Meritech – Durham

5926 NC Highway 55 East
Durham, NC 27713

Durham County TWWTP

Durham, NC
Samples Received: 07/10/2019

Analytical Report
0719-716

Isotope Dilution Method

PFAS – DEQ List

Enthalpy Analytical, LLC – Ultratrace

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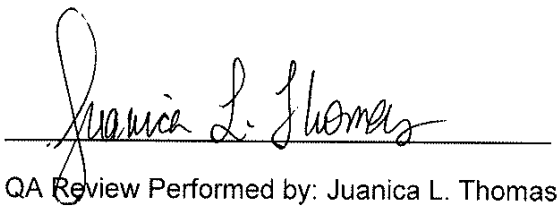
I certify that to the best of my knowledge all analytical data presented in this report:

- Have been checked for completeness
- Are accurate, error-free, and legible
- Have been conducted in accordance with approved protocol, and that all deviations and analytical problems are summarized in the appropriate narrative(s)

This analytical report was prepared in Portable Document Format (.PDF) and contains __27__ pages.



QA Review Performed by: Juanica L. Thomas

Report Issued Date: 7/28/19

ENTHALPY ANALYTICAL

Summary of Results

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Summary of Results: PFAS

Enthalpy Ultratrace Batch

10383

PFAS

Analyte	Method Blank	Influent# 070819193
	ng/L	ng/L
Acids		
PFBA	ND U	ND U
PFPeA	2.21 J	36.4
PFHxA	3.39	10.7 B
PFHpA	ND U	3.40
PFOA	ND U	7.72
PFNA	ND U	1.42 J
PFDA	ND U	1.87 J
PFUnA	ND U	ND U
PFDoA	ND U	ND U
PFTrA	ND U	ND U
PFTA	ND U	ND U
Sulfonates		
L-PFBS	ND U	ND U
PFPeS	ND U	ND U
PFHxS	ND U	ND U
PFHpS	ND U	ND U
PFOS	ND U	11.0
PFNS	ND U	ND U
PFDS	ND U	ND U
Other		
PFOSA	ND U	ND U
N-MeFOSAA	ND U	ND U
N-EtFOSAA	ND U	ND U
Lab Sample ID	LMB_10383	0719-716_10383_001R

Detailed Results

ENTHALPY ANALYTICAL

Influent# 070819193 — Detailed Results - PFAS

Client Details

Client Sample ID:	Influent# 070819193	**Client Name:**	**Durham County TWWTP**
Client Project ID:	N/A	**Sample Collection Date:**	**08-Jul-19**

Lab/Sample Details

Lab Job #:	**0719-716**	**Matrix:**	**Aqueous**	**Date Received:**	**08-Jul-19**
Lab Sample ID:	**0719-716_10383_001R**	**Wt./Vol.**	**31.2**	**Date Extracted:**	**24-Jul-19**
QC Batch #:	**10383**			**Date Analyzed:**	**25-Jul-19**
Final Volume (mL)	**0.4**			**Time Analyzed:**	**22:21:16**

Analyte	CAS Number	Conc. (ng/L)		MDL (ng/L)	RL (ng/L)	Qualifiers	Standard	ES Recoveries (%)	Qualifiers
Acids							MPFBA	92.7	
PFBA	375-22-4	ND		1.26	2.88	U	M5PFPeA	119	
PFPeA	2706-90-3	36.4		0.719	2.88		M3PFBS	139	
PFHxA	307-24-4	10.7		1.26	2.88	B	M2-4:2 FTS	240	Q
PFHpA	375-85-9	3.40		0.557	2.88		M5PFHxA	86.9	
PFOA	335-67-1	7.72		0.636	2.88		M3HFPO-DA	114	
PFNA	375-95-1	1.42		0.408	2.88	J	M4PFHpA	93.3	
PFDA	335-76-2	1.87		1.00	2.88	J	M3PFHxS	90.3	
PFUnA	2058-94-8	ND		0.385	2.88	U	M2-6:2 FTS	194	Q
PFDoDA	307-55-1	ND		0.380	2.88	U	M8PFOA	91.9	
PFTrDA	72629-94-8	ND		0.597	2.88	U	M9PFNA	93.2	
PFTeDA	376-06-7	ND		0.665	2.88	U	M8PFOS	87.4	
							M2-8:2 FTS	80.5	
Sulfonates							M8FOSA-I	61.0	
L-PFBS	375-73-5	ND		0.665	2.88	U	M6PFDA	88.8	
PFPeS	2706-91-4	ND		0.793	2.88	U	d3-N-MeFOSAA	36.0	Q
PFHxS	355-46-4	ND		0.662	2.88	U	d5-N-EtFOSAA	66.8	
PFHpS	375-92-8	ND		0.624	2.88	U	M7PFUdA	83.9	
PFOS	1763-23-1	11.0		0.377	2.88		MPFDoA	45.6	Q
PFNS	68259-12-1	ND		0.524	2.88	U	M2PFTeDA	29.2	Q
PFDS	335-77-3	ND		1.08	2.88	U			
Other									
PFOSA	754-91-6	ND		2.92	2.92	U			
N-MeFOSAA	2355-31-9	ND		0.436	2.88	U			
N-EtFOSAA	2991-50-6	ND		0.521	2.88	U			

