From: Edwards, James <JEdwards@geiconsultants.com>
Sent: Monday, May 20, 2019 2:13 PM
To: Spellman, John (DEC)
Cc: Holden, Jeffrey
Subject: Emerging Contaminant Sampling Report - Suffern MGP
Attachments: report.344045.2019-05-17.Suffern_Emerging_Contaminant.pdf; Transmittal Suffern EC Sampling Rpt 5.20.19.pdf

ATTENTION: This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

John,

Attached is the report of the emerging contaminants for the Suffern MGP site.

Please let us know if you have any questions regarding the information in the report.

Also if you need a hard copy.

Please direct any official correspondence from the Department to Maribeth McCormick.

Thanks,

GEI
JAMES EDWARDS, P.G.
Senior Geologist / Project Manager
607.216.8955 cell: 607.592.6786 fax: 607.274.7577
1301 Trumansburg Road, Suite N, Ithaca, NY 14850

Consulting
Engineers and
Scientists

GEI Consultants

LETTER OF TRANSMITTAL

1301 Trumansburg Road, Suite N
Ithaca, NY 14850
Phone: (607) 216-8955
www.geiconsultants.com

To:	Mr. John Spellman, P.E.	Date:	May 20, 2019
	Division of Environmental Remediation New York State Department of Environmental Conservation	GEI Project No.	1901029-1.1
	625 Broadway	Re:	Emerging Contaminant Sampling Report
	Albany, NY 12233-7014		Suffern MGP Site NYSDEC Site #3-44-045

We are sending you the following enclosures:

No.	Type	Description
1	Electronic	Emerging Contaminant Sampling Report, Suffern Former MGP Site, NYSDEC Site # 3-44-045, dated May 17, 2019

These are transmitted as checked below:

☒ For Approval ☐ For Your Use ☐ For Review/Comment ☐ As Requested ☐ Other

Message:

Signed:

James Edwards

James Edwards, P.G.
Project Manager

Copy to:
Ms. Maribeth McCormick – O&R (electronic copy)

If enclosures are not as noted, kindly notify us at once.

GEI Consultants

May 17, 2019
GEI Project 1901029

Consulting
Engineers and
Scientists

Mr. John Spellman, P.E.
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7014

RE: Emerging Contaminant Sampling Report
Suffern MGP Site
NYSDEC Site #3-44-045

Dear Mr. Spellman:

GEI Consultants, Inc., P.C. (GEI) on behalf of Orange and Rockland Utilities, Inc. (O&R), has prepared this report to provide the results of emerging contaminant (EC) groundwater sampling performed at the Suffern Manufactured Gas Plant (MGP) site. Background information, a summary of the field activities, and the results of the analyses are provided below.

Background

A project work plan was prepared in accordance with the New York State Department of Environmental Conservation's (NYSDEC) May 30, 2018 letter to O&R requiring the sampling of emerging contaminants at the O&R sites.

- **GEI Work Plan** – On behalf of O&R (and Con Edison), GEI prepared a work plan document entitled "*Emerging Contaminant Sampling Work Plan, O&R and Con Edison MGP Sites,*" dated August 17, 2018.
- **O&R Work Plan Addendum** – An Addendum was submitted by O&R to identify the specific sample locations at each of the O&R sites.

The NYSDEC approved the above-referenced Work Plan and the Addendum in an email correspondence to O&R dated January 17, 2019.

Field Activities

Groundwater sampling at the Suffern site was performed on March 12 and 13, 2019. The methods used to perform the field activities, and the field quality assurance / quality control (QA/QC) procedures were consistent with the specifications of the GEI Work Plan, and NYSDEC Guidance provided in the May 30, 2018 letter.

As specified in the Addendum, the following wells were sampled:

- **MW33** – (up-gradient shallow zone well, located closest to the site's boundary);
- **MW16** – (up-gradient deep zone well, located closest to the site's boundary);
- **MW5** – (shallow zone well, located in a central site location);

GEI Consultants, Inc., P.C.
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- **MW30** – (deep zone well; located in a central site location);
- **MW22** – (down-gradient deep zone well, located near the site's boundary);
- **MW35** – (shallow zone well located down-gradient of the former site operations area);
- **MW4** – (down-gradient shallow zone well, located near the site's boundary); and
- **MW10** – (down-gradient shallow zone well, located near the site's boundary).

For the Suffern site, the wells that monitor the shallow zone of the aquifer are screened from near the water table to around 45 feet deep. The wells that monitor the deep portion of the aquifer are screened from around 45 feet deep down to the surface of the bedrock.

The well locations are shown on the attached Figure 1.

Investigation Derived Residuals

Investigation derived waste (IDW) generated during the sampling consisted of monitoring well purge water. The water was placed in a drum and labeled and stored on site along with the IDW generated from the Suffern quarterly groundwater program. The IDW at the site is anticipated to be disposed of at the end of 2019, following the fourth quarterly sampling event for the site.

Laboratory Analyses

The groundwater samples were sent to TestAmerica (TA) laboratories in Burlington, VT (PFAS), and Edison, NJ (1,4-dioxane) for analysis. As indicated in the NYSDEC letter to O&R (referenced above), TA is a NYSDEC-approved laboratory for the emerging contaminant analyses.

The laboratory methods utilized were:

- **1,4 Dioxane** – 8270D SIM (selected ion monitoring); and
- **Per - and Polyfluoroalkyl (PFAS) Substances** – NY PFAAs-Isotope Dilution EPA 537 (Modified).

Laboratory QA/QC

The QA/QC procedures utilized in the laboratory for the analyses were consistent with the specifications of the NYSDEC-approved GEI Work Plan. Appendix A contains the laboratory Form I report sheets, and the chain of custody record for the sampling.

GEI performed a data review, and prepared a Data Usability Summary Report (DUSR) for the laboratory packages. The DUSR is provided in Appendix B. The data was determined to be usable as reported by the laboratory, with minor qualifications due to sample matrix, or laboratory quality control outliers. Additional detail is provided in the DUSR.

The Form I report sheets included in Appendix A have been modified with qualifiers as a result of the DUSR review. The Form I report sheets for the field QA/QC sample (the equipment blank), included in Appendix A, have also been modified with qualifiers as a result of the DUSR.

Laboratory Reporting Limits (RLs) were below the NYSDEC-specified target value (0.28 ug/L) for some constituents in all of the samples. Due to interference from non-target compounds, it was necessary for the laboratory to perform dilutions for the PFAS analysis for samples MW33 (all PFAS constituents) and MW10 (two PFAS constituents). Consequently, the Reporting Limits

(RLs) for some of the PFAS compounds for these samples were above the target RLs identified by the NYSDEC. With the exception of up-gradient well MW33, all PFOA and PFOS reporting limits met the 2 ng/L RL indicated in NYSDEC's May 30, 2018 letter. Also, although the dilutions were required, the final concentrations of PFAS compounds identified for these samples are similar to the concentrations reported for the other groundwater samples (Table 1). Also, all RLs were below the most stringent screening levels to which the results were compared. Therefore, the dilutions performed, and the resultant higher RLs for some compounds for MW10 and MW33 do not appear to represent an overall concern for the sampling event.

Field QA/QC

The results of the analysis of the equipment blank sample are provided in Appendix A and discussed in the DUSR in Appendix B. Neither 1,4-dioxane nor PFAS compounds were detected in the equipment blank sample.

Summary of Findings

The laboratory analytical results for eight sampled wells, plus a field duplicate sample from MW4, are summarized in Table 1. Included in the table are the Initial Screening Levels (ISLs) for both Drinking Water and Groundwater provided by the NYSDEC.

