

Mr. Daniel Lanners New York State Department of Environmental Conservation 625 Broadway Albany, New York 12233-7014

Subject:

Emerging Contaminant Groundwater Sampling Results

Orange and Rockland Utilities, Inc. Port Jervis Former MGP Site City of Port Jervis, Orange County, New York NYSDEC Site No. 336049

Dear Mr. Lanners:

On behalf of Orange and Rockland Utilities, Inc. (O&R), Arcadis of New York, Inc. (Arcadis) has prepared this letter to summarize the work performed and findings of a per- and polyfluoroalkyl substance (PFAS) and 1,4-dioxane (i.e., emerging contaminants) groundwater investigation at the O&R former manufactured gas plant (MGP) site located in the City of Port Jervis, Orange County, New York, (New York State Department of Environmental Conservation [NYSDEC] Site No. 336049). The groundwater investigation was performed in response to the NYSDEC's request in a May 30, 2018 letter.

As summarized herein, PFAS compounds were detected at low-level concentrations in groundwater samples collected from three monitoring wells. 1,4-dioxane was not detected in any of the groundwater samples. An overview of the groundwater sampling is presented below, followed by a summary of the groundwater investigation activities and the analytical results.

GROUNDWATER SAMPLING OVERVIEW

The following three monitoring wells, shown on the attached Figure 1, were selected for emerging contaminant sampling:

- MW-6 (upgradient monitoring well);
- MW-29 (monitoring well located in a central location of the site); and
- MW-24 (downgradient monitoring well).

Arcadis of New York, Inc. 855 Route 146 Suite 210 Clifton Park New York 12065 Tel 518 250 7300 Fax 518 250 7301 www.arcadis.com

ENVIRONMENT

Date: August 6, 2019

Contact: Mark Flusche

Phone: 518.250.7322

Email: Mark.flusche@arcadis.com

Our ref:

B0043021.0020

The above-listed monitoring wells represent an upgradient well located closest to the upgradient site boundary (MW-6), a well located in the center of the dissolved-phase benzene, toluene, ethylbenzene, and xylene (BTEX) and polyaromatic hydrocarbon (PAH) plume (MW-29), and a downgradient well located closest to the downgradient site boundary and downgradient of the central well selected for sampling (MW-24). The three selected wells are all located near the axis of the dissolved-phase BTEX and PAH plume and do not contain MGP source material.

The emerging contaminant groundwater samples were collected on May 20, 2019 and analyzed in accordance with the following documents:

- The NYSDEC-approved July 6, 2018 *Emerging Contaminant Groundwater Sampling Work Plan* for Con Edison and O&R MGP Sites (i.e., Work Plan) prepared by GEI Consultants, Inc., (GEI).
- NYSDEC's Groundwater Sampling for Emerging Contaminants guidance document.
- Updated Emerging Contaminants Sampling Schedule submitted to NYSDEC on February 20, 2019.

GROUNDWATER SAMPLING ACTIVITIES

Arcadis collected groundwater samples for PFAS and 1,4-dioxane analysis from monitoring wells MW-6, MW-24, and MW-29 on May 20, 2019. Quality assurance/quality control (QA/QC) samples, consisting of a field duplicate, a matrix spike, matrix spike duplicate sample, and an equipment blank were also collected. The equipment blank was collected by pumping laboratory-supplied "PFAS-free" water through high-density polyethylene (HDPE) tubing using a peristaltic pump with silicone tubing. The matrix spike, matrix spike duplicate samples were collected from MW-24.

Groundwater purging and sampling was performed using the low-flow techniques presented in the Work Plan. A peristaltic pump and HDPE tubing (separate disposable tubing for each well) were used to purge and sample groundwater from each monitoring well. Field parameters measured during purging and immediately prior to sampling are presented on the groundwater sampling logs included in Attachment A.

Each groundwater sample was placed in two laboratory-provided, pre-cleaned 250-ml HDPE bottles for PFAS analysis and two 1-liter amber glass bottles for 1,4-dioxane analysis. The PFAS samples were then placed in a dedicated PFAS cooler on ice and the 1,4-dioxane samples were placed in a separate dedicated 1,4-dioxane cooler on ice. The water level probe was decontaminated between each well using Alconox® and a "PFAS-free" water rinse. Arcadis submitted seven samples (including QA/QC samples) to Eurofins TestAmerica (TestAmerica) for laboratory analysis of the 21 PFAS compounds listed in NYSDEC's *Groundwater Sampling for Emerging Contaminants guidance document* by U.S. Environmental Protection Agency (EPA) Method 537 and 1,4-dioxane by EPA Method SIM 8270D.

Purge water and disposable sampling equipment were containerized into two separate 55-gallon drums for subsequent off-site disposal. The drums were picked up on July 9, 2019 by IWT Transport Inc. for non-hazardous waste disposal by Clean Earth of North Jersey, Inc. The waste manifest is included in Attachment B.

GROUNDWATER SAMPLING RESULTS

Arcadis validated the groundwater analytical results and found the results to be useable as reported. The laboratory analytical data report and data validation report are provided in Attachments C and D, respectively. As shown in the laboratory data package in Attachment C, PFAS compounds and 1,4-dioxane were not detected in the equipment blank and the duplicate result correlations were acceptable. The validated PFAS and 1,4-dioxane groundwater analytical results are presented in Table 1 and on Figure 1.

As shown in Table 1, 1,4-dioxane was not detected in the groundwater samples. PFAS compounds were detected at low-level concentrations in groundwater sampled from the three wells. The perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) analytical results are summarized by location below:

Well ID	NYSDOH Proposed Drinking Water Standard (ng/L)	PFOA Concentration (ng/L)	PFOS Concentration (ng/L)
MW-6	10	20	7.7
MW-24	10	11 [11]	9 U [14 J]
MW-29	10	21	18 J

Note:

- 1. ng/L: nanograms per liter
- 2. J: Estimated value.
- 3. U: Not detected. Reporting limit shown.
- 4. Concentration in brackets is from the analysis of a duplicate sample.

The state of New York does not currently have standards for PFAS compounds in drinking water or groundwater. However, the New York State Department of Health (NYSDOH) has proposed to set the drinking water standard for both PFOA and PFOS at 10 nanograms per liter (ng/L). The PFOA concentrations were slightly greater than the proposed drinking water standard at each of the three monitoring wells. PFOS was detected at estimated concentrations slightly greater than the proposed drinking water standard at two of the monitoring wells. There are currently no proposed standards in New York State for other PFAS compounds.

Due to the presence of PFOA and PFOS in groundwater collected from upgradient well MW-6, the PFAS compounds detected in groundwater collected from the site appear to be from an upgradient source or are representative of background concentrations.

Mr. Daniel Lanners August 6, 2019

Please do not hesitate to call me at 518-250-7322 or Maribeth McCormick of O&R at (914) 557-1361 if you have any questions or require additional information.

Sincerely,

Arcadis of New York, Inc.

Mark Flendle

Mark Flusche, P.G. Senior Hydrogeologist

Copies: Amen Omorogbe (NYSDEC) Maribeth McCormick (O&R)

Enclosures:

Table

1 Emerging Contaminant Analytical Results

Figure

1 Monitoring Well Locations

Attachments

- A Groundwater Sampling Logs
- B Non-Hazardous Waste Manifest
- C Laboratory Analytical Results
- D Data Validation Report

TABLES



Table 1 Emerging Contaminant Groundwater Analytical Results Orange and Rockland Utilities Former MGP Site Port Jervis, New York

Location ID:		MW-6	MW-24	MW-29
Date Collected:		05/20/19	05/20/19	05/20/19
Sample Name:	Units	MW-6-20190520	MW-24-20190520	MW-29-20190520
Semivolatile Organics				
1,4-Dioxane	ug/L	0.2 U	0.2 U [0.2 U]	2 UJ
PFAS compounds				
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ng/L	18 U	90 UJ [90 UJ]	85 U
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ng/L	18 U	90 UJ [90 UJ]	85 U
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	18 UJ	90 UJ [90 UJ]	85 U
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	18 UJ	90 UJ [90 UJ]	85 U
Perfluorobutanesulfonic acid (PFBS)	ng/L	6.8	9.6 J [7.3 J]	24
Perfluorobutanoic acid (PFBA)	ng/L	24 J	37 J [24 J]	8.5 UJ
Perfluorodecanesulfonic acid (PFDS)	ng/L	1.8 U	9 U [9 U]	8.5 U
Perfluorodecanoic acid (PFDA)	ng/L	1.8 U	9 U [9 U]	8.5 U
Perfluorododecanoic acid (PFDoA)	ng/L	1.8 U	9 U [9 UJ]	8.5 U
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	1.8 U	9 U [9 U]	8.5 U
Perfluoroheptanoic acid (PFHpA)	ng/L	11	5.6 J [6.2 J]	5.6 J
Perfluorohexanesulfonic acid (PFHxS)	ng/L	4.3	9.1 J [9 J]	15 J
Perfluorohexanoic acid (PFHxA)	ng/L	93	13 [16]	15 J
Perfluorononanoic acid (PFNA)	ng/L	1.8 U	9 U [9 U]	8.5 U
Perfluorooctanesulfonamide (PFOSA)	ng/L	1.8 UJ	9 U [9 U]	8.5 U
Perfluorooctanesulfonic acid (PFOS)	ng/L	7.7	9 U [14 J]	18 J
Perfluorooctanoic acid (PFOA)	ng/L	20	11 [11]	21
Perfluoropentanoic acid (PFPeA)	ng/L	75 J	8 J [17 J]	8.5 UJ
Perfluorotetradecanoic acid (PFTeA)	ng/L	1.8 UJ	9 UJ [9 UJ]	8.5 U
Perfluorotridecanoic acid (PFTriA)	ng/L	1.8 U	9 U [9 U]	8.5 U
Perfluoroundecanoic acid (PFUnA)	ng/L	1.8 U	9 U [9 U]	8.5 U

Notes	Definition
J	Estimated value.
U	Not detected. Reporting limit shown.
[value]	The duplicate sample results.

FIGURES





PLOTTED: 9/30/2016 1:38 PM PLTFULL.CTB PLOTSTYLETABLE: SAVED: 9/30/2016 1:37 PM LAYOUT: 3 \B0043021.0011 Site.dwg DB: J.LOVING 0043021\0011\00 DIV/GROUP:ENVCAD JRN-T0\Svracuse-NY\B CITY:I SYRACUSE-NY G:\ENVCAD\Irvine\RET

ATTACHMENT A

Groundwater Sampling Logs



MONITORING WELL FIELD DATA SHEET - Low-Flow Sampling

Project Name: O&R - Port Jervis - Emerging Contaminant Sampling				Monitoring Well I.D. S				ample Identification		
Project Loca	oject Location: Port Jervis, NY			MW-6 MW/6			201005	0100520		
Project Num	ber: B0043021-0020		_	(an a to 1)	141		MW-6-20190520			20
				Well N	leasurement D	ata				
Date:	5 20 2019	Depth (ft.)	Time: 10:48) - True DTW/(6)	Sampler(s):	MM	Weather:	Partly Sunr	y 95 Degrees Fahre	enheit
Depth to LN	APL	Deput (n.)	+ Corr. Factor (n	= 1 Fue D1W (ft.)	1	Water Quality Br	and/Model/Serial #			
Depth to Wa	ater	12.45	+	-		Turbidity Meter I	Brand/Model/Serial	1#		
Depth to DN	APL		+	=		Water Level Met	er Brand/Model/Se	rial #		
Depth to Bo	ttom	23.65	+	=		LNAPL Thick	ness:	DNAP	L Thickness:	
Comments:	Dog ears broken, missi	ng bolts								
	Steel Casing: 0 Well Cap Good Well I.D.: Visib Cement Collar: 0 Lock: Good / Comments:	Outside)/ Bent / Damu / Broken / Rus le / Illegible / K / Cracked / 1 Broken / Rusted	G aged / None ted / None meaved / None None	eneral Condition	: Good / Fair g & Stabilizati	V Needs Re PVC Casing: (Is PVC Plumb) H2O between F Evidence of: Ponding Aroun Area Around W	pair Inside K Damaged Ves No VC and Steel? One Spiders d Well? No /ell Flagged?	None No / Ye / Rodents / Yes Yes / N	s / Bees, Wasy	25
'ump Intake	Depth (feet):				C	Purging/Samplin	g Device: Grundfor	s / Pristaltic / Bla	er / Other	_
Time	Water Level (ft)	Pump Dial (Hz)	Pump Rate (mL/min)	Purge Volume (Liters)	Temp. (°C)	SC (uS/cm)	pH (SU)	ORP (mv)	DO (mg/L)	Turb. (NTU
	max. 0.3' drawdown				3%	3%	0.1 SU	10mV	10%	10% (if>1)
10:50	12.73		200	0.5	16.41	0.106	7.87	12.0	9.42	11.47
10:55	12.71		200	-1.0	15,4	0.196	7.62	18.1	8.73	11.47
11:00	12.72		200	1,5	14.85	0.286	7.49	21.0	6.95	103
11:05	12.72		200	2.0	14.65	0.387	7.41	19.5	C 10	
11.10	12 72		200	2.0	14.05	0.307	7.41	18.5	5.19	2.67
11.10	12,73		200	2.5	14.61	0.464	7.38	15.4	4.21	1.59
11:15	12.73		200	3.0	14.07	0.517	7.36	10.7	3.21	0.97
	_			Sa	mple Data				_	
opearance: Co C T S mments: S	olor: Clear Grey / Odor: None (Desc 'urbidity: Clear Si heen: None (light ampled at 11:25	Orange / Yellow / ribe) ty(slightly / very) : / heavy) / (hydr	Brown / Black / / Sandy (slightly ocarbon / organic)	Other / very) / Other	_	Container 250 ml plastic 1 L Amber	Number 2 2	Pres. None None	Ana PF. 1,4-Di	lysis AS oxane

MONITORING WELL FIELD DATA SHEET - Low-Flow Sampling

Project Name: O&R - Port Jervis - Emerging Contaminant Sampling					Monitorin	g Well I.D.		Sampl	e Identification	
Project Locat	tion: Port Jervis, NY				MW	MW-24 MW-24_201005			520	
Project Number: B0043021-0020				337.45 ×						
Data:	6 20 2010		Times 12:50	Well M	leasurement D	ata				
Date:	5/20/2019	Depth (ft.)	+ Corr. Factor (ft) = True DTW (ft.)	[Sampler(s):	MM	Weather:	Cloudy 95 1	Degrees Fahrenheit	
Depth to LN	APL	Depin (it.)	+	=	1	Water Quality Bra	and/Model/Serial #			
Depth to Wa	iter	16.02	+	-	1	Turbidity Meter B	rand/Model/Serial	#		
Depth to DN	APL		+	=		Water Level Mete	r Brand/Model/Ser	rial #		
Depth to Bot	tom		+	=		LNAPL Thick	ness:	DNAP	L Thickness:	
Comments:				111 11 0						
	Steel Casing: O Well Cap: Ood Well I.D.: Visib Cement Collar: C Lock: Good / 1 Comments:	Dutside Ø / Bent / Dama / Broken / Rus P/ Illegible / N P/ Cracked / Broken / Rusted	aged / None sted / None lone Heaved / None	Purgin	g & Stabilizati	/ Needs Rep PVC Casing: (Is PVC Plumb? H2O between P Evidence of N Ponding Around Area Around W	air Inside N/ Damaged Yes / No VC and Steel? (Ione / Spiders I Well? No ell Flagged?	/ None No/ Yes / Rodents / Yes Yes / N	i / Bees, Wasp o	15
ump Intake	Depth (feet):					Purging/Sampling	g Device: Grundfos	s / Prostaltic / Blad	er / Other	-
Time	Water Level (ft)	Pump Dial (Hz)	Pump Rate (mL/min)	Purge Volume (Liters)	Тетр. (° С)	SC (uS/cm)	pH (SU)	ORP (mv)	DO (mg/L)	Turb. (NTU
I (max. 0.3' drawdown				3%	3%	0.1 SU	10mV	10%	10% (if>1)
12:55			200	0.5	15.36	1.069	8.07	-45.5	0.51	39.5
13:00			200	1.0	15.46	1.090	8.02	-44.0	0.3	7 57
13:05			200	15	15 79	1.099	8.02	45.7	0.37	1.54
12.10			200		13.26	1.000	0.02	-45.7	0.27	6.95
13:10			200	2.0	15.3	1,055	7.99	-46.6	0.15	19.1
13:15			200	2.5	15.34	1.022	7.95	-46.1	0.14	14.5
				Sa	mple Data					
pearance: Co C T	olor: Clear / Grey / Dor: None / (Desc 'urbidity: Clear / Sil	Orange/Yellow ribe) ty (slightly (very)	/ Brown / Black /	Other / very) / Other	_	Container 250 ml plastic 1 L Amber	Number 8 8	Pres. None None	Ana PF. 1,4-Di	lysis AS oxane
mments: 1	3:10 - Fe deposits, lif	ted tubing approximated tubing approximated tubing approximated MS/MSD and Du	ately 1-2 feet plicate Sample							

MONITORING WELL FIELD DATA SHEET - Low-Flow Sampling

Project Name	oject Name: O&R - Port Jervis - Emerging Contaminant Sampling				Monitorin	g Well I.D.		Sampl	e Identification	
Project Loca	tion: Port Jervis, NY				MW-29MW-20_20		9-201905	0100520		
Project Num	ber: B0043021-0020	21-0020 Not Mo				surgement Data		11111-29-20190320		
Date:	5/20/2019		Time: 14:15	wentw	Sampler(s)	MM	Weather	Barth Clau	4. 05 Deereer Fals	ande a te
Juic.	5/20/2017	Depth (ft.)	+ Corr. Factor (ft.) = True DTW (ft.)	[Sampler(s).	IVIIVI	weather.	Parity Cloud	iy 95 Degrees Fanr	enneit
Depth to LN	APL		+	=]	Water Quality Bra	and/Model/Serial #			
Depth to Wa	ater	15.23	+	=		Turbidity Meter E	Brand/Model/Serial	#		
Depth to DN	APL		+	=	-	Water Level Meter	er Brand/Model/Ser	ial #		
Depth to Bo	ttom		+	=	1	LNAPL Thick	ness:	DNAP	L Thickness:	
Johnneins:				Well Co	ndition Inspec	tion				
	Steel Casing: Well Cap: Good Well I.D.: Visib Cement Collar: Lock: Good / Comments:	Outside K / Bent / Dama J / Broken / Rus ole / Illegible / (OK / Cracked / Broken / Rusted	G aged / None ited / None ine Heaved / None	eneral Condition:	: Good / Fair	/ Needs Rep PVC Casing: Is PVC Plumb? H2O between P Evidence of: Ponding Aroum Area Around W	Dair Inside No VC and Steel? Nonc/ Spiders d Well? No/ Vell Flagged?	/ None No / Yes / Rodents Yes / N	s / Bees, Wasp o	05
				Purgin	g & Stabilizati	on				
ump Intake	e Depth (feet):					Purging/Samplin	g Device: Grundfos	/ Postaltic / Blac	er / Other	_
Time	Water	Pump Dial (Hz)	Pump Rate	Purge Volume	Temp. (°c)	SC (uS/cm)	pH (SU)	ORP	DO (mg/L)	Turb. (NTU
	max. 0.3' drawdown		(inc) inc)	(LINUS)	3%	3%	0.1 SU	10mV	10%	10% (if>1)
14:20			200	0.5	16.02	1.186	8.03	-77.6	0.59	5.91
14:25			200	1.0	15.99	1.175	7.98	-78.9	0.27	6.30
14:30			200	1.5	16.03	1.163	7.96	-82.9	0.11	5.85
14:35			200	2.0	16.35	1.165	79	87.6	0.00	4.07
14.40			200		15.03	1 150	7.02	-02.0	0.07	4.57
				Sa	mple Data					
				54	pre Data	Container	Number	Pres.	Ала	lysis
opearance: C (] s mments: S	Color: Clear / Grey Odor: None / (Desc Turbidity: Clear / Si Sheen: None / (ligh Sampled at 14:45	/ Orange / Yellow cribe) ilty (slightly / very) it / heavy) / (hyd	/ Brown / Black / / Sandy (slightly rocarbon / organic)	Other		250 ml plastic 1 L Amber	2 2	None None	PF. 1,4-Di	AS oxane
omments: S	Sheen: None / (ligh Sampled at 14:45	it / heavy) / (hyd	rocarbon / organic)							

