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January 9, 2019

Mr. Glenn May, P.G.
Division of Environmental Remediation, Region 9
New York State Department of Environmental Conservation
270 Michigan Avenue
Buffalo, NY 14203-7226
glenn.may@dec.ny.gov

**Subject: Former Chemical Leaman Tank Lines Site
Fillmore Avenue, Tonawanda, Erie County, New York
NYSDEC Registry Site No. 915014
Summary of Emerging Contaminants Groundwater Sampling**

Dear Mr. May:

On behalf of Quality Distribution, Inc. (QDI), AECOM Technical Services, Inc. (AECOM) submits this letter report presenting the results of the emerging contaminants groundwater sampling that was completed at the Former Chemical Leaman Tank Lines Site (the "Site") in Tonawanda, New York (Figure 1 – Site Location Map).

The sampling was completed in response to the New York State Department of Environmental Conservation (NYSDEC) letter request of July 3, 2018, directing emerging contaminants (1,4-dioxane and Per- and polyfluoroalkyl substances (PFAS)) groundwater sampling at the Site. In response to the letter, AECOM submitted an Emerging Contaminants Groundwater Sampling Work Plan (Work Plan) to NYSDC on July 20, 2018. NYSDC approved the Work Plan on August 30, 2018. The Work Plan was used in conjunction with the U.S. Environmental Protection Agency Region II – Ground Water Sampling Procedure – Low Stress (Low Flow) Purging and Sampling (January 1998) standard method.

Field Activities

The Work Plan originally proposed wells B-07, B-12, and B-L1-3 for sampling. On October 5, 2018, AECOM visited the site to locate the three proposed wells and determine their condition. Two wells, B-07 and B-L1-3, were located and determined to be in working condition, however, well B-12 had been destroyed. This well, which had not been sampled since 2004, was located within an active drive area and was likely destroyed by past grading or snow plowing activities. Upon discovering the destroyed well, AECOM discussed possible alternate well locations with the NYSDC via telephone, and it was agreed that well B-13 would be sampled in lieu of B-12. Figure 2 depicts the location of the sampled monitoring wells.

Well redevelopment and sampling activities were performed in accordance with the following guidance information included as attachments to the Work Plan:

- Collection of Groundwater Samples for Perfluorooctanoic Acid (PFOA) and Perfluorinated Compounds (PFCs) from Monitoring Wells Sample Protocol Revision 1.2 (June 29, 2016); and,
- Groundwater Sampling for Emerging Contaminants (April 2018).
- PFC Sampling – Prohibited and Acceptable Items

Prior to commencing field activities, the PFAS Sampling Checklist was completed by the field geologist. A copy of the completed checklist is included as Attachment 1.

Since wells B-07 and B-13 had not been sampled since 2004, these wells were re-developed prior to sampling. Redevelopment was completed on October 8, 2018, and consisted of pumping a minimum of five well casing volumes from each well. An AECOM geologist monitored groundwater parameters of pH, temperature, and water clarity. Pumping continued until a minimum of five well casing volumes was removed. All purge water was containerized in a 55-gallon drum and staged onsite pending disposal. Well development logs are included in Attachment 2.

Groundwater sampling was conducted on October 12, 2018. A peristaltic pump and dedicated-disposable high density polyethylene (HDPE) tubing were used to complete the sampling by low-flow sampling techniques. During low-flow purging, an AECOM geologist monitored groundwater quality parameters of pH, conductivity, temperature, turbidity, DO, and ORP using a flow-through cell. Each well was purged until a minimum of three well volumes was removed and groundwater quality parameters stabilized. Groundwater samples were collected into laboratory-provided sample containers as described in the Work Plan. The low-flow purging/sampling logs are provided in Attachment 2. All purge water was containerized in a 55-gallon drum and staged onsite pending disposal.

The groundwater sample containers were labeled and placed into an ice-filled cooler and delivered by AECOM staff under chain-of-custody (COC) protocol to TestAmerica Laboratory, Inc. (TAL), a New York State Department of Health Environmental Laboratory Approval Program-(ELAP) analytical laboratory, located in Amherst, New York. Samples were submitted for analysis of the following parameters:

- 1,4-dioxane by EPA Method 8270 Selective Ion Monitoring (SIM) analyzed by TAL Buffalo, New York; and,
- 21 PFAS compounds by United States Environmental Protection Agency (EPA) Method 537 Modified (low level) analyzed by TAL Sacramento, California.

Groundwater Sample Analytical Results Summary

1,4-dioxane

As presented in the attached analytical summary table (Table 1), 1,4-dioxane was detected in wells B-L1-3 and B-13 at concentrations ranging from 0.60 micrograms/liter ($\mu\text{g/L}$) to 4.1 $\mu\text{g/L}$.

PFAS

As presented in Table 1, several PFAS compounds were detected at each well. PFOA and PFOS were detected in groundwater samples collected from all three wells. PFOA was detected at concentrations ranging from 20 ng/L (B-13) to 570 ng/L (B-L1-3). PFOS was detected at concentrations ranging from 2.8 ng/L (B-13) to 5.8 ng/L (B-L1-3).

Quality Assurance

Quality control samples (i.e., matrix spike/matrix spike duplicate, field duplicate, equipment blank, ambient blank (PFAS), and trip blank (1,4-dioxane)) were also collected in accordance with the Work Plan procedures. Equipment and ambient blanks were collected with PFAS free water supplied by the laboratory.

TAL provided the results in an Analytical Services Protocol (ASP) Category B data deliverable. An

AECOM chemist reviewed all data, performed data validation, and prepared a Data Usability Summary Report (DUSR). The DUSR, including the validated laboratory analytical summaries (Form 1s), is included as Attachment 3.

If you have any questions or comments, please contact me via email at colin.wasteneys@aecom.com or telephone at (716) 923-1164.

Sincerely yours,



Colin Wasteneys, PG
Project Manager
colin.wasteneys@aecom.com

Attachments:

Table 1

Figures 1 and 2

Attachment 1 – PFAS Sampling Checklist

Attachment 2 – Field Forms

Attachment 3 – Data Usability Summary Report

cc:

Mr. Roy Peterson, Quality Distribution, Inc. (electronic copy)
Project File 60567553

Table

Table 1

Analytical Results
Samples Collected October 12, 2018
Former Chemical Leaman Tank Lines Site
NYSDEC Registry Site No. 915014

Group	Method/Parameter	Units	B-07	B-13	B-L1-3	FD-10122018	Ambient Blank	EB-10122018
	SW846-8260C SIM							
	1,4-Dioxane	ug/L	0.097 U	4.1	0.60 J	0.52 U	NS	0.099 U
	EPA 537 Modified, Perfluorinated Alkyl Acids (PFOAs)							
Perfluoroalkyl sulfonates	Perfluorobutanesulfonic acid (PFBS)	ng/L	2.2	11	2.5 J	2 U	0.4 U	0.39 U
	Perfluorohexanesulfonic acid (PFHxS)	ng/L	0.34 J	3 J	2.2 J	2.7 J	0.24 U	0.23 U
	Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	0.75 U	0.73 U	4.1 U	3.8 U	0.74 U	0.73 U
	Perfluorooctanesulfonic acid (PFOS)	ng/L	2.9	2.8	5.8 J	4.2 J	0.69 U	0.68 U
	Perfluorodecanesulfonic acid (PFDS)	ng/L	0.49 U	0.47 U	2.6 U	2.5 U	0.48 U	0.47 U
Perfluoroalkyl carboxylates	Perfluorobutanoic acid (PFBA)	ng/L	6	59	50 J	16 J	0.37 U	0.37 U
	Perfluoropentanoic acid (PFPeA)	ng/L	16	64	17	21	0.68 U	0.67 U
	Perfluorohexanoic acid (PFHxA)	ng/L	3.6	14	9.9 U	9.3 U	0.22 U	0.37 J
	Perfluoroheptanoic acid (PFHpA)	ng/L	5.8	8.9 U	16	15	0.29 U	0.74 J
	Perfluorooctanoic acid (PFOA)	ng/L	350	20 J	530 J	570 J	0.29 U	1.1 J
	Perfluorononanoic acid (PFNA)	ng/L	1.8 U	1.8 U	9.9 U	9.3 U	0.34 U	0.97 J
	Perfluorodecanoic acid (PFDA)	ng/L	1.8 U	1.8 U	1.9 U	1.8 U	0.34 U	0.88 J
	Perfluoroundecanoic acid (PFUnA)	ng/L	1.8 U	1.8 U	1.2 U	1.2 U	0.31 J	2.8
	Perfluorododecanoic acid (PFDoA)	ng/L	1.8 U	1.8 U	1.7 U	1.6 U	0.32 U	1.8
	Perfluorotridecanoic acid (PFTriA)	ng/L	0.22 U	0.21 U	1.2 U	1.1 U	0.22 U	0.21 U
Fluorinated Telomer Sulfonates	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ng/L	0.99 J	0.91 J	5 U	4.6 U	0.91 U	0.89 U
	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ng/L	0.51 U	0.5 U	2.8 U	2.6 U	0.51 U	0.5 U
Perfluorooctanesulfonamide	Perfluorooctanesulfonamide (PFOSA)	ng/L	0.51 U	0.5 U	2.8 U	2.6 U	0.51 U	0.5 U
Perfluorooctanesulfonamidoacetic acids	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ng/L	0.41 U	0.4 U	2.2 U	2.1 U	0.41 U	0.4 U
	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ng/L	0.64 U	0.62 U	3.5 U	3.2 U	0.63 U	0.62 U
--	Sum of PFOS AND PFOA concentrations	ng/L	352.9	22.8	535.8	574.2	ND	1.1