On Table 1, where a concentration of a compound was detected (including estimated "J" values), the concentration is shown with a bold font. Where a concentration was identified to be greater than the NYSDEC Initial Drinking Water Screening Levels, the result has been shaded gray. No exceedances of the initial Groundwater Screening Level were identified (discussed below). Key observations from the data are summarized as follows:

- **1,4-Dioxane** – 1,4-Dioxane was detected in samples MW30 and MW35. The concentrations identified were both below the ISLs for Drinking Water and Groundwater. 1, 4-dioxane was not detected in any of the other samples.
- **PFOS** – PFOS was detected at a concentration of 48 ng/L at MW16. The concentration is greater than the ISL for Drinking Water of 20 ng/L. This well is located up-gradient of the site and is screened in the deep zone of the aquifer (Figure 1). PFOS was detected in other well samples; however, all detections were below the ISLs for Drinking Water and Groundwater (Table 1).
- **Other PFAS Compounds** – Other than the MW16 PFOS result indicated above, no exceedances of the ISLs for Drinking Water or Groundwater were identified for individual PFAS compounds (Table 1).
- **Total PFOS and PFOA - Drinking Water Screening Level** – The ISL for Drinking Water for the total of these two constituents is 20 ng/L. Exceedances of this criteria were identified at MW16 (63 ng/L), and MW22 (26.3 ng/L) (Table 1). MW16 is up gradient of the site and is screened in the deep zone of the aquifer. MW22 is located on the site at a location down gradient of MW16 (Figure 1). MW22 also is screened in the deep zone of the aquifer.
- **Total PFOS and PFOA - Groundwater Screening Level** – The ISL for Groundwater for the total of these two constituents is 70 ng/L. No exceedances of the ISL for Groundwater for the total of these two constituents were identified (Table 1).

- **Total NYSDEC Target PFAS List Exceedances** – The total PFAS ISL for both Drinking Water and Groundwater is 500 ng/L. No exceedances of either screening level was identified for any of the samples.

As required by the NYSDEC, the data has been submitted to the NYSDEC EIMS website at https://www.dec.ny.gov/chemical/62440.html.

Please contact me at (607) 216-8958 if you have any questions or comments regarding the information provided in this letter. Please direct any official correspondence from the Department to Maribeth McCormick of O&R.

Sincerely,

GEI CONSULTANTS, INC., P.C.

James Edwards, P.G.
Senior Geologist

Jeffrey S. Holden, P.E.
Senior Engineer

JE:mlr

Attachments: Table 1 – Summary of Analytical Results
Figure 1 – Well Locations
Appendix A – Laboratory Form I Sheets
Appendix B – DUSR

JE:mlr

c: Maribeth McCormick – O&R

\\bos1v-FS02\Data_Storage\Working\O&R\1901029 Suffern 1Qtr2019 and EC Sampling\Emerging COC Report\Text\Suffern EC Report 5.17.2019.docx

Table

Table i
Acronym and NYSDEC Reference Key
for Analytical Summary Tables

Groundwater Notes:

NYSDEC References:
GW STD - New York Groundwater Guidance or Standard Values - NYSDEC, Division of Water, TOGS (1.1.1) [NYSDEC, 1998], with Addendums.
s = Standard Value
g = Guidance Value

62	**Bold value** - analyte estimated or detected at a concentration greater than the method detection limit.
62	**Gray Shaded value** - analyte estimated or detected at concentration greater than the NYSDEC Groundwater Standard or Guidance Values.

Units for groundwater samples:
µg/L = micrograms/Liter = parts per billion
mg/L = milligrams/Liter = parts per million

Laboratory or Validation Qualifiers:
B = For organics analysis - compound was found in the associated blank sample. For metals analysis - the result is an estimated quantity.
B = For inorganic analysis - analyte detected in the associated method blank.
E = Analyte concentration exceeded the calibration range of the instrument.
F = MS and/or MSD Recovery is outside acceptance limits.
F1 = MS and/or MSD Recovery is outside acceptance limits.
F2 = MS/MSD RPD exceeds control limits.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J- = The result is an estimated quantity, likely to be biased low. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity, likely to be biased high. The associated numerical value is the approximate concentration of the analyte in the sample.
N = Tentative identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling events.
R = The data are unusable. The sample results are rejected due to serious deficiencies in the ability to meet quality control criteria.
U = The analyte was analyzed for, but was not detected above the level reported.
UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.
BW - Analyte detected in the associated method blank and post-digest spike recovery furnace analysis was out of 85-115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance.
BWN - Analyte detected in the associated method blank and post-digest spike recovery furnace analysis was out of 85-115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance. Analyte is presumptively present.
UW - Not detected at or above the reporting limit shown and post-digest spike recovery furnace analysis was out of 85-115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance.
JB - Estimated value and the analyte was detected in the associated method blank.
* = LCS or LCSD is outside acceptance limits.

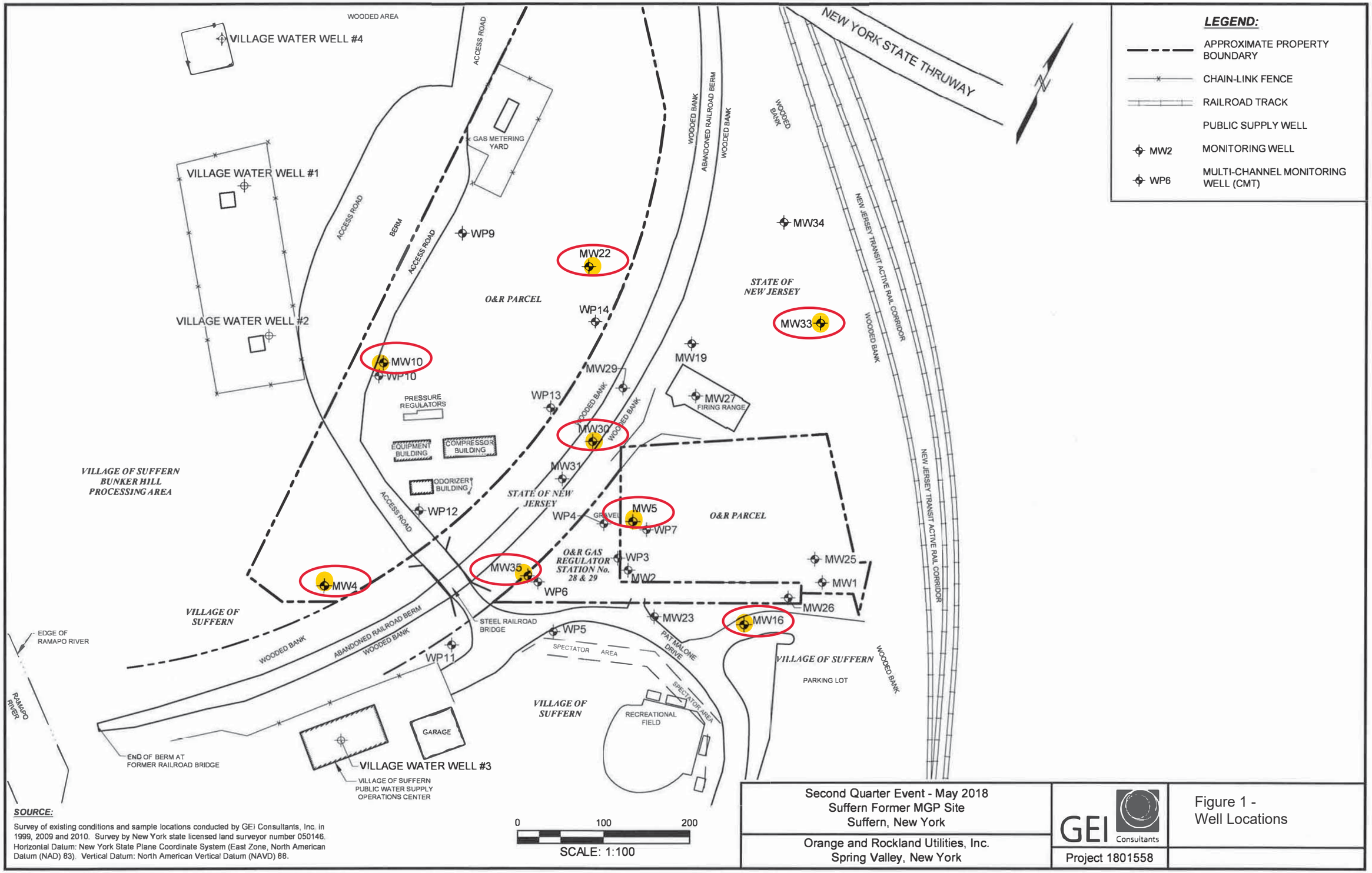
Other Notes:
NA = Not analyzed for, Not applicable
ND = Not detected. Total concentration is listed as ND because no compounds were detected in the group (such as for Total BTEX).
NE = Not established
NL = Not Listed
PAHs - polycyclic aromatic hydrocarbons
SVOCs - semi-volatile organic compounds
TAL - Target Analyte List
TCL - Target Compound List

BTEX and Total PAHs are calculated using detects only.
Total VOCs includes all BTEX compounds.
Total SVOCs includes all PAH compounds.