ATTACHMENT B

Non-Hazardous Waste Manifest



NON-HAZARDOUS WASTE MANIFEST	1. Generator ID Nur	nber		2. Page 1 of 1	3. Emergency Respor 511	onse Phone 4. Waste Tracking Number 18-250-7322					_
5. Generator's Name and Mail Generator's Phone. 845-29	ling Address 4-1757	Orange and R 3 Old Chester Goshen, NY 1	lockland Uti Road 10924	ities, inc	Generator's Site Addre Orang 1-9 Pi Port J	es (if different t and Ro ke Street ervis, NY	han mailing add ckland Util 12771	lities, Inc	<u>)</u> ,		
6. Transporter 1 Company Na	me ransport inc						U.S. EPA ID) Number			
7. Transporter 2 Company Na	me							Munther	NJR98	662816	2
				×. 1			0.5. EPA ID	Number			
8. Designated Facility Name a Facility's Phone: 97334 -	nd Site Address	Clean Ea 105 Jacol Keamy N	rth of North bus Ave. J 07032	Jersey, I	nc.		U.S. EPA ID) Number	NJD99	129110	5
9. Waste Shipping Nam	e and Description				10. Cor	tainers	11. Total	12. Unit			
	io and Decemption		- 1		No.	Туре	Quantity	Wt./Vol.	1. A. 10		
Non-Hazardo	ous Waste				1	DM	50	P	1072		
^{2.} Non-Hazardo	ous Waste				1	DM	50	P	ID27		1
3.											
4.				_							-
14. GENERATOR'S/OFFERO marked and labeled/placar	R'S CERTIFICATION: ded, and are in all resp yped Name	I hereby declare that the ects in proper condition f	contents of this co for transport accord	insignment ar ling to applica Sign	re fully and accurately de able international and na nature	escribed above tional governme	by the proper sh ental regulations	hipping name 5.	, and are classif Month	ied, packag Day	ged, Year
15. International Shipments	Import to U	.S.		Export from U	.s. Port of e	entry/exit:	Car	mil	9	19	19
Transporter Signature (for expo	orts only): ant of Receipt of Materi	ale			Date lea	ving U.S.:					
Transporter 1 Printed/Typed Na	ame			Sigr	natures O				Month	Dav	Voor
Transporter 2 Printed/Typed Na	ame	AMRON	,	Sigr	P) Jon	Con	<u> </u>		Month	Day	Year
17. Discrepancy											
17a. Discrepancy Indication Sp	Quantity		П Туре		Residue		Partial Rej	jection		Full Reject	tion
17b. Alternate Facility (or Gene	erator)				Manifest Reference	Number:	U.S. EPA ID	Number			
Facility's Phone:							T.	and for all the f			
17c. Signature of Alternate Fac	ility (or Generator)			Ĩ					Month	Day	Year
17c. Signature of Alternate Fac	ility (or Generator)			1	3/31			1. 20	Month	Day	Year
17c. Signature of Alternate Fac	ility (or Generator)	on of receipt of materials	covered by the ma	nifest except	as noted in Item 17a			N - 5 E	Month	Day	Year

ATTACHMENT C

Laboratory Analytical Results



Environment Testing TestAmerica

ANALYTICAL REPORT

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

Laboratory Job ID: 480-153995-1

Client Project/Site: Orange & Rockland Utilities -Port Jervis

For:

ARCADIS U.S. Inc 855 Route 146 Suite 210 Clifton Park, New York 12065

Attn: Mark Flusche

Authorized for release by: 6/18/2019 6:04:37 PM Rebecca Jones, Project Management Assistant I rebecca.jones@testamericainc.com

Designee for

LINKS

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Expert

Melissa Deyo, Project Manager I (716)504-9874 melissa.deyo@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Detection Summary	6
Client Sample Results	7
Isotope Dilution Summary	13
QC Sample Results	15
QC Association Summary	21
Lab Chronicle	23
Certification Summary	25
Method Summary	26
Sample Summary	27
Chain of Custody	28
Receipt Checklists	31

Definitions/Glossary

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Job ID: 480-153995-1

Qualifiers

Qualifiers		3
GC/MS Sem Qualifier *	i VOA Qualifier Description Isotope Dilution analyte is outside acceptance limits.	_ 4
E	Result exceeded calibration range.	5
LCMS Qualifier	Qualifier Description	6
* F1	Isotope Dilution analyte is outside acceptance limits. MS and/or MSD Recovery is outside acceptance limits.	
F2 J	MS/MSD RPD exceeds control limits Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value	
Glossary		- 8
Abbreviation	These commonly used abbreviations may or may not be present in this report.	- 9

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: 480-153995-1

Laboratory: Eurofins TestAmerica, Buffalo

Narrative

Job Narrative 480-153995-1

Receipt

The samples were received on 5/22/2019 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.3° C.

GC/MS Semi VOA

Method(s) 8270D SIM ID: The following sample was diluted due to the nature of the sample matrix: MW-29-20190520 (480-153995-3). Elevated reporting limits (RLs) are provided.

Method(s) 8270D SIM ID: Surrogate recovery for the following sample was outside acceptance limits: MW-29-20190520 (480-153995-3). Due to insufficient volume remaining for re-extraction, the results have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

LCMS

Method(s) 537 (modified): The continuing calibration verification (CCV) associated with batch 200-143837 recovered above the upper control limit for Perfluoropentanoic acid (PFPeA). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 537 (modified): The matrix spike / matrix spike duplicate / sample duplicate (MS/MSD/DUP) precision for preparation batch 200-143529 and analytical batch 200-143837 was outside control limits for Perfluorobutanesulfonic acid (PFBS), Perfluorohexanesulfonic acid (PFHxS), Perfluoropentanoic acid (PFPeA), N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA) and 1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2). Sample matrix interference and non-homogeneity are suspected.

Method(s) 537 (modified): Results for samples MW-24-20190520 (480-153995-2), MW-24-20190520 (480-153995-2[MS]), MW-24-20190520 (480-153995-2[MSD]), MW-29-20190520 (480-153995-3) and DUP-20190520 (480-153995-4) were reported from the analysis of a diluted extract due to high concentration of the target analyte in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

Method(s) 537 (modified): 187O2 PFHxS, d3-NMeFOSAA and d5-NEtFOSAA Isotope Dilution Analyte (IDA) recoveries associated with the following sample are below the method recommended limit: (LCS 200-143529/2-A). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

Method(s) 537 (modified): d3-NMeFOSAA Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit: (MB 200-143529/1-A). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

Method(s) 537 (modified): 13C3 PFBS, d3-NMeFOSAA and d5-NEtFOSAA Isotope Dilution Analyte (IDA) recoveries associated with the following sample is below the method recommended limit: MW-24-20190520 (480-153995-2[MS]). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

Method(s) 537 (modified): 13C3 PFBS, 13C2 PFDoA, 13C2 PFTeDA, d3-NMeFOSAA, d5-NEtFOSAA and 13C4 PFOS Isotope Dilution Analyte (IDA) recoveries associated with the following sample is below the method recommended limit: DUP-20190520 (480-153995-4). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

Method(s) 537 (modified): 13C4 PFBA, 13C2 PFTeDA, d3-NMeFOSAA and d5-NEtFOSAA Isotope Dilution Analyte (IDA) recoveries associated with the following sample is below the method recommended limit: MW-6-20190520 (480-153995-1). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

Job ID: 480-153995-1 (Continued)

Laboratory: Eurofins TestAmerica, Buffalo (Continued)

Method(s) 537 (modified): 13C3 PFBS, 13C2 PFTeDA, d3-NMeFOSAA and d5-NEtFOSAA Isotope Dilution Analyte (IDA) recoveries associated with the following sample is below the method recommended limit: MW-24-20190520 (480-153995-2). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

Method(s) 537 (modified): 13C3 PFBS, 18O2 PFHxS, 13C2 PFDoA, 13C2 PFTeDA, d3-NMeFOSAA and d5-NEtFOSAA Isotope Dilution Analyte (IDA) recoveries associated with the following sample are below the method recommended limit: MW-24-20190520 (480-153995-2[MSD]). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

Method(s) 537 (modified): 13C4 PFBA, 13C2 PFHxA, 18O2 PFHxS and 13C4 PFOS Isotope Dilution Analyte (IDA) recoveries associated with the following sample are below the method recommended limit: MW-29-20190520 (480-153995-3). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

Method(s) 537 (modified): 18O2 PFHxS, 13C2 PFTeDA, d3-NMeFOSAA and d5-NEtFOSAA Isotope Dilution Analyte (IDA) recoveries associated with the following sample are below the method recommended limit: EB-020190520 (480-153995-5). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample(s). All detection limits are below the lower calibration.

Method(s) 537 (modified): The low level continuing calibration verification (CCVL) associated with batch 200-144054 recovered above the upper control limit for Perfluorobutanoic acid (PFBA) and Perfluorobutanesulfonic acid (PFBS). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method(s) 537 (modified): The following samples were diluted due to the abundance of non-target analytes: MW-24-20190520 (480-153995-2) and MW-24-20190520 (480-153995-2[MS]). A more concentrated analysis was not possible.

Method(s) 537 (modified): Results for samples MW-24-20190520 (480-153995-2) and MW-24-20190520 (480-153995-2[MS]) were reported from the analysis of a diluted extract due to high concentration of target and/or non-target analytes in the analysis of the undiluted extract. The dilution factor was applied to the labeled internal standard area counts and these area counts were within acceptance limits

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

RL

1.8

1.8

1.8

1.8

18

1.8

1.8

1.8

RL

9.0

9.0

9.0

9.0

9.0

9.0

9.0

RL

8.5

8.5

8.5

8.5

9.0

9.0

9.0

9.0

9.0

9.0

MDL Unit

0.88 ng/L

0.67 ng/L

0.56 ng/L

0.43 ng/L

0.71 ng/L

0.54 ng/L

MDL Unit

ng/L

ng/L

2.2 ng/L

3.6 ng/L

MDL Unit

3.2 ng/L

3.9 ng/L

2.7 ng/L

2.1 ng/L

4.5 ng/L

2.8

3.4 ng/L

4.1 na/L

2.8

0.56 ng/L

0.80 ng/L

Result Qualifier

24

75

93

11

20

6.8

4.3

7.7

37

13

5.6

11

9.6 F2

9.1 F2

Result Qualifier

15

21

24

16

11

90

6.2 J

7.3 J

5.6 J

Result Qualifier

8.0 J F2

.

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: MW-6-20190520

Client Sample ID: MW-24-20190520

Client Sample ID: MW-29-20190520

Analyte

Analyte

Analyte

Analyte

Perfluorobutanoic acid (PFBA)

Perfluoropentanoic acid (PFPeA)

Perfluorohexanoic acid (PFHxA)

Perfluoroheptanoic acid (PFHpA)

Perfluorobutanesulfonic acid (PFBS)

Perfluorooctanesulfonic acid (PFOS)

Perfluorohexanesulfonic acid (PFHxS)

Perfluorooctanoic acid (PFOA)

Perfluorobutanoic acid (PFBA)

Perfluoropentanoic acid (PFPeA)

Perfluorohexanoic acid (PFHxA)

Perfluoroheptanoic acid (PFHpA)

Perfluorobutanesulfonic acid (PFBS)

Perfluorohexanesulfonic acid (PFHxS)

Perfluorooctanoic acid (PFOA)

Perfluorohexanoic acid (PFHxA)

Perfluoroheptanoic acid (PFHpA)

Perfluorobutanesulfonic acid (PFBS)

Perfluorohexanesulfonic acid (PFHxS) Perfluorooctanesulfonic acid (PFOS)

Client Sample ID: DUP-201

Perfluorooctanoic acid (PFOA)

Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA)

Perfluoroheptanoic acid (PFHpA)

Perfluorobutanesulfonic acid (PFBS)

Perfluorohexanesulfonic acid (PFHxS)

Perfluorooctanoic acid (PFOA)

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Total/NA

Prep Type

Total/NA

5-4

pe

5

5

5

5

5

5

Dil Fac D

5

5

5

5

5

5

5

5

5

5

537 (modified)

Lab Sample ID: 480-153995-5

Method

Lab Sample ID: 480-153995-3

Lab Sam	nple ID: 480	-153995-1	
Dil Fac D	Method	Prep Type	
1	537 (modified)	Total/NA	
1	537 (modified)	Total/NA	
1	537 (modified)	Total/NA	5
1	537 (modified)	Total/NA	
1	537 (modified)	Total/NA	
1	537 (modified)	Total/NA	
1	537 (modified)	Total/NA	
1	537 (modified)	Total/NA	
	. ,		0
Lab San	1ple ID: 480	-153995-2	0
Dil Fac D	Method	Prep Type	9
5	537 (modified)	Total/NA	
5	537 (modified)	Total/NA	

_	

15		8.5	3.4	ng/L	5		537 (modified)	Total/NA
18		8.5	2.6	ng/L	5		537 (modified)	Total/NA
90520					Lab Sa	am	nple ID: 480	-15399
Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Ty
24		9.0	4.5	ng/L	5	_	537 (modified)	Total/NA
47					-		507 (UC I)	T (1010
17		9.0	2.8	ng/L	5		537 (modified)	I otal/NA

3.4 ng/L

4.1 ng/L

2.8 ng/L

2.2 ng/L

3.6 ng/L

2.7 ng/L

Perfluorooctanesulfonic acid (PFOS) 14 Client Sample ID: EB-020190520

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: MW-6-20190520 Date Collected: 05/20/19 11:25 Date Received: 05/22/19 09:15

Job ID: 480-153995-1

Lab Sample ID: 480-153995-1 Matrix: Water

Method: 8270D SIM ID - Semiv	olatile Orga	anic Comp	ounds (GC/N	<mark>IS SIM</mark> /	Isotop	e Diluti	on)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		05/24/19 16:11	05/30/19 08:25	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	19		15 - 110				05/24/19 16:11	05/30/19 08:25	1
Method: 537 (modified) - Fluo	rinated Alky	/I Substan	Ces	MDI	Unit	Б	Branarad	Applyzod	
Perfluerobutonoio coid (DEPA)		Quaimer	<u> </u>				05/20/10 11:27	06/07/10 19:55	
Perfluoroputationa acid (PEBA)	24		1.0	0.00	ng/L		05/29/19 11:37	06/12/10 19:09	1
Perfluoropentanoic acid (PFPeA)	75		1.0	0.50	ng/L		05/29/19 11.37	06/07/10 19:55	1
Perfluorohentanoic acid (PFHxA)	93		1.0	0.07	ng/L		05/29/19 11:37	06/07/19 18:55	
Perfluere estancia esid (PEOA)	20		1.0	0.00	ng/L		05/20/10 11:37	06/07/10 19:55	1
Perfluoropopapoio acid (PFUA)	20		1.0	0.50	ng/L		05/29/19 11.37	06/07/10 19:55	1
			1.0	0.24	ng/L		05/29/19 11.37	00/07/19 10:55	
	ND		1.0	0.00	ng/∟ mar/l		05/29/19 11.37	00/07/19 16.55	1
Perfluere de de cenerie acid (PFUA)	ND		1.8	0.47	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorododecanoic acid (PFDOA)	ND		1.8	0.52	ng/L		05/29/19 11:37	06/07/19 18:55	
Perfluorotridecanoic acid (PFTriA)	ND		1.8	0.53	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.81	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorobutanesulfonic acid	6.8		1.8	0.43	ng/L		05/29/19 11:37	06/07/19 18:55	1
(PFBS)			4.0	0.71	na/l		05/20/10 11:27	00/07/10 10:55	
Pertitioronexanesultonic acid	4.3		1.8	0.71	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorobentanesulfonic Acid	ND		1.8	0.84	na/L		05/29/19 11:37	06/07/19 18:55	1
(PEHnS)				0.01			00.20.10		
Perfluorooctanesulfonic acid	7.7		1.8	0.54	ng/L		05/29/19 11:37	06/07/19 18:55	1
(PFOS)									
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.79	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.56	ng/L		05/29/19 11:37	06/07/19 18:55	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		18	1.5	ng/L		05/29/19 11:37	06/07/19 18:55	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtEOSAA)	ND		18	1.3	ng/L		05/29/19 11:37	06/07/19 18:55	1
1H.1H.2H.2H-perfluorooctanesulfonic	ND		18	4.1	ng/L		05/29/19 11:37	06/07/19 18:55	1
acid (6:2)					-				
1H,1H,2H,2H-perfluorodecanesulfonic	ND		18	2.6	ng/L		05/29/19 11:37	06/07/19 18:55	1
acid (8:2)									
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	55		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C4 PFHpA	67		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C4 PFOA	65		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C4 PFOS	55		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C5 PFNA	55		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C4 PFBA	22	*	25 - 150				05/29/19 11:37	06/07/19 18:55	1
13C2 PFHxA	52		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C2 PFDA	52		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C2 PFUnA	53		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C2 PFDoA	50		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C8 FOSA	43		25 - 150				05/29/19 11.37	06/07/19 18:55	1
13C5 PFPeA	45		25_150				05/29/19 11.37	06/13/19 18:08	1
13C2 PFTeDA	48	*	50 - 150				05/29/19 11.37	06/07/19 18:55	
d3-NMeFOSAA	.36	*	50 _ 150				05/29/19 11:37	06/07/19 18:55	1
d5-NEtFOSAA	40	*	50 - 150				05/29/19 11:37	06/07/19 18:55	1

Eurofins TestAmerica, Buffalo

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: MW-6-20190520 Date Collected: 05/20/19 11:25 Date Received: 05/22/19 09:15

Method: 537 (modified)	- Fluorinated Alkyl Substar	ices (Continued)			
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	103	25 - 150	05/29/19 11:37	06/07/19 18:55	1
M2-8:2 FTS	85	25 - 150	05/29/19 11:37	06/07/19 18:55	1
13C3 PFBS	53	50 - 150	05/29/19 11:37	06/07/19 18:55	1

Client Sample ID: MW-24-20190520 Date Collected: 05/20/19 13:20 Date Received: 05/22/19 09:15

Perfluoroheptanesulfonic Acid

cetic acid (NMeFOSAA)

etic acid (NEtFOSAA)

Perfluorooctanesulfonic acid (PFOS)

Perfluorodecanesulfonic acid (PFDS)

Perfluorooctanesulfonamide (PFOSA)

N-methylperfluorooctanesulfonamidoa

N-ethylperfluorooctanesulfonamidoac

1H,1H,2H,2H-perfluorooctanesulfonic

(PFHpS)

acid (6:2)

Method: 8270D SIM ID - Semiv	volatile Orga	anic Comp	ounds (GC/M	IS SIM /	Isotope) Diluti	on)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		05/24/19 16:11	05/30/19 04:02	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	18		15 - 110				05/24/19 16:11	05/30/19 04:02	1
Method: 537 (modified) - Fluo	rinated Alky	yl Substan	ces						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	37		9.0	4.5	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluoropentanoic acid (PFPeA)	8.0	J F2	9.0	2.8	ng/L		05/29/19 11:37	06/13/19 18:23	5
Perfluorohexanoic acid (PFHxA)	13		9.0	3.4	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluoroheptanoic acid (PFHpA)	5.6	J	9.0	4.1	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorooctanoic acid (PFOA)	11		9.0	2.8	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorononanoic acid (PFNA)	ND		9.0	1.2	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorodecanoic acid (PFDA)	ND		9.0	3.5	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluoroundecanoic acid (PFUnA)	ND		9.0	2.4	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorododecanoic acid (PFDoA)	ND		9.0	2.6	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorotridecanoic acid (PFTriA)	ND		9.0	2.7	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorotetradecanoic acid (PFTeA)	ND		9.0	4.1	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorobutanesulfonic acid (PFBS)	9.6	F2	9.0	2.2	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorohexanesulfonic acid (PFHxS)	9.1	F2	9.0	3.6	ng/L		05/29/19 11:37	06/07/19 19:11	5

9.0

9.0

9.0

9.0

90

90

90

4.3 ng/L

2.7 ng/L

4.0 ng/L

2.9 ng/L

7.6 ng/L

6.7 ng/L

21 ng/L

ND

ND

ND

ND

ND

ND F2

ND F2

1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		90	13 ng/L	05/29/19 11:37	06/07/19 19:11	5
sotope Dilution	%Recovery	Qualifier	Limits		Prepared	Analyzed	Dil Fac
18O2 PFHxS	50		50 - 150		05/29/19 11:37	06/07/19 19:11	5
13C4 PFHpA	81		50 - 150		05/29/19 11:37	06/07/19 19:11	5
13C4 PFOA	77		50 - 150		05/29/19 11:37	06/07/19 19:11	5
13C4 PFOS	57		50 - 150		05/29/19 11:37	06/07/19 19:11	5
13C5 PFNA	61		50 - 150		05/29/19 11:37	06/07/19 19:11	5
13C4 PFBA	41		25 - 150		05/29/19 11:37	06/07/19 19:11	5

Matrix: Water

Job ID: 480-153995-1

Lab Sample ID: 480-153995-2 **Matrix: Water**

05/29/19 11:37 06/07/19 19:11

05/29/19 11:37 06/07/19 19:11

05/29/19 11:37 06/07/19 19:11

05/29/19 11:37 06/07/19 19:11

05/29/19 11:37 06/07/19 19:11

05/29/19 11:37 06/07/19 19:11

05/29/19 11:37 06/07/19 19:11

Lab Sample ID: 480-153995-1

Eurofins TestAmerica, Buffalo

5

5

5

5

5

5

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: MW-24-20190520 Date Collected: 05/20/19 13:20 Date Received: 05/22/19 09:15