QC Data

ENTHALPY
ANALYTICAL

Continuing Calibration/Instrument Sensitivity PFAS

Concentration (ng/L)	**225**
Standard ID	**AG99**
Acquisition Date	**25-Jul-19**
Acquisition Time	**20:41:46**

Analyte	Concentration (ng/L)	% Recovery	Limit	Acceptable	
Acids					
PFBA	231	103	±30	Yes	
PFPeA	227	101	±30	Yes	
PFHxA	194	86.3	±30	Yes	
PFHpA	238	106	±30	Yes	
PFOA	225	100	±30	Yes	
PFNA	219	97.1	±30	Yes	
PFDA	207	91.9	±30	Yes	
PFUnA	277	123	±30	Yes	
PFDoDA	241	107	±30	Yes	
PFTrDA	247	110	±30	Yes	
PFTeDA	242	108	±30	Yes	
Sulfonates					
L-PFBS	143	71.7	±30	Yes	
PFPeS	187	88.3	±30	Yes	
PFHxS	176	85.7	±30	Yes	
PFHpS	187	87.4	±30	Yes	
PFOS	204	98.0	±30	Yes	
PFNS	254	118	±30	Yes	
PFDS	273	126	±30	Yes	
4:2 FTS	213	101	±30	Yes	
6:2 FTS	216	101	±30	Yes	
8:2 FTS	194	89.7	±30	Yes	
Other					
PFOSA	246	109	±30	Yes	
N-MeFOSAA	210	93.2	±30	Yes	
N-EtFOSAA	178	79.2	±30	Yes	
HFPO-DA (Gen-X)	8,157	104	±30	Yes	

Continuing Calibration/Instrument Sensitivity PFAS

Concentration (ng/L)	**4480**
Standard ID	**AG99**
Acquisition Date	**25-Jul-19**
Acquisition Time	**20:41:46**

Analyte	Response	Midpoint Response	Recovery (%)	Limit (%)	Acceptable
M3PFBA	4952	4890	101	±50	Yes
M5PFPeA	5086	4650	109	±50	Yes
M3PFBS	3297	3120	106	±50	Yes
M2-4:2 FTS	1327	1420	93	±50	Yes
M5PFHxA	4168	4020	104	±50	Yes
M3HFPO-DA	2538	2340	108	±50	Yes
M4PFHpA	4626	4300	108	±50	Yes
M3PFHxS	4546	4380	104	±50	Yes
M2-6:2 FTS	1670	1680	99	±50	Yes
M8PFOA	4452	4350	102	±50	Yes
M9PFNA	3992	3860	103	±50	Yes
M8PFOS	4394	4430	99	±50	Yes
M2-8:2 FTS	2578	2520	102	±50	Yes
M8FOSA	5034	4790	105	±50	Yes
M6PFDA	5640	5520	102	±50	Yes
d3-N-MeFOSAA	7597	7260	105	±50	Yes
d5-N-EtFOSAA	3322	2640	126	±50	Yes
M7PFUdA	4981	4450	112	±50	Yes
MPFDoA	2273	2870	79	±50	Yes
M2PFTeDA	1689	2650	64	±50	Yes
Injection Standards	Area	Recovery (%)			
MPFBA	34965	98.2			
M2PFOA	61215	116			
MPFDA	39488	120			
MPFOS	22862	121			

Continuing Calibration PFAS

Concentration (ng/L)	**900**
Standard ID	**AG97**
Acquisition Date	**25-Jul-19**
Acquisition Time	**23:27:38**