Table 1
Emerging Contaminant Sampling Results
Suffern MGP Site

Analyte	Units	CAS No.	NYSDEC Initial DW Screening Level	NYSDEC Initial GW Screening Level	Sample Name Sample Date Parent Sample MW 4	DUP 031319 3/13/2019 MW 4	MW 5 3/12/2019	MW 10 3/13/2019	MW 16 3/12/2019	MW 22 3/13/2019	MW 30 3/13/2019	MW 33 3/12/2019	MW 35 3/12/2019
SVOC SIM	ng/L												
1,4-Dioxane		123-91-1	350	350	200 U	200 U	200 U	200 U	200 U	200 U	**280**	200 U	**160 J**
PFAS	ng/L												
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)		2991-50-6	100	100	16 U	16 U	17 U	16 U	16 U	16 U	16 U	81 U	16 U
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)		2355-31-9	100	100	16 U	16 U	17 U	16 U	16 U	16 U	16 U	81 U	16 U
Perfluorobutanesulfonic acid (PFBS)		375-73-5	100	100	**4.9**	**4.5 J**	**2.5 J**	**3 J**	**6.6**	**1.5 J**	**2.4**	**7.2 J**	**2.8**
Perfluorobutanoic acid (PFBA)		375-22-4	100	100	**4.3 J**	8.2 UJ	**3.6**	8.2 UJ	**4.8**	**6.1 J**	**4.7 J**	**15**	**4**
Perfluorodecanesulfonic acid (PFDS)		335-77-3	100	100	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	8.1 U	1.6 U
Perfluorodecanoic acid (PFDA)		335-76-2	100	100	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	8.1 U	1.6 U
Perfluorododecanoic acid (PFDoA)		307-55-1	100	100	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	8.1 U	1.6 U
Perfluoroheptanesulfonic acid (PFHpS)		375-92-8	100	100	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	8.1 U	1.6 U
Perfluoroheptanoic acid (PFHpA)		375-85-9	100	100	**0.97 J**	**0.93 J**	**2.4**	**2.2**	**7**	**4.6**	**1.8**	8.1 U	**2.2**
Perfluorohexanoic acid (PFHxA)		307-24-4	100	100	**1.7 J**	**1.1 J**	**4.3**	**4 J**	**9.1**	**5.1 J**	**2.8 J**	**7.6 J**	**3.9**
Perfluorooctanesulfonamide (FOSA)		754-91-6	100	100	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	8.1 U	1.6 U
Perfluoropentanoic Acid (PFPeA)		2706-90-3	100	100	**1.8**	**1.6**	**5.4**	**5.3**	**15 J**	**8.3**	**5.3**	**16**	**4.5**
Perfluorotetradecanoic acid (PFTA/PFTeDA)		376-06-7	100	100	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	8.1 U	1.6 U
Perfluorotridecanoic acid (PFTriA/PFTrDA)		72629-94-8	100	100	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	8.1 U	1.6 U
Perfluoroundecanoic acid (PFUnA)		2058-94-8	100	100	1.6 U	1.6 U	1.7 U	1.6 U	1.6 U	1.6 U	1.6 U	8.1 U	1.6 U
Sodium 1H,1H,2H,2H-Perfluorodecane Sulfonate (8:2)		39108-34-4	100	100	16 U	16 U	17 UJ	16 U	16 UJ	16 U	16 U	81 UJ	16 UJ
Sodium 1H,1H,2H,2H-Perfluorooctane Sulfonate (6:2)		27619-97-2	100	100	16 U	16 U	17 U	16 U	16 U	16 U	16 U	81 U	16 U
Perfluorohexanesulfonic acid (PFHxS)		355-46-4	100	100	**2.1**	**1.1 J**	**2.4**	**1.4 J**	**4.2**	**2.5**	1.6 U	**5.9 J**	**1.1 J**
Perfluorononanoic Acid (PFNA)		375-95-1	100	100	**1.8**	**1.3 J**	**2.4 J**	**2.1**	**6.1**	**2.9**	**0.81 J**	8.1 U	**2.2**
Perfluorooctanesulfonic acid (PFOS)		1763-23-1	20	70	**7.5**	**6.1**	**7.3**	**7**	**48**	**17**	**1.8**	8.1 U	**6.4**
Perfluorooctanoic Acid (PFOA)		335-67-1	20	70	**4.6**	**4.2**	**7.1**	**8**	**15**	**9.3**	**8**	**3.1 J**	**7.7**
Total PFOS and PFOA	ng/L	NA	20	70	**12.1**	**10.3**	**14.4**	**15**	**63**	**26.3**	**9.8**	**3.1**	**14.1**
Total NYSDEC Target PFAS List	ng/L	NA	500	500	**29.67**	**20.83**	**37.4**	**33**	**115.8**	**57.3**	**27.61**	**54.8**	**34.8**

Figure



SOURCE:

Survey of existing conditions and sample locations conducted by GEI Consultants, Inc. in 1999, 2009 and 2010. Survey by New York state licensed land surveyor number 050146. Horizontal Datum: New York State Plane Coordinate System (East Zone, North American Datum (NAD) 83). Vertical Datum: North American Vertical Datum (NAVD) 88.

Second Quarter Event - May 2018
Suffern Former MGP Site
Suffern, New York

Orange and Rockland Utilities, Inc.
Spring Valley, New York

GEI Consultants

Project 1801558

Figure 1 -
Well Locations

---- I:\Project\ORANGE & ROCKLAND\Suffern\Quarterly GW\Suffern-GW Figs_Q2 2018.dwg - 6/18/2018

Appendix A

Chain of Custody Record and Validated Laboratory Form I Reports

Client Sample Results

Client: GEI Consultants, Inc.
Project/Site: Suffern MGP Site, Suffern NY

TestAmerica Job ID: 200-47778-1

Client Sample ID: MW 16
Date Collected: 03/12/19 09:55
Date Received: 03/13/19 10:27

Lab Sample ID: 200-47778-1
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	0.016	ug/L		03/15/19 11:13	03/15/19 20:18	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*37*		*10 - 150*	*03/15/19 11:13*	*03/15/19 20:18*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND	UJ.	16	2.3	ng/L		03/22/19 07:10	03/23/19 08:32	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		16	3.7	ng/L		03/22/19 07:10	03/23/19 08:32	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		16	1.2	ng/L		03/22/19 07:10	03/23/19 08:32	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		16	1.4	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorobutanesulfonic acid (PFBS)	**6.6**		1.6	0.40	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorobutanoic acid (PFBA)	**4.8**		1.6	0.81	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.6	0.73	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorodecanoic acid (PFDA)	ND		1.6	0.62	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorododecanoic acid (PFDoA)	ND		1.6	0.48	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.6	0.77	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluoroheptanoic acid (PFHpA)	**7.0**		1.6	0.74	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorohexanesulfonic acid (PFHxS)	**4.2**		1.6	0.65	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorohexanoic acid (PFHxA)	**9.1**		1.6	0.61	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorononanoic acid (PFNA)	**6.1**		1.6	0.22	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.6	0.52	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorooctanesulfonic acid (PFOS)	**48**		1.6	0.49	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorooctanoic acid (PFOA)	**15**		1.6	0.51	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluoropentanoic acid (PFPeA)	**15**	~~F2~~ J.	1.6	0.51	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.6	0.74	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluorotridecanoic acid (PFTriA)	ND		1.6	0.48	ng/L		03/22/19 07:10	03/23/19 08:32	1
Perfluoroundecanoic acid (PFUnA)	ND		1.6	0.43	ng/L		03/22/19 07:10	03/23/19 08:32	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*86*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C2 PFDoA	*79*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C2 PFHxA	*71*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C2 PFTeDA	*79*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C2 PFUnA	*80*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C3 PFBS	*80*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C4 PFBA	*53*		*25 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C4 PFHpA	*83*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C4 PFOA	*76*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C4 PFOS	*78*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C5 PFNA	*74*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C5 PFPeA	*47*		*25 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
13C8 FOSA	*54*		*25 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
18O2 PFHxS	*87*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*
d3-NMeFOSAA	*65*		*50 - 150*	*03/22/19 07:10*	*03/23/19 08:32*	*1*