Method: 537 (modified) - Fluor	rinated Alkyl Substan	ces (Continued)			
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	63	50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C2 PFDA	64	50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C2 PFUnA	56	50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C2 PFDoA	53	50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C8 FOSA	51	25 - 150	05/29/19 11:37	06/07/19 19:11	5
13C5 PFPeA	53	25 - 150	05/29/19 11:37	06/13/19 18:23	5
13C2 PFTeDA	48 *	50 - 150	05/29/19 11:37	06/07/19 19:11	5
d3-NMeFOSAA	44 *	50 - 150	05/29/19 11:37	06/07/19 19:11	5
d5-NEtFOSAA	46 *	50 - 150	05/29/19 11:37	06/07/19 19:11	5
M2-6:2 FTS	103	25 - 150	05/29/19 11:37	06/07/19 19:11	5
M2-8:2 FTS	81	25 - 150	05/29/19 11:37	06/07/19 19:11	5
13C3 PFBS	39 *	50 - 150	05/29/19 11:37	06/07/19 19:11	5

Client Sample ID: MW-29-20190520 Date Collected: 05/20/19 14:45 Date Received: 05/22/19 09:15

Lab Sample ID: 480-153995-3

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		2.0	1.0	ug/L		05/24/19 16:11	05/30/19 08:49	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	12	*	15 - 110				05/24/19 16:11	05/30/19 08:49	10
Method: 537 (modified) - Fluor	rinated Alky	/I Substan	Ces	MDI	Unit	D	Bronorod	Analyzad	
Derfluerobutonoio coid (DEPA)		Quaimer					05/20/10 11:27		
Perfluoroportonoio acid (PEDA)			0.0	4.2	ng/L		05/29/19 11.37	06/07/19 20.15	5
Perhuoropentanoic acid (PFPeA)			0.0 0.5	2.7	ng/L		05/29/19 11.37	00/07/19 20.15	5 F
Perfluorohexanoic acid (PFHxA)	15		8.5	3.2	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluoroheptanoic acid (PFHpA)	5.6	J	8.5	3.9	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorooctanoic acid (PFOA)	21		8.5	2.7	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorononanoic acid (PFNA)	ND		8.5	1.1	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorodecanoic acid (PFDA)	ND		8.5	3.3	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluoroundecanoic acid (PFUnA)	ND		8.5	2.2	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorododecanoic acid (PFDoA)	ND		8.5	2.5	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorotridecanoic acid (PFTriA)	ND		8.5	2.5	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorotetradecanoic acid (PFTeA)	ND		8.5	3.9	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorobutanesulfonic acid (PFBS)	24		8.5	2.1	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorohexanesulfonic acid (PFHxS)	15		8.5	3.4	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluoroheptanesulfonic Acid (PFHpS)	ND		8.5	4.0	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorooctanesulfonic acid (PFOS)	18		8.5	2.6	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorodecanesulfonic acid (PFDS)	ND		8.5	3.8	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorooctanesulfonamide (PFOSA)	ND		8.5	2.7	ng/L		05/29/19 11:37	06/07/19 20:15	5
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		85	7.2	ng/L		05/29/19 11:37	06/07/19 20:15	5
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		85	6.3	ng/L		05/29/19 11:37	06/07/19 20:15	5
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		85	19	ng/L		05/29/19 11:37	06/07/19 20:15	5

Job ID: 480-153995-1

Matrix: Water

Lab Sample ID: 480-153995-2

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: MW-29-20190520 Date Collected: 05/20/19 14:45 Date Received: 05/22/19 09:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		85	12	ng/L		05/29/19 11:37	06/07/19 20:15	5
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
18O2 PFHxS	36	*	50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C4 PFHpA	51		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C4 PFOA	74		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C4 PFOS	48	*	50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C5 PFNA	65		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C4 PFBA	21	*	25 - 150				05/29/19 11:37	06/07/19 20:15	5
13C2 PFHxA	42	*	50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C2 PFDA	72		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C2 PFUnA	76		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C2 PFDoA	54		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C8 FOSA	55		25 - 150				05/29/19 11:37	06/07/19 20:15	5
13C5 PFPeA	27		25 - 150				05/29/19 11:37	06/07/19 20:15	5
13C2 PFTeDA	54		50 - 150				05/29/19 11:37	06/07/19 20:15	5
d3-NMeFOSAA	56		50 - 150				05/29/19 11:37	06/07/19 20:15	5
d5-NEtFOSAA	54		50 - 150				05/29/19 11:37	06/07/19 20:15	5
M2-6:2 FTS	108		25 - 150				05/29/19 11:37	06/07/19 20:15	5
M2-8:2 FTS	91		25 - 150				05/29/19 11:37	06/07/19 20:15	5
13C3 PFBS	73		50 - 150				05/29/19 11:37	06/07/19 20:15	5
Client Sample ID: DUP-20 [,]	190520					La	ab Sample	ID: 480-153	3995-4

Client Sample ID: DUP-20190520

Date Collected: 05/20/19 00:00

Date Received: 05/22/19 09:15

Method: 8270D SIM ID	- Semivolatile Orga	anic Comp	ounds (GC/N	/IS SIM /	Isotope	e Diluti	on)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		05/24/19 16:11	05/30/19 09:13	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	15		15 - 110				05/24/19 16:11	05/30/19 09:13	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	24		9.0	4.5	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluoropentanoic acid (PFPeA)	17		9.0	2.8	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorohexanoic acid (PFHxA)	16		9.0	3.4	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluoroheptanoic acid (PFHpA)	6.2	J	9.0	4.1	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorooctanoic acid (PFOA)	11		9.0	2.8	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorononanoic acid (PFNA)	ND		9.0	1.2	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorodecanoic acid (PFDA)	ND		9.0	3.5	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluoroundecanoic acid (PFUnA)	ND		9.0	2.4	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorododecanoic acid (PFDoA)	ND		9.0	2.7	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorotridecanoic acid (PFTriA)	ND		9.0	2.7	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorotetradecanoic acid (PFTeA)	ND		9.0	4.1	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorobutanesulfonic acid (PFBS)	7.3	J	9.0	2.2	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorohexanesulfonic acid (PFHxS)	9.0		9.0	3.6	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluoroheptanesulfonic Acid (PFHpS)	ND		9.0	4.3	ng/L		05/29/19 11:37	06/07/19 20:31	5

Lab Sample ID: 480-153995-3 Matrix: Water



Matrix: Water

Fac 5

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: DUP-20190520 Date Collected: 05/20/19 00:00 Date Received: 05/22/19 09:15

Lab Sample ID: 480-153995-4

Matrix: Water

5

6

Method: 537 (modified) - Fluor	inated Alky	/I Substan	ces (Continu	ed)					
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid	14		9.0	2.7	ng/L		05/29/19 11:37	06/07/19 20:31	5
(PFOS)									
Perfluorodecanesulfonic acid (PFDS)	ND		9.0	4.1	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorooctanesulfonamide (PFOSA)	ND		9.0	2.9	ng/L		05/29/19 11:37	06/07/19 20:31	5
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		90	7.7	ng/L		05/29/19 11:37	06/07/19 20:31	5
N-ethylperfluorooctanesulfonamidoac	ND		90	6.8	ng/L		05/29/19 11:37	06/07/19 20:31	5
1H,1H,2H,2H-perfluorooctanesulfonic	ND		90	21	ng/L		05/29/19 11:37	06/07/19 20:31	5
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		90	13	ng/L		05/29/19 11:37	06/07/19 20:31	5
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
18O2 PFHxS	52		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C4 PFHpA	74		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C4 PFOA	74		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C4 PFOS	33	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C5 PFNA	57		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C4 PFBA	39		25 - 150				05/29/19 11:37	06/07/19 20:31	5
13C2 PFHxA	64		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C2 PFDA	58		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C2 PFUnA	55		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C2 PFDoA	45	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C8 FOSA	56		25 - 150				05/29/19 11:37	06/07/19 20:31	5
13C5 PFPeA	56		25 - 150				05/29/19 11:37	06/07/19 20:31	5
13C2 PFTeDA	44	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5
d3-NMeFOSAA	39	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5
d5-NEtFOSAA	47	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5
M2-6:2 FTS	100		25 - 150				05/29/19 11:37	06/07/19 20:31	5
M2-8:2 FTS	90		25 - 150				05/29/19 11:37	06/07/19 20:31	5
13C3 PFBS	41	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5

Client Sample ID: EB-020190520

Date Collected: 05/20/19 12:00

Date Received: 05/22/19 09:15

Lab Sample ID: 480-153995-5

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		05/24/19 16:11	05/30/19 09:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	25		15 - 110				05/24/19 16:11	05/30/19 09:37	1
- Method: 537 (modified) - Flu	orinated Alk	/I Substan	ces						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
•			=			-			Burao
Perfluorobutanoic acid (PFBA)	ND		1.7	0.87	ng/L		05/29/19 11:37	06/07/19 20:46	1
Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA)	ND ND		<u> </u>	0.87	ng/L ng/L		05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46	1
Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA)	ND ND ND		1.7 1.7 1.7	0.87 0.55 0.66	ng/L ng/L ng/L	<u> </u>	05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	1 1 1
Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA) Perfluoroheptanoic acid (PFHpA)	ND ND ND ND		1.7 1.7 1.7 1.7 1.7 1.7	0.87 0.55 0.66 0.80	ng/L ng/L ng/L ng/L		05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	1 1 1 1
Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA) Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA)	ND ND ND ND ND		1.7 1.7 1.7 1.7 1.7 1.7 1.7	0.87 0.55 0.66 0.80 0.55	ng/L ng/L ng/L ng/L ng/L	<u> </u>	05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	1 1 1 1 1 1
Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA) Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA) Perfluorononanoic acid (PFNA)	ND ND ND ND ND ND ND		1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7	0.87 0.55 0.66 0.80 0.55 0.24	ng/L ng/L ng/L ng/L ng/L ng/L	=	05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	1 1 1 1 1 1 1 1

Eurofins TestAmerica, Buffalo

6/18/2019

Project/Site: Orange & Rockland Utilities -Port Jervis Client Sample ID: EB-020190520

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

Date Collected: 05/20/19 12:00 Date Received: 05/22/19 09:15

Client: ARCADIS U.S. Inc

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluoroundecanoic acid (PFUnA)	ND		1.7	0.46	ng/L		05/29/19 11:37	06/07/19 20:46	1
Perfluorododecanoic acid (PFDoA)	ND		1.7	0.52	ng/L		05/29/19 11:37	06/07/19 20:46	1
Perfluorotridecanoic acid (PFTriA)	ND		1.7	0.52	ng/L		05/29/19 11:37	06/07/19 20:46	1
Perfluorotetradecanoic acid (PFTeA)	ND		1.7	0.80	ng/L		05/29/19 11:37	06/07/19 20:46	1
Perfluorobutanesulfonic acid (PFBS)	ND		1.7	0.43	ng/L		05/29/19 11:37	06/07/19 20:46	1
Perfluorohexanesulfonic acid (PFHxS)	ND		1.7	0.70	ng/L		05/29/19 11:37	06/07/19 20:46	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.7	0.83	ng/L		05/29/19 11:37	06/07/19 20:46	1
Perfluorooctanesulfonic acid (PFOS)	ND		1.7	0.53	ng/L		05/29/19 11:37	06/07/19 20:46	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.7	0.79	ng/L		05/29/19 11:37	06/07/19 20:46	1
Perfluorooctanesulfonamide (PFOSA)	ND		1.7	0.56	ng/L		05/29/19 11:37	06/07/19 20:46	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		17	1.5	ng/L		05/29/19 11:37	06/07/19 20:46	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		17	1.3	ng/L		05/29/19 11:37	06/07/19 20:46	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		17	4.0	ng/L		05/29/19 11:37	06/07/19 20:46	1
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		17	2.5	ng/L		05/29/19 11:37	06/07/19 20:46	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	49	*	50 - 150				05/29/19 11:37	06/07/19 20:46	1
13C4 PFHpA	71		50 - 150				05/29/19 11:37	06/07/19 20:46	1
13C4 PFOA	66		50 - 150				05/29/19 11:37	06/07/19 20:46	1
13C4 PFOS	53		50 - 150				05/29/19 11:37	06/07/19 20:46	1
13C5 PFNA	63		50 - 150				05/29/19 11:37	06/07/19 20:46	1
13C4 PFBA	39		25 - 150				05/29/19 11:37	06/07/19 20:46	1
13C2 PFHxA	72		50 - 150				05/29/19 11:37	06/07/19 20:46	1
13C2 PFDA	65		50 - 150				05/29/19 11:37	06/07/19 20:46	1
13C2 PFUnA	62		50 - 150				05/29/19 11:37	06/07/19 20:46	1
13C2 PFDoA	51		50 - 150				05/29/19 11:37	06/07/19 20:46	1
13C8 FOSA	42		25 - 150				05/29/19 11:37	06/07/19 20:46	1
13C5 PFPeA	62		25 - 150				05/29/19 11:37	06/07/19 20:46	1
13C2 PFTeDA	45	*	50 - 150				05/29/19 11:37	06/07/19 20:46	1
d3-NMeFOSAA	43	*	50 - 150				05/29/19 11:37	06/07/19 20:46	1
d5-NEtFOSAA	48	*	50 - 150				05/29/19 11:37	06/07/19 20:46	1
M2-6:2 FTS	84		25 - 150				05/29/19 11:37	06/07/19 20:46	1
M2-8:2 FTS	77		25 - 150				05/29/19 11:37	06/07/19 20:46	1
13C3 PFBS	52		50 - 150				05/29/19 11:37	06/07/19 20:46	1

Job ID: 480-153995-1

Lab Sample ID: 480-153995-5

Matrix: Water

Isotope Dilution Summary

27

27

Prep Type: Total/NA

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution) Prep Type: Total/NA Percent Isotope Dilution Recovery (Acceptance Limits) DXE (15-110) **Client Sample ID** MW-6-20190520 19 MW-24-20190520 18 MW-24-20190520 21 17 MW-24-20190520 7 MW-29-20190520 12 * DUP-20190520 15 25 EB-020190520

Surrogate Legend

DXE = 1,4-Dioxane-d8

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Control Sample

Method Blank

Matrix: Water

Matrix: Water

Lab Sample ID

480-153995-1

480-153995-2

480-153995-3

480-153995-4

480-153995-5

480-153995-2 MS

480-153995-2 MSD

LCS 480-474688/2-A

MB 480-474688/1-A

		Percent Isotope Dilution Recovery (Acceptance Limits)											
		PFHxS	PFHpA	PFOA	PFOS	PFNA	PFBA	PFHxA	PFDA				
Lab Sample ID	Client Sample ID	(50-150)	(50-150)	(50-150)	(50-150)	(50-150)	(25-150)	(50-150)	(50-150)				
480-153995-1	MW-6-20190520	55	67	65	55	55	22 *	52	52				
480-153995-1	MW-6-20190520												
480-153995-2	MW-24-20190520	50	81	77	57	61	41	63	64				
480-153995-2	MW-24-20190520												
480-153995-2 MS	MW-24-20190520	50	75	64	51	57	45	64	64				
480-153995-2 MS	MW-24-20190520												
480-153995-2 MSD	MW-24-20190520	39 *	68	70	53	53	39	54	54				
480-153995-3	MW-29-20190520	36 *	51	74	48 *	65	21 *	42 *	72				
480-153995-4	DUP-20190520	52	74	74	33 *	57	39	64	58				
480-153995-5	EB-020190520	49 *	71	66	53	63	39	72	65				
LCS 200-143529/2-A	Lab Control Sample	46 *	69	69	54	62	44	66	64				
LCS 200-143529/2-A	Lab Control Sample												
MB 200-143529/1-A	Method Blank	54	75	67	59	63	43	71	71				
			Perce	ent Isotope	Dilution Re	covery (Ac	ceptance L	imits)					
		PFUnA	PFDoA	PFOSA	PFPeA	PFTDA	-NMeFOS	-NEtFOS/	M262FTS				
Lab Sample ID	Client Sample ID	(50-150)	(50-150)	(25-150)	(25-150)	(50-150)	(50-150)	(50-150)	(25-150)				
480-153995-1	MW-6-20190520	53	50	43		48 *	36 *	40 *	103				
480-153995-1	MW-6-20190520				45								
480-153995-2	MW-24-20190520	56	53	51		48 *	44 *	46 *	103				
480-153995-2	MW-24-20190520				53								
480-153995-2 MS	MW-24-20190520	57	52	48	57	50	38 *	47 *	85				
480-153995-2 MS	MW-24-20190520				57								
480-153995-2 MSD	MW-24-20190520	58	42 *	44	75	43 *	42 *	43 *	94				
480-153995-3	MW-29-20190520	76	54	55	27	54	56	54	108				
480-153995-4	DUP-20190520	55	45 *	56	56	44 *	39 *	47 *	100				
480-153995-5	EB-020190520	62	51	42	62	45 *	43 *	48 *	84				
LCS 200-143529/2-A	Lab Control Sample	68	59	45		56	48 *	48 *	86				
LCS 200-143529/2-A	Lab Control Sample				68								
MB 200-143529/1-A	Method Blank	67	58	37	60	55	44 *	52	79				

Isotope Dilution Summary

Job ID: 480-153995-1

5

7

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

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

Matrix: Water				Prep Type: Total/NA
			Percent Isotope	Dilution Recovery (Acceptance Limits)
		M282FTS	3C3-PFB	
Lab Sample ID	Client Sample ID	(25-150)	(50-150)	
480-153995-1	MW-6-20190520	85	53	
480-153995-1	MW-6-20190520			
480-153995-2	MW-24-20190520	81	39 *	
480-153995-2	MW-24-20190520			
480-153995-2 MS	MW-24-20190520	67	46 *	
480-153995-2 MS	MW-24-20190520			
480-153995-2 MSD	MW-24-20190520	75	27 *	
480-153995-3	MW-29-20190520	91	73	
480-153995-4	DUP-20190520	90	41 *	
480-153995-5	EB-020190520	77	52	
LCS 200-143529/2-A	Lab Control Sample	103	59	
LCS 200-143529/2-A	Lab Control Sample			
MB 200-143529/1-A	Method Blank	96	63	
Surrogate Legend				
$PEH_{VS} = 1802 PEH_{VS}$	8			

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

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Perfluoroheptanoic acid (PFHpA)

Perfluorooctanoic acid (PFOA)

Perfluorononanoic acid (PFNA)

Perfluorodecanoic acid (PFDA)

Perfluoroundecanoic acid (PFUnA)