Analyte	Concentration (ng/L)	% Recovery	Limit	Acceptable
Acids				
PFBA	896.5074	99.6	±30	Yes
PFPeA	898.4515	99.8	±30	Yes
PFHxA	897.5691	99.7	±30	Yes
PFHpA	939.1391	104	±30	Yes
PFOA	912.1937	101	±30	Yes
PFNA	901.2807	100	±30	Yes
PFDA	973.8054	108	±30	Yes
PFUnA	945.7387	105	±30	Yes
PFDoDA	979.1828	109	±30	Yes
PFTrDA	1003.2694	112	±30	Yes
PFTeDA	959.8339	107	±30	Yes
Sulfonates				
L-PFBS	776.8508	97.5	±30	Yes
PFPeS	881.9399	104	±30	Yes
PFHxS	802.3878	97.8	±30	Yes
PFHpS	802.4070	93.8	±30	Yes
PFOS	781.7763	93.9	±30	Yes
PFNS	947.6663	110	±30	Yes
PFDS	931.2146	107	±30	Yes
4:2 FTS	812.7478	96.6	±30	Yes
6:2 FTS	861.2302	101	±30	Yes
8:2 FTS	865.8458	100	±30	Yes
Other				
PFOSA	960.2269	107	±30	Yes
N-MeFOSAA	986.7986	110	±30	Yes
N-EtFOSAA	859.0977	95.5	±30	Yes
HFPO-DA (Gen-X)	34453.8589	109	±30	Yes

Continuing Calibration PFAS

Concentration (ng/L)	**4480**
Standard ID	**AG97**
Acquisition Date	**25-Jul-19**
Acquisition Time	**23:27:38**

Analyte	Response	Midpoint Response	Recovery (%)	Limit (%)	Acceptable
M3PFBA	5072	4890	104	±50	Yes
M5PFPeA	5082	4650	109	±50	Yes
M3PFBS	2998	3120	96.1	±50	Yes
M2-4:2 FTS	1228	1420	86.5	±50	Yes
M5PFHxA	4153	4020	103	±50	Yes
M3HFPO-DA	2560	2340	109	±50	Yes
M4PFHpA	4567	4300	106	±50	Yes
M3PFHxS	4489	4380	102	±50	Yes
M2-6:2 FTS	1433	1680	85.3	±50	Yes
M8PFOA	4489	4350	103	±50	Yes
M9PFNA	4124	3860	107	±50	Yes
M8PFOS	4500	4430	102	±50	Yes
M2-8:2 FTS	2493	2520	98.9	±50	Yes
M8FOSA	4806	4790	100	±50	Yes
M6PFDA	5156	5520	93.4	±50	Yes
d3-N-MeFOSAA	7639	7260	105	±50	Yes
d5-N-EtFOSAA	2701	2640	102	±50	Yes
M7PFUdA	4736	4450	106	±50	Yes
MPFDoA	2183	2870	76.1	±50	Yes
M2PFTeDA	1670	2650	63.0	±50	Yes
Injection Standards	Area	Recovery (%)			
MPFBA	36100	101			
M2PFOA	57750	109			
MPFDA	44820	136			
MPFOS	21543	114			

Continuing Calibration PFAS

Concentration (ng/L)	**2250**
Standard ID	**AG96**
Acquisition Date	**26-Jul-19**
Acquisition Time	**12:36:35**

Analyte	Concentration (ng/L)	% Recovery	Limit	Acceptable
Acids				
PFBA	2122.0799	94.3	±30	Yes
PFPeA	2167.5367	96.3	±30	Yes
PFHxA	2181.1721	96.9	±30	Yes
PFHpA	2179.7498	96.9	±30	Yes
PFOA	2150.1162	95.6	±30	Yes
PFNA	2177.4948	96.8	±30	Yes
PFDA	2189.9172	97.3	±30	Yes
PFUnA	2231.1159	99.2	±30	Yes
PFDoDA	2264.5019	100.6	±30	Yes
PFTrDA	2245.5980	99.8	±30	Yes
PFTeDA	2172.6277	96.6	±30	Yes
Sulfonates				
L-PFBS	1819.7177	91.4	±30	Yes
PFPeS	2077.4099	98.2	±30	Yes
PFHxS	1965.6298	95.8	±30	Yes
PFHpS	2011.7614	94.1	±30	Yes
PFOS	1874.0027	90.0	±30	Yes
PFNS	2117.7033	98.0	±30	Yes
PFDS	2182.6266	100.5	±30	Yes
4:2 FTS	2068.8170	98.3	±30	Yes
6:2 FTS	2064.8789	96.6	±30	Yes
8:2 FTS	2151.9896	99.6	±30	Yes
Other				
PFOSA	2212.9142	98.4	±30	Yes
N-MeFOSAA	2264.0105	100.6	±30	Yes
N-EtFOSAA	2057.9612	91.5	±30	Yes
HFPO-DA (Gen-X)	76721.4270	97.4	±30	Yes