Notes:

ug/L - micrograms per liter (parts per billion)

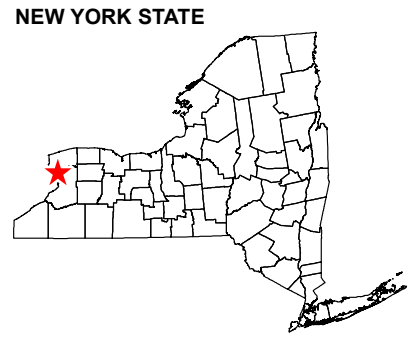
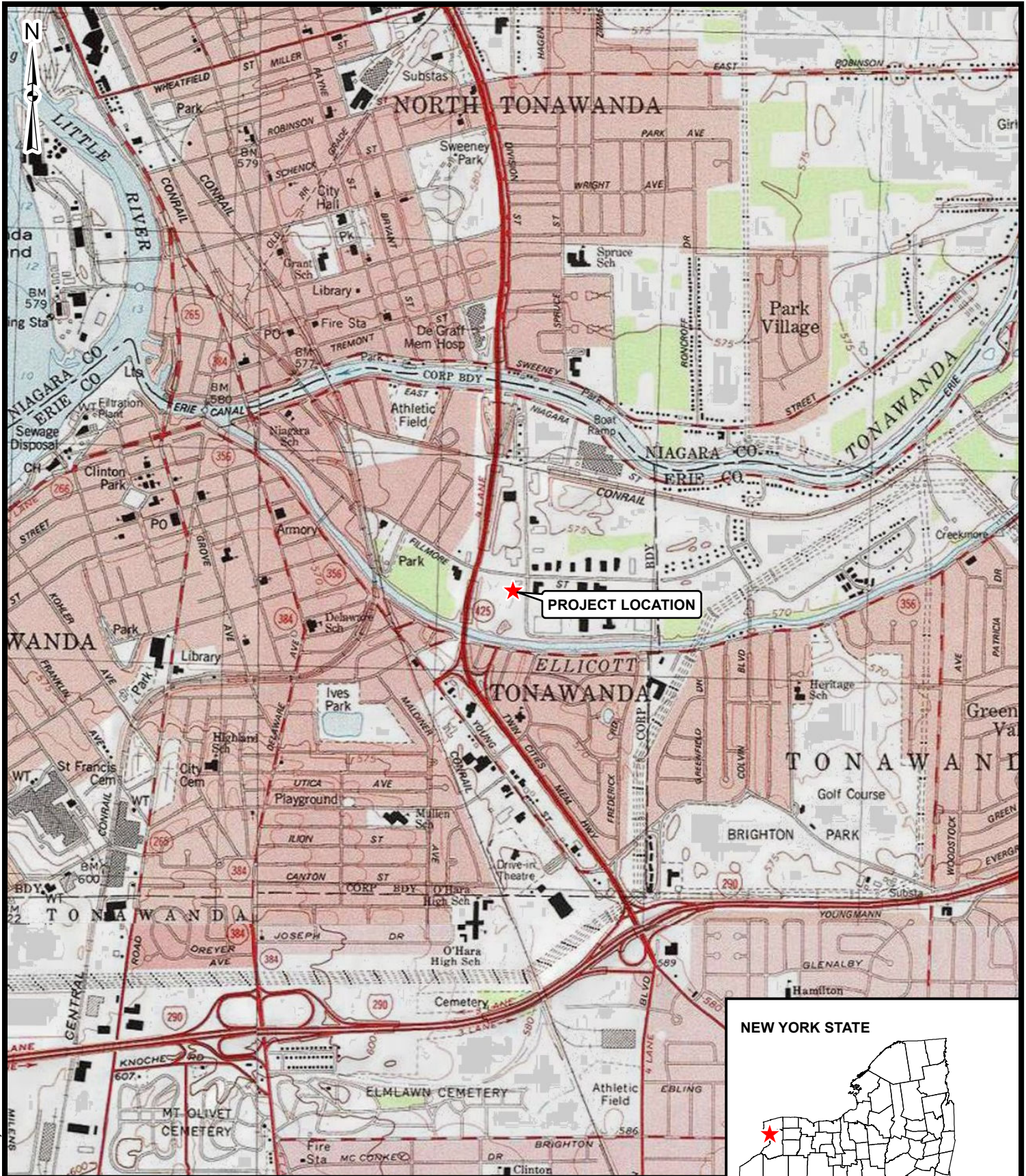
ng/L - nanograms per liter (parts per trillion)

J - Result is less than the reporting limit (RL) but greater than or equal to the Method Detection Limit (MDL) and the concentration is an approximate value.

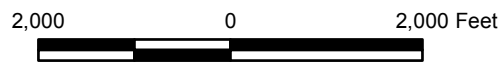
U - not detected above the method detection limit shown.

NS - Not sampled.

Figures



Source: 2013 National Geographic Society, i-cubed. ESRI USA Topo Maps

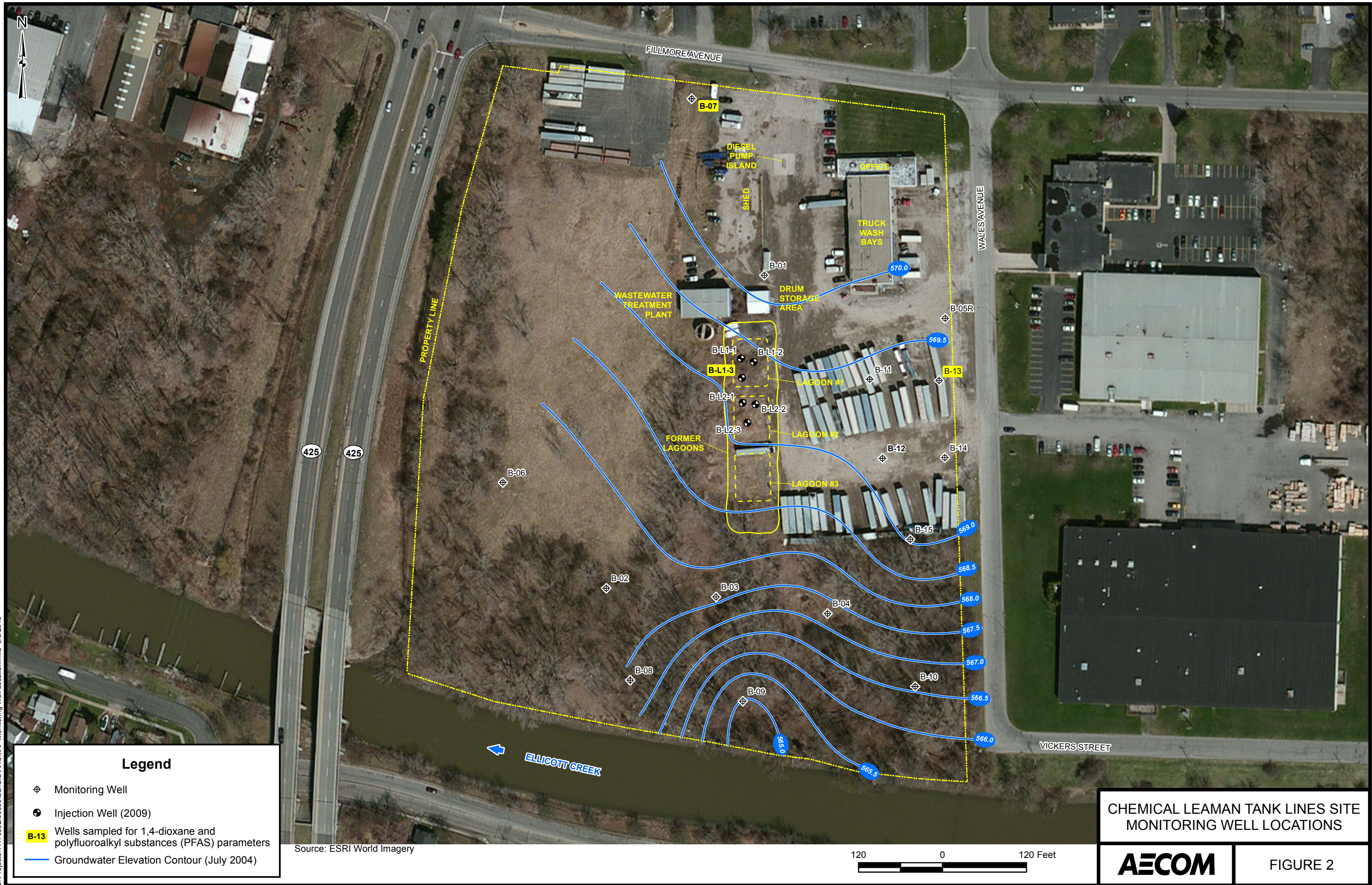


CHEMICAL LEAMAN TANK LINES SITE
PROJECT LOCATION

FIGURE 1

J:\Projects\11170332_00\00\GIS\ARCMAP\Project Location.mxd 7/31/2018

J:\Projects\1170332.00000\DB\GIS\ARCMAP\Monitoring Well Location.mxd 8/6/2018



Attachment 1

PFAS Sampling Checklist

Figure 1 PFAS Sampling Checklist

Project No.: 60567553-4

Project Location: Former Chemical Leaman, Tonawanda, NY

Signature:

Date: 10/8/18

Well Redevelopment

Team Members

Yes	No	Description
☒	☐	Has AECOM PFAS Sampling guidance been reviewed by all team members?
		Comments:
☒	☐	Has AECOM field sampling staff received needed training certification?
		Comments:
☒	☐	Was a briefing held for field sampling staff?
		Comments:
☒	☐	Were additional PFAS sampling instructions given to field sampling staff?
		Comments: <i>Keep 1,4-dioxane in separate coolers (Teflon cap), Sample separate of PFAS.</i>
☒	☐	Have personal clothing and PPE requirements been followed by all field sampling staff?
		Comments: <i>No lotions or cosmetics.</i>
☒	☒	Were lotions and sunscreen used for field sampling staff?
		Comment:

Sample Collection

☒	☐	Has a PFAS-free water source been identified?
		Comment: <i>Lab provided.</i>
		Source of PFAS-free water:
☒	☐	Have all sampling items, parts and equipment been inspected to be free of PFAS?
		Comment:
☒	☐	Has sampling location sequence been communicated to avoid cross-contaminations?
		Comment:
☒	☒	Have drilling fluids been evaluated and shown to be free of PFAS?
		Comment: <i>Not Applicable.</i>
☒	☐	Use of PFAS-free decontamination solution?
		Brand name of decontamination solution: <i>Alconox.</i>
☒	☐	Have all field logs, notebooks, pens, labels been inspected, and do they meet AECOM PFAS sampling guidance requirements?
		Comment: <i>metal clipboard, ballpoint Bic pen, loose paper for notes.</i>
☒	☐	Have all sample shipping materials (ice, Ziploc® bags or similar style bags) been inspected, and do they meet AECOM PFAS sampling guidance requirements?
		Comment: <i>PFAS put in lab-provided Ziploc® bags</i>
☒	☐	Have all blanks arrived at the site and will they be collected to verify cross-contamination?
		Comment:

Document Control

☒	☐	Have all variances from sampling guidance been documented?
		Comment:

Other Comments:

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Figure 1 PFAS Sampling Checklist

Project No.: 60567553-4

Project Location: Former Chemical Leaman, Tonawanda, NY

Signature:

Date: 10/12/18

Well Sampling

Team Members

Yes	No	Description
☒	☐	Has AECOM PFAS Sampling guidance been reviewed by all team members?
		Comments:
☒	☐	Has AECOM field sampling staff received needed training certification?
		Comments:
☒	☐	Was a briefing held for field sampling staff?
		Comments:
☒	☐	Were additional PFAS sampling instructions given to field sampling staff?
		Comments: <i>Keep 1,4-dioxane in separate coolers (Teflon cap), Sample separate of PFAS.</i>
☒	☐	Have personal clothing and PPE requirements been followed by all field sampling staff?
		Comments: <i>No lotions or cosmetics.</i>
☒	☒	Were lotions and sunscreen used for field sampling staff?
		Comment:

Sample Collection

☒	☐	Has a PFAS-free water source been identified?
		Comment <i>Lab provided.</i>
		Source of PFAS-free water:
☒	☐	Have all sampling items, parts and equipment been inspected to be free of PFAS?
		Comment:
☒	☐	Has sampling location sequence been communicated to avoid cross-contaminations?
		Comment:
☒	☒	Have drilling fluids been evaluated and shown to be free of PFAS?
		Comment: <i>Not Applicable.</i>
☒	☐	Use of PFAS-free decontamination solution?
		Brand name of decontamination solution: <i>Alconox.</i>
☒	☐	Have all field logs, notebooks, pens, labels been inspected, and do they meet AECOM PFAS sampling guidance requirements?
		Comment: <i>metal clipboard, ballpoint Bic pen, loose paper for notes.</i>
☒	☐	Have all sample shipping materials (ice, Ziploc® bags or similar style bags) been inspected, and do they meet AECOM PFAS sampling guidance requirements?
		Comment: <i>PFAS put in lab-provided Ziploc® bags.</i>
☒	☐	Have all blanks arrived at the site and will they be collected to verify cross-contamination?
		Comment:

Document Control

☒	☐	Have all variances from sampling guidance been documented?
		Comment:

Other Comments:

Attachment 2

Field Forms

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: Chemical Leaman WELL NO.: B-07 (pg. 1 of 2)

PROJECT NO.: 60567553

STAFF: S. Connelly

DATE(S): 10/8/2018

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	<u>14.50</u>	WELL ID. 1"	(GAL/FT) 0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	<u>3.97</u>	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	<u>10.53</u>	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	<u>0.17</u>	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	<u>1.79</u>	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	<u>8.95</u>	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	<u>9.0</u>	8"	2.60
OR $V=0.0408 \times (\text{CASING DIAMETER})^2$				

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										INSTRUMENT
	INITIAL	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	
pH	6.48	6.11	6.06	6.01	5.94	5.96	5.99	5.98	6.03	6.01	
SPEC. COND. (umhos)	1.121	1.101	1.076	1.079	1.090	1.131	1.157	1.156	1.160	1.164	
APPEARANCE	Brown/ orange	Brown/ orange	Brown/ orange	light brown	light brown	clear	clear	Orange/ Clear	Clear/ Brown	clear	
TEMPERATURE (°C)	16.70	16.70	16.81	16.79	16.76	16.68	16.00	16.14	16.51	16.52	
PUMPING RATE (ml/min)	400	400	400	400	400	300	300	300	300	300	
WATER LEVEL (btor)	5.15	6.15	6.93	7.25	8.05	8.35	8.64	8.92	9.05	9.10	
Time	12:47	12:50	12:56	13:01	13:06	13:15	13:24	13:32	13:37	13:45	

COMMENTS:

12:40 - very muddy initial water. Pumping straight to carboy until it clears up.

13:06 - Turned pump down to 300 ml/min.

13:32 - (3.5 gallons) hit a patch of iron Bacteria.

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: Chemical Leaman WELL NO.: B-07 (pg. 2 of 2)

PROJECT NO.: 60567553

STAFF: S. Connelly

DATE(S): 10/8/2018

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	<u>14.50</u>	WELL ID. 1"	. (GAL/FT) 0.04
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	<u>3.97</u>	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	<u>10.53</u>	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	<u>0.17</u>	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	<u>1.79</u>	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	<u>8.95</u>	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	<u>9.0</u>	8"	2.60
OR $V=0.0408 \times (\text{CASING DIAMETER})^2$				

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										INSTRUMENT
	5.0	5.5	6.5	7.0	7.5	8.0	8.5	9.0			
pH	6.00	6.30	6.27	6.27	6.29	6.42	6.42	6.43			
SPEC. COND. (umhos)	1.168	1.177	1.183	1.187	1.194	1.212	1.214	1.213			
APPEARANCE	clear	clear	clear	clear	clear	clear	clear	clear			
TEMPERATURE (°C)	16.37	16.38	16.75	16.67	16.61	16.57	16.58	16.58			
PUMPING RATE (ml/min)	300	300	300	300	300	300	300	300			
WATER LEVEL (btor)	9.15	9.20	9.25	9.25	9.25	9.25	9.25	9.25			
Time	13:52	14:02	14:11	14:18	14:24	14:30	14:40	14:48			

COMMENTS:

WELL DEVELOPMENT LOG

AECOM

PROJECT TITLE: Chemical Leaman WELL NO.: B-13

PROJECT NO.: 60567553

STAFF: S. Connelly

DATE(S): 10/8/2018

1. TOTAL CASING AND SCREEN LENGTH (FT.)	=	<u>20.05</u>	WELL ID. <u>1"</u>	(GAL/FT) <u>0.04</u>
2. WATER LEVEL BELOW TOP OF CASING (FT.)	=	<u>2.00</u>	2"	0.17
3. NUMBER OF FEET STANDING WATER (#1 - #2)	=	<u>18.05</u>	3"	0.38
4. VOLUME OF WATER/FOOT OF CASING (GAL.)	=	<u>0.04</u>	4"	0.66
5. VOLUME OF WATER IN CASING (GAL.)(#3 x #4)	=	<u>0.72</u>	5"	1.04
6. VOLUME OF WATER TO REMOVE (GAL.)(#5 x 3)	=	<u>3.61</u>	6"	1.50
7. VOLUME OF WATER ACTUALLY REMOVED (GAL.)	=	<u>4.0</u>	8"	2.60
OR V=0.0408 x (CASING DIAMETER) ²				

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										INSTRUMENT
	INITIAL	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0		
pH	8.38	8.52	7.54	7.18	6.97	6.87	6.86	6.86	6.88		
SPEC. COND. (umhos)	1.039	1.021	1.266	1.446	1.558	1.604	1.642	1.681	1.693		
APPEARANCE	cloudy	cloudy	clear	clear	clear	clear	clear	clear	clear		
TEMPERATURE (°C)	15.26	15.77	15.17	14.94	14.81	14.87	14.82	14.98	14.92		
PUMPING RATE (ml/min)	200	200	200	200	200	200	200	200	200		
WATER LEVEL (btor)	9.3	11.25	11.55	11.82	11.93	11.95	12.00	12.00	12.00		
Time	10:55	11:04	11:12	11:24	11:36	11:46	12:00	12:11	12:24		

COMMENTS: Started redevelopment at 10:50.