Job ID: 480-153995-1

Lah Sample ID: MR 490 47	74699/4 4								Clic	nt Sam		thed	Blan
Lab Sample ID: MB 460-47 Matrix: Wator	4000/1-A								Cile	ent Samj	Dren Tyn		biani bial/N/
Analysis Batch: 475144											Pron Bat	ch 4	7468
Analysis Daten. 470144		МВ МЕ	5								пер Ба	UII. 4	1400
Analvte	Re	sult Qu	alifier	RL		MDL Unit		D	Р	repared	Analyze	d	Dil Fa
1,4-Dioxane		ND		0.20		0.10 ug/L			05/2	4/19 16:11	05/30/19 0	2:27	-
,		МВ МЕ	3			5							
Isotope Dilution	%Recov	verv Qu	alifier	Limits					Р	repared	Analyze	ed	Dil Fa
1,4-Dioxane-d8		27		15 - 110					05/2	4/19 16:11	05/30/19 0	2:27	-
Lab Sample ID: LCS 480-4	74688/2-A						C	lient	Sar	nple ID:	Lab Cont	rol Sa	ample
Matrix: Water											Prep Typ	e: To	tal/N
Analysis Batch: 475144											Prep Bat	ch: 4	7 <mark>46</mark> 8
				Spike	LCS	LCS					%Rec.		
Analyte				Added	Result	Qualifier	Unit		D	%Rec	Limits		
1,4-Dioxane				1.00	1.16		ug/L			116	40 - 140		
	LCS	LCS											
Isotope Dilution	%Recovery	Qualifie	r	Limits									
1,4-Dioxane-d8	27			15-110									
Lah Sampla ID: 490 45200	E 2 MG							CII	ont	Sampla		1 204	0052
Lab Sample ID. 400-15555 Matrix: Watar	5-2 113							CII	ent	Sample	Drop Typ	+-201	
Analysia Patahy 475144											Prop Bot	e. 10	di/11/
Analysis Batch. 475144	Sample	Sample		Snike	MS	MS					WRec	CII. 4	/ 400
Analyte	Result	Qualifie	r		Result	Qualifier	Unit		р	%Rec	l imits		
1 4-Dioxane				1 00	1 22	F				122 -	40 _ 140		
	MS	MS		1.00	1.22	-	ug/L			122	40-140		
Isotope Dilution	%Recovery	Qualific	r	l imite									
1,4-Dioxane-d8	21	Quanne		15 - 110									
Lab Sample ID: 480-15399	5-2 MSD							Cli	ent	Sample	ID: MW-24	4-201	9052
Matrix: Water											Prep Typ	e: To	tal/N/
Analysis Batch: 475144											Prep Bat	ch: 4	7468
	Sample	Sample		Spike	MSD	MSD					%Rec.		RP
Analyte	Result	Qualifie	r	Added	Result	Qualifier	Unit		D	%Rec	Limits	RPD	Lim
	ND			1.00	1.36	E	ug/L			136	40 - 140	11	2
1,4-Dioxane													
1,4-Dioxane	MSD	MSD											
Isotope Dilution	MSD %Recovery	MSD Qualifie	r	Limits									
Isotope Dilution 1,4-Dioxane-d8	MSD %Recovery 17	MSD Qualifie	r	Limits 15 - 110									
Isotope Dilution 1,4-Dioxane-d8	MSD %Recovery 17	MSD Qualifie	r	Limits 15-110									
Isotope Dilution 1,4-Dioxane-d8 Iethod: 537 (modified)	MSD %Recovery 17) - Fluorina	MSD Qualifie	r	Limits 15-110 Substanc	es								
Isotope Dilution 1,4-Dioxane-d8 Iethod: 537 (modified) Lab Sample ID: MB 200-14	MSD %Recovery 17) - Fluorina 13529/1-A	MSD Qualifie	alkyl	Limits 15 - 110 Substanc	es				Clie	ent Sam	ole ID: Me	thod	Blan
Isotope Dilution 1,4-Dioxane-d8 Iethod: 537 (modified) Lab Sample ID: MB 200-14 Matrix: Water	MSD %Recovery 17) - Fluorina 13529/1-A	MSD Qualifie	r	Limits 15-110 Substanc	es				Clie	ent Sam	ole ID: Me Prep Typ	thod e: To	Blan tal/N
Isotope Dilution 1,4-Dioxane-d8 Iethod: 537 (modified) Lab Sample ID: MB 200-14 Matrix: Water Analysis Batch: 143837	MSD %Recovery 17) - Fluorina 13529/1-A	MSD Qualifie	r	Limits 15-110 Substanc	es				Clie	ent Sam	ole ID: Me Prep Typ Prep Bat	thod e: To ch: 1	Blan tal/N/ 4352
Isotope Dilution 1,4-Dioxane-d8 Aethod: 537 (modified) Lab Sample ID: MB 200-14 Matrix: Water Analysis Batch: 143837 Analyte	MSD %Recovery 17) - Fluorina 13529/1-A	MSD Qualifie ated A MB ME	alifier	Limits 15-110 Substand	es				Clie	ent Sam	ole ID: Me Prep Typ Prep Bat	thod e: To ch: 1	Blani tal/N/ 43529
Isotope Dilution 1,4-Dioxane-d8 Iethod: 537 (modified) Lab Sample ID: MB 200-14 Matrix: Water Analysis Batch: 143837 Analyte Perfluorobutanoic acid (PEBA)	MSD %Recovery 17) - Fluorina 43529/1-A Re	MSD Qualifie ated A MB ME sult Qu	ar Alkyl alifier	Limits 15-110 Substanc	es	MDL Unit		D	Clie Pi	ent Samp repared	Die ID: Me Prep Typ Prep Bat Analyze	thod e: To ch: 1	Blani tal/N/ 43529 Dil Fa
Isotope Dilution 1,4-Dioxane-d8 Method: 537 (modified) Lab Sample ID: MB 200-14 Matrix: Water Analysis Batch: 143837 Analyte Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFBA)	MSD %Recovery 17) - Fluorina 13529/1-A Re	MSD Qualifie ated A MB ME sult Qu ND	alifier	Limits 15-110 Substanc RL 2.0 2 0	es	MDL Unit 1.0 ng/L 0.63 ng/L		D	Clie Pr 05/2	ent Samp repared 9/19 11:37 9/10 11:37	Die ID: Me Prep Typ Prep Bat Analyze 06/07/19 1	thod e: To ch: 1 6:32	Blanl tal/N/ 43529 Dil Fa

Eurofins TestAmerica, Buffalo

05/29/19 11:37 06/07/19 16:32

05/29/19 11:37 06/07/19 16:32

05/29/19 11:37 06/07/19 16:32

05/29/19 11:37 06/07/19 16:32

05/29/19 11:37 06/07/19 16:32

2.0

2.0

2.0

2.0

2.0

0.91 ng/L

0.63 ng/L

0.27 ng/L

0.77 ng/L

0.53 ng/L

ND

ND

ND

ND

ND

1

1

1

1

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

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

Lab Sample ID: MB 200-143529/1-A Matrix: Water Analysis Batch: 143837

Client Sample ID: Method Blank Prep Type: Total/NA Prep Batch: 143529

Job ID: 480-153995-1

							Thep Bateri.	140020
MB	MB							
Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
ND		2.0	0.59	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		2.0	0.60	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		2.0	0.92	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		2.0	0.49	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		2.0	0.80	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		2.0	0.95	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		2.0	0.61	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		2.0	0.90	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		2.0	0.64	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		20	1.7	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		20	1.5	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		20	4.6	ng/L		05/29/19 11:37	06/07/19 16:32	1
ND		20	2.9	ng/L		05/29/19 11:37	06/07/19 16:32	1
MB	МВ							
	MB Result ND ND ND ND ND ND ND ND ND ND ND ND ND	MBQualifierNDQualifierNDMDNDMDNDMDNDMDNDMDNDMB	MB MB Result Qualifier RL ND 2.0 ND	MB MB Result Qualifier RL MDL ND 2.0 0.59 ND 2.0 0.60 ND 2.0 0.92 ND 2.0 0.49 ND 2.0 0.80 ND 2.0 0.81 ND 2.0 0.95 ND 2.0 0.61 ND 2.0 0.61 ND 2.0 0.64 ND 20 1.7 ND 20 1.5 ND 20 4.6 ND 20 2.9 MB MB 20 2.9	MB MB Result Qualifier RL MDL Unit ND 2.0 0.59 ng/L ND 2.0 0.60 ng/L ND 2.0 0.60 ng/L ND 2.0 0.92 ng/L ND 2.0 0.49 ng/L ND 2.0 0.80 ng/L ND 2.0 0.80 ng/L ND 2.0 0.80 ng/L ND 2.0 0.61 ng/L ND 2.0 0.61 ng/L ND 2.0 0.64 ng/L ND 2.0 0.64 ng/L ND 2.0 0.64 ng/L ND 20 1.7 ng/L ND 20 1.5 ng/L ND 20 2.9 ng/L ND 20 2.9 ng/L ND 20 2.9 ng/L	MB MB Result Qualifier RL MDL Unit D ND 2.0 0.59 ng/L D ND 2.0 0.60 ng/L D ND 2.0 0.92 ng/L D ND 2.0 0.49 ng/L D ND 2.0 0.80 ng/L D ND 2.0 0.80 ng/L D ND 2.0 0.61 ng/L D ND 2.0 0.61 ng/L D ND 2.0 0.64 ng/L D ND 2.0 0.64 ng/L D ND 2.0 0.64 ng/L D ND 20 1.5 ng/L D ND 20 4.6 ng/L D ND 20 2.9 ng/L D ND 20 2.9 ng/L D </td <td>MB MB Result Qualifier RL MDL Unit P Prepared ND 2.0 0.59 ng/L 05/29/19 11:37 ND 2.0 0.60 ng/L 05/29/19 11:37 ND 2.0 0.60 ng/L 05/29/19 11:37 ND 2.0 0.92 ng/L 05/29/19 11:37 ND 2.0 0.49 ng/L 05/29/19 11:37 ND 2.0 0.80 ng/L 05/29/19 11:37 ND 2.0 0.80 ng/L 05/29/19 11:37 ND 2.0 0.61 ng/L 05/29/19 11:37 ND 2.0 0.61 ng/L 05/29/19 11:37 ND 2.0 0.64 ng/L 05/29/19 11:37 ND 20 1.5 ng/L 05/29/19 11:37 ND 20 1.5 ng/L 05/29/19 11:37 ND 20 1.5 ng/L 05/29/19 11:37 ND 20<!--</td--><td>MB MB Result Qualifier RL MDL Unit D Prepared Analyzed ND 2.0 0.59 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.60 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.92 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.49 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.80 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.80 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.95 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.61 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.64 ng/L 05/29/19 11:37 06/07/19 16:32 ND 20 1.7 ng/L 05/29/19 11:37 06/07/19 16:32 ND 20 1.5 ng/L <td< td=""></td<></td></td>	MB MB Result Qualifier RL MDL Unit P Prepared ND 2.0 0.59 ng/L 05/29/19 11:37 ND 2.0 0.60 ng/L 05/29/19 11:37 ND 2.0 0.60 ng/L 05/29/19 11:37 ND 2.0 0.92 ng/L 05/29/19 11:37 ND 2.0 0.49 ng/L 05/29/19 11:37 ND 2.0 0.80 ng/L 05/29/19 11:37 ND 2.0 0.80 ng/L 05/29/19 11:37 ND 2.0 0.61 ng/L 05/29/19 11:37 ND 2.0 0.61 ng/L 05/29/19 11:37 ND 2.0 0.64 ng/L 05/29/19 11:37 ND 20 1.5 ng/L 05/29/19 11:37 ND 20 1.5 ng/L 05/29/19 11:37 ND 20 1.5 ng/L 05/29/19 11:37 ND 20 </td <td>MB MB Result Qualifier RL MDL Unit D Prepared Analyzed ND 2.0 0.59 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.60 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.92 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.49 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.80 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.80 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.95 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.61 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.64 ng/L 05/29/19 11:37 06/07/19 16:32 ND 20 1.7 ng/L 05/29/19 11:37 06/07/19 16:32 ND 20 1.5 ng/L <td< td=""></td<></td>	MB MB Result Qualifier RL MDL Unit D Prepared Analyzed ND 2.0 0.59 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.60 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.92 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.49 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.80 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.80 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.95 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.61 ng/L 05/29/19 11:37 06/07/19 16:32 ND 2.0 0.64 ng/L 05/29/19 11:37 06/07/19 16:32 ND 20 1.7 ng/L 05/29/19 11:37 06/07/19 16:32 ND 20 1.5 ng/L <td< td=""></td<>

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
18O2 PFHxS	54		50 - 150	05/29/19 11:37	06/07/19 16:32	1
13C4 PFHpA	75		50 - 150	05/29/19 11:37	06/07/19 16:32	1
13C4 PFOA	67		50 - 150	05/29/19 11:37	06/07/19 16:32	1
13C4 PFOS	59		50 - 150	05/29/19 11:37	06/07/19 16:32	1
13C5 PFNA	63		50 - 150	05/29/19 11:37	06/07/19 16:32	1
13C4 PFBA	43		25 - 150	05/29/19 11:37	06/07/19 16:32	1
13C2 PFHxA	71		50 - 150	05/29/19 11:37	06/07/19 16:32	1
13C2 PFDA	71		50 - 150	05/29/19 11:37	06/07/19 16:32	1
13C2 PFUnA	67		50 - 150	05/29/19 11:37	06/07/19 16:32	1
13C2 PFDoA	58		50 - 150	05/29/19 11:37	06/07/19 16:32	1
13C8 FOSA	37		25 - 150	05/29/19 11:37	06/07/19 16:32	1
13C5 PFPeA	60		25 - 150	05/29/19 11:37	06/07/19 16:32	1
13C2 PFTeDA	55		50 - 150	05/29/19 11:37	06/07/19 16:32	1
d3-NMeFOSAA	44	*	50 - 150	05/29/19 11:37	06/07/19 16:32	1
d5-NEtFOSAA	52		50 - 150	05/29/19 11:37	06/07/19 16:32	1
M2-6:2 FTS	79		25 - 150	05/29/19 11:37	06/07/19 16:32	1
M2-8:2 FTS	96		25 - 150	05/29/19 11:37	06/07/19 16:32	1
13C3 PFBS	63		50 - 150	05/29/19 11:37	06/07/19 16:32	1

Lab Sample ID: LCS 200-143529/2-A Matrix: Water Analysis Batch: 143837

Analysis Batch: 143837							Prep Batch: 143529
-	Spike	LCS	LCS				%Rec.
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	40.0	54.3		ng/L		136	50 - 150
Perfluorohexanoic acid (PFHxA)	40.0	41.4		ng/L		103	70 - 130
Perfluoroheptanoic acid (PFHpA)	40.0	41.1		ng/L		103	70 - 130
Perfluorooctanoic acid (PFOA)	40.0	38.8		ng/L		97	70 - 130
Perfluorononanoic acid (PFNA)	40.0	38.4		ng/L		96	70 - 130
Perfluorodecanoic acid (PFDA)	40.0	40.7		ng/L		102	70 - 130

Eurofins TestAmerica, Buffalo

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

13C3 PFBS

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

Lab Sample ID: LCS 200-1 Matrix: Water	43529/2-A					Cli	ient Sampl	e ID:	Lab Control Sample Prep Type: Total/NA	
Analysis Batch: 143837			Spiko	1.09	1.09				Prep Batch: 143529	
Analyto			Addod	Posult	Qualifier	Unit	D %E	200	MRC.	5
			40.0	42.7	Quaimer			107	70 130	
(PELInA)			40.0	72.1		ng/L		107	10-100	
Perfluorododecanoic acid			40.0	36.7		ng/L		92	70 - 130	
(PFDoA)						U				
Perfluorotridecanoic acid			40.0	37.4		ng/L		94	70 - 130	
(PFTriA)										8
Perfluorotetradecanoic acid			40.0	39.2		ng/L		98	70 - 130	
(PFTeA)			25 4	21.0		ng/l		00	70 120	9
			55.4	31.9		ng/L		90	70 - 130	
Perfluorobexanesulfonic acid			36.4	38.2		na/L		105	70 - 130	
(PFHxS)						5				
Perfluoroheptanesulfonic Acid			38.1	42.2		ng/L		111	50 - 150	
(PFHpS)										
Perfluorooctanesulfonic acid			37.1	40.9		ng/L		110	70 - 130	
(PFOS)			20.6	26.6		~~/l		05	EQ 1EQ	
			30.0	30.0		ng/L		95	50 - 150	40
(FFDS) Perfluorooctanesulfonamide			40.0	40.2		na/L		101	50 - 150	13
(PFOSA)										
N-methylperfluorooctanesulfona			40.0	43.1		ng/L		108	70 - 130	
midoacetic acid (NMeFOSAA)										
N-ethylperfluorooctanesulfonami			40.0	44.5		ng/L		111	70 - 130	
doacetic acid (NEtFOSAA)				20.0				100	50.450	
1H,1H,2H,2H-perfluorooctanesult			37.9	39.0		ng/L		103	50 - 150	
011C acid (0.2) 1H 1H 2H 2H-perfluorodecanesul			38.3	39.9		na/L		104	50 - 150	
fonic acid (8:2)										
	LCS	LCS								
Isotope Dilution	%Recovery	Qualifier	Limits							
1802 PFHxS	46	*	50 - 150							
13C4 PFHpA	69		50 - 150							
13C4 PFOA	69		50 - 150							
13C4 PFOS	54		50 _ 150							
13C5 PFNA	62		50 - 150							
13C4 PFBA	44		25 - 150							
13C2 PFHxA	66		50 - 150							
13C2 PFDA	64		50 - 150							
13C2 PFUnA	68		50 - 150							
13C2 PFDoA	59		50 - 150							
13C8 FOSA	45		25 - 150							
13C2 PFTeDA	56		50 - 150							
d3-NMeFOSAA	48	*	50 - 150							
d5-NEtFOSAA	48	*	50 - 150							
M2-6:2 FTS	86		25 - 150							
M2-8:2 FTS	103		25 - 150							

50 - 150

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Job ID: 480-153995-1

Lab Sample ID: LCS 200-1	43529/2-A					CI	ient Sa	mple ID	: Lab Control Sample
Matrix: Water Analysis Batch: 144054									Prep Type: Total/N/ Prep Batch: 143529
			Spike	LCS	LCS		_		%Rec.
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluoropentanoic acid (PFPeA)	1.00	1.00	40.0	45.8		ng/L		114	50 - 150
Isotope Dilution	%Pacovary	LUS Qualifior	Limite						
13C5 PFPeA	68	Quanner	25 - 150						
Lab Sample ID: 480-15399 Matrix: Water	5-2 MS						Client	Sample	e ID: MW-24-20190520 Pren Type: Total/N/
Analysis Batch: 143837									Pren Batch: 143529
Analysis Baton. 140007	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluorobutanoic acid (PFBA)	37		36.2	63.8		ng/L		73	40 - 160
Perfluorohexanoic acid (PFHxA)	13		36.2	49.5		ng/L		100	40 - 160
Perfluoroheptanoic acid (PFHpA)	5.6	J	36.2	39.8		ng/L		95	40 - 160
Perfluorooctanoic acid (PFOA)	11		36.2	47.0		ng/L		101	40 - 160
Perfluorononanoic acid (PFNA)	ND		36.2	40.1		ng/L		111	40 - 160
Perfluorodecanoic acid (PFDA)	ND		36.2	32.4		ng/L		90	40 - 160
Perfluoroundecanoic acid (PFUnA)	ND		36.2	35.6		ng/L		98	40 - 160
Perfluorododecanoic acid (PFDoA)	ND		36.2	32.5		ng/L		90	40 - 160
Perfluorotridecanoic acid (PFTriA)	ND		36.2	31.9		ng/L		88	40 - 160
Perfluorotetradecanoic acid (PFTeA) Derfluorobuteneoulfenia acid		E2	30.2	33.0		ng/L		91	40 - 160
(PFBS)	0.1	F2	32.0	20.1		ng/L		70	40 160
Perfluoronexanesultonic acid (PFHxS)	9.1 ND		32.9	20.0		ng/L		116	40 - 160
(PFHpS)			34.4	39.9		ng/L		144	40 - 160
Perfluorooctanesulfonic acid (PFOS)			33.0	47.4		ng/∟		79	40 160
Perfluorodecanesultonic acid (PFDS)			36.2	21.2		ng/L		20	40 160
(PFOSA)		E2	36.2	23.0		ng/L		61	40 160
midoacetic acid (NMeFOSAA)		12	36.2	33.5	J	ng/L		93	40 160
doacetic acid (NEtFOSAA)	ND	F2	34.3	43.5	J	ng/L		127	40 - 160
nic acid (6:2) 1H,1H,2H,2H,Perfluorodecanesul	ND		34.6	33.7	J	ng/L		97	40 - 160
tonic acid (8:2)	Мс	MS							
Isotope Dilution	%Recoverv	Qualifier	Limits						
1802 PFHxS	50	4.4.11161	50 - 150						
13C4 PFHpA	75		50 - 150						
13C4 PFOA	, o 64		50 - 150						
13C4 PFOS	51		50 - 150						
13C5 PFNA	57		50 - 150						
13C4 PEBA	45		25 - 150						

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

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

Lab Sample ID: 480-153995-2 MS Matrix: Water

Analysis Batch: 143837

	MS	MS					
Isotope Dilution	%Recovery	Qualifier	Limits				
13C2 PFHxA	64		50 - 150				
13C2 PFDA	64		50 - 150				
13C2 PFUnA	57		50 - 150				
13C2 PFDoA	52		50 - 150				
13C8 FOSA	48		25 - 150				
13C5 PFPeA	57		25 - 150				
13C2 PFTeDA	50		50 - 150				
d3-NMeFOSAA	38	*	50 - 150				
d5-NEtFOSAA	47	*	50 - 150				
M2-6:2 FTS	85		25 - 150				
M2-8:2 FTS	67		25 - 150				
13C3 PFBS	46	*	50 - 150				

57

Lab Sample ID: 480-153995-2 MS Matrix: Water

Analysis Batch: 144054									Prep Batch: 143529
-	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
Perfluoropentanoic acid (PFPeA)	8.0	J F2	36.2	56.7		ng/L		135	40 - 160
	MS	MS							
Isotope Dilution	%Recovery	Qualifier	Limits						