Continuing Calibration PFAS

Concentration (ng/L)	4480
Acquisition Date	26-Jul-19
Acquisition Time	12:36:35

Analyte	Response	Midpoint Response	Recovery (%)	Limit (%)	Acceptable
M3PFBA	5308	4890	109	±50	Yes
M5PFPeA	5281	4650	114	±50	Yes
M3PFBS	3184	3120	102	±50	Yes
M2-4:2 FTS	1316	1420	93	±50	Yes
M5PFHxA	4167	4020	104	±50	Yes
M3HFPO-DA	2551	2340	109	±50	Yes
M4PFHpA	4525	4300	105	±50	Yes
M3PFHxS	4407	4380	101	±50	Yes
M2-6:2 FTS	1641	1680	98	±50	Yes
M8PFOA	4598	4350	106	±50	Yes
M9PFNA	4160	3860	108	±50	Yes
M8PFOS	4558	4430	103	±50	Yes
M2-8:2 FTS	2599	2520	103	±50	Yes
M8FOSA	4854	4790	101	±50	Yes
M6PFDA	5637	5520	102	±50	Yes
d3-N-MeFOSAA	7597	7260	105	±50	Yes
d5-N-EtFOSAA	2992	2640	113	±50	Yes
M7PFUdA	4880	4450	110	±50	Yes
MPFDoA	2419	2870	84	±50	Yes
M2PFTeDA	1998	2650	75	±50	Yes
Injection Standards	Area	Recovery (%)			
MPFBA	35641	105			
M2PFOA	57536	109			
MPFDA	42186	128			
MPFOS	21217	112			

Instrument Sensitivity Check PFAS

Concentration (ng/L)	**225**
Standard ID	**AG99**
Acquisition Date	**25-Jul-19**
Acquisition Time	**20:41:46**

Analyte	Concentration (ng/L)	PD (v. ICAL)	Limit	Acceptable	
Acids					
PFBA	230.7887	2.6	±30	Yes	
PFPeA	227.3597	1.0	±30	Yes	
PFHxA	225.0166	0.0	±30	Yes	
PFHpA	241.3779	7.3	±30	Yes	
PFOA	242.1302	7.6	±30	Yes	
PFNA	186.7681	-11.7	±30	Yes	
PFDA	254.3938	17.8	±30	Yes	
PFUnA	272.9219	25.7	±30	Yes	
PFDoDA	209.7057	-6.8	±30	Yes	
PFTrDA	178.1308	-20.8	±30	Yes	
PFTeDA	8156.5716	3.6	±30	Yes	
Sulfonates					
L-PFBS	194.2866	-13.7	±30	Yes	
PFPeS	206.7343	-8.1	±30	Yes	
PFHxS	241.3779	7.3	±30	Yes	
PFHpS	142.7881	-28.3	±30	Yes	
PFOS	175.7727	-14.3	±30	Yes	
PFNS	212.8892	1.2	±30	Yes	
PFDS	216.0071	1.1	±30	Yes	
4:2 FTS	225.0166	0.0	±30	Yes	
6:2 FTS	175.7727	-14.3	±30	Yes	
8:2 FTS	209.7057	-6.8	±30	Yes	
Other					
PFOSA	204.0074	-2.0	±30	Yes	
N-MeFOSAA	193.8140	-10.3	±30	Yes	
N-EtFOSAA	245.9036	9.3	±30	Yes	
HFPO-DA (Gen-X)	218.5246	-2.9	±30	Yes	

Instrument Blank PFAS

Standard ID	**AH17**
Acquisition Date	**25-Jul-19**
Acquisition Time	**20:08:36**

Analyte	Concentration (ng/L)	% of RL	Limit	Acceptable	
Acids					
PFBA	0.00	0.0	50	Yes	
PFPeA	69.8	31.0	50	Yes	
PFHxA	35.9	16.0	50	Yes	
PFHpA	0.00	0.0	50	Yes	
PFOA	63.7	28.3	50	Yes	
PFNA	0.00	0.0	50	Yes	
PFDA	0.00	0.0	50	Yes	
PFUnA	0.00	0.0	50	Yes	
PFDoDA	0.00	0.0	50	Yes	
PFTrDA	0.00	0.0	50	Yes	
PFTeDA	0.00	0.0	50	Yes	
Sulfonates					
L-PFBS	102	45.4	50	Yes	
PFPeS	0.00	0.0	50	Yes	
PFHxS	0.00	0.0	50	Yes	
PFHpS	0.00	0.0	50	Yes	
PFOS	0.00	0.0	50	Yes	
PFNS	0.00	0.0	50	Yes	
PFDS	0.00	0.0	50	Yes	
4:2 FTS	35.9	16.0	50	Yes	
6:2 FTS	0.00	0.0	50	Yes	
8:2 FTS	0.00	0.0	50	Yes	
Other					
PFOSA	0.00	0.0	50	Yes	
N-MeFOSAA	0.00	0.0	50	Yes	
N-EtFOSAA	0.00	0.0	50	Yes	
HFPO-DA (Gen-X)	0.00	0.0	50	Yes	

