lab File ID: U3312333.D

Analysis Method: 8270D SIM ID | Date Collected: 10/04/2018 13:55

Extract. Method: 3510C | Date Extracted: 10/09/2018 07:33

Sample wt/vol: 1040(mL) | Date Analyzed: 10/12/2018 00:25

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

Injection Volume: 1(uL) | Level: (low/med) Low

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

Analysis Batch No.: 438984 | Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	ND		0.19	0.096

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8	30		15-110

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-142994-1
SDG No.:
Client Sample ID: EB-100418
Lab Sample ID: 480-142994-3
Matrix: Water
Lab File ID: U3312334.D
Analysis Method: 8270D SIM ID
Date Collected: 10/04/2018 10:45
Extract. Method: 3510C
Date Extracted: 10/09/2018 07:33
Sample wt/vol: 1040(mL)
Date Analyzed: 10/12/2018 00:48
Con. Extract Vol.: 1(mL)
Dilution Factor: 1
Injection Volume: 1(uL)
Level: (low/med) Low
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 438984
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	ND		0.19	0.096

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8	31		15-110

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo
Job No.: 480-142994-1
SDG No.:
Client Sample ID: X-1-100418 [MW-2]
Lab Sample ID: 480-142994-5
Matrix: Water
Lab File ID: U3312335.D
Analysis Method: 8270D SIM ID
Date Collected: 10/04/2018 00:00
Extract. Method: 3510C
Date Extracted: 10/09/2018 07:33
Sample wt/vol: 1030(mL)
Date Analyzed: 10/12/2018 01:12
Con. Extract Vol.: 1(mL)
Dilution Factor: 1
Injection Volume: 1(uL)
Level: (low/med) Low
% Moisture:
GPC Cleanup:(Y/N) N
Analysis Batch No.: 438984
Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	ND		0.19	0.097

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8	28		15-110