25 - 150

Lab Sample ID: 480-153995-2 MSD **Matrix: Water**

Analysis Batch: 143837

13C5 PFPeA

Prep Type: Total/NA **Prep Batch: 143529** Sample Sample Spike MSD MSD %Rec. RPD **Result Qualifier** Analyte Added **Result Qualifier** Unit D %Rec Limits RPD Limit Perfluorobutanoic acid (PFBA) 68 F1 35.4 63.1 F1 F2 ng/L -15 40 - 160 68 30 8.0 J F2 35.4 30 Perfluoropentanoic acid (PFPeA) 31.1 F2 ng/L 65 40 - 160 58 Perfluorohexanoic acid (PFHxA) ND F1 35.4 56.0 ng/L 158 40 - 160 19 20 Perfluoroheptanoic acid (PFHpA) ND 35.4 43.8 ng/L 124 40 - 160 14 20 Perfluorooctanoic acid (PFOA) 9.9 35.4 45.4 ng/L 101 40 - 160 3 20 Perfluorononanoic acid (PFNA) ND 35.4 40.0 ng/L 113 40 - 160 3 20 Perfluorodecanoic acid (PFDA) ND 35.4 36.3 ng/L 103 40 - 160 3 20 ND I 35.4 36.9 104 40 - 160 8 20 Perfluoroundecanoic acid ng/L (PFUnA) ND 35.4 37.4 Perfluorododecanoic acid ng/L 106 40 - 160 3 20 (PFDoA) ND 35.4 36.8 104 40 - 160 17 20 Perfluorotridecanoic acid ng/L (PFTriA) Perfluorotetradecanoic acid ND 35.4 36.1 ng/L 102 40 - 160 1 20 (PFTeA) ND F21 31.3 53.1 F1 F2 170 20 40 - 160ng/L 41 Perfluorobutanesulfonic acid (PFBS) ND F2 32.2 47.3 147 40 - 160 9 20 Perfluorohexanesulfonic acid ng/L (PFHxS) ND 33.7 32.0 95 40 - 160 30 ng/L 6 Perfluoroheptanesulfonic Acid (PFHpS) Perfluorooctanesulfonic acid ND * F1 32.8 39.5 ng/L 120 40 - 160 NC 20 (PFOS)

Client Sample ID: MW-24-20190520

Job ID: 480-153995-1

Prep Type: Total/NA Prep Batch: 143529

Client Sample ID: MW-24-20190520

Client Sample ID: MW-24-20190520

Prep Type: Total/NA

Eurofins TestAmerica, Buffalo

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Job ID: 480-153995-1

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

Lab Sample ID: 480-153995-2 MSDClient Sample ID: IMatrix: WaterPreAnalysis Batch: 143837Pre						e ID: MW- Prep Ty Prep Ba): MW-24-20190520 rep Type: Total/NA Prep Batch: 143529				
-	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	C	%Rec	Limits	RPD	Limit
Perfluorodecanesulfonic acid (PFDS)	ND		34.1	27.1		ng/L		79	40 - 160	24	30
Perfluorooctanesulfonamide (PFOSA)	ND		35.4	34.0		ng/L		96	40 - 160	4	30
N-methylperfluorooctanesulfona midoacetic acid (NMeFOSAA)	ND	F2	35.4	34.4	J	ng/L		97	40 - 160	13	20
N-ethylperfluorooctanesulfonami doacetic acid (NEtFOSAA)	ND	*	35.4	36.8	J	ng/L		104	40 - 160	1	20
1H,1H,2H,2H-perfluorooctanesulf onic acid (6:2)	ND	F2 F1	33.5	26.8	J	ng/L		80	40 - 160	NC	30
1H,1H,2H,2H-perfluorodecanesul fonic acid (8:2)	ND		33.9	30.4	J F2	ng/L		90	40 - 160	56	30
	MSD	MSD									
Isotope Dilution	%Recovery	Qualifier	Limits								
1802 PFHxS	39	*	50 - 150								
13C4 PFHpA	68		50 - 150								
13C4 PFOA	70		50 - 150								
13C4 PFOS	53		50 - 150								
13C5 PFNA	53		50 - 150								
13C4 PFBA	39		25 - 150								
13C2 PFHxA	54		50 - 150								
13C2 PFDA	54		50 - 150								
13C2 PFUnA	58		50 - 150								
13C2 PFDoA	42	*	50 - 150								
13C8 FOSA	44		25 - 150								
13C5 PFPeA	75		25 - 150								
13C2 PFTeDA	43	*	50 - 150								
d3-NMeFOSAA	42	*	50 - 150								
d5-NEtFOSAA	43	*	50 - 150								
M2-6:2 FTS	94		25 - 150								
M2-8:2 FTS	75		25 - 150								
13C3 PFBS	27	*	50 - 150								

. 11

5

QC Association Summary

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

GC/MS Semi VOA

Prep Batch: 474688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-153995-1	MW-6-20190520	Total/NA	Water	3510C	
480-153995-2	MW-24-20190520	Total/NA	Water	3510C	
480-153995-3	MW-29-20190520	Total/NA	Water	3510C	
480-153995-4	DUP-20190520	Total/NA	Water	3510C	
480-153995-5	EB-020190520	Total/NA	Water	3510C	
MB 480-474688/1-A	Method Blank	Total/NA	Water	3510C	
LCS 480-474688/2-A	Lab Control Sample	Total/NA	Water	3510C	
480-153995-2 MS	MW-24-20190520	Total/NA	Water	3510C	
480-153995-2 MSD	MW-24-20190520	Total/NA	Water	3510C	

Analysis Batch: 475144

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-153995-1	MW-6-20190520	Total/NA	Water	8270D SIM ID	474688
480-153995-2	MW-24-20190520	Total/NA	Water	8270D SIM ID	474688
480-153995-3	MW-29-20190520	Total/NA	Water	8270D SIM ID	474688
480-153995-4	DUP-20190520	Total/NA	Water	8270D SIM ID	474688
480-153995-5	EB-020190520	Total/NA	Water	8270D SIM ID	474688
MB 480-474688/1-A	Method Blank	Total/NA	Water	8270D SIM ID	474688
LCS 480-474688/2-A	Lab Control Sample	Total/NA	Water	8270D SIM ID	474688
480-153995-2 MS	MW-24-20190520	Total/NA	Water	8270D SIM ID	474688
480-153995-2 MSD	MW-24-20190520	Total/NA	Water	8270D SIM ID	474688

LCMS

Prep Batch: 143529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-153995-1	MW-6-20190520	Total/NA	Water	3535	
480-153995-2	MW-24-20190520	Total/NA	Water	3535	
480-153995-3	MW-29-20190520	Total/NA	Water	3535	
480-153995-4	DUP-20190520	Total/NA	Water	3535	
480-153995-5	EB-020190520	Total/NA	Water	3535	
MB 200-143529/1-A	Method Blank	Total/NA	Water	3535	
LCS 200-143529/2-A	Lab Control Sample	Total/NA	Water	3535	
480-153995-2 MS	MW-24-20190520	Total/NA	Water	3535	
480-153995-2 MSD	MW-24-20190520	Total/NA	Water	3535	

Analysis Batch: 143837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-153995-1	MW-6-20190520	Total/NA	Water	537 (modified)	143529
480-153995-2	MW-24-20190520	Total/NA	Water	537 (modified)	143529
480-153995-3	MW-29-20190520	Total/NA	Water	537 (modified)	143529
480-153995-4	DUP-20190520	Total/NA	Water	537 (modified)	143529
480-153995-5	EB-020190520	Total/NA	Water	537 (modified)	143529
MB 200-143529/1-A	Method Blank	Total/NA	Water	537 (modified)	143529
LCS 200-143529/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	143529
480-153995-2 MS	MW-24-20190520	Total/NA	Water	537 (modified)	143529
480-153995-2 MSD	MW-24-20190520	Total/NA	Water	537 (modified)	143529

Analysis Batch: 144054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
480-153995-1	MW-6-20190520	Total/NA	Water	537 (modified)	143529

Eurofins TestAmerica, Buffalo

Job ID: 480-153995-1
QC Association Summary

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

LCMS (Continued)

Analysis Batch: 1440	054 (Continued)			
Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method
480-153995-2	MW-24-20190520	Total/NA	Water	537 (modified)
LCS 200-143529/2-A	Lab Control Sample	Total/NA	Water	537 (modified)
480-153995-2 MS	MW-24-20190520	Total/NA	Water	537 (modified)

Job ID: 480-153995-1

Prep Batch 143529 143529

143529

9

Eurofins TestAmerica, Buffalo

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: MW-6-20190520 Date Collected: 05/20/19 11:25 Date Received: 05/22/19 09:15

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			474688	05/24/19 16:11	AAP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	475144	05/30/19 08:25	RJS	TAL BUF
Total/NA	Prep	3535			143529	05/29/19 11:37	ТРВ	TAL BUR
Total/NA	Analysis	537 (modified)		1	143837	06/07/19 18:55	JM1	TAL BUR
Total/NA	Prep	3535			143529	05/29/19 11:37	TPB	TAL BUR
Total/NA	Analysis	537 (modified)		1	144054	06/13/19 18:08	JM1	TAL BUR

Client Sample ID: MW-24-20190520 Date Collected: 05/20/19 13:20 Date Received: 05/22/19 09:15

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			474688	05/24/19 16:11	AAP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	475144	05/30/19 04:02	RJS	TAL BUF
Total/NA	Prep	3535			143529	05/29/19 11:37	ТРВ	TAL BUR
Total/NA	Analysis	537 (modified)		5	143837	06/07/19 19:11	JM1	TAL BUR
Total/NA	Prep	3535			143529	05/29/19 11:37	ТРВ	TAL BUR
Total/NA	Analysis	537 (modified)		5	144054	06/13/19 18:23	JM1	TAL BUR

Client Sample ID: MW-29-20190520 Date Collected: 05/20/19 14:45 Date Received: 05/22/19 09:15

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			474688	05/24/19 16:11	AAP	TAL BUF
Total/NA	Analysis	8270D SIM ID		10	475144	05/30/19 08:49	RJS	TAL BUF
Total/NA	Prep	3535			143529	05/29/19 11:37	ТРВ	TAL BUR
Total/NA	Analysis	537 (modified)		5	143837	06/07/19 20:15	JM1	TAL BUR

Client Sample ID: DUP-20190520 Date Collected: 05/20/19 00:00 Date Received: 05/22/19 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			474688	05/24/19 16:11	AAP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	475144	05/30/19 09:13	RJS	TAL BUF
Total/NA	Prep	3535			143529	05/29/19 11:37	ТРВ	TAL BUR
Total/NA	Analysis	537 (modified)		5	143837	06/07/19 20:31	JM1	TAL BUR

Client Sample ID: EB-020190520 Date Collected: 05/20/19 12:00 Date Received: 05/22/19 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			474688	05/24/19 16:11	AAP	TAL BUF
Total/NA	Analysis	8270D SIM ID		1	475144	05/30/19 09:37	RJS	TAL BUF

Eurofins TestAmerica, Buffalo

Lab Sample ID: 480-153995-1 **Matrix: Water**

Lab Sample ID: 480-153995-3

Lab Sample ID: 480-153995-4

Lab Sample ID: 480-153995-2

Matrix: Water

Matrix: Water

Matrix: Water

Matrix: Water

Lab Sample ID: 480-153995-5

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: EB-020190520 Date Collected: 05/20/19 12:00 Date Received: 05/22/19 09:15

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	3535			143529	05/29/19 11:37	TPB	TAL BUR
Total/NA	Analysis	537 (modified)		1	143837	06/07/19 20:46	JM1	TAL BUR

Laboratory References:

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

TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Job ID: 480-153995-1

Matrix: Water

Lab Sample ID: 480-153995-5

Accreditation/Certification Summary

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis Job ID: 480-153995-1

Laboratory: Eurofins 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	03-31-20

Laboratory: Eurofins TestAmerica, Burlington

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
New York	NELAP	2	10391	04-01-20

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
537 (modified)	3535	Water	1H,1H,2H,2H-perfluorodecanesulfonic acid
			(8:2)
537 (modified)	3535	Water	1H,1H,2H,2H-perfluorooctanesulfonic acid
			(6:2)
537 (modified)	3535	Water	N-ethylperfluorooctanesulfonamidoacetic
			acid (NEtFOSAA)
537 (modified)	3535	Water	N-methylperfluorooctanesulfonamidoacetic
			acid (NMeFOSAA)
537 (modified)	3535	Water	Perfluorobutanesulfonic acid (PFBS)
537 (modified)	3535	Water	Perfluorobutanoic acid (PFBA)
537 (modified)	3535	Water	Perfluorodecanesulfonic acid (PFDS)
537 (modified)	3535	Water	Perfluorodecanoic acid (PFDA)
537 (modified)	3535	Water	Perfluorododecanoic acid (PFDoA)
537 (modified)	3535	Water	Perfluoroheptanesulfonic Acid (PFHpS)
537 (modified)	3535	Water	Perfluoroheptanoic acid (PFHpA)
537 (modified)	3535	Water	Perfluorohexanesulfonic acid (PFHxS)
537 (modified)	3535	Water	Perfluorohexanoic acid (PFHxA)
537 (modified)	3535	Water	Perfluorononanoic acid (PFNA)
537 (modified)	3535	Water	Perfluorooctanesulfonamide (PFOSA)
537 (modified)	3535	Water	Perfluorooctanesulfonic acid (PFOS)
537 (modified)	3535	Water	Perfluorooctanoic acid (PFOA)
537 (modified)	3535	Water	Perfluoropentanoic acid (PFPeA)
537 (modified)	3535	Water	Perfluorotetradecanoic acid (PFTeA)
537 (modified)	3535	Water	Perfluorotridecanoic acid (PFTriA)
537 (modified)	3535	Water	Perfluoroundecanoic acid (PFUnA)

Method Summary

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

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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 BUR
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL BUF
3535	Solid-Phase Extraction (SPE)	SW846	TAL BUR

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 = Eurofins TestAmerica, Buffalo, 10 Hazelwood Drive, Amherst, NY 14228-2298, TEL (716)691-2600 TAL BUR = Eurofins TestAmerica, Burlington, 30 Community Drive, Suite 11, South Burlington, VT 05403, TEL (802)660-1990

Sample Summary

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Job ID: 480-153995-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
480-153995-1	MW-6-20190520	Water	05/20/19 11:25	05/22/19 09:15
480-153995-2	MW-24-20190520	Water	05/20/19 13:20	05/22/19 09:15
480-153995-3	MW-29-20190520	Water	05/20/19 14:45	05/22/19 09:15
480-153995-4	DUP-20190520	Water	05/20/19 00:00	05/22/19 09:15
480-153995-5	EB-020190520	Water	05/20/19 12:00	05/22/19 09:15

Eurofins TestAmerica, Buffalo

	Sampler: M	Mar	Senzie	Lab PM: Deyo, N	Cifelissa L	arrier Tracking No(s):	COC No: 480-130246-29388.1
Client Contact: Mark Flusche	Phone Phone	1107-12	0	E-Mail: melissa	deyo@testamericainc.com		Page: Page 1 of 1
Company. ARCADIS U.S. Inc					Analysis Redu	ested	Job #;
Address: 855 Route 146 Suite 210	Due Date Requeste	:pe				- And the second	Preservation Codes:
city Clifton Park	TAT Requested (da	:(ski					
State, Zip; NY, 12065					(59)		
Phone: 518-250-7322(Tel)	PO#: B0043021,0020			(0	Viene	480	0-153995 Chain of Custody
Email: mark.flusche@arcadis-us.com	# OM			8 Of N	(oN sile sile	-	D - DI Water V - MCAA
Project Name: Port Jervis, NY - Groundwater Project	Project #: 48020198			(A6	to se to id b, to id b,		L-EDA V-pH 4-5 L-EDA Z-other (specify)
Site	SSOW#:			Iqma2	, t - 01_, it - 10_, it -		contrer:
		Sample	Sample Type (C=comp.	Matrix da (wwwater, Sesolid, O-wasteloli,	M/2M mohar Aqq - Aqi_2q 2m_mi2_0075		Mar Halo Login-
Sample Identification	Sample Uate		Preservation	on Code: X			+ special instructions/Note:
NW-16 - 20190520	5/20/14	1125	0	Water	XX	7	
(newer) - 24 - 20,905 20 1 Mesh 50)	5/20/19	1320	5	Water	XXX	×	2
ANU - 29 - 20190520	5/20/19	1445	5	Water	71	2	X
DUN-20 R0520	5/20/19		3	Water	イイ	2	
EB-25190520	5/20/14	1200	G	Water	XX	7	
5				Water			
				Water			
Possible Hazard Identification					Sample Disposal (A fee may be ass	essed if samples are reta	nined longer than 1 month)
Non-Hazard Hammable Skin Itritant	Poison B Unkno	wn Ra	diological		Return To Client	oosal By Lab	chive For Months
Deliverable Requested: 1, 11, 111, 1V, Other (specify)					opecial instructions/00 requirements		
Empty Kit Relinquished by:		Date:		Tir	ne:	Method of Shipment:	
April an a la Man Do A Re	0121/19	11:40	am c	ompany	Palle Short	Saile	Il: Yoon Test ,
reinoppole by a 12 year	5/2 1/19	5:00	Pm	nd tast An	Received	5/22/17	7:15 COMPANY
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Custody Seals Intact: Custody Seal No.: A Yes A No					Cooler Temperature(s) °C and Other Rem	arks 2, 3 44	

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Eurofins TestAmerica, Buffalo



Login Sample Receipt Checklist

Client: ARCADIS U.S. Inc

Login Number: 153995 List Number: 1 Creator: Wallace, Cameron

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.	True	
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.	True	
Chlorine Residual checked.	N/A	

List Source: Eurofins TestAmerica, Buffalo

Client: ARCADIS U.S. Inc

Login Number: 153995 List Number: 2 Creator: McNabb, Robert W

Job	Number:	480-153995-1
000	number.	+00-100000-1

List Creation: 05/24/19 10:08 AM

List Source: Eurofins TestAmerica, Burlington

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td>Lab does not accept radioactive samples.</td>	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	True	Not present
Sample custody seals, if present, are 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	0.1°C
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	MM
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.	N/A	
Sample Preservation Verified.	True	
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 D

Data Validation Report





Orange & Rockland Utilities

DATA USABILTY SUMMARY REPORT (DUSR)

Port Jervis, New York

1,4-Dioxane and Perfluoroalkyl Substances (PFAS) Analyses

SDG #480-153995-1

Analyses Performed By: Eurofins Environment Testing / TestAmerica Buffalo, New York and South Burlington, Vermont

Report #33212R Review Level: Tier III Project: B0043021.0020.00001

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) #480-153995-1 for samples collected in association with the Orange & Rockland Utilities site located in Port Jervis, New York. The review was conducted as a Tier III evaluation and included review of data package completeness. Analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

			Sample		Anal	ysis
Sample ID	Lab ID	Matrix	Collection Date	Parent Sample	1,4-D	PFAS
MW-6-20190520	480-153995-1	Water	5/20/2019		х	Х
MW-24-20190520	480-153995-2	Water	5/20/2019		x	х
MW-29-20190520	480-153995-3	Water	5/20/2019		х	х
DUP-20190520	480-153995-4	Water	5/20/2019	MW-24-20190520	х	Х
EB-20190520	480-153995-5	Water	5/20/2019		х	Х

Note:

- 1. 1,4-D = 1,4-dioxane; PFAS = perfluoroalkyl substances
- 2. 1,4-Dioxane analysis was performed by Eurofins TestAmerica, Buffalo and PFAS analysis was performed by Eurofins TestAmerica, Burlington.

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

	Reported		Performance Acceptable		Not
Items Reviewed	No	Yes	No	Yes	Required
1. Sample receipt condition		Х		Х	
2. Requested analyses and sample results		Х		Х	
3. Master tracking list		Х		Х	
4. Methods of analysis		Х		Х	
5. Reporting limits		Х		Х	
6. Sample collection date		Х		Х	
7. Laboratory sample received date		Х		Х	
8. Sample preservation verification (as applicable)		Х		Х	
9. Sample preparation/extraction/analysis dates		Х		Х	
10. Fully executed Chain-of-Custody (COC) form		Х		Х	
11. Narrative summary of QA or sample problems provided		Х		Х	
12. Data Package Completeness and Compliance		Х		Х	

Note:

QA - Quality Assurance

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 8270D by Selected Ion Monitoring (SIM) and USEPA Method 537 (Modified). Data were reviewed in accordance with USEPA National Functional Guidelines for Organic Superfund Methods Data Review, EPA 540-R-2017-002, January 2017 (with reference to the historical USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, OSWER 9240.1-05A-P, October 1999, as appropriate); USEPA Method 537; Eurofins TestAmerica, Burlington Standard Operating Procedure Per-and Poly-fluorinated Substances (PFAS) in Drinking Water and Non-Potable Water [Method 537 (Modified)]; and Department of Defense (DoD) Quality Systems Manual (QSM) version 5.1.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
 - U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
 - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
 - E The compound was quantitated above the calibration range.
 - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
 - J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
 - UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
 - JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
 - UB Compound is considered non-detect at the listed value due to associated blank contamination.
 - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
 - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and

provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

1,4-DIOXANE ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8270D- SIM	Water	7 days from collection to extraction and 40 days from extraction to analysis	Cool to < 6°C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

Quality assurance (QA) blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A blank action level (BAL) of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the method detection limit (MDL). The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

1,4-Dioxane was not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable, and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

The initial calibration and continuing calibration verification results were within the specified control limits.

5. Surrogates/System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. 1,4-Dioxane analysis requires that 1,4-dioxane-d8 exhibits a recovery within the laboratory-established acceptance limits.