ENTHALPY ANALYTICAL

OPR					Detailed Results - PFAS
Lab/Sample Details					
		Matrix:	**Aqueous**	**Date Received:**	**N/A**
Lab Sample ID:	**OPR_10383**	**Wt./Vol.**	**30**	**Date Extracted:**	**24-Jul-19**
QC Batch #:	**10383**			**Date Analyzed:**	**25-Jul-19**
Final Volume (mL)	**0.4**			**Time Analyzed:**	**21:03:56**

Analyte	CAS Number	Conc. (ng/L)		MDL (ng/L)	RL (ng/L)	Qualifiers	Standard	ES Recoveries	Qualifiers
Acids							MPFBA	88.5	
PFBA	375-22-4	437		1.31	3.00		M5PFPeA	82.5	
PFPeA	2706-90-3	443		0.748	3.00		M3PFBS	87.2	
PFHxA	307-24-4	444		1.31	3.00		M2-4:2 FTS	94.1	
PFHpA	375-85-9	438		0.579	3.00		M5PFHxA	91.8	
PFOA	335-67-1	448		0.662	3.00		M3HFPO-DA	94.3	
PFNA	375-95-1	441		0.424	3.00		M4PFHpA	89.2	
PFDA	335-76-2	425		1.04	3.00		M3PFHxS	87.6	
PFUnA	2058-94-8	435		0.401	3.00		M2-6:2 FTS	88.9	
PFDoDA	307-55-1	464		0.396	3.00		M8PFOA	84.7	
PFTrDA	72629-94-8	526		0.621	3.00		M9PFNA	86.0	
PFTeDA	376-06-7	442		0.692	3.00		M8PFOS	82.3	
							M2-8:2 FTS	77.4	
Sulfonates							M8FOSA-I	86.3	
L-PFBS	375-73-5	375		0.692	3.00		M6PFDA	82.5	
PFPeS	2706-91-4	386		0.825	3.00		d3-N-MeFOSAA	75.2	
PFHxS	355-46-4	401		0.689	3.00		d5-N-EtFOSAA	70.0	
PFHpS	375-92-8	474		0.649	3.00		M7PFUdA	79.2	
PFOS	1763-23-1	409		0.392	3.00		MPFDoA	77.1	
PFNS	68259-12-1	414		0.545	3.00		M2PFTeDA	56.5	
PFDS	335-77-3	395		1.12	3.00				
Other									
PFOSA	754-91-6	434		3.04	3.04				
N-MeFOSAA	2355-31-9	453		0.453	3.00				
N-EtFOSAA	2991-50-6	449		0.543	3.00				

OPR Evaluation

Batch ID#: 10383

Analyte	Conc. (ng/L)	Recovery (%)	Lower Limit	Upper Limit	Acceptable?
Acids					
PFBA	437	105%	73	129	Y
PFPeA	443	106%	72	129	Y
PFHxA	444	106%	72	129	Y
PFHpA	438	105%	72	130	Y
PFOA	448	107%	71	133	Y
PFNA	441	106%	69	130	Y
PFDA	425	102%	71	129	Y
PFUnA	435	104%	69	133	Y
PFDoDA	464	111%	72	134	Y
PFTrDA	526	126%	65	144	Y
PFTeDA	442	106%	71	132	Y
Sulfonates					
L-PFBS	375	102%	72	130	Y
PFPeS	386	98.6%	71	127	Y
PFHxS	401	106%	68	131	Y
PFHpS	474	120%	69	134	Y
PFOS	409	106%	65	140	Y
PFNS	414	104%	69	127	Y
PFDS	395	98.1%	53	142	Y
Other					
PFOSA	434	104%	68	141	Y
N-MeFOSAA	453	109%	65	136	Y
N-EtFOSAA	449	108%	61	135	Y

ENTHALPY ANALYTICAL

Method Blank

Detailed Results - PFAS

Lab/Sample Details

		Matrix:	Aqueous	Date Received:	N/A
Lab Sample ID:	LMB_10383	Wt./Vol.	30.0	Date Extracted:	24-Jul-19
QC Batch #:	10383			Date Analyzed:	25-Jul-19
Final Volume (mL)	0.4			Time Analyzed:	21:26:03