4/18/19

Client Sample ID: MW 16
Date Collected: 03/12/19 09:55
Date Received: 03/13/19 10:27

Lab Sample ID: 200-47778-1
Matrix: Water

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	80		50 - 150	03/22/19 07:10	03/23/19 08:32	1
M2-6:2 FTS	99		25 - 150	03/22/19 07:10	03/23/19 08:32	1
M2-8:2 FTS	107		25 - 150	03/22/19 07:10	03/23/19 08:32	1

Client Sample ID: MW 5
Date Collected: 03/12/19 11:50
Date Received: 03/13/19 10:27

Lab Sample ID: 200-47778-2
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		0.20	0.016	ug/L		03/15/19 11:13	03/15/19 21:08	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	32		10 - 150	03/15/19 11:13	03/15/19 21:08	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND	UJ.	17	2.4	ng/L		03/22/19 07:10	03/23/19 09:19	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		17	3.9	ng/L		03/22/19 07:10	03/23/19 09:19	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		17	1.3	ng/L		03/22/19 07:10	03/23/19 09:19	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		17	1.4	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorobutanesulfonic acid (PFBS)	**2.5**	J.	1.7	0.41	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorobutanoic acid (PFBA)	**3.6**		1.7	0.84	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.76	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.65	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.50	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.7	0.80	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluoroheptanoic acid (PFHpA)	**2.4**		1.7	0.77	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorohexanesulfonic acid (PFHxS)	**2.4**		1.7	0.68	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorohexanoic acid (PFHxA)	**4.3**		1.7	0.64	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorononanoic acid (PFNA)	**2.4**	J.	1.7	0.23	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.7	0.54	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorooctanesulfonic acid (PFOS)	**7.3**		1.7	0.51	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorooctanoic acid (PFOA)	**7.1**		1.7	0.53	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluoropentanoic acid (PFPeA)	**5.4**		1.7	0.53	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.78	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	0.51	ng/L		03/22/19 07:10	03/23/19 09:19	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.45	ng/L		03/22/19 07:10	03/23/19 09:19	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	89		50 - 150	03/22/19 07:10	03/23/19 09:19	1
13C2 PFDoA	76		50 - 150	03/22/19 07:10	03/23/19 09:19	1
13C2 PFHxA	68		50 - 150	03/22/19 07:10	03/23/19 09:19	1
13C2 PFTeDA	78		50 - 150	03/22/19 07:10	03/23/19 09:19	1
13C2 PFUnA	78		50 - 150	03/22/19 07:10	03/23/19 09:19	1

Client Sample ID: MW 5

Date Collected: 03/12/19 11:50
Date Received: 03/13/19 10:27

Lab Sample ID: 200-47778-2
Matrix: Water

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C3 PFBS	79		50 - 150	03/22/19 07:10	03/23/19 09:19	1
13C4 PFBA	50		25 - 150	03/22/19 07:10	03/23/19 09:19	1
13C4 PFHpA	90		50 - 150	03/22/19 07:10	03/23/19 09:19	1
13C4 PFOA	90		50 - 150	03/22/19 07:10	03/23/19 09:19	1
13C4 PFOS	73		50 - 150	03/22/19 07:10	03/23/19 09:19	1
13C5 PFNA	85		50 - 150	03/22/19 07:10	03/23/19 09:19	1
13C5 PFPeA	51		25 - 150	03/22/19 07:10	03/23/19 09:19	1
13C8 FOSA	57		25 - 150	03/22/19 07:10	03/23/19 09:19	1
18O2 PFHxS	87		50 - 150	03/22/19 07:10	03/23/19 09:19	1
d3-NMeFOSAA	65		50 - 150	03/22/19 07:10	03/23/19 09:19	1
d5-NEtFOSAA	80		50 - 150	03/22/19 07:10	03/23/19 09:19	1
M2-6:2 FTS	109		25 - 150	03/22/19 07:10	03/23/19 09:19	1
M2-8:2 FTS	103		25 - 150	03/22/19 07:10	03/23/19 09:19	1

Client Sample ID: MW 33

Date Collected: 03/12/19 13:20
Date Received: 03/13/19 10:27

Lab Sample ID: 200-47778-3
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		0.20	0.016	ug/L		03/15/19 11:13	03/15/19 21:25	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	35		10 - 150	03/15/19 11:13	03/15/19 21:25	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND	UJ	81	12	ng/L		03/22/19 07:10	03/23/19 09:35	5
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		81	19	ng/L		03/22/19 07:10	03/23/19 09:35	5
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		81	6.0	ng/L		03/22/19 07:10	03/23/19 09:35	5
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		81	6.9	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorobutanesulfonic acid (PFBS)	**7.2**	J	8.1	2.0	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorobutanoic acid (PFBA)	**15**		8.1	4.0	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorodecanesulfonic acid (PFDS)	ND		8.1	3.6	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorodecanoic acid (PFDA)	ND		8.1	3.1	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorododecanoic acid (PFDoA)	ND		8.1	2.4	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluoroheptanesulfonic Acid (PFHpS)	ND		8.1	3.8	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluoroheptanoic acid (PFHpA)	ND		8.1	3.7	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorohexanesulfonic acid (PFHxS)	**5.9**	J	8.1	3.2	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorohexanoic acid (PFHxA)	**7.6**	J	8.1	3.1	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorononanoic acid (PFNA)	ND		8.1	1.1	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorooctanesulfonamide (PFOSA)	ND		8.1	2.6	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorooctanesulfonic acid (PFOS)	ND		8.1	2.5	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorooctanoic acid (PFOA)	**3.1**	J	8.1	2.5	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluoropentanoic acid (PFPeA)	**16**		8.1	2.5	ng/L		03/22/19 07:10	03/23/19 09:35	5

Client Sample ID: MW 33

Date Collected: 03/12/19 13:20
Date Received: 03/13/19 10:27

Lab Sample ID: 200-47778-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotetradecanoic acid (PFTeA)	ND		8.1	3.7	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluorotridecanoic acid (PFTriA)	ND		8.1	2.4	ng/L		03/22/19 07:10	03/23/19 09:35	5
Perfluoroundecanoic acid (PFUnA)	ND		8.1	2.1	ng/L		03/22/19 07:10	03/23/19 09:35	5

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*91*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C2 PFDoA	*75*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C2 PFHxA	*51*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C2 PFTeDA	*54*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C2 PFUnA	*80*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C3 PFBS	*64*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C4 PFBA	*25*		*25 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C4 PFHpA	*67*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C4 PFOA	*91*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C4 PFOS	*80*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C5 PFNA	*89*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C5 PFPeA	*28*		*25 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
13C8 FOSA	*59*		*25 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
18O2 PFHxS	*57*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
d3-NMeFOSAA	*68*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
d5-NEtFOSAA	*70*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
M2-6:2 FTS	*100*		*25 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*
M2-8:2 FTS	*91*		*25 - 150*	*03/22/19 07:10*	*03/23/19 09:35*	*5*