Sample locations associated with surrogates exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	Surrogate	Recovery
MW-29-20190520	1,4-Dioxane-d8	< LL but > 10%

The criteria used to evaluate the surrogate recoveries are presented in the following table. In the case of a surrogate deviation, the sample results are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
> the upper control limit (III.)	Non-detect	No Action
	Detect	J
s the lower control limit (11) but > 10%	Non-detect	UJ
	Detect	J
- 100/	Non-detect	R
< 10%	Detect	J

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compound associated with 1,4-dioxane exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

7. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The relative percent difference (RPD) between the MS/MSD recoveries must exhibit an RPD within the laboratory-established acceptance limits.

Note: The MS/MSD recovery control limits do not apply for MS/MSD performed on sample locations where the compound concentration detected in the parent sample exceeds the MS/MSD concentration by a factor of four or greater.

The MS/MSD performed on sample location MW-24-20190520 exhibited acceptable recoveries and RPD between the MS/MSD recoveries.

8. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

The LCS analysis exhibited a recovery for 1,4-dioxane within the control limits.

9. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-24-20190520 / DUP-20190520	1,4-Dioxane	0.20 U	0.20 U	AC

Notes:

µg/L Microgram per liter

AC Acceptable

1,4-Dioxane was not detected in the parent sample MW-24-20190520 and field duplicate sample DUP-20190520.

10. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra. All identified compounds met the specified criteria.

11. System Performance and Overall Assessment

Sample MW-29-20190520 required dilution due to the nature of the sample matrix. The 1,4-dioxane result was reported as not detected at an elevated reporting limit of 2.0µg/L.

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR 1,4-DIOXANE

1,4-Dioxane: SW-846 8270D-SIM	Rep	orted	Perforr Accep	nance table	Not
	No	Yes	No	Yes	Required
GAS CHROMATOGRAPHY/MASS SPECTROM	ETRY (GC	:/MS)			
Tier II Validation					
Holding times		x		Х	
Reporting limits (units)		x		Х	
Blanks					
A. Method blanks		x		Х	
B. Equipment blanks		x		Х	
Laboratory Control Sample (LCS) %R		x		Х	
Laboratory Control Sample Duplicate (LCSD) %R	х				Х
LCS/LCSD Precision (RPD)	х				Х
Matrix Spike (MS) %R		x		Х	
Matrix Spike Duplicate (MSD) %R		x		Х	
MS/MSD Precision (RPD)		x		Х	
Field Duplicate Precision (RPD)		x		Х	
Surrogate Spike Recoveries		x	х		
Dilution Factor		x		Х	
Moisture Content	х				Х
Tier III Validation					
System performance and column resolution		х		Х	
Initial calibration %RSDs		x		Х	
Continuing calibration RRFs		х		Х	
Continuing calibration %Ds		х		Х	
Instrument tune and performance check		x		Х	
Ion abundance criteria for each instrument used		х		Х	
Internal standard		х		Х	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		х		Х	
B. Quantitation Reports		х		Х	
C. RT of sample compounds within the established RT windows		x		x	

1,4-Dioxane: SW-846 8270D-SIM	Repo	rted Perfor Acce		mance otable	Not
	No	Yes	No	Yes	Required
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
D. Quantitation transcriptions/calculations		x		Х	
E. Reporting limits adjusted to reflect sample dilutions		Х		Х	
Notoo					

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

PERFLUOROALKYL SUBSTANCES (PFAS) ANALYSES

1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
USEPA Method 537 (Modified)	Water	14 days from collection to extraction and 28 days from extraction to analysis	Cool to <6 °C

All samples were analyzed within the specified holding time criteria.

2. Blank Contamination

QA blanks (i.e., method and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Rinse blanks measure contamination of samples during field operations.

A BAL of five times the concentration of a detected compound in an associated blank (common laboratory contaminant compounds are calculated at ten times) is calculated for QA blanks containing concentrations greater than the MDL. The BAL is compared to the associated sample results to determine the appropriate qualification of the sample results, if needed.

Compounds were not detected above the MDL in the associated blanks; therefore, detected sample results were not associated with blank contamination.

3. Mass Calibration

Mass calibration and system performance were acceptable.

4. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The %RSD of the RF must be less than 20%, or for linear calibration, $r^2 \ge 0.99$. Analytes must be within 70-130% of their true value for each calibration standard.

4.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a %D less than the control limit of 30%.

All calibrations were within the specified control limits with the exception of the compounds presented in the following table.

Sample Locations	Initial/Continuing	Compound	Criteria
MW-29-20190520			
DUP-20190520	Continuing Calibration	Perfluorobutanoic acid (PFBA)	+35.4%
EB-20190520			

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial Calibration	% RSD > 20% or a correlation coefficient <0.00	Non-detect	UJ
millar Calibration	ANSD > 20 % of a correlation coefficient <0.99	Detect	J
Continuing Calibration	9/D - 209/ (increase in consitiuity)	Non-detect	No Action
	%D > 30% (increase in sensitivity)	Detect	J
		Non-detect	UJ
	$\sim 20\%$ (uectedse in sensitivity)	Detect	J

5. Isotopically Labelled Standards

5.1. Extracted Internal Standard (EIS)/Surrogate Compounds

Labeled standards must be added to all field samples and QC samples prior to extraction. EIS recoveries must be within DoD QSM 5.1 specified limits of 50% to150%.

Sample locations associated with EIS exhibiting recoveries outside of the control limits are presented in the following table.

Sample Locations	EIS	Associated Compound	Recovery	
	13C4 PFBA	Perfluorobutanoic acid (PFBA)	< 25% but > 10%	
	13C8 FOSA	Perfluorooctanesulfonamidoacetic acid (PFOSA)		
	13C5 PFPeA	Perfluoropentanoic acid (PFPeA)		
MW-6-20190520	13C2 PFTeDA	Perfluorotetradecanoic acid (PFTeA)		
	d3-NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	< 50% but > 25%	
	d5-NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)		
13C4 PFBA		Perfluorobutanoic acid (PFBA)		
MW-24-20190520	13C2 PFTeDA	Perfluorotetradecanoic acid (PFTeA)	< 50% but > 25%	
	d3-NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	< 00 /0 Sul > 20 /0	

Sample Locations	EIS	Associated Compound	Recovery	
	d5-NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)		
	13C3 PFBS	Perfluorobutanesulfonic acid (PFBS)		
	13C4 PFBA	Perfluorobutanoic acid (PFBA)	< 25% but > 10%	
	18O2 PFHxS	Perfluorohexanesulfonic acid (PFHxS)		
MW-29-20190520	13C PFOS	Perfluorooctanesulfonic acid (PFOS)		
	13C2 PFHxA	Perfluorohexanoic acid (PFHxA)	< 50% but > 25%	
	13C5 PFPeA	Perfluoropentanoic acid (PFPeA)	-	
	13C4 PFOS	Perfluorooctanesulfonic acid (PFOS)		
	13C4 PFBA	Perfluorobutanoic acid (PFBA)	-	
	13C2 PFDoA	Perfluorododecanoic acid (PFDoA)		
	13C2 PFTeDA	Perfluorotetradecanoic acid (PFTeA)	< 50% but > 25%	
DUP-20190520	d3-NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)		
	d5-NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)		
	13C PFBS Perfluorobutanesulfonic acid (PFBS)			
	18O2 PFHxS	Perfluorohexanesulfonic acid (PFHxS)		
	13C4 PFBA	Perfluorobutanoic acid (PFBA)	-	
EB-20190520	13C8 FOSA	Perfluorooctanesulfonamidoacetic acid (PFOSA)		
	13C2 PFTeDA	Perfluorotetradecanoic acid (PFTeA)	< 50% but > 25%	
	d3-NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)		
	d5-NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)		

The criteria used to evaluate the EIS recoveries are presented in the following table. In the case of an EIS deviation, the sample results associated with the EIS are qualified as documented in the table below.

Control Limit	Sample Result	Qualification
4500/	Non-detect	No Action
> 150%	Detect	J
< 50% but > 25%	Non-detect	
	Detect	No Action
	Non-detect	UJ
< 25% but > 10%	Detect	J

Control Limit	Sample Result	Qualification
	Non-detect	R
< 10%	Detect	J

As part of the isotope dilution analysis, the EIS are used for quantitation of the sample results, therefore the calculation of sample concentrations is adjusted for EIS recoveries. The data will not be qualified unless EIS recoveries are less than 25%.

5.2. Injection Internal Standards

Injection internal standards must be added to the aliquot of sample dilutions, QC samples, and standards just prior to analysis. Peak areas must be within 50-150% of the area measured in the ICAL midpoint standard. On days when ICAL is not performed, the peak areas must be within 50-150% of the peak area measured in daily initial CCV.

Internal standard responses were within the control limits with the following exceptions:

The peak areas for 13C2 PFOA were less than 50% but greater than 10% for samples MW-24-20190520, MW-29-20190520, and DUP-20190520. Since the EIS are used for quantitation of the sample results and the peak areas were greater than 10%, no qualification of the sample results was taken.

6. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Analysis

MS/MSD data are used to assess the precision and accuracy of the analytical method. The compounds used to perform the MS/MSD analysis must exhibit a percent recovery within the laboratory-established acceptance limits. The RPD between the MS/MSD recoveries must exhibit an RPD less than 30%.

The MS/MSD performed using sample MW-24-20190520 exhibited recoveries outside of the control limits as presented in the following table.

Sample Locations	Compound	MS Recovery	MSD Recovery
	Perfluorobutanoic acid (PFBA)	10	< 10%
MW-24-20190520	Perfluorobutanoesulfonic acid (PFBS)	AC	> UL

Note:

AC Acceptable

The criteria used to evaluate the MS/MSD recoveries are presented in the following table. In the case of an MS/MSD deviation, the sample results are qualified as documented in the table below. Qualifiers were also assigned to the associated field duplicate sample DUP-20190520.

Control Limit	Sample Result	Qualification
	Non-detect	No Action
> the upper control limit (UL)	Detect	J
	Non-detect	UJ
< the lower control limit (LL) but > 10%	Detect	J

Control Limit	Sample Result	Qualification
	Non-detect	R
< 10%	Detect	J

Sample locations associated with MS/MSD recoveries exhibiting an RPD greater than of the control limit presented in the following table.

Sample Locations	Compound
	Perfluorobutanoic acid (PFBA)
	Perfluoropentanoic acid (PFPeA)
	Perfluorobutanoesulfonic acid (PFBS)
MW-24-20190520	Perfluorohexanesulfonic acid (PFHxS)
	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)
	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)

The criteria used to evaluate the RPD between the MS/MSD recoveries are presented in the following table. In the case of an RPD deviation, the sample results are qualified as documented in the table below. Qualifiers were also assigned to the associated field duplicate sample DUP-20190520.

Control Limit	Sample Result	Qualification
	Non-detect	UJ
> 0L	Detect	J

7. Laboratory Control Sample (LCS) Analysis

The LCS analysis is used to assess the precision and accuracy of the analytical method independent of matrix interferences. The compounds associated with the LCS analysis must exhibit a percent recovery within the laboratory-established acceptance limits.

All compounds associated with the LCS analysis exhibited recoveries within the control limits.

8. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (ng/L)	Duplicate Result (ng/L)	RPD
	Perfluorobutanoic acid (PFBA)	37	24	
	Perfluoropentanoic acid (PFPeA)	8.0 J	17	
	Perfluorohexanoic acid (PFHxA)	13	16	
	Perfluoroheptanoic acid (PFHpA)	5.6 J	6.2 J	
MW-24-20190520 / DUP-20190520	Perfluorooctanoic acid (PFOA)	11	11	AC
	Perfluorobutanesulfonic acid (PFBS)	9.6	7.3 J	
	Perfluorohexanesulfonic acid (PFHxS)	9.1	9.0	
	Perfluorooctanesulfonic acid (PFOS)	9.0 U	14	

Notes:

AC Acceptable

ng/L Nanogram per liter

The differences in the results between the parent sample MW-24-20190520 and field duplicate sample DUP-20190520 were acceptable.

9. Compound Identification

PFAS analytes are identified by using the compound's ion abundance ratios, signal-to-noise values, and relative retention times.

All identified compounds met method criteria.

10. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

DATA VALIDATION CHECKLIST FOR PFAS

PFAS: USEPA Modified 537	Rep	orted	Perforr Accep	nance table	Not
	No	Yes	No	Yes	Required
LIQUID CHROMATOGRAPHY/TANDEM MASS	SPECTRO	OMETRY (L	_C/MS/MS	5)	
Tier II Validation					
Holding times		x		Х	
Reporting limits (units)		х		Х	
Blanks					
A. Method blanks		x		Х	
B. Field blanks		x		Х	
Laboratory Control Sample (LCS) %R		x		Х	
Laboratory Control Sample Duplicate (LCSD) %R					Х
LCS/LCSD Precision (RPD)					Х
Matrix Spike (MS) %R		х		Х	
Matrix Spike Duplicate (MSD) %R		x	х		
MS/MSD Precision (RPD)		x	х		
Field Duplicate (RPD)		x		Х	
Extracted Internal Standards (EIS) %R		x	Х		
Injection Internal Standard %R		x		Х	
Dilution Factor		x		Х	
Moisture Content	х				Х
Tier III Validation	<u>.</u>	·			·
Instrument tune and performance check		x		Х	
Initial calibration %RSDs		x		Х	
Continuing calibration %Ds		x	х		
Instrument sensitivity check		х		Х	
Ion transitions used		х		Х	
Compound identification and quantitation	<u>.</u>	·			·
A. Reconstructed ion chromatograms		x		Х	
B. Quantitation Reports		x		Х	
C. RT of sample compounds within the established RT windows		x		х	
D. Transcription/calculations acceptable		x		Х	

PFAS: USEPA Modified 537		Repo	orted	Perforr Accep	nance table	Not
		No	Yes	No	Yes	Required
LIQU	ID CHROMATOGRAPHY/TANDEM MASS	SPECTRO	METRY (I	_C/MS/MS	5)	
E.	Reporting limits adjusted to reflect sample dilutions		Х		х	
Notes:						

%RSD	Relative standard deviation
%R	Percent recovery

RPD Relative percent difference

%D Percent difference

SAMPLE COMPLIANCE REPORT

SAMPLE COMPLIA	NCE REPORT
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Sample Delivery	ample Delivery Sampling Protocol Sample ID		Motrix	Comp	liancy ¹	No	
Groups (SDGs)	Date	Protocol	Sample ID	Wallix	SVOC	PFAS	Noncompliance
	5/20/2019		MW-6-20190520	Water	Yes	No	PFAS: EIS
480-153995-1	5/20/2019	USEPA Method 537 Modified and	MW-24-20190520	Water	Yes	No	PFAS: EIS, MSD %R, MS/MSD RPD
	5/20/2019		Method 537 Modified and	MW-29-20190520	Water	No	No
	5/20/2019	SW-846 8270D-SIM	DUP-20190520	Water	Yes	No	PFAS: CCV %D, EIS, MSD %R, MS/MSD RPD
	5/20/2019		EB-20190520	Water	Yes	No	PFAS: CCV %D, EIS

Note:

1 Samples which are compliant with no added validation qualifiers are listed as "yes". Samples which are non-compliant or which have added qualifiers are listed as "no". A "no" designation does not necessarily indicate that the data have been rejected or are otherwise unusable.

VALIDATION PERFORMED BY: Jennifer Singer

SIGNATURE:

knnifer Alinger

DATE: July 2, 2019

PEER REVIEW: Dennis Capria

DATE: July 2, 2019

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



Eurofins TestAmerica, Buffalo

220-Shelton	Chain of	Custody	Record
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220-Shelton

eurofins

10 Hazelwood Drive Amherst, NY 14228-2298 Phone (716) 691-2600 Eax (716) 691

Client Information	Sampler: M	Mac	Benzie	Deyo	, Meliss	aL		Camer	racking No(s):		480-130246-29388.1
Client Contact: Mark Flusche	Phone: BleD. 471.6180 E-Ma meti			E-Mail melis	sa.deyo	a.deyo@testamericainc.com					Page: Page 1 of 1
Company: ARCADIS U.S. Inc							Analy	sis Requeste	d		# doL
Address: 355 Route 146 Suite 210	Due Date Request	ted:									Preservation Codes:
Dity. Clifton Park	TAT Requested (d	lays):									
State. Zip:						(5					
Phone:	PO #:					natyte				480	153995 Chain of Custody
Email:	WO #:)			I NO	(21 al				400-	
nark.flusche@arcadis-us.com ?roject Name:	Project #:				Yes o	rd List				iners	K - EDTA W - pH 4-5
Port Jervis, NY - Groundwater Project	48020198				Yes (Yes	tandar - 1,4 E				conta	Cther:
		-			d San	AS, S				ar of o	
			Sample	Matrix (Wewater,	m MS	SIM_N				lumbe	Buffalo login-
Comple Identification	Sample Date	Sample	(C=comp,	Sesolid, O-waste/oil,	erfor	FC_ID				otal	Special Instructions (Note)
Sample identification	Sample Date		Preservatio	n Code:		N N				X	Special Instructions/Note.
MW-le-20190520	5/20/14	1125	G	Water		XX				4	
MW-24-20190520 (USUSD)	5/20/19	1320	G	Water	Y	XX				12	
MW -29-20190520	5/20/19	1445	G	Water		XX				4	
DU8-2090520	5/20/19		G	Water		14				4	
EB-26190520	5/20/19	12DD	G	Water		XX	N			14	
				Water							
				Water							
Possible Hazard Identification			Padialogical		Sam	ple Dis	sposal (A fee i	may be assesse	d if samples	are retain	ned longer than 1 month)
Deliverable Requested: I, II, III, IV, Other (specify)	DISOTI DI UTIKIN	own r	lauloiogicai		Spec	cial Inst	tructions/QC Re	equirements:	by Lau	Alch	Workins
Empty Kit Relinquished by:		Date:		-	Time:			Me	thod of Shipmen	0	
veringuished by: Van Dayles	Date/Time:	11.10	a m Co	mpany	F	Pred	0. M	APRA	Date/Tim	· /10	111400 Company Fect
relinguished by	DateTime	5100	Pin Co	mpany A	F	leceiveb	KBY.	r	Date	119	Company D
telinguished by:	Date/Time:	0.00	Cc	mpany	F	Received	Dy:		Date/Tim	2/17 ne:/	Company
Custody Seals Intact: Custody Seal No.			1		0	Cooler Te	emperature(s) °C ar	nd Other Remarks	20	-	/
A Yes A No								a second second second	5,5	FI 1	

6/18/2019

Definitions/Glossary

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Job ID: 480-153995-1

Qualifiers

Qualifiers		3
GC/MS Sem Qualifier *	i VOA Qualifier Description Isotope Dilution analyte is outside acceptance limits.	_ 4
E	Result exceeded calibration range.	5
LCMS Qualifier	Qualifier Description	6
* F1	Isotope Dilution analyte is outside acceptance limits. MS and/or MSD Recovery is outside acceptance limits.	
F2 J	MS/MSD RPD exceeds control limits Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value	
Glossary		- 8
Abbreviation	These commonly used abbreviations may or may not be present in this report.	- 9

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)
Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: MW-6-20190520 Date Collected: 05/20/19 11:25 Date Received: 05/22/19 09:15

Job ID: 480-153995-1

Lab Sample ID: 480-153995-1 Matrix: Water

Method: 8270D SIM ID - Semiv	olatile Orga	anic Com	pounds (GC/I	MS SIM /	Isotope	Diluti	on)		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		05/24/19 16:11	05/30/19 08:25	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	19		15 - 110				05/24/19 16:11	05/30/19 08:25	1
-									
Method: 537 (modified) - Fluor	inated Alky	I Substai	nces			_	- ·		
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	DILFac
Perfluorobutanoic acid (PFBA)	24	J	1.8	0.88	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluoropentanoic acid (PFPeA)	75	J	1.8	0.56	ng/L		05/29/19 11:37	06/13/19 18:08	1
Perfluorohexanoic acid (PFHxA)	93		1.8	0.67	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluoroheptanoic acid (PFHpA)	11		1.8	0.80	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorooctanoic acid (PFOA)	20		1.8	0.56	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorononanoic acid (PFNA)	ND		1.8	0.24	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorodecanoic acid (PFDA)	ND		1.8	0.68	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluoroundecanoic acid (PFUnA)	ND		1.8	0.47	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorododecanoic acid (PFDoA)	ND		1.8	0.52	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorotridecanoic acid (PFTriA)	ND		1.8	0.53	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorotetradecanoic acid (PFTeA)	ND	UJ	1.8	0.81	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorobutanesulfonic acid (PFBS)	6.8		1.8	0.43	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorohexanesulfonic acid (PFHxS)	4.3		1.8	0.71	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.84	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorooctanesulfonic acid (PFOS)	7.7		1.8	0.54	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.79	ng/L		05/29/19 11:37	06/07/19 18:55	1
Perfluorooctanesulfonamide (PFOSA)	ND	UJ	1.8	0.56	ng/L		05/29/19 11:37	06/07/19 18:55	1
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND	UJ	18	1.5	ng/L		05/29/19 11:37	06/07/19 18:55	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND	UJ	18	1.3	ng/L		05/29/19 11:37	06/07/19 18:55	1
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		18	4.1	ng/L		05/29/19 11:37	06/07/19 18:55	1
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		18	2.6	ng/L		05/29/19 11:37	06/07/19 18:55	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	55		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C4 PFHpA	67		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C4 PFOA	65		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C4 PFOS	55		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C5 PFNA	55		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C4 PFBA	22	*	25 - 150				05/29/19 11:37	06/07/19 18:55	1
13C2 PFHxA	52		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C2 PFDA	52		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C2 PFUnA	53		50 - 150				05/29/19 11:37	06/07/19 18:55	1
13C2 PEDoA	50		50 - 150				05/29/19 11:37	06/07/19 18:55	
13C8 FOSA	50 4٦		25 _ 150				05/29/19 11:37	06/07/19 18:55	1
13C5 PEPeA	45		25 - 150				05/29/19 11:37	06/13/19 18:08	1
13C2 PETeDA	48	*	50 - 150				05/29/19 11.37	06/07/19 18:55	
d3-NMeEOSAA	36	*	50 - 150				05/29/19 11:37	06/07/19 18:55	1
d5-NEtFOSAA	40	*	50 - 150				05/29/19 11:37	06/07/19 18:55	1