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Chemical Leaman Tank Lines, Inc. Site: Tonawanda, NY PAGE: Well I.D.: B-07
Date: 10/12/2018 Sampling Personnel: S. Connelly Company: AECOM

Purging/
Sampling
Device: Geopump Tubing Type: HDPE and Silicone Tubing Inlet: Screen midpoint
Measuring Point: Below Top of Riser Initial Depth to Water: 4.96 Depth to Well Bottom: 14.5 Well Diameter: 2" Screen Length: 10'
Casing Type: PVC Volume in 1 Well Casing (gal): 1.62 Estimated Purge Volume (gal): 5.0

Sample ID: B-07 Sample Time: 09:45 QA/QC: MS/MSD

Sample Parameters: 1,4-dioxane by EPA Method 8270 SIM; 21 PFAS compounds by USEPA Method 537 Modified (low level)

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O ₂ (mg/l)	TURB. (NTU)	ORP (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
8:30	6.65	14.70	1.149	8.76	14.40	7.8	300	5.85
08:40	6.66	15.31	1.107	0.68	13.70	7.4	300	8.81
08:50	6.68	15.23	1.135	0.99	15.00	6.3	300	9.80
09:00	6.73	14.98	1.22	1.68	2.87	3.4	300	10.52
09:10	6.74	14.77	1.222	1.45	4.72	3.3	300	10.73
09:20	6.71	14.68	1.203	1.16	2.15	4.0	300	10.81
09:30	6.73	14.72	1.214	1.13	2.10	3.6	300	10.73
09:35	6.74	14.70	1.223	1.14	2.08	3.4	300	10.73
09:40	6.74	14.69	1.225	1.16	2.07	3.3	300	10.73
Tolerance:	0.1	---	0.03	0.1	0.1	+ or - 10	---	

Information:

Remarks: PFAS sampling, need minimum 3 well volumes - 4.86 gallons

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Chemical Leaman Tank Lines, Inc. Site: Tonawanda, NY PAGE: Well I.D.: B-13

Date: 10/12/2018 Sampling Personnel: S. Connelly Company: AECOM

Purging/ Sampling Device:	Geopump			Tubing Type:	HDPE and Silicone		Tubing Inlet:	Screen midpoint	
Measuring Point:	Below Top of Riser	Initial Depth to Water:	6.37	Depth to Well Bottom:	20.05	Well Diameter:	1"	Screen Length:	10'
Casing Type:	PVC			Volume in 1 Well Casing (gal):	0.55	Estimated Purge Volume (gal):	2.0		

Sample ID: B-13 Sample Time: 13:35 QA/QC:

Sample Parameters: 1,4-dioxane by EPA Method 8270 SIM; 21 PFAS compounds by USEPA Method 537 Modified (low level)

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O ₂ (mg/l)	TURB. (NTU)	ORP (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
12:45	7.40	14.04	1.855	1.29	67.0	-31.4	200	9.50
12:55	7.28	14.13	1.768	1.37	27.3	-25.7	200	12.86
13:05	7.13	13.78	1.814	1.71	15.6	-17.5	200	13.53
13:15	7.04	13.44	1.916	1.48	7.8	-12.8	200	13.55
13:20	7.04	13.36	1.943	1.37	7.8	-12.7	200	13.55
13:25	7.04	13.34	1.945	1.39	8.0	-12.7	200	13.55
13:30	7.04	13.31	1.949	1.38	8.1	-12.7	200	13.55
Tolerance:	0.1	---	0.03	0.1	0.1	+ or - 10	---	

Information:

Remarks: PFAS sampling, need minimum 3 well volumes - 1.64 gallons

LOW FLOW GROUNDWATER PURGING/SAMPLING LOG

Project: Chemical Leaman Tank Lines, Inc. Site: Tonawanda, NY PAGE: Well I.D.: B-L1-3
 Date: 10/12/2018 Sampling Personnel: S. Connelly Company: AECOM

Purging/
Sampling
Device: Geopump Tubing Type: HDPE and Silicone Tubing Inlet: Screen midpoint
 Measuring Point: Below Top of Riser Initial Depth to Water: 11.22 Depth to Well Bottom: 18.91 Well Diameter: 2" Screen Length: 7'
 Casing Type: PVC Volume in 1 Well Casing (gal): 1.25 Estimated Purge Volume (gal): 4.0

Sample ID: B-L1-3 Sample Time: 12:05 QA/QC: Field duplicate (FD-10122018)
 Sample Parameters: 1,4-dioxane by EPA Method 8270 SIM; 21 PFAS compounds by USEPA Method 537 Modified (low level)

PURGE PARAMETERS

TIME	pH	TEMP (°C)	COND. (mS/cm)	DISS. O ₂ (mg/l)	TURB. (NTU)	ORP (mV)	FLOW RATE (ml/min.)	DEPTH TO WATER (btor)
10:30	7.09	12.64	1.895	0.66	-25	-15.6	200	13.36
10:40	7.11	12.67	1.881	0.31	-25	-16.6	200	15.10
10:50	7.13	12.53	1.790	0.24	-25	-17.8	200	16.00
11:00	7.15	12.20	1.617	0.18	-25	-18.9	200	16.45
11:10	7.19	11.73	1.493	0.23	-25	-21.0	150	16.55
11:20	7.17	11.83	1.466	0.11	-25	-19.6	150	16.59
11:30	7.16	11.84	1.455	0.08	822	-19.1	150	16.63
11:40	7.15	11.74	1.443	0.10	-16	-18.6	150	16.72
11:50	7.15	11.90	1.441	0.12	15.6	-18.4	150	16.83
11:55	7.14	11.95	1.440	0.10	14.6	-18.4	150	16.85
12:00	7.14	11.97	1.440	0.09	14.2	-18.4	150	16.87
Tolerance:	0.1	---	0.03	0.1	0.1	+ or - 10	---	

Information:

Remarks: PFAS sampling, need minimum 3 well volumes - 3.9 gallons
 Dark silty water w/ slight odor @ beginning of purge.

Attachment 3

Data Usability Summary Report

DATA USABILITY SUMMARY REPORT

**CHEMICAL LEAMAN TANK LINES SITE
EMERGING CONTAMINANTS GROUNDWATER SAMPLING
FILLMORE AVENUE, TONAWANDA, NEW YORK
SITE ID# 915014**

Analyses Performed by:

**TESTAMERICA LABORATORIES, INC.
AMHERST, NEW YORK AND BURLINGTON, VERMONT**

Prepared for:

**NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL REMEDIATION**

Prepared by:

**AECOM
257 WEST GENESEE STREET
BUFFALO, NY 14202**

NOVEMBER 2018

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TABLES

(Following Text)

Table 1	Validated Groundwater Sample Analytical Results
Table 2	Validated Field QC Sample Analytical Results

ATTACHMENTS

Attachment A – Form 1s

Attachment B – Support Documentation

I. INTRODUCTION

This Data Usability Summary Report (DUSR) has been prepared following the guidelines provided in New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation *DER-10 Technical Guidance for Site Investigation and Remediation*, Appendix 2B - *Guidance for Data Deliverables and the Development of Data Usability Summary Reports*, May 2010. The samples were collected from the Chemical Leaman Tank Lines site (Site No. 915014).

II. ANALYTICAL METHODOLOGIES AND DATA VALIDATION PROCEDURES

The data being evaluated are from the October 12, 2018 sampling of 3 groundwater (GW) samples, 1 GW matrix spike/matrix spike duplicate (MS/MSD), 1 GW field duplicate (FD), and 2 field/equipment blanks. The analytical laboratory that performed the analyses is TestAmerica Laboratories, Inc. located in Amherst, NY and Burlington, VT. The samples were analyzed for the following parameters. Not all samples were analyzed for all parameters.