Client Sample ID: MW 35

Date Collected: 03/12/19 15:25
Date Received: 03/13/19 10:27

Lab Sample ID: 200-47778-4
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	0.16	J	0.20	0.016	ug/L		03/15/19 11:13	03/15/19 21:42	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*32*		*10 - 150*	*03/15/19 11:13*	*03/15/19 21:42*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND	UJ	16	2.4	ng/L		03/22/19 07:10	03/23/19 09:51	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		16	3.8	ng/L		03/22/19 07:10	03/23/19 09:51	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		16	1.2	ng/L		03/22/19 07:10	03/23/19 09:51	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		16	1.4	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorobutanesulfonic acid (PFBS)	**2.8**		1.6	0.40	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorobutanoic acid (PFBA)	**4.0**		1.6	0.82	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.6	0.73	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorodecanoic acid (PFDA)	ND		1.6	0.63	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorododecanoic acid (PFDoA)	ND		1.6	0.48	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.6	0.77	ng/L		03/22/19 07:10	03/23/19 09:51	1

Client Sample ID: MW 35
Date Collected: 03/12/19 15:25
Date Received: 03/13/19 10:27

Lab Sample ID: 200-47778-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroheptanoic acid (PFHpA)	**2.2**		1.6	0.74	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorohexanesulfonic acid (PFHxS)	**1.1**	J	1.6	0.65	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorohexanoic acid (PFHxA)	**3.9**		1.6	0.62	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorononanoic acid (PFNA)	**2.2**		1.6	0.22	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.6	0.52	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorooctanesulfonic acid (PFOS)	**6.4**		1.6	0.50	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorooctanoic acid (PFOA)	**7.7**		1.6	0.51	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluoropentanoic acid (PFPeA)	**4.5**		1.6	0.51	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.6	0.75	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluorotridecanoic acid (PFTriA)	ND		1.6	0.49	ng/L		03/22/19 07:10	03/23/19 09:51	1
Perfluoroundecanoic acid (PFUnA)	ND		1.6	0.43	ng/L		03/22/19 07:10	03/23/19 09:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*88*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C2 PFDoA	*74*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C2 PFHxA	*73*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C2 PFTeDA	*75*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C2 PFUnA	*79*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C3 PFBS	*70*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C4 PFBA	*56*		*25 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C4 PFHpA	*92*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C4 PFOA	*87*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C4 PFOS	*77*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C5 PFNA	*87*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C5 PFPeA	*59*		*25 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
13C8 FOSA	*69*		*25 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
18O2 PFHxS	*85*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
d3-NMeFOSAA	*67*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
d5-NEtFOSAA	*76*		*50 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
M2-6:2 FTS	*104*		*25 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*
M2-8:2 FTS	*97*		*25 - 150*	*03/22/19 07:10*	*03/23/19 09:51*	*1*

TestAmerica Burlington
30 Community Drive Suite 11
South Burlington, VT 05403
Phone (802) 660-1990 Fax (802) 660-1919

Chain of Custody Record

200-47778 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: J. Peake / M. Sharif	Lab PM: Deyo, Melissa L	COC No: 200-23127-10034.1
Client Contact: James Edwards	Phone: 607 7936424	E-Mail: melissa.deyo@testamericainc.com	Page: Page 1 of 2
Company: GEI Consultants, Inc.			Job #:
Address: 1301 Trumansburg Road Suite N	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Ithaca	TAT Requested (days):		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: NY, 14850			
Phone:	PO #: 1901029		
Email: jedwards@geiconsultants.com	WO #:		Other:
Project Name: Suffern MGP Site, Suffern NY	Project #: 20008560		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	PFC_IDA - PFAS, Standard List (21)	8270D_SIM_MS_ID - 1,4-Dioxane	Total Number of containers	Special Instructions/Note:
			Preservation Code:			N	N		
MW 16	3/12/19	0955	G	Water		X	X		
MW 16 MS	3/12/19	1007	G	Water		X	X		
MW 16 MSD	3/12/19	1015	G	Water		X	X		
MW5	3/12/19	1150	G	Water		X	X		
MW 33	3/12/19	1320	G	Water		X	X		
MW 35	3/12/19	1525	G	Water		X	X		
				Water					
				Water					
				Water					
				Water					
				Water					

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 3/13/19 10:27	Company TA Burl
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
			Received by:	Date/Time:	Company

Custody Seals Intact: X Yes Δ No | Custody Seal No.: 737535

Cooler Temperature(s) °C and Other Remarks: 5.0

Ver: 01/16/2019

Client Sample Results

Client: GEI Consultants, Inc.
Project/Site: Suffern MGP Site, Suffern NY

Job ID: 200-47799-1

Client Sample ID: MW 10
Date Collected: 03/13/19 08:45
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-1
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	0.016	ug/L		03/19/19 10:12	03/19/19 20:02	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	33		10 - 150	03/19/19 10:12	03/19/19 20:02	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		16	2.4	ng/L		03/25/19 10:32	03/30/19 11:52	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		16	3.8	ng/L		03/25/19 10:32	03/30/19 11:52	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		16	1.2	ng/L		03/25/19 10:32	03/30/19 11:52	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		16	1.4	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorobutanesulfonic acid (PFBS)	**3.0**	J.	1.6	0.40	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorobutanoic acid (PFBA)	ND	UJ.	8.2	4.1	ng/L		03/25/19 10:32	04/11/19 22:57	5
Perfluorodecanesulfonic acid (PFDS)	ND		1.6	0.74	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorodecanoic acid (PFDA)	ND		1.6	0.63	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorododecanoic acid (PFDoA)	ND		1.6	0.49	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.6	0.78	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluoroheptanoic acid (PFHpA)	**2.2**		1.6	0.75	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorohexanesulfonic acid (PFHxS)	**1.4**	J.	1.6	0.66	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorohexanoic acid (PFHxA)	**4.0**	J.	1.6	0.63	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorononanoic acid (PFNA)	**2.1**		1.6	0.22	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.6	0.53	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorooctanesulfonic acid (PFOS)	**7.0**		1.6	0.50	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorooctanoic acid (PFOA)	**8.0**		1.6	0.52	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluoropentanoic acid (PFPeA)	**5.3**		1.6	0.52	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.6	0.76	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluorotridecanoic acid (PFTriA)	ND		1.6	0.49	ng/L		03/25/19 10:32	03/30/19 11:52	1
Perfluoroundecanoic acid (PFUnA)	ND		1.6	0.44	ng/L		03/25/19 10:32	03/30/19 11:52	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	81		50 - 150	03/25/19 10:32	03/30/19 11:52	1
13C2 PFDoA	71		50 - 150	03/25/19 10:32	03/30/19 11:52	1
13C2 PFHxA	79		50 - 150	03/25/19 10:32	03/30/19 11:52	1
13C2 PFTeDA	73		50 - 150	03/25/19 10:32	03/30/19 11:52	1
13C2 PFUnA	77		50 - 150	03/25/19 10:32	03/30/19 11:52	1
13C3 PFBS	46	*	50 - 150	03/25/19 10:32	03/30/19 11:52	1
13C4 PFBA	115		25 - 150	03/25/19 10:32	03/30/19 11:52	1
13C4 PFHpA	77		50 - 150	03/25/19 10:32	04/11/19 22:57	5
13C4 PFOA	86		50 - 150	03/25/19 10:32	03/30/19 11:52	1
13C4 PFOS	59		50 - 150	03/25/19 10:32	03/30/19 11:52	1
13C5 PFNA	78		50 - 150	03/25/19 10:32	03/30/19 11:52	1
13C5 PFPeA	62		25 - 150	03/25/19 10:32	03/30/19 11:52	1
13C8 FOSA	64		25 - 150	03/25/19 10:32	03/30/19 11:52	1
18O2 PFHxS	66		50 - 150	03/25/19 10:32	03/30/19 11:52	1
d3-NMeFOSAA	70		50 - 150	03/25/19 10:32	03/30/19 11:52	1

dam 4/18/19

Client Sample ID: MW 10
Date Collected: 03/13/19 08:45
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-1
Matrix: Water

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	79		50 - 150	03/25/19 10:32	03/30/19 11:52	1
M2-6:2 FTS	107		25 - 150	03/25/19 10:32	03/30/19 11:52	1
M2-8:2 FTS	97		25 - 150	03/25/19 10:32	03/30/19 11:52	1