Analyte	CAS Number	Conc. (ng/L)		MDL (ng/L)	RL (ng/L)	Qualifiers	Standard	ES Recoveries (%)	Qualifiers
Acids							MPFBA	97.8	
PFBA	375-22-4	ND		1.31	3.00	U	M5PFPeA	99.4	
PFPeA	2706-90-3	2.21		0.748	3.00	J	M3PFBS	98.6	
PFHxA	307-24-4	3.39		1.31	3.00		M2-4:2 FTS	104	
PFHpA	375-85-9	ND		0.579	3.00	U	M5PFHxA	109	
PFOA	335-67-1	ND		0.662	3.00	U	M3HFPO-DA	114	
PFNA	375-95-1	ND		0.424	3.00	U	M4PFHpA	110	
PFDA	335-76-2	ND		1.04	3.00	U	M3PFHxS	114	
PFUnA	2058-94-8	ND		0.401	3.00	U	M2-6:2 FTS	102	
PFDoDA	307-55-1	ND		0.396	3.00	U	M8PFOA	100	
PFTrDA	72629-94-8	ND		0.621	3.00	U	M9PFNA	97.3	
PFTeDA	376-06-7	ND		0.692	3.00	U	M8PFOS	95.6	
							M2-8:2 FTS	98.7	
Sulfonates							M8FOSA-I	92.9	
L-PFBS	375-73-5	ND		0.692	3.00	U	M6PFDA	98.5	
PFPeS	2706-91-4	ND		0.825	3.00	U	d3-N-MeFOSAA	84.5	
PFHxS	355-46-4	ND		0.689	3.00	U	d5-N-EtFOSAA	89.8	
PFHpS	375-92-8	ND		0.649	3.00	U	M7PFUdA	106	
PFOS	1763-23-1	ND		0.392	3.00	U	MPFDoA	77.7	
PFNS	68259-12-1	ND		0.545	3.00	U	M2PFTeDA	22.4	Q
PFDS	335-77-3	ND		1.12	3.00	U			
Other									
PFOSA	754-91-6	ND		3.04	3.04	U			
N-MeFOSAA	2355-31-9	ND		0.453	3.00	U			
N-EtFOSAA	2991-50-6	ND		0.543	3.00	U			

Narrative Summary

Enthalpy Analytical Narrative Summary

Company	Meritech – Durham
Job#	0719-716 PFAS - DEQ list
Client Project #	n/a

Custody	Braidy May of Enthalpy Analytical Wilmington received the sample(s) (via courier) on 07/10/19 on ice at 9.2°C in good condition. Prior to, during, and after analysis, the sample(s) was stored in the laboratory with access only by authorized personnel of Enthalpy Analytical, LLC.
Analysis	The sample(s) was analyzed by isotope dilution method for PFAS using Waters Acquity UPLC equipped with Xevo TQ MS (LC/MS/MS "Kili"). For aqueous samples, a 30mL aliquot (or less due to sample amount) was weighed and spiked with Extraction Standard (ES). The sample was then mixed well and centrifuged. Cleanup procedures were performed on the supernatant and then extracted via SPE. Each final sample extract was transferred to an autosampler vial and spiked with 400 µL of Injection Standard (IS), prior to analysis.
Calibration	The analytes and labeled standards in the initial calibration (ICAL) exhibited RSDs less than 50% with the exception of M2PFTeDA. All analytes passed the R^2 coefficient correlation criteria. Per DoD QSM 5.3 Table B-15, the ICAL is acceptable for all analytes since R^2 met criteria. All analytes will be reported. The continuing calibration met the ±30% criteria for native analytes and ±50% criteria for ES recoveries.
QC Notes	The QC injection met the ±50% criteria for ES recoveries and ±30% Recovery of target concentration. Two analytes were detected in the method blank above the LOD. The analytes were observed at more than 1/10 the value of the sample amount. Therefore, analytes detected in the samples are notated with a "B" qualifier. The samples were extracted within the 14-day from collection holding time Extracts were analyzed within the 28-days from extraction to analysis holding time required by the method.
Reporting Notes	During the initial analysis, QC parameters did not meet method criteria for several analytes. This required re-extraction of the batch. This report contains data from the re-extracted sample indicated by an "R" in the Lab ID. Some analytes in the samples fell outside the limits for ES recoveries, notated with a "Q" qualifier. It is concluded to be due to matrix effects.

Reporting Notes (continued)	Based on the native results in the OPR meeting criteria, the out-of- range ES recoveries have no impact on the accuracy of the target analyte (native) compounds. Therefore, the data are considered acceptable. Analyte peak PFBA, was manually integrated due to not meeting 10:1 signal to noise criteria. This analyte is reported as "ND". The results presented in this report are representative of the samples as provided to the laboratory. The samples, calibrations and standards for the data presented in this report were analyzed at 2714 Exchange Drive, Wilmington, NC 28405.