Matrix	Parameter	Method
Groundwater	1,4-Dioxane	SW8270D SIM
	Per- and Polyfluoroalkyl Substances (PFASs)	Method 537-Modified

A limited data validation was performed following the guidelines in the following USEPA Region II document (where applicable) along with the method and laboratory SOPs for PFASs:

- *Validating Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry, SW-846 Method 8270D*, SOP HW-22, Rev. 5, December 2010

Qualifications applied to the data during the limited data validation include 'J' (estimated concentration) and 'U' (non-detect). Definitions of USEPA data qualifiers are presented at the end of this text. The validated analytical results are presented on Table 1 (GW) and Table 2 (field QC). Copies of validated laboratory analytical summaries (Form 1s) are presented in Attachment A. Documentation supporting the qualification of data is presented in Attachment B. Only analytical deviations affecting data usability are discussed in this report.

III. DATA DELIVERABLE COMPLETENESS

The laboratory deliverable data package was equivalent to NYSDEC Analytical Services Protocol (ASP) Category B (or CLP-like) requirements.

IV. SAMPLE RECEIPT/PRESERVATION/HOLDING TIMES

All samples were received by the laboratory intact, properly preserved and under proper chain-of-custody (COC). All samples were analyzed within the required holding times (HT).

V. NON-CONFORMANCES

- **Internal Standards**

The percent recovery (%R) of internal standard 13C2 perfluorooctanoic acid (PFOA) was below the lower QC limit in samples B-13, B-L1-3, and FD-10122018 (B-L1-3). The results for PFOA in these samples have been qualified 'J'.

Support documentation (i.e., Form 8) is provided in Attachment B.

- **Laboratory Blanks/Equipment Rinsate Blank (EB) and Ambient Blank**

Perfluorodecanoic acid (PFUnA), perfluorohexanoic acid (PFHxA), perfluoroheptanoic acid (PFHpA), PFOA, perfluorononanoic acid (PFNA), perfluorodecanoic acid (PFDA), and perfluorododecanoic acid (PFDoA) were detected below the reporting limit (RL) in one or more of the laboratory method blanks and field blanks associated with the samples. Those associated samples that had concentrations of these compounds less than the RL were qualified 'U' at the RL. Those samples that had concentrations greater than the RL had the 'B' qualifier applied by the laboratory removed.

Support documentation (i.e., Forms 1 and 4) are provided in Attachment A.

- **Field Duplicates**

A field duplicate was collected at sample location B-L1-3.

The field duplicate relative percent differences (RPD) generally exhibited good analytical precision (e.g., for results > RL the %RPD <50%). The result for perfluorobutanoic acid (PFBA) was qualified 'J' in the parent and field duplicate samples because the %RPD was >50%.

VI. SAMPLE RESULTS AND REPORTING

All quantitation/detection limits were reported in accordance with method requirements and were adjusted for sample volume, moisture content (where applicable), and dilution factors. Results below the quantitation limits were qualified 'J' by the laboratory.

Several samples required dilutions due to matrix issues (strong unpleasant odors, presence of elevated levels of non-target compounds). The detection limits reported for the non-detect compounds represent the lowest achievable at the dilution factor used during the analysis.

VII. SUMMARY

All sample analyses were found to be compliant with the method and validation criteria, except where previously noted. Those results qualified 'J' and 'U' are considered conditionally usable. All other sample results are usable as reported. AECOM does not recommend the recollection of any samples at this time.

Prepared By: Ann Marie Kropovitch, Chemist



Date:

11/8/18

Reviewed By: George E. Kisluk, Senior Chemist



Date:

11/8/18

DEFINITIONS OF USEPA DATA QUALIFIERS

- U – The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
- J – The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- (J+) – The result is an estimated quantity. The associated numerical value is biased high.
- (J-) – The result is an estimated quantity. The associated numerical value is biased low.
- UJ – The analyte was analyzed for, but not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
- R – The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.
- D – The sample result was reported from a secondary dilution analysis.
- NJ – The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.

TABLE 1
VALIDATED GROUNDWATER SAMPLE ANALYTICAL RESULTS
CHEMICAL LEAMAN TANK LINES SITE

Location ID		B-07	B-13	B-L1-3	B-L1-3
Sample ID		B-07	B-13	B-L1-3	FD - 10122018
Matrix		Ground Water	Ground Water	Ground Water	Ground Water
Depth Interval (ft)		-	-	-	-
Date Sampled		10/12/18	10/12/18	10/12/18	10/12/18
Parameter	Units				Field Duplicate (1-1)
Semivolatiles					
1,4-Dioxane	UG/L	0.097 U	4.1	0.60 J	0.52 U
Perfluorobutanoic acid (PFBA)	NG/L	6.0	59	50 J	16 J
Perfluoropentanoic acid (PFPeA)	NG/L	16	64	17	21
Perfluorohexanoic acid (PFHxA)	NG/L	3.6	14	9.9 U	9.3 U
Perfluoroheptanoic acid (PFHpA)	NG/L	5.8	8.9 U	16	15
Perfluorooctanoic acid (PFOA)	NG/L	350	20 J	530 J	570 J
Perfluorononanoic acid (PFNA)	NG/L	1.8 U	1.8 U	9.9 U	9.3 U
Perfluorodecanoic acid (PFDA)	NG/L	1.8 U	1.8 U	1.9 U	1.8 U
Perfluoroundecanoic acid (PFUnA)	NG/L	1.8 U	1.8 U	1.2 U	1.2 U
Perfluorododecanoic acid (PFDoA)	NG/L	1.8 U	1.8 U	1.7 U	1.6 U
Perfluorotridecanoic acid (PFTriA)	NG/L	0.22 U	0.21 U	1.2 U	1.1 U
Perfluorotetradecanoic acid (PFTeA)	NG/L	0.41 U	0.40 U	2.2 U	2.1 U
Perfluorobutanesulfonic acid (PFBS)	NG/L	2.2	11	2.5 J	2.0 U
Perfluorohexanesulfonic acid (PFHxS)	NG/L	0.34 J	3.0 J	2.2 J	2.7 J
Perfluoroheptanesulfonic acid (PFHpS)	NG/L	0.75 U	0.73 U	4.1 U	3.8 U
Perfluorooctanesulfonic acid (PFOS)	NG/L	2.9	2.8	5.8 J	4.2 J
Perfluorodecane sulfonate (PFDS)	NG/L	0.49 U	0.47 U	2.6 U	2.5 U
Perfluorooctane sulfonamide (PFOSA)	NG/L	0.51 U	0.50 U	2.8 U	2.6 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	NG/L	0.41 U	0.40 U	2.2 U	2.1 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NG/L	0.64 U	0.62 U	3.5 U	3.2 U
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2)	NG/L	0.99 J	0.91 J	5.0 U	4.6 U
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2)	NG/L	0.51 U	0.50 U	2.8 U	2.6 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 11/7/18

CHECKED BY: GEK 11/7/18

Detection Limits shown are MDL

TABLE 2
VALIDATED FIELD QC SAMPLE ANALYTICAL RESULTS
CHEMICAL LEAMAN TANK LINES SITE

Location ID		FIELDQC	FIELDQC
Sample ID		AMBIENT BLANK - 101218	EB - 10122018
Matrix		Quality Control	Quality Control
Depth Interval (ft)		-	-
Date Sampled		10/12/18	10/12/18
Parameter	Units	Field Blank (1-1)	Equipment Blank (1-1)
Semivolatiles			
1,4-Dioxane	UG/L	NA	0.099 U
Perfluorobutanoic acid (PFBA)	NG/L	0.37 U	0.37 U
Perfluoropentanoic acid (PFPeA)	NG/L	0.68 U	0.67 U
Perfluorohexanoic acid (PFHxA)	NG/L	0.22 U	0.37 J
Perfluoroheptanoic acid (PFHpA)	NG/L	0.29 U	0.74 J
Perfluorooctanoic acid (PFOA)	NG/L	0.29 U	1.1 J
Perfluorononanoic acid (PFNA)	NG/L	0.34 U	0.97 J
Perfluorodecanoic acid (PFDA)	NG/L	0.34 U	0.88 J
Perfluoroundecanoic acid (PFUnA)	NG/L	0.31 J	2.8
Perfluorododecanoic acid (PFDoA)	NG/L	0.32 U	1.8
Perfluorotridecanoic acid (PFTriA)	NG/L	0.22 U	0.21 U
Perfluorotetradecanoic acid (PFTeA)	NG/L	0.41 U	0.40 U
Perfluorobutanesulfonic acid (PFBS)	NG/L	0.40 U	0.39 U
Perfluorohexanesulfonic acid (PFHxS)	NG/L	0.24 U	0.23 U
Perfluoroheptanesulfonic acid (PFHpS)	NG/L	0.74 U	0.73 U
Perfluorooctanesulfonic acid (PFOS)	NG/L	0.69 U	0.68 U
Perfluorodecane sulfonate (PFDS)	NG/L	0.48 U	0.47 U
Perfluorooctane sulfonamide (PFOSA)	NG/L	0.51 U	0.50 U
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	NG/L	0.41 U	0.40 U
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	NG/L	0.63 U	0.62 U
1H,1H,2H,2H-Perfluorooctanesulfonic acid (6:2)	NG/L	0.91 U	0.89 U
1H,1H,2H,2H-Perfluorodecanesulfonic acid (8:2)	NG/L	0.51 U	0.50 U

Flags assigned during chemistry validation are shown.