Client Sample ID: MW 4
Date Collected: 03/13/19 09:55
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-2
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		0.20	0.016	ug/L		03/19/19 10:12	03/19/19 20:18	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	32		10 - 150	03/19/19 10:12	03/19/19 20:18	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		16	2.3	ng/L		03/25/19 10:32	03/30/19 16:06	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		16	3.7	ng/L		03/25/19 10:32	03/30/19 16:06	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		16	1.2	ng/L		03/25/19 10:32	03/30/19 16:06	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		16	1.4	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorobutanesulfonic acid (PFBS)	**4.9**		1.6	0.40	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorobutanoic acid (PFBA)	**4.3**	J.	1.6	0.81	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.6	0.73	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorodecanoic acid (PFDA)	ND		1.6	0.62	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorododecanoic acid (PFDoA)	ND		1.6	0.48	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.6	0.77	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluoroheptanoic acid (PFHpA)	**0.97**	J.	1.6	0.74	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorohexanesulfonic acid (PFHxS)	**2.1**		1.6	0.65	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorohexanoic acid (PFHxA)	**1.7**	J.	1.6	0.62	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorononanoic acid (PFNA)	**1.8**		1.6	0.22	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.6	0.52	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorooctanesulfonic acid (PFOS)	**7.5**		1.6	0.49	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorooctanoic acid (PFOA)	**4.6**		1.6	0.51	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluoropentanoic acid (PFPeA)	**1.8**		1.6	0.51	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.6	0.74	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluorotridecanoic acid (PFTriA)	ND		1.6	0.49	ng/L		03/25/19 10:32	03/30/19 16:06	1
Perfluoroundecanoic acid (PFUnA)	ND		1.6	0.43	ng/L		03/25/19 10:32	03/30/19 16:06	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFDA	68		50 - 150	03/25/19 10:32	03/30/19 16:06	1
13C2 PFDoA	63		50 - 150	03/25/19 10:32	03/30/19 16:06	1
13C2 PFHxA	59		50 - 150	03/25/19 10:32	03/30/19 16:06	1
13C2 PFTeDA	69		50 - 150	03/25/19 10:32	03/30/19 16:06	1
13C2 PFUnA	63		50 - 150	03/25/19 10:32	03/30/19 16:06	1
13C3 PFBS	54		50 - 150	03/25/19 10:32	03/30/19 16:06	1

Client Sample ID: MW 4

Date Collected: 03/13/19 09:55
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-2
Matrix: Water

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C4 PFBA	27		25 - 150	03/25/19 10:32	03/30/19 16:06	1
13C4 PFHpA	67		50 - 150	03/25/19 10:32	03/30/19 16:06	1
13C4 PFOA	74		50 - 150	03/25/19 10:32	03/30/19 16:06	1
13C4 PFOS	58		50 - 150	03/25/19 10:32	03/30/19 16:06	1
13C5 PFNA	67		50 - 150	03/25/19 10:32	03/30/19 16:06	1
13C5 PFPeA	36		25 - 150	03/25/19 10:32	03/30/19 16:06	1
13C8 FOSA	46		25 - 150	03/25/19 10:32	03/30/19 16:06	1
18O2 PFHxS	54		50 - 150	03/25/19 10:32	03/30/19 16:06	1
d3-NMeFOSAA	58		50 - 150	03/25/19 10:32	03/30/19 16:06	1
d5-NEtFOSAA	68		50 - 150	03/25/19 10:32	03/30/19 16:06	1
M2-6:2 FTS	124		25 - 150	03/25/19 10:32	03/30/19 16:06	1
M2-8:2 FTS	86		25 - 150	03/25/19 10:32	03/30/19 16:06	1

Client Sample ID: MW 22

Date Collected: 03/13/19 12:15
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-3
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		0.20	0.016	ug/L		03/19/19 10:12	03/19/19 20:35	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	30		10 - 150	03/19/19 10:12	03/19/19 20:35	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		16	2.4	ng/L		03/25/19 10:32	03/30/19 16:25	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		16	3.8	ng/L		03/25/19 10:32	03/30/19 16:25	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		16	1.2	ng/L		03/25/19 10:32	03/30/19 16:25	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		16	1.4	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorobutanesulfonic acid (PFBS)	**1.5**	J	1.6	0.40	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorobutanoic acid (PFBA)	**6.1**	J	1.6	0.82	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.6	0.74	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorodecanoic acid (PFDA)	ND		1.6	0.63	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorododecanoic acid (PFDoA)	ND		1.6	0.48	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.6	0.78	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluoroheptanoic acid (PFHpA)	**4.6**		1.6	0.75	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorohexanesulfonic acid (PFHxS)	**2.5**		1.6	0.66	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorohexanoic acid (PFHxA)	**5.1**	J	1.6	0.62	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorononanoic acid (PFNA)	**2.9**		1.6	0.22	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.6	0.53	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorooctanesulfonic acid (PFOS)	**17**		1.6	0.50	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorooctanoic acid (PFOA)	**9.3**		1.6	0.52	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluoropentanoic acid (PFPeA)	**8.3**		1.6	0.52	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.6	0.76	ng/L		03/25/19 10:32	03/30/19 16:25	1

Client Sample ID: MW 22

Date Collected: 03/13/19 12:15
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-3
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorotridecanoic acid (PFTriA)	ND		1.6	0.49	ng/L		03/25/19 10:32	03/30/19 16:25	1
Perfluoroundecanoic acid (PFUnA)	ND		1.6	0.44	ng/L		03/25/19 10:32	03/30/19 16:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*78*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C2 PFDoA	*70*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C2 PFHxA	*74*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C2 PFTeDA	*74*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C2 PFUnA	*77*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C3 PFBS	*65*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C4 PFBA	*35*		*25 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C4 PFHpA	*77*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C4 PFOA	*78*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C4 PFOS	*61*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C5 PFNA	*74*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C5 PFPeA	*50*		*25 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
13C8 FOSA	*56*		*25 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
18O2 PFHxS	*62*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
d3-NMeFOSAA	*67*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
d5-NEtFOSAA	*78*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
M2-6:2 FTS	*102*		*25 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*
M2-8:2 FTS	*86*		*25 - 150*	*03/25/19 10:32*	*03/30/19 16:25*	*1*

Client Sample ID: MW 30

Date Collected: 03/13/19 13:35
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-4
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	0.28		0.20	0.016	ug/L		03/19/19 10:12	03/19/19 20:51	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*33*		*10 - 150*	*03/19/19 10:12*	*03/19/19 20:51*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		16	2.3	ng/L		03/25/19 10:32	03/30/19 16:41	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		16	3.7	ng/L		03/25/19 10:32	03/30/19 16:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		16	1.2	ng/L		03/25/19 10:32	03/30/19 16:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		16	1.4	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorobutanesulfonic acid (PFBS)	**2.4**		1.6	0.39	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorobutanoic acid (PFBA)	**4.7**	J.	1.6	0.80	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.6	0.72	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorodecanoic acid (PFDA)	ND		1.6	0.61	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorododecanoic acid (PFDoA)	ND		1.6	0.47	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.6	0.76	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluoroheptanoic acid (PFHpA)	**1.8**		1.6	0.72	ng/L		03/25/19 10:32	03/30/19 16:41	1