Eurofins TestAmerica, Buffalo

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: MW-6-20190520 Date Collected: 05/20/19 11:25 Date Received: 05/22/19 09:15

Method: 537 (modified)) - Fluorinated Alkyl Substar	nces (Continued)			
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
M2-6:2 FTS	103	25 - 150	05/29/19 11:37	06/07/19 18:55	1
M2-8:2 FTS	85	25 - 150	05/29/19 11:37	06/07/19 18:55	1
13C3 PFBS	53	50 - 150	05/29/19 11:37	06/07/19 18:55	1

Client Sample ID: MW-24-20190520 Date Collected: 05/20/19 13:20 Date Received: 05/22/19 09:15

1H,1H,2H,2H-perfluorodecanesulfonic

Method: 8270D SIM ID - Semiv Analyte	volatile Orga Result	anic Comp Qualifier	ounds (GC/N RL	/IS SIM / MDL	Unit	Diluti D	on) Prepared	Analvzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		05/24/19 16:11	05/30/19 04:02	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	18		15 - 110				05/24/19 16:11	05/30/19 04:02	1
- Method: 537 (modified) - Fluo	rinated Alky	/I Substan	ces						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	37	J	9.0	4.5	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluoropentanoic acid (PFPeA)	8.0	JF2	9.0	2.8	ng/L		05/29/19 11:37	06/13/19 18:23	5
Perfluorohexanoic acid (PFHxA)	13		9.0	3.4	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluoroheptanoic acid (PFHpA)	5.6	J	9.0	4.1	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorooctanoic acid (PFOA)	11		9.0	2.8	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorononanoic acid (PFNA)	ND		9.0	1.2	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorodecanoic acid (PFDA)	ND		9.0	3.5	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluoroundecanoic acid (PFUnA)	ND		9.0	2.4	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorododecanoic acid (PFDoA)	ND		9.0	2.6	ng/L		05/29/19 11:37	06/07/19 19:11	5
Perfluorotridecanoic acid (PFTriA)	ND		9.0	2.7	ng/L		05/29/19 11:37	06/07/19 19:11	5
					-				

Perfluorotridecanoic acid (PFTriA)	ND	9.0	2.7 ng/L	05/29/19 11:37 06/07/19 19:11	5
Perfluorotetradecanoic acid (PFTeA)	ND UJ	9.0	4.1 ng/L	05/29/19 11:37 06/07/19 19:11	5
Perfluorobutanesulfonic acid (PFBS)	9.6 F2 J	9.0	2.2 ng/L	05/29/19 11:37 06/07/19 19:11	5
Perfluorohexanesulfonic acid (PFHxS)	9.1 F <mark>2</mark> J	9.0	3.6 ng/L	05/29/19 11:37 06/07/19 19:11	5
Perfluoroheptanesulfonic Acid (PFHpS)	ND	9.0	4.3 ng/L	05/29/19 11:37 06/07/19 19:11	5
Perfluorooctanesulfonic acid (PFOS)	ND	9.0	2.7 ng/L	05/29/19 11:37 06/07/19 19:11	5
Perfluorodecanesulfonic acid (PFDS)	ND	9.0	4.0 ng/L	05/29/19 11:37 06/07/19 19:11	5
Perfluorooctanesulfonamide (PFOSA)	ND	9.0	2.9 ng/L	05/29/19 11:37 06/07/19 19:11	5
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND F2 UJ	90	7.6 ng/L	05/29/19 11:37 06/07/19 19:11	5
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND UJ	90	6.7 ng/L	05/29/19 11:37 06/07/19 19:11	5
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND F2 UJ	90	21 ng/L	05/29/19 11:37 06/07/19 19:11	5
1H.1H.2H.2H-perfluorodecanesulfonic	ND UJ	90	13 ng/L	05/29/19 11:37 06/07/19 19:11	5

acid (8:2)						
Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
18O2 PFHxS	50		50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C4 PFHpA	81		50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C4 PFOA	77		50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C4 PFOS	57		50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C5 PFNA	61		50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C4 PFBA	41		25 - 150	05/29/19 11:37	06/07/19 19:11	5

Eurofins TestAmerica, Buffalo

Matrix: Water

Matrix: Water

Lab Sample ID: 480-153995-1

Lab Sample ID: 480-153995-2

5 6

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: MW-24-20190520 Date Collected: 05/20/19 13:20 Date Received: 05/22/19 09:15

Method: 537 (modified) - Fluor	rinated Alkyl Substan	ces (Continued)			
Isotope Dilution	%Recovery Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	63	50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C2 PFDA	64	50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C2 PFUnA	56	50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C2 PFDoA	53	50 - 150	05/29/19 11:37	06/07/19 19:11	5
13C8 FOSA	51	25 - 150	05/29/19 11:37	06/07/19 19:11	5
13C5 PFPeA	53	25 - 150	05/29/19 11:37	06/13/19 18:23	5
13C2 PFTeDA	48 *	50 - 150	05/29/19 11:37	06/07/19 19:11	5
d3-NMeFOSAA	44 *	50 - 150	05/29/19 11:37	06/07/19 19:11	5
d5-NEtFOSAA	46 *	50 - 150	05/29/19 11:37	06/07/19 19:11	5
M2-6:2 FTS	103	25 - 150	05/29/19 11:37	06/07/19 19:11	5
M2-8:2 FTS	81	25 - 150	05/29/19 11:37	06/07/19 19:11	5
13C3 PFBS	39 *	50 - 150	05/29/19 11:37	06/07/19 19:11	5

Client Sample ID: MW-29-20190520 Date Collected: 05/20/19 14:45 Date Received: 05/22/19 09:15

Lab Sample ID: 480-153995-3

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND	UJ	2.0	1.0	ug/L		05/24/19 16:11	05/30/19 08:49	10
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	12	*	15 - 110				05/24/19 16:11	05/30/19 08:49	10
Method: 537 (modified) - Fluo	rinated Alky	/I Substan	ices						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorobutanoic acid (PFBA)	ND	UJ	8.5	4.2	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluoropentanoic acid (PFPeA)	ND	UJ	8.5	2.7	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorohexanoic acid (PFHxA)	15	J	8.5	3.2	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluoroheptanoic acid (PFHpA)	5.6	J	8.5	3.9	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorooctanoic acid (PFOA)	21		8.5	2.7	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorononanoic acid (PFNA)	ND		8.5	1.1	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorodecanoic acid (PFDA)	ND		8.5	3.3	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluoroundecanoic acid (PFUnA)	ND		8.5	2.2	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorododecanoic acid (PFDoA)	ND		8.5	2.5	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorotridecanoic acid (PFTriA)	ND		8.5	2.5	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorotetradecanoic acid (PFTeA)	ND		8.5	3.9	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorobutanesulfonic acid (PFBS)	24		8.5	2.1	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorohexanesulfonic acid (PFHxS)	15	J	8.5	3.4	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluoroheptanesulfonic Acid (PFHpS)	ND		8.5	4.0	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorooctanesulfonic acid (PFOS)	18	J	8.5	2.6	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorodecanesulfonic acid (PFDS)	ND		8.5	3.8	ng/L		05/29/19 11:37	06/07/19 20:15	5
Perfluorooctanesulfonamide (PFOSA)	ND		8.5	2.7	ng/L		05/29/19 11:37	06/07/19 20:15	5
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND		85	7.2	ng/L		05/29/19 11:37	06/07/19 20:15	5
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND		85	6.3	ng/L		05/29/19 11:37	06/07/19 20:15	5
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		85	19	ng/L		05/29/19 11:37	06/07/19 20:15	5

Eurofins TestAmerica, Buffalo

Matrix: Water

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Lab Sample ID: 480-153995-2

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: MW-29-20190520 Date Collected: 05/20/19 14:45 Date Received: 05/22/19 09:15

Method: 537 (m	nodified) - Fluorinated A	kyl Substances	(Continued))
Amaluta	Dee			

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1H,1H,2H,2H-perfluorodecanesulfonic	ND		85	12	ng/L		05/29/19 11:37	06/07/19 20:15	5
acid (8:2)									
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
18O2 PFHxS	36	*	50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C4 PFHpA	51		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C4 PFOA	74		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C4 PFOS	48	*	50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C5 PFNA	65		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C4 PFBA	21	*	25 - 150				05/29/19 11:37	06/07/19 20:15	5
13C2 PFHxA	42	*	50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C2 PFDA	72		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C2 PFUnA	76		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C2 PFDoA	54		50 - 150				05/29/19 11:37	06/07/19 20:15	5
13C8 FOSA	55		25 - 150				05/29/19 11:37	06/07/19 20:15	5
13C5 PFPeA	27		25 - 150				05/29/19 11:37	06/07/19 20:15	5
13C2 PFTeDA	54		50 - 150				05/29/19 11:37	06/07/19 20:15	5
d3-NMeFOSAA	56		50 - 150				05/29/19 11:37	06/07/19 20:15	5
d5-NEtFOSAA	54		50 - 150				05/29/19 11:37	06/07/19 20:15	5
M2-6:2 FTS	108		25 - 150				05/29/19 11:37	06/07/19 20:15	5
M2-8:2 FTS	91		25 - 150				05/29/19 11:37	06/07/19 20:15	5
13C3 PFBS	73		50 - 150				05/29/19 11:37	06/07/19 20:15	5

Client Sample ID: DUP-20190520

Date Collected: 05/20/19 00:00 Date Received: 05/22/19 09:15

Method: 8270D SIM ID - Semivolatile Organic Compounds (GC/MS SIM / Isotope Dilution) Analyte **Result Qualifier** MDL Unit RL D Prepared Analyzed Dil Fac 1.4-Dioxane ND 0.20 0.10 ug/L 05/24/19 16:11 05/30/19 09:13 1 Isotope Dilution %Recoverv Qualifier Limits Prepared Analvzed Dil Fac 1.4-Dioxane-d8 15 - 110 05/24/19 16:11 05/30/19 09:13 15 1 Method: 537 (modified) - Fluorinated Alkyl Substances Analyte **Result Qualifier** RL MDL Unit D Prepared Analyzed Dil Fac Perfluorobutanoic acid (PFBA) 24 J 9.0 4.5 na/L 05/29/19 11:37 06/07/19 20:31 5 Perfluoropentanoic acid (PFPeA) 17 J 9.0 2.8 ng/L 05/29/19 11:37 06/07/19 20:31 5 Perfluorohexanoic acid (PFHxA) 16 9.0 3.4 ng/L 05/29/19 11:37 06/07/19 20:31 5 9.0 4.1 ng/L 5 Perfluoroheptanoic acid (PFHpA) 6.2 J 05/29/19 11:37 06/07/19 20:31 5 Perfluorooctanoic acid (PFOA) 11 9.0 2.8 ng/L 05/29/19 11:37 06/07/19 20:31 5 Perfluorononanoic acid (PFNA) ND 9.0 1.2 ng/L 05/29/19 11:37 06/07/19 20:31 06/07/19 20:31 Perfluorodecanoic acid (PFDA) ND 9.0 3.5 ng/L 05/29/19 11:37 5 5 Perfluoroundecanoic acid (PFUnA) ND 90 2.4 ng/L 05/29/19 11:37 06/07/19 20:31 Perfluorododecanoic acid (PFDoA) ND UJ 9.0 2.7 ng/L 05/29/19 11:37 06/07/19 20:31 5 2.7 ng/L Perfluorotridecanoic acid (PFTriA) ND 9.0 05/29/19 11:37 06/07/19 20:31 5 5

Perfluorotetradecanoic acid (PFTeA) ND UJ 9.0 4.1 ng/L 05/29/19 11:37 06/07/19 20:31 05/29/19 11:37 06/07/19 20:31 Perfluorobutanesulfonic acid 90 2.2 ng/L 7.3 J (PFBS) Perfluorohexanesulfonic acid 9.0 3.6 ng/L 05/29/19 11:37 06/07/19 20:31 9.0 J (PFHxS) ND 9.0 4.3 ng/L 05/29/19 11:37 06/07/19 20:31 Perfluoroheptanesulfonic Acid (PFHpS)

Eurofins TestAmerica, Buffalo

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Lab Sample ID: 480-153995-3

Matrix: Water

Lab Sample ID: 480-153995-4

Matrix: Water

Job ID: 480-153995-1

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis

Client Sample ID: DUP-20190520 Date Collected: 05/20/19 00:00 Date Received: 05/22/19 09:15

Lab Sample ID: 480-153995-4

Matrix: Water

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6

Method: 537 (modified) - Fluor	rinated Alky	/I Substan	ces (Continu	ed)					
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorooctanesulfonic acid (PFOS)	14	J	9.0	2.7	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorodecanesulfonic acid (PFDS)	ND		9.0	4.1	ng/L		05/29/19 11:37	06/07/19 20:31	5
Perfluorooctanesulfonamide (PFOSA)	ND		9.0	2.9	ng/L		05/29/19 11:37	06/07/19 20:31	5
N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND	UJ	90	7.7	ng/L		05/29/19 11:37	06/07/19 20:31	5
N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND	UJ	90	6.8	ng/L		05/29/19 11:37	06/07/19 20:31	5
1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND	UJ	90	21	ng/L		05/29/19 11:37	06/07/19 20:31	5
1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND	UJ	90	13	ng/L		05/29/19 11:37	06/07/19 20:31	5
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1802 PFHxS	52		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C4 PFHpA	74		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C4 PFOA	74		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C4 PFOS	33	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C5 PFNA	57		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C4 PFBA	39		25 - 150				05/29/19 11:37	06/07/19 20:31	5
13C2 PFHxA	64		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C2 PFDA	58		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C2 PFUnA	55		50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C2 PFDoA	45	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5
13C8 FOSA	56		25 - 150				05/29/19 11:37	06/07/19 20:31	5
13C5 PFPeA	56		25 - 150				05/29/19 11:37	06/07/19 20:31	5
13C2 PFTeDA	44	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5
d3-NMeFOSAA	39	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5
d5-NEtFOSAA	47	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5
M2-6:2 FTS	100		25 - 150				05/29/19 11:37	06/07/19 20:31	5
M2-8:2 FTS	90		25 - 150				05/29/19 11:37	06/07/19 20:31	5
13C3 PFBS	41	*	50 - 150				05/29/19 11:37	06/07/19 20:31	5

Client Sample ID: EB-020190520

Date Collected: 05/20/19 12:00

Date Received: 05/22/19 09:15

Lab Sample ID: 480-153995-5

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	ND		0.20	0.10	ug/L		05/24/19 16:11	05/30/19 09:37	1
Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,4-Dioxane-d8	25		15 - 110				05/24/19 16:11	05/30/19 09:37	1
Method: 537 (modified) - Flu	orinated Alk	/I Substan	ces						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Analyte Perfluorobutanoic acid (PFBA)	Result	Qualifier UJ	RL 1.7	MDL 0.87	Unit ng/L	<u>D</u>	Prepared 05/29/19 11:37	Analyzed 06/07/19 20:46	Dil Fac
Analyte Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA)	Result ND	Qualifier UJ	RL 1.7 1.7	MDL 0.87 0.55	Unit ng/L ng/L	<u>D</u>	Prepared 05/29/19 11:37 05/29/19 11:37	Analyzed 06/07/19 20:46 06/07/19 20:46	Dil Fac 1
Analyte Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA)	Result ND ND ND ND	Qualifier UJ	RL 1.7 1.7 1.7 1.7	MDL 0.87 0.55 0.66	Unit ng/L ng/L ng/L	<u>D</u>	Prepared 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	Analyzed 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	Dil Fac 1 1 1
Analyte Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA) Perfluoroheptanoic acid (PFHpA)	Result ND ND ND ND ND ND	Qualifier UJ	RL 1.7 1.7 1.7 1.7 1.7	MDL 0.87 0.55 0.66 0.80	Unit ng/L ng/L ng/L ng/L	<u> </u>	Prepared 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	Analyzed 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	Dil Fac 1 1 1 1
Analyte Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA) Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA)	- Result ND ND ND ND ND ND	Qualifier UJ	RL 1.7 1.7 1.7 1.7 1.7 1.7	MDL 0.87 0.55 0.66 0.80 0.55	Unit ng/L ng/L ng/L ng/L ng/L	<u> </u>	Prepared 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	Analyzed 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	Dil Fac 1 1 1 1 1 1
Analyte Perfluorobutanoic acid (PFBA) Perfluoropentanoic acid (PFPeA) Perfluorohexanoic acid (PFHxA) Perfluoroheptanoic acid (PFHpA) Perfluorooctanoic acid (PFOA) Perfluorononanoic acid (PFNA)	Result	Qualifier UJ	RL 1.7 1.7 1.7 1.7 1.7 1.7 1.7 1.7	MDL 0.87 0.55 0.66 0.80 0.55 0.24	Unit ng/L ng/L ng/L ng/L ng/L	<u>D</u>	Prepared 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	Analyzed 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	Dil Fac 1 1 1 1 1 1 1 1

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6/18/2019

RL

MDL Unit

D

Prepared

Client: ARCADIS U.S. Inc Project/Site: Orange & Rockland Utilities -Port Jervis Client Sample ID: EB-020190520