General Reporting Notes – Data Qualifiers

The following are general reporting notes that are applicable to all Enthalpy Analytical, Inc.-Wilmington, NC data reports, unless specifically noted otherwise.

General Data Qualifiers / Data Attributes

- B – The analyte was found in the method blank, at a concentration that was at least 10% of the concentration in the sample.
- C – Two or more congeners co-elute. In EDDs, C denotes the lowest IUPAC congener in a co-elution group and additional co-eluters for the group are shown with the number of the lowest IUPAC co-eluter**.**
- E – The reported concentration exceeds the calibration range (upper point of the calibration curve).
- EMPC – Represents an estimated maximum possible concentration. EMPCs arise in cases where the signal/noise ratio is not sufficient for peak identification (the determined ion-abundance ratio is outside the allowed theoretical range), or where there is a co-eluting interference.
- J – Indicates that an analyte has a concentration below the reporting limit (lowest point of the calibration curve).
- L - Indicates that an analyte has a concentration below the Minimum Detection Limit (MDL).
- ND – Indicates a non-detect.
- NR – Indicates a value that is not reportable.
- PR – Due to interference, the associated congener is poorly resolved.
- DI – Indicates the presence of a quantitative interference.
- SI – Denotes “Single Ion Mode” and is utilized for PCBs where the secondary ion trace has a significantly elevated noise level due to background PFK. Responses for such peaks are calculated using an EMPC approach based solely on the primary ion area(s) and may be considered estimates.
- U – The analyte was not detected. The Estimated Detection Limit (EDL) may be reported for this analyte.
- V – The labeled standard recovery was found to be outside of the method control limits.

DRBC/TMDL Specific Data Qualifiers / Data Attributes

- J – The reported result is an estimate. The value is less than the minimum calibration level but greater than the Estimated Detection Limit (EDL).
- U – The analyte was not detected in the sample at the Estimated Detection Limit (EDL).

- E – The reported concentration is an estimate. The value exceeds the upper calibration range (upper point of the calibration curve).
- D – Dilution Data. Result was obtained from the analysis of a dilution.
- B – Analyte found in the sample and associated method blank.
- Cxx – Co-elutes with the indicated congener, data is reported under the lowest IUPAC congener. 'xx' denotes the IUPAC number with the lowest numerical designated congener.
- NR – Analyte is not reportable because of problems in sample preparation or analysis.
- V – Labeled standard recovery is not within method control limits.
- X – Results from re-injection/repeat/second-column analysis.
- EMPC – Estimated Maximum Possible Concentration. Indicates that a peak is identified but did not meet the method specified ion-abundance ratio.

Lab Identifiers

- AR – Indicates use of the archived portion of the sample extract.
- CU – Indicates a sample that required additional clean-up prior to HRMS injection/processing.
- D – Indicates a dilution of the sample extract. The number that follows the "D" indicates the dilution factor.
- DE – Indicates a dilution performed with the addition of ES (Extraction Standard) solution.
- DUP – Designation for a duplicate sample.
- MS – Designation for a matrix spike.
- MSD – Designation for a matrix spike duplicate.
- RJ – Indicates a reinjection of the sample extract.
- S – Indicates a sample split. The number that follows the "S" indicates the split factor.

Attachment B

To locate a lab capable of performing the PFAS analysis, please visit https://www.denix.osd.mil/edqw/accreditation/accreditedlabs/and search by method "PFAS by LCMSMS Compliant with Table B-15 of QSM 5.1 or Latest Version". Grab samples are required to avoid cross-contamination and ensure consistency.

It is the Division's understanding that this test method is capable of providing results for the listed PFAS compounds listed below. The Division recognizes that there may be variations from lab to lab. Each facility shall provide results for PFOA, PFOS, and shall include as many of the following PFAS compounds as possible:

Analyte Name	Acronym	Fluorinated Carbon Chain Length	Molecular Formula	CAS Number
Perfluorotetradecanoic acid	PFTeA	C_{14}	$C_{13}F_{27}COOH$	376-06-7
Perfluorotridecanoic acid	PFTriA	C_{13}	$C_{12}F_{25}COOH$	72629-94-8
Perfluorododecanoic acid	PFDoA	C_{12}	$C_{11}F_{23}COOH$	307-55-1
Perfluoroundecanoic acid	PFUnA	C_{11}	$C_{10}F_{21}COOH$	2058-94-8
Perfluorodecanoic acid	PFDA	C_{10}	$C_9F_{19}COOH$	335-76-2
Perfluorononanoic acid	PFNA	C_9	$C_8F_{17}COOH$	375-95-1
Perfluorooctanoic acid	PFOA	C_8	$C_7F_{15}COOH$	335-67-1
Perfluoroheptanoic acid	PFHpA	C_7	$C_6F_{13}COOH$	375-85-9
Perfluorohexanoic acid	PFHxA	C_6	$C_5F_{11}COOH$	307-24-4
Perfluoropentanoic acid	PFPeA	C_5	C_4F_9COOH	2706-90-3
Perfluorobutanoic acid	PFBA	C_4	C_3F_7COOH	375-22-4
Perfluorodecanesulfonic acid	PFDS	C_{10}	$C_{10}F_{21}SO_3H$	335-77-3
Perfluorononanesulfonic acid	PFNS	C_9	$C_9F_{19}SO_3H$	68259-12-1
Perfluorooctanesulfonic acid	PFOS	C_8	$C_8F_{17}SO_3H$	1763-23-1
Perfluoroheptanesulfonic acid	PFHpS	C_7	$C_7F_{15}SO_3H$	375-92-8
Perfluorohexanesulfonic acid	PFHxS	C_6	$C_6F_{13}SO_3H$	355-46-4
Perfluoropentanesulfonic acid	PFPeS	C_5	$C_5F_{11}SO_3H$	2706-91-4
Perfluorobutanesulfonic acid	PFBS	C_{4OMG}	$C_4F_9SO_3H$	375-73-5
Perfluorooctanesulfonamide	PFOSA	C_8	$C_8F_{17}SO_2NH_2$	754-91-6
2-(N-Ethylperfluorooctanesulfonamido) acetic acid	N-EtFOSAA	C_8	$C_8F_{17}SO_2N(C_2H_5)CH_2COOH$	2991-50-6
2-(N-Methylperfluorooctanesulfonamido) acetic acid	N-MeFOSAA	C_8	$C_8F_{17}SO_2N(CH_3)CHCOOH$	2355-31-9

Sample Custody

0719-716

Meritech – Durham County

Chain of Custody Record

ENTHALPY analytical

Enthalpy Ultratrace Job#: _____ COC Page 1 of 1

Special Handling:

☒ Standard Turn Around Time

☐ Rush Turn Around Time -- Date Needed_____

• All Fast TATs Subject to Approval by Enthalpy Analytical, Inc.

• All Samples Disposed of After 6 months Unless Otherwise Instructed.

Enthalpy Analytical-Wilmington, NC has added enhancements to standard methods to improve accuracy, precision and permit an assessment of laboratory performance in the context of your specific data needs. For more information email Cindy.James@enthalpy.com.

Client Name: Durham County TWWTP

Project Manager: Amy Moore

Report To: Amy Moore

Project Number: _____

Site Name: TWWTP

Location: Influent

PO#: _____

Telephone#: 919-560-9035

Email: ajmoore@dconc.gov

This Chain of Custody is applicable to Non-Air samples. Standard TAT differ per analysis and are provided by request.

Client Special Instructions:

Matrix: GW-Groundwater, WW-Wastewater, NW-Non-Potable Water, DW-Drinking Water, S-Soil, SL-Sludge, BT-Biological Tissue, O-Other

Type: G=Grab C=Composite Q=Quality Control

Sample ID	Date	Time	Sample Volume	Type	Matrix	Sample Containers: # of Bottles	# of Jars	# of Bags	# Other	Analyses: Method 1613	Method 8290	Method 1668A/B/C PCB	PFAS by LC/MS/MS	PAHs by HRGC/HRMS	Sample on Hold	Notes:
Influent #070819193	7/8/19	0916	30mL x 2	G	WW	2							X			sampled by: KK

Relinquished By:	Date:	Received By:	Date:	Time:	Sample Temperature Upon Receipt:
Kelly McCamy	7/8/19		7/8/19	1053	☐ Iced ☐ Ambient °C_____
	7/8/19		7/8/19	1650	☐ Iced ☐ Ambient °C_____
	7/10/19		07-10-19	9:32 AM	☐ Iced ☐ Ambient °C 0.6°C Raytek 5 DF 07-10-19

2714 Exchange Drive • Wilmington, NC 28405 • (910) 212-5858 • www.enthalpy.com

7/10/19 15:14 4.1°C (Courier, Cooler, 9.2°C, TR, no seal, condition: Good, On Ice, Bu 7/10/19 at 15:15

This Is The Last Page Of This Report.

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