MADE BY: AMK 11/7/18

CHECKED BY: GEK 11/7/18

Detection Limits shown are MDL

ATTACHMENT A

FORM 1s

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo Job No.: 480-143444-1
 SDG No.: _____
 Client Sample ID: B-07 Lab Sample ID: 480-143444-1
 Matrix: Water Lab File ID: U3312487.D
 Analysis Method: 8270D SIM ID Date Collected: 10/12/2018 09:45
 Extract. Method: 3510C Date Extracted: 10/18/2018 07:57
 Sample wt/vol: 1030 (mL) Date Analyzed: 10/19/2018 17:50
 Con. Extract Vol.: 1 (mL) Dilution Factor: 1
 Injection Volume: 1 (uL) Level: (low/med) Low
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 440551 Units: ug/L

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

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

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo Job No.: 480-143444-1
SDG No.: _____
Client Sample ID: B-13 Lab Sample ID: 480-143444-3
Matrix: Water Lab File ID: U3312507.D
Analysis Method: 8270D SIM ID Date Collected: 10/12/2018 13:35
Extract. Method: 3510C Date Extracted: 10/18/2018 07:57
Sample wt/vol: 920 (mL) Date Analyzed: 10/23/2018 14:58
Con. Extract Vol.: 1 (mL) Dilution Factor: 5
Injection Volume: 1 (uL) Level: (low/med) Low
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 441175 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	4.1		1.1	0.54

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

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo Job No.: 480-143444-1
SDG No.: _____
Client Sample ID: B-L1-3 Lab Sample ID: 480-143444-2
Matrix: Water Lab File ID: U3312489.D
Analysis Method: 8270D SIM ID Date Collected: 10/12/2018 12:05
Extract. Method: 3510C Date Extracted: 10/18/2018 07:57
Sample wt/vol: 980 (mL) Date Analyzed: 10/19/2018 18:37
Con. Extract Vol.: 1 (mL) Dilution Factor: 5
Injection Volume: 1 (uL) Level: (low/med) Low
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 440551 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	0.60	J	1.0	0.51

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8	71		15-110

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

B-4-3

Lab Name: TestAmerica Buffalo Job No.: 480-143444-1
SDG No.: _____
Client Sample ID: FD - 10122018 Lab Sample ID: 480-143444-5
Matrix: Water Lab File ID: U3312491.D
Analysis Method: 8270D SIM ID Date Collected: 10/12/2018 11:30
Extract. Method: 3510C Date Extracted: 10/18/2018 07:57
Sample wt/vol: 960 (mL) Date Analyzed: 10/19/2018 19:24
Con. Extract Vol.: 1 (mL) Dilution Factor: 5
Injection Volume: 1 (uL) Level: (low/med) Low
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 440551 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	ND		1.0	0.52

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
17647-74-4	1,4-Dioxane-d8	73		15-110

[Handwritten signature]
11/6/18

FORM I
GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Buffalo Job No.: 480-143444-1
SDG No.: _____
Client Sample ID: EB - 10122018 Lab Sample ID: 480-143444-6
Matrix: Water Lab File ID: U3312492.D
Analysis Method: 8270D SIM ID Date Collected: 10/12/2018 14:00
Extract. Method: 3510C Date Extracted: 10/18/2018 07:57
Sample wt/vol: 1010 (mL) Date Analyzed: 10/19/2018 19:47
Con. Extract Vol.: 1 (mL) Dilution Factor: 1
Injection Volume: 1 (uL) Level: (low/med) Low
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 440551 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
123-91-1	1,4-Dioxane	ND		0.20	0.099

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

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 480-143444-1
 SDG No.: _____
 Client Sample ID: B-07 Lab Sample ID: 480-143444-1
 Matrix: Water Lab File ID: PF102318A39.d
 Analysis Method: 537 (modified) Date Collected: 10/12/2018 09:45
 Extraction Method: 3535 Date Extracted: 10/22/2018 13:00
 Sample wt/vol: 272 (mL) Date Analyzed: 10/24/2018 02:23
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: C-18 ID: 4.6 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 135676 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	6.0		1.8	0.38
2706-90-3	Perfluoropentanoic acid (PFPeA)	16		1.8	0.69
307-24-4	Perfluorohexanoic acid (PFHxA)	3.6		1.8	0.22
375-85-9	Perfluoroheptanoic acid (PFHpA)	5.8		1.8	0.29
335-67-1	Perfluorooctanoic acid (PFOA)	350		1.8	0.29
375-95-1	Perfluorononanoic acid (PFNA)	0.91 ND	J	1.8	0.35 1.8
335-76-2	Perfluorodecanoic acid (PFDA)	0.49 ND	J	1.8	0.35 1.8
2058-94-8	Perfluoroundecanoic acid (PFUnA)	1.0 ND	J B	1.8	0.23 1.8
307-55-1	Perfluorododecanoic acid (PFDoA)	0.76 ND	J	1.8	0.32 1.8
72629-94-8	Perfluorotridecanoic acid (PFTrIA)	ND		1.8	0.22
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.41
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.2		1.8	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	0.34	J	1.8	0.24
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.75
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.9		1.8	0.70
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.49
754-91-6	Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.51
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	0.41
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	0.64
27619-97-2	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.99	J	18	0.92
39108-34-4	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		18	0.51

OK
11/2/18

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 480-143444-1
 SDG No.: _____
 Client Sample ID: B-13 Lab Sample ID: 480-143444-3
 Matrix: Water Lab File ID: PF102318A43.d
 Analysis Method: 537 (modified) Date Collected: 10/12/2018 13:35
 Extraction Method: 3535 Date Extracted: 10/22/2018 13:00
 Sample wt/vol: 281.7 (mL) Date Analyzed: 10/24/2018 03:27
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: C-18 ID: 4.6 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 135676 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	59		1.8	0.36
2706-90-3	Perfluoropentanoic acid (PFPeA)	64		1.8	0.67
307-24-4	Perfluorohexanoic acid (PFHxA)	14		1.8	0.21
375-95-1	Perfluorononanoic acid (PFNA)	ND 1.5 J		1.8	1.8 0.34
335-76-2	Perfluorodecanoic acid (PFDA)	ND 1.3 J		1.8	1.8 0.34
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND 0.56 J/B		1.8	1.8 0.22
307-55-1	Perfluorododecanoic acid (PFDoA)	ND 0.41 J		1.8	1.8 0.31
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		1.8	0.21
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.40
375-73-5	Perfluorobutanesulfonic acid (PFBS)	11		1.8	0.39
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.73
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	2.8		1.8	0.67
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.47
754-91-6	Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.50
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	0.40
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	0.62
27619-97-2	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	0.91	J	18	0.89
39108-34-4	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		18	0.50

OK
11/21/18

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 480-143444-1
 SDG No.: _____
 Client Sample ID: B-13 Lab Sample ID: 480-143444-3
 Matrix: Water Lab File ID: PF102418A14.d
 Analysis Method: 537 (modified) Date Collected: 10/12/2018 13:35
 Extraction Method: 3535 Date Extracted: 10/22/2018 13:00
 Sample wt/vol: 281.7 (mL) Date Analyzed: 10/24/2018 15:59
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 5
 Injection Volume: 20 (uL) GC Column: C-18 ID: 4.6 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 135728 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND 3.9	5	8.9	8.9 1.4
335-67-1	Perfluorooctanoic acid (PFOA)	20	5	8.9	1.4

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL01892	13C4 PFHpA	75		25-150
STL00990	13C4 PFOA	93		25-150

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10/24/18

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Burlington</u>	Job No.: <u>480-143444-1</u>
SDG No.: _____	
Client Sample ID: <u>B-13</u>	Lab Sample ID: <u>480-143444-3</u>
Matrix: <u>Water</u>	Lab File ID: <u>PF102418A15.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>10/12/2018 13:35</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>10/22/2018 13:00</u>
Sample wt/vol: <u>281.7 (mL)</u>	Date Analyzed: <u>10/24/2018 16:15</u>
Con. Extract Vol.: <u>0.5 (mL)</u>	Dilution Factor: <u>2</u>
Injection Volume: <u>20 (uL)</u>	GC Column: <u>C-18</u> ID: <u>4.6 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>135728</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	3.0	J	3.5	0.46