Client Sample ID: MW 30
Date Collected: 03/13/19 13:35
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-4
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanesulfonic acid (PFHxS)	ND		1.6	0.64	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorohexanoic acid (PFHxA)	**2.8**	J.	1.6	0.61	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorononanoic acid (PFNA)	**0.81**	J.	1.6	0.22	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.6	0.51	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorooctanesulfonic acid (PFOS)	**1.8**		1.6	0.49	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorooctanoic acid (PFOA)	**8.0**		1.6	0.50	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluoropentanoic acid (PFPeA)	**5.3**		1.6	0.50	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.6	0.73	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluorotridecanoic acid (PFTriA)	ND		1.6	0.48	ng/L		03/25/19 10:32	03/30/19 16:41	1
Perfluoroundecanoic acid (PFUnA)	ND		1.6	0.42	ng/L		03/25/19 10:32	03/30/19 16:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*78*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C2 PFDoA	*68*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C2 PFHxA	*72*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C2 PFTeDA	*68*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C2 PFUnA	*74*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C3 PFBS	*55*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C4 PFBA	*28*		*25 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C4 PFHpA	*76*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C4 PFOA	*81*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C4 PFOS	*67*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C5 PFNA	*77*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C5 PFPeA	*43*		*25 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
13C8 FOSA	*51*		*25 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
18O2 PFHxS	*63*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
d3-NMeFOSAA	*65*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
d5-NEtFOSAA	*74*		*50 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
M2-6:2 FTS	*127*		*25 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*
M2-8:2 FTS	*95*		*25 - 150*	*03/25/19 10:32*	*03/30/19 16:41*	*1*

Client Sample ID: DUP 031319
Date Collected: 03/13/19 00:00
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-5
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	0.016	ug/L		03/19/19 10:12	03/19/19 21:08	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*34*		*10 - 150*	*03/19/19 10:12*	*03/19/19 21:08*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		16	2.4	ng/L		03/25/19 10:32	03/30/19 13:12	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		16	3.8	ng/L		03/25/19 10:32	03/30/19 13:12	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		16	1.2	ng/L		03/25/19 10:32	03/30/19 13:12	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		16	1.4	ng/L		03/25/19 10:32	03/30/19 13:12	1

Client Sample ID: DUP 031319

Date Collected: 03/13/19 00:00
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-5
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanesulfonic acid (PFBS)	**4.5**	J.	1.6	0.40	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorobutanoic acid (PFBA)	ND	UJ.	8.2	4.1	ng/L		03/25/19 10:32	04/11/19 23:13	5
Perfluorodecanesulfonic acid (PFDS)	ND		1.6	0.74	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorodecanoic acid (PFDA)	ND		1.6	0.63	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorododecanoic acid (PFDoA)	ND		1.6	0.48	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.6	0.78	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluoroheptanoic acid (PFHpA)	**0.93**	J	1.6	0.74	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorohexanesulfonic acid (PFHxS)	**1.1**	J	1.6	0.65	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorohexanoic acid (PFHxA)	**1.1**	J	1.6	0.62	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorononanoic acid (PFNA)	**1.3**	J	1.6	0.22	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.6	0.52	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorooctanesulfonic acid (PFOS)	**6.1**		1.6	0.50	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorooctanoic acid (PFOA)	**4.2**		1.6	0.52	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluoropentanoic acid (PFPeA)	**1.6**		1.6	0.52	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.6	0.75	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluorotridecanoic acid (PFTriA)	ND		1.6	0.49	ng/L		03/25/19 10:32	03/30/19 13:12	1
Perfluoroundecanoic acid (PFUnA)	ND		1.6	0.43	ng/L		03/25/19 10:32	03/30/19 13:12	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	*80*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C2 PFDoA	*74*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C2 PFHxA	*63*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C2 PFTeDA	*78*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C2 PFUnA	*80*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C3 PFBS	*46*	*	*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C4 PFBA	*93*		*25 - 150*	*03/25/19 10:32*	*04/11/19 23:13*	*5*
13C4 PFHpA	*73*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C4 PFOA	*82*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C4 PFOS	*68*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C5 PFNA	*79*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C5 PFPeA	*43*		*25 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
13C8 FOSA	*55*		*25 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
18O2 PFHxS	*59*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
d3-NMeFOSAA	*72*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
d5-NEtFOSAA	*80*		*50 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
M2-6:2 FTS	*137*		*25 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*
M2-8:2 FTS	*102*		*25 - 150*	*03/25/19 10:32*	*03/30/19 13:12*	*1*

Client Sample ID: EQUIPMENT BLANK

Date Collected: 03/12/19 16:15
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-6
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	0.016	ug/L		03/19/19 10:12	03/19/19 21:25	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,4-Dioxane-d8	*35*		*10 - 150*	*03/19/19 10:12*	*03/19/19 21:25*	*1*

Client Sample ID: EQUIPMENT BLANK

Date Collected: 03/12/19 16:15
Date Received: 03/14/19 10:08

Lab Sample ID: 200-47799-6
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND	UJ	17	2.5	ng/L		03/22/19 07:10	03/23/19 11:58	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		17	3.9	ng/L		03/22/19 07:10	03/23/19 11:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		17	1.3	ng/L		03/22/19 07:10	03/23/19 11:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		17	1.4	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.7	0.42	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorobutanoic acid (PFBA)	ND		1.7	0.85	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.76	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorodecanoic acid (PFDA)	ND		1.7	0.65	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.50	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.7	0.81	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluoroheptanoic acid (PFHpA)	ND		1.7	0.77	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.7	0.68	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorohexanoic acid (PFHxA)	ND		1.7	0.65	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorononanoic acid (PFNA)	ND		1.7	0.23	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.7	0.54	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.7	0.52	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorooctanoic acid (PFOA)	ND		1.7	0.54	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluoropentanoic acid (PFPeA)	ND		1.7	0.54	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.78	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	0.51	ng/L		03/22/19 07:10	03/23/19 11:58	1
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.45	ng/L		03/22/19 07:10	03/23/19 11:58	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFDA	106		50 - 150	03/22/19 07:10	03/23/19 11:58	1
13C2 PFDoA	88		50 - 150	03/22/19 07:10	03/23/19 11:58	1
13C2 PFHxA	94		50 - 150	03/22/19 07:10	03/23/19 11:58	1
13C2 PFTeDA	82		50 - 150	03/22/19 07:10	03/23/19 11:58	1
13C2 PFUnA	91		50 - 150	03/22/19 07:10	03/23/19 11:58	1
13C3 PFBS	129		50 - 150	03/22/19 07:10	03/23/19 11:58	1
13C4 PFBA	88		25 - 150	03/22/19 07:10	03/23/19 11:58	1
13C4 PFHpA	101		50 - 150	03/22/19 07:10	03/23/19 11:58	1
13C4 PFOA	91		50 - 150	03/22/19 07:10	03/23/19 11:58	1
13C4 PFOS	104		50 - 150	03/22/19 07:10	03/23/19 11:58	1
13C5 PFNA	96		50 - 150	03/22/19 07:10	03/23/19 11:58	1
13C5 PFPeA	107		25 - 150	03/22/19 07:10	03/23/19 11:58	1
13C8 FOSA	76		25 - 150	03/22/19 07:10	03/23/19 11:58	1
18O2 PFHxS	123		50 - 150	03/22/19 07:10	03/23/19 11:58	1
d3-NMeFOSAA	79		50 - 150	03/22/19 07:10	03/23/19 11:58	1
d5-NEtFOSAA	89		50 - 150	03/22/19 07:10	03/23/19 11:58	1
M2-6:2 FTS	90		25 - 150	03/22/19 07:10	03/23/19 11:58	1
M2-8:2 FTS	124		25 - 150	03/22/19 07:10	03/23/19 11:58	1

TestAmerica Burlington
30 Community Drive Suite 11
South Burlington, VT 05403
Phone (802) 660-1990 Fax (802) 660-1919

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: J. Locke / M. Sharif	Lab PM: Deyo, Melissa L	Carrier Tracking No(s):	COC No: 200-23127-10034.2
Client Contact: James Edwards	Phone: 607 793 6424	E-Mail: melissa.deyo@testamericainc.com		Page: Page ~~2 of 2~~ 1 of 1
Company: GEI Consultants, Inc.				Job #:
Address: 1301 Trumansburg Road Suite N	Due Date Requested:			
City: Ithaca	TAT Requested (days):			
State, Zip: NY, 14850				
Phone:	PO #: 1901029			
Email: jedwards@geiconsultants.com	WO #:			
Project Name: Suffern MGP Site, Suffern NY	Project #: 20008560			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	PFC_IDA - PFAS, Standard List (21)	8270D_SIM_MS_ID - 1,4-Dioxane	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N		
MW 10	3/13/19	0845	G	Water			X	X		
MW 4	3/13/19	0955	G	Water			X	X		
MW 22	3/13/19	1215	G	Water			X	X		
MW 30	3/13/19	1335	G	Water			X	X		
Dup 03/13/19	3/13/19	N/A	G	Water			X	X		
Equipment Blank	3/12/19	1615	G	Water			X	X		