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

Result Qualifier

Date Collected: 05/20/19 12:00 Date Received: 05/22/19 09:15

Analyte

Perfluoroddecanoic acid (PEDA) ND 1.7 0.52 ng/L 05/29/19 11.37 06/07/19 20.46 1 Perfluorodtacanoic acid (PETA) ND 1.7 0.80 ng/L 05/29/19 11.37 06/07/19 <th>Perfluoroundecanoic acid (PFUnA)</th> <th>ND</th> <th>1.7</th> <th>0.46</th> <th>ng/L</th> <th>05/29/19 11:37</th> <th>06/07/19 20:46</th> <th>1</th>	Perfluoroundecanoic acid (PFUnA)	ND	1.7	0.46	ng/L	05/29/19 11:37	06/07/19 20:46	1
Perflucrotridecanoic acid (PFTA) ND 1.7 0.52 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perflucrotridaresultonic acid (PFEA) ND 1.7 0.43 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perflucrotridaresultonic acid (PFES) ND 1.7 0.70 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perflucrotridaresultonic acid (PFDS) ND 1.7 0.70 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perflucrotexpanesultonic acid (PFOS) ND 1.7 0.73 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perflucrocctanesultonamide acid (PFOS) ND 1.7 0.73 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perflucrocctanesultonamide (PFOSA) ND UJ 1.7 1.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 N=methylperflucrocctanesultonamidoa ND UJ 17 1.3 ng/L 05/29/19 11:37 06/07/19 20:46 1 etic acid (NEFOSA) ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 acit aci (AME/CSAA)	Perfluorododecanoic acid (PFDoA)	ND	1.7	0.52	ng/L	05/29/19 11:37	06/07/19 20:46	1
Perfluorobtanesulfonic acid (PFTEA) ND UJ 1.7 0.80 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluorobtanesulfonic acid (PFHxS) ND UJ 1.7 0.43 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluorobtanesulfonic acid (PFNxS) ND 1.7 0.53 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluorobtanesulfonic acid (PFOS) ND 1.7 0.53 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluorobtanesulfonanide (PFOSA) ND UJ 1.7 0.53 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluorobtanesulfonamidoac ND UJ 1.7 0.55 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluorobtanesulfonamidoac ND UJ 1.7 1.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluorobtanesulfonic acid (NEFOSA) ND UJ 1.7 1.5 ng/L 05/29/19 <	Perfluorotridecanoic acid (PFTriA)	ND	1.7	0.52	ng/L	05/29/19 11:37	06/07/19 20:46	1
Perfluorobutanesulfonic acid (PFBS) ND 1.7 0.43 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluorobexanesulfonic acid (PFDS) ND 1.7 0.53 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluoroctanesulfonic acid (PFOS) ND 1.7 0.53 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluoroctanesulfonic acid (PFOS) ND 1.7 0.79 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluoroctanesulfonic acid (PFOSA) ND 1.7 0.79 ng/L 05/29/19 11:37 06/07/19 20:46 1 Nmethylepfluorocctanesulfonamidoac ND 1.7 1.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 Nethylpefluorocctanesulfonic ND 17 1.3 ng/L 05/29/19 11:37 06/07/19 20:46 1 Ita cid (6:2) ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 Isc ope Diution YeReovery Qualifier Limits YeReovery 06	Perfluorotetradecanoic acid (PFTeA)	ND UJ	1.7	0.80	ng/L	05/29/19 11:37	06/07/19 20:46	1
Perfluorohexanesulfonic acid (PFHxS) ND UJ 1.7 0.70 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluorobeptanesulfonic acid (PFOS) ND 1.7 0.83 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluoroctanesulfonic acid (PFOS) ND 1.7 0.53 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluoroctanesulfonamidoa ND UJ 1.7 0.56 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluoroctanesulfonamidoa ND UJ 1.7 0.56 ng/L 05/29/19 11:37 06/07/19 20:46 1 Verthyperfluoroctanesulfonamidoac ND UJ 17 1.3 ng/L 05/29/19 11:37 06/07/19 20:46 1 H1:11:2,12:H-perfluoroctanesulfonic ND 17 4.0 ng/L 05/29/19 11:37 06/07/19 20:46 1 13C4 PFhpA 71<	Perfluorobutanesulfonic acid (PFBS)	ND	1.7	0.43	ng/L	05/29/19 11:37	06/07/19 20:46	1
Perfluctorcheptanesulfonic Acid ND 1.7 0.83 ng/L 05/29/19 11:37 06/07/19 20:46 1 (PFHpS) ND 1.7 0.53 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perflucrocctanesulfonic acid (PFOS) ND 1.7 0.56 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perflucrocctanesulfonamidea ND <u< td=""> 1.7 0.56 ng/L 05/29/19 11:37 06/07/19 20:46 1 N=methylperflucrocctanesulfonamidoac ND<u< td=""> 1.7 0.56 ng/L 05/29/19 11:37 06/07/19 20:46 1 H-thtylperflucrocctanesulfonamidoac ND 17 4.0 ng/L 05/29/19 11:37 06/07/19 20:46 1 11 1.14 2.14 perflucrocctanesulfonamidoa ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 11 1.14 2.14 perflucrocctanesulfonami</u<></u<>	Perfluorohexanesulfonic acid (PFHxS)	ND UJ	1.7	0.70	ng/L	05/29/19 11:37	06/07/19 20:46	1
Perfluoroctanesulfonic acid (PFOS) ND 1.7 0.53 ng/L 05/29/19 11:37 06/07/19 20:46 1 Perfluoroctanesulfonamido (PFOS) ND 1.7 0.79 0.79 05/29/19 11:37 06/07/19 20:46 1 N-methylperfluoroctanesulfonamidoa ND UJ 1.7 0.56 ng/L 05/29/19 11:37 06/07/19 20:46 1 N-methylperfluoroctanesulfonamidoa ND UJ 17 1.3 ng/L 05/29/19 11:37 06/07/19 20:46 1 Ne-thylperfluoroctanesulfonamidoac ND UJ 17 1.3 ng/L 05/29/19 11:37 06/07/19 20:46 1 ND UJ 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (8:2) ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA 71 50 .150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA 63 50 .150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFD	Perfluoroheptanesulfonic Acid (PFHpS)	ND	1.7	0.83	ng/L	05/29/19 11:37	06/07/19 20:46	1
Perfluorodecanesulfonic acid (PFOS) ND 1.7 0.79 ng/L 05/29/19 05/29/19 11:37 06/07/19 20:46 1 Perfluoroctanesulfonamida ND UJ 17 0.56 ng/L 05/29/19 11:37 06/07/19 20:46 1 N-methylperfluorooctanesulfonamidaa ND UJ 17 1.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 N-ethylperfluorooctanesulfonidaac ND UJ 17 1.3 ng/L 05/29/19 11:37 06/07/19 20:46 1 etic acid (NEFOSAA) ND 17 4.0 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (6:2) ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 11,11,11,21,21,24-perfluorodecanesulfonic ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 113C4 PFbpA 71 50	Perfluorooctanesulfonic acid (PFOS)	ND	1.7	0.53	ng/L	05/29/19 11:37	06/07/19 20:46	1
Perflucrocotanesulfonamide (PFOSA) ND UJ 1.7 0.56 ng/L 05/29/19 05/29/19 11:37 06/07/19 20:46 1 N-methylperfluorooctanesulfonamidoa ND UJ 17 1.3 ng/L 05/29/19 11:37 06/07/19 20:46 1 etic acid (MEFOSAA) ND UJ 17 1.3 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (6:2) ND 17 4.0 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (6:2) ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA 71 50-150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA 71 50-150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFOA 66 50-150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA	Perfluorodecanesulfonic acid (PFDS)	ND	1.7	0.79	ng/L	05/29/19 11:37	06/07/19 20:46	1
N-methylperfluoroctanesulfonamidoa ND UJ 17 1.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 Nethylperfluoroctanesulfonamidoac ND UJ 17 1.3 ng/L 05/29/19 11:37 06/07/19 20:46 1 Hethylperfluoroctanesulfonamidoac ND 17 4.0 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (62) ND 17 4.0 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (82) ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 Isotop Dilution %Recovery Qualifier Limits Prepared Analyzed DI Fac 13C4 PFHpA 71 50-150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFOS 53 50-150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA 71 50-150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFBA 39 25-150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFNA 63 50-150 <td< td=""><td>Perfluorooctanesulfonamide (PFOSA)</td><td>ND UJ</td><td>1.7</td><td>0.56</td><td>ng/L</td><td>05/29/19 11:37</td><td>06/07/19 20:46</td><td>1</td></td<>	Perfluorooctanesulfonamide (PFOSA)	ND UJ	1.7	0.56	ng/L	05/29/19 11:37	06/07/19 20:46	1
N-ethylperfluorooctanesulfonamidoac etic acid (NEIFOSAA) ND 17 1.3 ng/L 05/29/19 11:37 06/07/19 20:46 1 netic acid (NEIFOSAA) ND 17 4.0 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (6:2) ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (8:2) ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (8:2) ND 17 50 05/29/19 11:37 06/07/19 20:46 1 13C4 PFbA 71 50 150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFOS 53 50 150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA 63 50 150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA 63 50 150	N-methylperfluorooctanesulfonamidoa cetic acid (NMeFOSAA)	ND UJ	17	1.5	ng/L	05/29/19 11:37	06/07/19 20:46	1
1H,1H,2H,2H-perfluorooctanesulfonic ND 17 4.0 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (6:2) IND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (6:2) Interpreter Inter Interpreter Interpreter	N-ethylperfluorooctanesulfonamidoac etic acid (NEtFOSAA)	ND <mark>UJ</mark>	17	1.3	ng/L	05/29/19 11:37	06/07/19 20:46	1
1H,1H,2H,2H-perfluorodecanesulfonic ND 17 2.5 ng/L 05/29/19 11:37 06/07/19 20:46 1 acid (8:2) Isotope Dilution %Recovery Qualifier Limits Prepared Analyzed Dil Fac 1802 PFHxS 49 * 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA 71 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA 66 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFDA 66 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFBA 39 25 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 63 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 65 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFUA 62 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 62 50 - 150 05/29/19 11:37 06/07/19 20:46 1	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND	17	4.0	ng/L	05/29/19 11:37	06/07/19 20:46	1
Isotope Dilution%RecoveryQualifierLimitsPreparedAnalyzedDil Fac1802 PFHxS49*50.15005/29/19 11:3706/07/19 20:46113C4 PFDA7150.15005/29/19 11:3706/07/19 20:46113C4 PFOA6650.15005/29/19 11:3706/07/19 20:46113C4 PFOS5350.15005/29/19 11:3706/07/19 20:46113C4 PFOA6350.15005/29/19 11:3706/07/19 20:46113C4 PFAA3925.15005/29/19 11:3706/07/19 20:46113C2 PFBA3925.15005/29/19 11:3706/07/19 20:46113C2 PFDA6550.15005/29/19 11:3706/07/19 20:46113C2 PFDA6550.15005/29/19 11:3706/07/19 20:46113C2 PFDA6550.15005/29/19 11:3706/07/19 20:46113C2 PFDA6250.15005/29/19 11:3706/07/19 20:46113C2 PFDA6250.15005/29/19 11:3706/07/19 20:46113C2 PFDA6225.15005/29/19 11:3706/07/19 20:46113C2 PFDA6225.15005/29/19 11:3706/07/19 20:46113C2 PFDA6225.15005/29/19 11:3706/07/19 20:46113C2 PFDA6225.15005/29/19 11:3706/07/19 20:46113C2 PFTeA4550.15005/29/19 11:3706/07/19 20:46113C2 PFTeA62	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND	17	2.5	ng/L	05/29/19 11:37	06/07/19 20:46	1
1802 PFHxS 49 50.150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFHpA 71 50.150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFOA 66 50.150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFOS 53 50.150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFOS 53 50.150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFOA 63 50.150 05/29/19 11:37 06/07/19 20:46 1 13C5 PFNA 63 50.150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFHxA 72 50.150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 65 50.150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 62 50.150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 62 50.150 05/29/19 11:37 06/07/19 20:46 1 13C3 PFDA 62 25.150 05/29/19 11:37 06/07/19 20:46	Isotope Dilution	%Recovery Qualifier	Limits			Prepared	Analyzed	Dil Fac
13C4 PFHpA7150.15005/29/19 11:3706/07/19 20:46113C4 PFOA6650.15005/29/19 11:3706/07/19 20:46113C4 PFOS5350.15005/29/19 11:3706/07/19 20:46113C5 PFNA6350.15005/29/19 11:3706/07/19 20:46113C4 PFBA3925.15005/29/19 11:3706/07/19 20:46113C2 PFHxA7250.15005/29/19 11:3706/07/19 20:46113C2 PFDA6550.15005/29/19 11:3706/07/19 20:46113C2 PFUnA6250.15005/29/19 11:3706/07/19 20:46113C2 PFDA6250.15005/29/19 11:3706/07/19 20:46113C2 PFDA6250.15005/29/19 11:3706/07/19 20:46113C2 PFDA6250.15005/29/19 11:3706/07/19 20:46113C3 PFDA6225.15005/29/19 11:3706/07/19 20:46113C5 PFPA6225.15005/29/19 11:3706/07/19 20:46113C2 PFTeDA4550.15005/29/19 11:3706/07/19 20:46113C2 PFTeDA43*50.15005/29/19 11:3706/07/19 20:46113C2 PFTeDA48*50.15005/29/19 11:3706/07/19 20:46113C2 PFTeDA48*50.15005/29/19 11:3706/07/19 20:46113C3 PFBS7725.15005/29/19 11:3706/07/19 20:46113C3 PFBS52 <t< td=""><td>18O2 PFHxS</td><td>49 *</td><td>50 - 150</td><td></td><td></td><td>05/29/19 11:37</td><td>06/07/19 20:46</td><td>1</td></t<>	18O2 PFHxS	49 *	50 - 150			05/29/19 11:37	06/07/19 20:46	1
13C4 PFOA6650 - 15005/29/19 11:3706/07/19 20:46113C4 PFOS5350 - 15005/29/19 11:3706/07/19 20:46113C5 PFNA6350 - 15005/29/19 11:3706/07/19 20:46113C4 PFBA3925 - 15005/29/19 11:3706/07/19 20:46113C2 PFHxA7250 - 15005/29/19 11:3706/07/19 20:46113C2 PFDA6550 - 15005/29/19 11:3706/07/19 20:46113C2 PFDA6250 - 15005/29/19 11:3706/07/19 20:46113C2 PFDA6250 - 15005/29/19 11:3706/07/19 20:46113C2 PFDA6250 - 15005/29/19 11:3706/07/19 20:46113C3 PFDA6225 - 15005/29/19 11:3706/07/19 20:46113C3 PFPeA6225 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45*50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA43*50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA43*50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA48*50 - 15005/29/19 11:3706/07/19 20:46113C3 PFTeS8425 - 15005/29/19 11:3706/07/19 20:461M2-6:2 FTS8425 - 15005/29/19 11:3706/07/19 20:461M2-6:2 FTS725 - 15005/29/19 11:3706/07/19 20:46 <td< td=""><td>13C4 PFHpA</td><td>71</td><td>50 - 150</td><td></td><td></td><td>05/29/19 11:37</td><td>06/07/19 20:46</td><td>1</td></td<>	13C4 PFHpA	71	50 - 150			05/29/19 11:37	06/07/19 20:46	1
13C4 PFOS 53 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C5 PFNA 63 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C4 PFBA 39 25 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFHxA 72 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 65 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 62 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 62 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 62 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFDA 62 25 - 150 05/29/19 11:37 06/07/19 20:46 1 13C5 PFPeA 62 25 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFTeDA 45 * 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFTeDA 45 * 50 - 150 05/29/19 11:37 06/07/19 20:46 1 d5-NEtFOSAA 43 * 50								1
13C5 PFNA6350 - 15005/29/19 11:3706/07/19 20:46113C4 PFBA3925 - 15005/29/19 11:3706/07/19 20:46113C2 PFHxA7250 - 15005/29/19 11:3706/07/19 20:46113C2 PFDA6550 - 15005/29/19 11:3706/07/19 20:46113C2 PFUnA6250 - 15005/29/19 11:3706/07/19 20:46113C2 PFDoA5150 - 15005/29/19 11:3706/07/19 20:46113C2 PFDoA5150 - 15005/29/19 11:3706/07/19 20:46113C3 FOSA4225 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA6225 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45*50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45*50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45*50 - 15005/29/19 11:3706/07/19 20:461d3-NMeFOSAA43*50 - 15005/29/19 11:3706/07/19 20:461M2-6: 2 FTS8425 - 15005/29/19 11:3706/07/19 20:461M2-6: 2 FTS8425 - 15005/29/19 11:3706/07/19 20:461M2-8: 2 FTS7725 - 15005/29/19 11:3706/07/19 20:46113C3 PFBS5250 - 15005/29/19 11:3706/07/19 20:461	13C4 PFOA	66	50 - 150			05/29/19 11:37	06/07/19 20:46	'
13C4 PFBA3925.15005/29/19 11:3706/07/19 20:46113C2 PFHxA7250.15005/29/19 11:3706/07/19 20:46113C2 PFDA6550.15005/29/19 11:3706/07/19 20:46113C2 PFUnA6250.15005/29/19 11:3706/07/19 20:46113C2 PFDoA5150.15005/29/19 11:3706/07/19 20:46113C2 PFDoA5150.15005/29/19 11:3706/07/19 20:46113C3 FOSA4225.15005/29/19 11:3706/07/19 20:46113C5 PFPeA6225.15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45*50.15005/29/19 11:3706/07/19 20:46113C2 PFTeDA43*50.15005/29/19 11:3706/07/19 20:461d3-NMeFOSAA43*50.15005/29/19 11:3706/07/19 20:461M2-6:2 FTS8425.15005/29/19 11:3706/07/19 20:461M2-8:2 FTS7725.15005/29/19 11:3706/07/19 20:46113C3 PFBS5250.15005/29/19 11:3706/07/19 20:461	13C4 PFOA 13C4 PFOS	66 53	50 - 150 50 - 150			05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46	1
13C2 PFHxA7250 - 15005/29/19 11:3706/07/19 20:46113C2 PFDA6550 - 15005/29/19 11:3706/07/19 20:46113C2 PFUnA6250 - 15005/29/19 11:3706/07/19 20:46113C2 PFDoA5150 - 15005/29/19 11:3706/07/19 20:46113C8 FOSA4225 - 15005/29/19 11:3706/07/19 20:46113C5 PFPeA6225 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45 *50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA48 *50 - 15005/29/19 11:3706/07/19 20:461d5-NEtFOSAA48 *50 - 15005/29/19 11:3706/07/19 20:461M2-6:2 FTS8425 - 15005/29/19 11:3706/07/19 20:461M2-8:2 FTS7725 - 15005/29/19 11:3706/07/19 20:46113C3 PFBS5250 - 15005/29/19 11:3706/07/19 20:461	13C4 PFOA 13C4 PFOS 13C5 PFNA	66 53 63	50 - 150 50 - 150 50 - 150			05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	1 1
13C2 PFDA6550 - 15005/29/19 11:3706/07/19 20:46113C2 PFUnA6250 - 15005/29/19 11:3706/07/19 20:46113C2 PFDoA5150 - 15005/29/19 11:3706/07/19 20:46113C8 FOSA4225 - 15005/29/19 11:3706/07/19 20:46113C5 PFPeA6225 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45*50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45*50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA43*50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA43*50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA48*50 - 15005/29/19 11:3706/07/19 20:46113C3 PFBS7725 - 15005/29/19 11:3706/07/19 20:46113C3 PFBS5250 - 15005/29/19 11:3706/07/19 20:461	13C4 PFOA 13C4 PFOS 13C5 PFNA 13C4 PFBA	66 53 63 39	50 - 150 50 - 150 50 - 150 25 - 150			05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	1 1 1
13C2 PFUnA6250 - 15005/29/19 11:3706/07/19 20:46113C2 PFDoA5150 - 15005/29/19 11:3706/07/19 20:46113C8 FOSA4225 - 15005/29/19 11:3706/07/19 20:46113C5 PFPeA6225 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45 *50 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45 *50 - 15005/29/19 11:3706/07/19 20:461d3-NMeFOSAA43 *50 - 15005/29/19 11:3706/07/19 20:461d5-NEtFOSAA48 *50 - 15005/29/19 11:3706/07/19 20:461M2-6:2 FTS8425 - 15005/29/19 11:3706/07/19 20:461M2-8:2 FTS7725 - 15005/29/19 11:3706/07/19 20:46113C3 PFBS5250 - 15005/29/19 11:3706/07/19 20:461	13C4 PFOA 13C4 PFOS 13C5 PFNA 13C4 PFBA 13C2 PFHxA	66 53 63 39 72	50 - 150 50 - 150 50 - 150 25 - 150 50 - 150			05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	1 1 1 1
13C2 PFDoA 51 50 - 150 05/29/19 11:37 06/07/19 20:46 1 13C8 FOSA 42 25 - 150 05/29/19 11:37 06/07/19 20:46 1 13C5 PFPeA 62 25 - 150 05/29/19 11:37 06/07/19 20:46 1 13C2 PFTeDA 45 * 50 - 150 05/29/19 11:37 06/07/19 20:46 1 d3-NMeFOSAA 43 * 50 - 150 05/29/19 11:37 06/07/19 20:46 1 d5-NEtFOSAA 48 * 50 - 150 05/29/19 11:37 06/07/19 20:46 1 M2-6:2 FTS 84 25 - 150 05/29/19 11:37 06/07/19 20:46 1 M2-8:2 FTS 77 25 - 150 05/29/19 11:37 06/07/19 20:46 1 13C3 PFBS 52 50 - 150 05/29/19 11:37 06/07/19 20:46 1	13C4 PFOA 13C4 PFOS 13C5 PFNA 13C4 PFBA 13C2 PFHxA 13C2 PFDA	66 53 63 39 72 65	50 - 150 50 - 150 50 - 150 25 - 150 50 - 150 50 - 150			05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	1 1 1 1 1
13C8 FOSA4225 - 15005/29/19 11:3706/07/19 20:46113C5 PFPeA6225 - 15005/29/19 11:3706/07/19 20:46113C2 PFTeDA45 *50 - 15005/29/19 11:3706/07/19 20:461d3-NMeFOSAA43 *50 - 15005/29/19 11:3706/07/19 20:461d5-NEtFOSAA48 *50 - 15005/29/19 11:3706/07/19 20:461M2-6:2 FTS8425 - 15005/29/19 11:3706/07/19 20:461M2-8:2 FTS7725 - 15005/29/19 11:3706/07/19 20:46113C3 PFBS5250 - 15005/29/19 11:3706/07/19 20:461	13C4 PFOA 13C4 PFOS 13C5 PFNA 13C4 PFBA 13C2 PFHxA 13C2 PFDA 13C2 PFUnA	66 53 63 39 72 65 62	50 - 150 50 - 150 50 - 150 25 - 150 50 - 150 50 - 150 50 - 150			05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37 05/29/19 11:37	06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46 06/07/19 20:46	1 1 1 1 1 1
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Job ID: 480-153995-1

Matrix: Water

Lab Sample ID: 480-153995-5

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