CAS NO.	ISOTOPE DILUTION	%REC	Q	LIMITS
STL00994	18O2 PFHxS	87		25-150

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Burlington</u>	Job No.: <u>480-143444-1</u>
SDG No.: _____	
Client Sample ID: <u>B-L1-3</u>	Lab Sample ID: <u>480-143444-2</u>
Matrix: <u>Water</u>	Lab File ID: <u>PF102318A42.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>10/12/2018 12:05</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>10/22/2018 13:00</u>
Sample wt/vol: <u>252.4 (mL)</u>	Date Analyzed: <u>10/24/2018 03:11</u>
Con. Extract Vol.: <u>0.5 (mL)</u>	Dilution Factor: <u>5</u>
Injection Volume: <u>20 (uL)</u>	GC Column: <u>C-18</u> ID: <u>4.6 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>135676</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	50	J	9.9	2.0
2706-90-3	Perfluoropentanoic acid (PFPeA)	17		9.9	3.7
307-24-4	Perfluorohexanoic acid (PFHxA)	ND 6.7	J	9.9	9.9 1.2
375-85-9	Perfluoroheptanoic acid (PFHpA)	16		9.9	1.6
335-67-1	Perfluorooctanoic acid (PFOA)	530	J	9.9	1.6
375-95-1	Perfluorononanoic acid (PFNA)	ND 4.8	J	9.9	9.9 1.9
335-76-2	Perfluorodecanoic acid (PFDA)	ND		9.9	1.9
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		9.9	1.2
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		9.9	1.7
72629-94-8	Perfluorotridecanoic acid (PFTrIA)	ND		9.9	1.2
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		9.9	2.2
375-73-5	Perfluorobutanesulfonic acid (PFBS)	2.5	J	9.9	2.2
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.2	J	9.9	1.3
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		9.9	4.1
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	5.8	J	9.9	3.8
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		9.9	2.6
754-91-6	Perfluorooctanesulfonamide (PFOSA)	ND		9.9	2.8
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		99	2.2
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		99	3.5
27619-97-2	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		99	5.0
39108-34-4	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		99	2.8

OK
11/2/18

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

B-4-3

Lab Name: TestAmerica Burlington Job No.: 480-143444-1
SDG No.: _____
Client Sample ID: FD - 10122018 Lab Sample ID: 480-143444-5
Matrix: Water Lab File ID: PF102318A45.d
Analysis Method: 537 (modified) Date Collected: 10/12/2018 11:30
Extraction Method: 3535 Date Extracted: 10/22/2018 13:00
Sample wt/vol: 270.2(mL) Date Analyzed: 10/24/2018 03:59
Con. Extract Vol.: 0.5(mL) Dilution Factor: 5
Injection Volume: 20(uL) GC Column: C-18 ID: 4.6 (mm)
% Moisture: _____ GPC Cleanup: (Y/N) N
Analysis Batch No.: 135676 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	16	J	9.3	1.9
2706-90-3	Perfluoropentanoic acid (PFPeA)	21		9.3	3.5
307-24-4	Perfluorohexanoic acid (PFHxA)	ND 6.5	J	9.3	9.3 1.1
375-85-9	Perfluoroheptanoic acid (PFHpA)	15		9.3	1.5
335-67-1	Perfluorooctanoic acid (PFOA)	570	J	9.3	1.5
375-95-1	Perfluorononanoic acid (PFNA)	ND 4.6	J	9.3	9.3 1.8
335-76-2	Perfluorodecanoic acid (PFDA)	ND		9.3	1.8
2058-94-8	Perfluoroundecanoic acid (PFUnA)	ND		9.3	1.2
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		9.3	1.6
72629-94-8	Perfluorotridecanoic acid (PFTriA)	ND		9.3	1.1
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		9.3	2.1
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		9.3	2.0
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	2.7	J	9.3	1.2
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		9.3	3.8
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	4.2	J	9.3	3.5
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		9.3	2.5
754-91-6	Perfluorooctanesulfonamide (PFOSA)	ND		9.3	2.6
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		93	2.1
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		93	3.2
27619-97-2	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		93	4.6
39108-34-4	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		93	2.6

OK 11/2/18

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: <u>TestAmerica Burlington</u>	Job No.: <u>480-143444-1</u>
SDG No.: _____	
Client Sample ID: <u>AMBIENT BLANK - 101218</u>	Lab Sample ID: <u>480-143444-4</u>
Matrix: <u>Water</u>	Lab File ID: <u>PF102318A44.d</u>
Analysis Method: <u>537 (modified)</u>	Date Collected: <u>10/12/2018 09:00</u>
Extraction Method: <u>3535</u>	Date Extracted: <u>10/22/2018 13:00</u>
Sample wt/vol: <u>275.8 (mL)</u>	Date Analyzed: <u>10/24/2018 03:43</u>
Con. Extract Vol.: <u>0.5 (mL)</u>	Dilution Factor: <u>1</u>
Injection Volume: <u>20 (uL)</u>	GC Column: <u>C-18</u> ID: <u>4.6 (mm)</u>
% Moisture: _____	GPC Cleanup: (Y/N) <u>N</u>
Analysis Batch No.: <u>135676</u>	Units: <u>ng/L</u>

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	ND		1.8	0.37
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		1.8	0.68
307-24-4	Perfluorohexanoic acid (PFHxA)	ND		1.8	0.22
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		1.8	0.29
335-67-1	Perfluorooctanoic acid (PFOA)	ND		1.8	0.29
375-95-1	Perfluorononanoic acid (PFNA)	ND		1.8	0.34
335-76-2	Perfluorodecanoic acid (PFDA)	ND		1.8	0.34
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.31	J B	1.8	0.23
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		1.8	0.32
72629-94-8	Perfluorotridecanoic acid (PFTrIA)	ND		1.8	0.22
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.41
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		1.8	0.40
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND		1.8	0.24
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.74
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND		1.8	0.69
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.48
754-91-6	Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.51
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	0.41
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	0.63
27619-97-2	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		18	0.91
39108-34-4	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		18	0.51

[Signature]
11/2/18

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 480-143444-1
 SDG No.: _____
 Client Sample ID: EB - 10122018 Lab Sample ID: 480-143444-6
 Matrix: Water Lab File ID: PF102318A46.d
 Analysis Method: 537 (modified) Date Collected: 10/12/2018 14:00
 Extraction Method: 3535 Date Extracted: 10/22/2018 13:00
 Sample wt/vol: 280.3 (mL) Date Analyzed: 10/24/2018 04:15
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: C-18 ID: 4.6 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 135676 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	ND		1.8	0.37
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		1.8	0.67
307-24-4	Perfluorohexanoic acid (PFHxA)	0.37	J	1.8	0.21
375-85-9	Perfluoroheptanoic acid (PFHpA)	0.74	J	1.8	0.29
335-67-1	Perfluorooctanoic acid (PFOA)	1.1	J	1.8	0.29
375-95-1	Perfluorononanoic acid (PFNA)	0.97	J	1.8	0.34
335-76-2	Perfluorodecanoic acid (PFDA)	0.88	J	1.8	0.34
2058-94-8	Perfluoroundecanoic acid (PFUnA)	2.8	B	1.8	0.22
307-55-1	Perfluorododecanoic acid (PFDoA)	1.8		1.8	0.31
72629-94-8	Perfluorotridecanoic acid (PFTrIA)	ND		1.8	0.21
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		1.8	0.40
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		1.8	0.39
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND		1.8	0.23
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		1.8	0.73
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND		1.8	0.68
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		1.8	0.47
754-91-6	Perfluorooctanesulfonamide (PFOSA)	ND		1.8	0.50
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		18	0.40
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		18	0.62
27619-97-2	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		18	0.89
39108-34-4	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		18	0.50

OK
11/2/18

ATTACHMENT B

SUPPORT DOCUMENTATION

TestAmerica

Ver 08/04/2016

Client Information (Sub Contract Lab)		Sampler:	Lab PM: Deyo, Melissa L.		480-143444 Chain of Custody		COC No: 480-45685-1		
Client Contact: Shipping/Receiving		Phone:	E-Mail: melissa.deyo@testamerica.com		New York		Page: Page 1 of 1		
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - New York				Job #: 480-143444-1			
Address: 30 Community Drive, Suite 11, City: South Burlington State, Zip: VT, 05403		Due Date Requested: 10/24/2018		Analysis Requested				Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify) Other:	
Project Name: 60567553, Chem Leeman Project		TAT Requested (days):							
Email:		PO #:							
WO #:		Project #: 48016395							
Site:		SSOW#:							
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, AA=Air)	Prior Method Sample (Yes or No)	Element Analyzed (Yes or No)	PFC IDA3335_IWIT PFAS, Standard List (21 analytes)	Total Number of bottles/liters	Special Instructions/Note:
B-07 (480-143444-1)	10/12/18	09:45 Eastern		Water	X			1	
B-07 (480-143444-1MS)	10/12/18	09:45 Eastern	MS	Water	X			1	
B-07 (480-143444-1MSD)	10/12/18	09:45 Eastern	MSD	Water	X			1	
B-4-3 (480-143444-2) B-LI-3	10/12/18	12:05 Eastern		Water	X			1	
B-13 (480-143444-3)	10/12/18	13:35 Eastern		Water	X			1	
AMBIENT BLANK - 101218 (480-143444-4)	10/12/18	09:00 Eastern		Water	X			1	
FD - 10122018 (480-143444-5)	10/12/18	11:30 Eastern		Water	X			1	
EB - 10122018 (480-143444-6)	10/12/18	14:00 Eastern		Water	X			1	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/test/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.									
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
Unconfirmed					☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months				
Deliverable Requested: I, II, III, IV, Other (specify)					Primary Deliverable Rank: 2				
Empty Kit Relinquished by:					Special Instructions/QC Requirements:				
Relinquished by:		Date/Time:	Company:	Received by:	Date/Time:	Company:			
Relinquished by:		Date/Time:	Company:	Received by:	Date/Time:	Company:			
Relinquished by:		Date/Time:	Company:	Received by:	Date/Time:	Company:			
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:			Cooler Temperature(s) °C and Other Remarks:				

Job Narrative
480-143444-1

Receipt

The samples were received on 10/12/2018 5:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.9° C.