200-47799 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 10:08 3/14/19	Company TA Burl
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
			Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

04/12/2019

Appendix B

Data Usability Study Results

Suffern, 1901029-1.1

Site: Suffern MGP, Suffern, NY
Laboratory: Test America, Burlington, VT and Edison, NJ
Report Nos.: 200-47778 and 200-47799
Reviewer: Lorie MacKinnon/GEI Consultants
Date: April 23, 2019

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
MW 16	200-47778-01	PFAS, 1,4-Dioxane
MW 5	200-47778-02	PFAS, 1,4-Dioxane
MW 33	200-47778-03	PFAS, 1,4-Dioxane
MW 35	200-47778-04	PFAS, 1,4-Dioxane
MW 10	200-47799-01	PFAS, 1,4-Dioxane
MW 4	200-47799-02	PFAS, 1,4-Dioxane
MW 22	200-47799-03	PFAS, 1,4-Dioxane
MW 30	200-47799-04	PFAS, 1,4-Dioxane
DUP 031319	200-47799-05	PFAS, 1,4-Dioxane
Equipment Blank	200-47799-06	PFAS, 1,4-Dioxane

Associated QC Samples:
Equipment Blank: Equipment Blank
Field Duplicate pair: MW 4/DUP 031319

The above-listed aqueous samples and equipment blank sample were collected on March 12 and 13, 2019 and were analyzed for perfluorinated alkyl substances (PFAS) by modified Method 537 and 1,4-Dioxane by 1,4-dioxane by SW-846 method 8270D selective ion monitoring (SIM) Isotope dilution. The data validation was performed based on the USEPA Region 2 SOP HW-35 (Revision 2) *Semivolatile Data Validation* (March 2013), modified for the methods referenced and professional and technical judgment.

The data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Initial and Continuing Calibrations
- Blanks
- Isotope Dilution Analyte (IDA) Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards

- Field Duplicate Results
- Quantitation Limits
- Sample Quantitation and Compound Identification

In general, the data appear usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data packages were found to be complete as received by the laboratory.

Holding Times and Sample Preservation

All criteria were met.

Initial and Continuing Calibrations

1,4-Dioxane

All initial and continuing calibration criteria were met.

PFAS

Compounds that did not meet criteria in the calibrations are summarized in the following table.

Instrument/ Calibration Standard	Compound	Calibration Exceedance	Validation Qualifier
LC410 CCV 03/30 12:56	Perfluorobutanoic acid (PFBA)	96.1 %D	Validation action was not taken as the standard recovery was high and results for PFBA were nondetect in the associated samples.
Associated samples: MW 10, DUP 031319			
LC410 Low Level CCVL 03/22/19 13:53	8:2 FTS	-62.1 %D	Estimate (UJ) nondetect results for 1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2 FTS) in samples MW 16, MW 5, MW 33, MW 35, and Equipment Blank; Low bias.
Associated samples: MW 16, MW 5, MW 33, MW 35, Equipment Blank			

Low level Continuing Calibration Verification (CCVL) percent recovery (%R) > 50%D; professional judgment was taken to estimate results less than the affected range of five times the reporting limit (RL) dependent on the recovery.

Blanks

Analytes were not detected in the associated laboratory method and field blank samples.

Isotope Dilution Analyte (IDA) Recoveries

The following tables lists the isotope dilution analytes recovered outside of the method recommended control limits and validation actions taken.

Sample	IDA	Recovery (%)	Control Limits (%)	Validation Actions
MW 10	13C3 PFBS	46	50-150	Estimate (J) the positive results for Perfluorobutanesulfonic acid (PFBS) in samples MW 10 and DUP 031319.
DUP 031319	13C3 PFBS	46		

It should be noted that IDA recoveries outside of control limits generally have a minimal effect on the data quality as the results are quantitated by isotope dilution and are corrected accordingly. However, professional judgment was taken to qualify affected compound results for associated isotope dilution analytes recovered outside of the recommended control limits.

MS/MSD Results

MS/MSD analyses were performed on sample MW 16 for 1,4-dioxane and PFAS. Recovery and precision criteria were met for 1,4-dioxane. The MS/MSD relative percent difference (RPD) for perfluoropentanoic acid (36%) exceeded the control limit of 20. The positive result for perfluoropentanoic acid (PFPeA) in sample MW 16 was estimated (J).

LCS Results

1,4-Dioxane

All criteria were met.

PFAS

The following tables list the LCS/LCSD recoveries and RPDs outside of the method control limits and the resulting actions.

Analyte	LCS ID: Associated Samples	LCS/LCSD %R (%)	RPD (%)	QC Limits (%)	Validation Actions
Perfluorobutanoic acid (PFBA)	LCS 200-141177: MW 10, MW 4, MW 22, MW 30, DUP 031319	68, 69	-	70-130	Estimate (J/UJ) the positive and nondetect results for PFBA in the associated samples; Low bias.
Perfluorohexanoic acid (PFHxA)		-	31	20	Estimate (J) the positive results for PFHxA in the associated samples; Indeterminate bias.
- criterion met					

Internal Standards

All criteria were met.

Field Duplicate Results

Samples MW 4 and DUP 031319 were submitted as the field duplicate pair with this sample group. The following table summarizes the RPDs of the detected analytes, which were within the acceptance criteria.

Analyte	MW 4 (ng/L)	DUP 031319 (ng/L)	RPD (%)
Perfluorobutanesulfonic acid (PFBS)	4.9	4.5	8.5
Perfluorobutanoic acid (PFBA)	4.3	8.2 U	NC, Within the RL
Perfluoroheptanoic acid (PFHpA)	0.97 J	0.93 J	4.2
Perfluorohexanesulfonic acid (PFHxS)	2.1	1.1 J	62.5, Within the RL
Perfluorohexanoic acid (PFHxA)	1.7	1.1 J	42.9, Within the RL
Perfluorononanoic acid (PFNA)	1.8	1.3 J	32.3, Within the RL
Perfluorooctanoic acid (PFOS)	7.5	6.1	20.6
Perfluorooctanoic acid (PFOA)	4.6	4.2	9.1
Perfluoropentanoic acid (PFPeA)	1.8	1.6	11.8
NC – Not calculable Criteria: When both results are ≥5x the RL, RPDs must be <30%. When results are < 5x the QL, the absolute difference between the original and field duplicate results must be < RL			

Quantitation Limits

Results were reported which were below the reporting limit (RL)/quantitation limit (QL) and above the method detection limit (MDL). These results were qualified as estimated (J) by the laboratory.

The following table lists the sample dilutions which were performed and the results to be reported.

Sample	PFAS Analysis Reported
MW 33	A five-fold dilution was performed due to non-target compounds. RLs were elevated in this sample.
MW 10	A five-fold dilution was performed for perfluorobutanoic acid (PFBA) due to interference from non-target compounds. The RL was elevated for this compound.
DUP 031319	A five-fold dilution was performed for perfluorobutanoic acid (PFBA) due to interference from non-target compounds. The RL was elevated for this compound.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

The following table lists the compound signal abundance ratios which were outside of the acceptance criteria of 50 – 150 percent. The positive results for these compounds are considered to be estimated maximum possible concentrations and are estimated (J).

Sample	Compound	Ratio	Acceptance Limits	Validation Action
MW 5	Perfluorobutanesulfonic acid (PFBS)	0.79	0.83-2.51	Estimate (J) results for PFBS and PFNA in sample MW 5.
	Perfluorononanoic acid (PFNA)	8.11	2.50-7.50	
	Perfluorodecanesulfonic acid (PFDS)	0.50	0.63-1.88	Results for PFDS and PFUnA were detected below the method detection limits (reported as nondetect), therefore validation actions were not taken.
	Perfluoroundecanoic acid (PFUnA)	3.46	3.53-10.58	

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.