GC/MS Semi VOA

Method(s) 8270D SIM ID: The following samples were diluted due to the nature of the sample matrix: B-L1-3 (480-143444-2) and FD - 10122018 (480-143444-5). Elevated reporting limits (RLs) are provided.

Method(s) 8270D SIM ID: The following sample was diluted to bring the concentration of target analytes within the calibration range: B-13 (480-143444-3). Elevated reporting limits (RLs) are provided.

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

LCMS

Method(s) 537 (modified): Due to sample matrix effect on the internal standard (ISTD), a dilution was required for the following sample: B-13 (480-143444-3). The raw sample smelled like sewage, which is the likely cause of the ISTD suppression.

Method(s) 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following samples: B-07 (480-143444-1), B-07 (480-143444-1[MS]), B-07 (480-143444-1[MSD]), B-L1-3 (480-143444-2), B-13 (480-143444-3) and FD - 10122018 (480-143444-5). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method(s) 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following samples is below the method recommended limit: B-07 (480-143444-1), B-07 (480-143444-1[MS]), B-07 (480-143444-1[MSD]) and B-13 (480-143444-3). 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): The native sample, matrix spike, and matrix spike duplicate (MS/MSD) associated with preparation batch 200-135602 and analytical batch 200-135676 were performed at the same dilution. Due to the additional level of analyte present in the spiked samples, the concentration of Perfluorooctanoic acid (PFOA) in the MS/MSD was above the instrument calibration range. The data have been reported and qualified.

Method(s) 537 (modified): Due to sample matrix effect on the chromatography (early RT shift), a dilution was required for the following sample: B-13 (480-143444-3). The ISTD is not fortified for IDA analysis, therefore the response is below acceptance criteria.

Method(s) 537 (modified): Due to sample matrix effect on the chromatography (early retention time shift), a dilution was required for the following samples: B-L1-3 (480-143444-2) and FD - 10122018 (480-143444-5). The extract was visibly contaminated with non-target compounds. The dilution analysis weakened the effects of the interferences on the RT drift, but since the internal standard is not fortified in dilutions, the responses fall below the ISTD acceptance criteria.

Method(s) 537 (modified): The following samples were diluted due to the abundance of non-target analytes: B-L1-3 (480-143444-2) and FD - 10122018 (480-143444-5). A more concentrated analysis was attempted, but resulted in the ISTD still eluting too early. The ISTD is necessary to quantitate the IDA recoveries.

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.

FORM IV
LCMS METHOD BLANK SUMMARY

Lab Name: TestAmerica Burlington Job No.: 480-143444-1
 SDG No.: _____
 Lab File ID: PF102318A22.d Lab Sample ID: MB 200-135602/1-A
 Matrix: Water Date Extracted: 10/22/2018 13:00
 Instrument ID: LC410 Date Analyzed: 10/23/2018 21:52
 Level: (Low/Med) Low

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES:

CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
	LCS 200-135602/2-A	PF102318A23 .d	10/23/2018 22:08
B-07	480-143444-1	PF102318A39 .d	10/24/2018 02:23
B-07 MS	480-143444-1 MS	PF102318A40 .d	10/24/2018 02:39
B-07 MSD	480-143444-1 MSD	PF102318A41 .d	10/24/2018 02:55
B-L1-3	480-143444-2	PF102318A42 .d	10/24/2018 03:11
B-13	480-143444-3	PF102318A43 .d	10/24/2018 03:27
AMBIENT BLANK - 101218	480-143444-4	PF102318A44 .d	10/24/2018 03:43
FD - 10122018	480-143444-5	PF102318A45 .d	10/24/2018 03:59
EB - 10122018	480-143444-6	PF102318A46 .d	10/24/2018 04:15
B-13	480-143444-3	PF102418A14 .d	10/24/2018 15:59
B-13	480-143444-3	PF102418A15 .d	10/24/2018 16:15

FORM I
LCMS ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Burlington Job No.: 480-143444-1
 SDG No.: _____
 Client Sample ID: _____ Lab Sample ID: MB 200-135602/1-A
 Matrix: Water Lab File ID: PF102318A22.d
 Analysis Method: 537 (modified) Date Collected: _____
 Extraction Method: 3535 Date Extracted: 10/22/2018 13:00
 Sample wt/vol: 250 (mL) Date Analyzed: 10/23/2018 21:52
 Con. Extract Vol.: 0.5 (mL) Dilution Factor: 1
 Injection Volume: 20 (uL) GC Column: C-18 ID: 4.6 (mm)
 % Moisture: _____ GPC Cleanup: (Y/N) N
 Analysis Batch No.: 135676 Units: ng/L

CAS NO.	COMPOUND NAME	RESULT	Q	RL	MDL
375-22-4	Perfluorobutanoic acid (PFBA)	ND		2.0	0.41
2706-90-3	Perfluoropentanoic acid (PFPeA)	ND		2.0	0.75
307-24-4	Perfluorohexanoic acid (PFHxA)	ND		2.0	0.24
375-85-9	Perfluoroheptanoic acid (PFHpA)	ND		2.0	0.32
335-67-1	Perfluorooctanoic acid (PFOA)	ND		2.0	0.32
375-95-1	Perfluorononanoic acid (PFNA)	ND		2.0	0.38
335-76-2	Perfluorodecanoic acid (PFDA)	ND		2.0	0.38
2058-94-8	Perfluoroundecanoic acid (PFUnA)	0.368	J	2.0	0.25
307-55-1	Perfluorododecanoic acid (PFDoA)	ND		2.0	0.35
72629-94-8	Perfluorotridecanoic acid (PFTrIA)	ND		2.0	0.24
376-06-7	Perfluorotetradecanoic acid (PFTeA)	ND		2.0	0.45
375-73-5	Perfluorobutanesulfonic acid (PFBS)	ND		2.0	0.44
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	ND		2.0	0.26
375-92-8	Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.0	0.82
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	ND		2.0	0.76
335-77-3	Perfluorodecanesulfonic acid (PFDS)	ND		2.0	0.53
754-91-6	Perfluorooctanesulfonamide (PFOSA)	ND		2.0	0.56
2355-31-9	N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		20	0.45
2991-50-6	N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		20	0.70
27619-97-2	1H,1H,2H,2H-perfluorooctanesulfonic acid (6:2)	ND		20	1.0
39108-34-4	1H,1H,2H,2H-perfluorodecanesulfonic acid (8:2)	ND		20	0.56

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 480-143444-1
 SDG No.: _____
 Sample No.: CCVIS 200-135676/6 Date Analyzed: 10/23/2018 17:37
 Instrument ID: LC410 GC Column: C-18 ID: 4.6 (mm)
 Lab File ID (Standard): PF102318A06.d Heated Purge: (Y/N) N
 Calibration ID: 40218

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		739175	4.37				
UPPER LIMIT		1108763	4.57				
LOWER LIMIT		369588	4.17				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 200-135676/7		819872	4.37				
CCV 200-135676/21		771202	4.37				
MB 200-135602/1-A		856704	4.37				
LCS 200-135602/2-A		860293	4.37				
CCV 200-135676/34		742916	4.37				
480-143444-1	B-07	449580	4.32				
480-143444-1 MS	B-07 MS	445132	4.30				
480-143444-1 MSD	B-07 MSD	439081	4.30				
480-143444-2	B-L1-3	102002*	4.30				
480-143444-3	B-13	360813*	4.27				
480-143444-4	AMBIENT BLANK - 101218	715407	4.36				
480-143444-5	FD - 10122018	114954*	4.30				
480-143444-6	EB - 10122018	732717	4.36				

13PFOA = 13C2 PFOA

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537 (MODIFIED)

FORM VIII
LCMS INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Burlington Job No.: 480-143444-1
 SDG No.: _____
 Sample No.: CCVIS 200-135728/6 Date Analyzed: 10/24/2018 13:51
 Instrument ID: LC410 GC Column: C-18 ID: 4.6 (mm)
 Lab File ID (Standard): PF102418A06.d Heated Purge: (Y/N) N
 Calibration ID: 40218

		13PFOA					
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12/24 HOUR STD		640862	4.37				
UPPER LIMIT		961293	4.57				
LOWER LIMIT		320431	4.17				
LAB SAMPLE ID	CLIENT SAMPLE ID						
CCVL 200-135728/7		719182	4.37				
CCV 200-135728/8		869066	4.37				
480-143444-3	B-13	100717*	4.36				
480-143444-3	B-13	266253*	4.30				
CCV 200-135728/19		589030	4.36				

13PFOA = 13C2 PFOA

Area Limit = 50%-150% of internal standard area
 RT Limit = $\pm$ 0.2 minutes of internal standard RT

Column used to flag values outside QC limits

FORM VIII 537 (MODIFIED)