

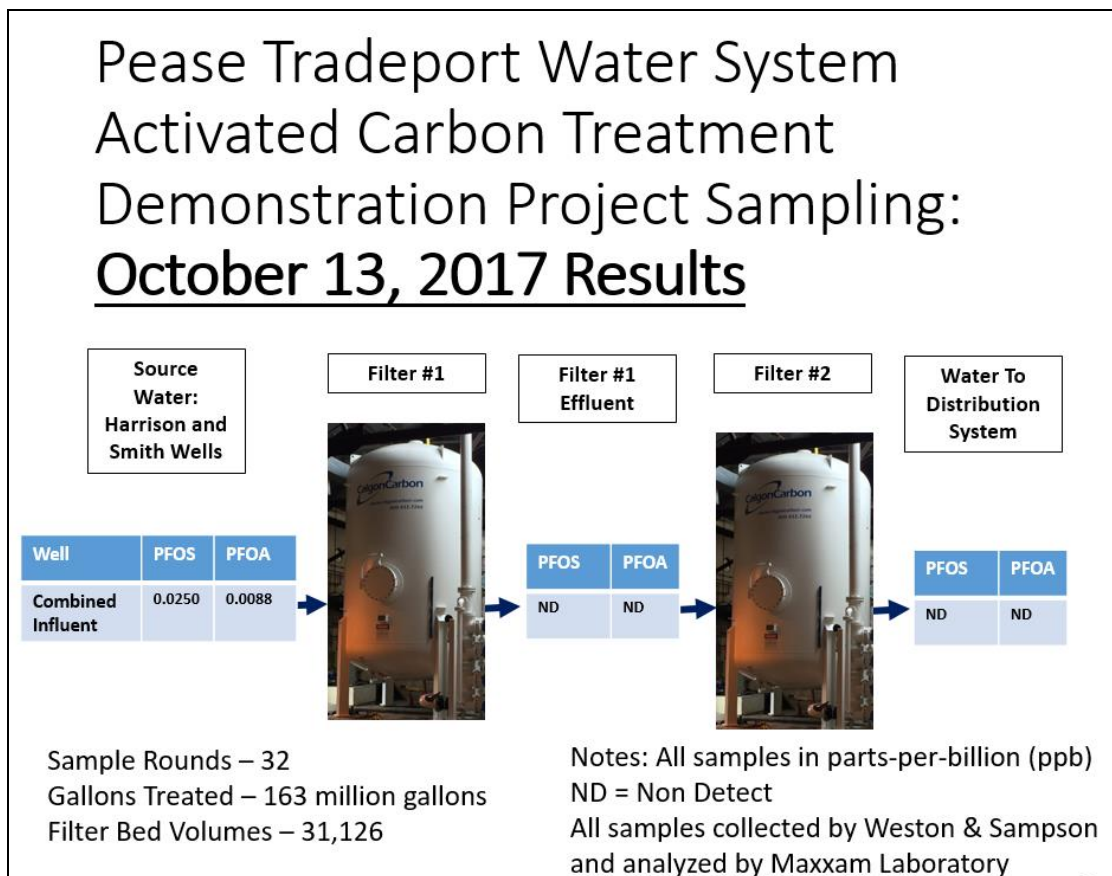


November 7, 2017

PEASE TRADEPORT WATER SUPPLY UPDATE

Demonstration Filter Performance

The City's engineering consultant continues to sample the performance of the activated carbon filters based on the amount of water treated. The graphic below shows the most recent source water sampling and treated filter water quality results for the PFOS and PFOA.



The activated carbon demonstration filters for the Harrison and Smith wells have been on line for over a year. As of October 13, 2017, 163 million gallons of water from these two wells has been treated through the activated carbon F400 Calgon Filtrasorb Filter media. This equates to 31,126 filter bed volumes of water.

Currently, the short chain PFAS compound, PFPeA, has started to come through filter number one. This is what our consultant and the manufacturer of the carbon had anticipated. Other water systems have seen similar results with their PFAS carbon treatment systems. Our consultant continues to sample and track this compound and is currently developing projections as to when the longer chain compounds may start coming through the first filter. These filters are in series so currently any compound that passes through the first filter is captured by the second filter prior to water going into the drinking water system.

A determination of a date when the carbon in the filters will be changed out has not yet been reached with the Air Force. The City's consultant is gathering data and making projections of the remaining life of the filter media and the City is sharing this information with the Air Force to get their concurrence the plan for the media replacement.

Demonstration Project Sample Data

All samples collected are analyzed by Maxxam laboratories, the same laboratory that has been performing the Pease well PFC analysis since 2014. Data for the Pease Well sampling is uploaded to the City's website when it is validated by the Air Force's consultant and sent to the City. A summary of the data for the Pease Well Carbon Treatment Demonstration Project is attached.

Final Treatment System Design

The City of Portsmouth and the United States Air Force entered into an agreement on August 8, 2017 to continue design efforts for the final treatment system for all three Pease Tradeport wells. This effort is anticipated to take eight months, at which time the project will be ready to bid for construction and another agreement with the Air Force will ensue to cover the costs of construction. Currently, a retrofit to the existing Grafton Road Water Facility at Pease is planned. Eight carbon filters (4 sets of two), aeration, tanks, associated piping and controls are planned.

The City staff presented an update on the Pease Tradeport Drinking Water System at October 24, 2017 Pease Restoration Advisory Board (RAB) meeting. A copy of that presentation can be accessed at the City's updated website:

www.cityofportsmouth.com/publicworks/water/pease-tradeport-water-system

Additional updates on this design will be provided to the public as the project continues.

Haven Well Water Pilot Treatment System

The City's consultant recently installed a pilot treatment system at the Haven Well to analyze water treatment on that water source. Through discussions with the Air Force, the regulators and the Pease Development Authority it was determined that a small scale filter system, utilizing the same F400 carbon as the demonstration project, would be installed and operated on the Haven Well water. Additionally, a filter with resin media is also being tested for treatment performance to determine if it might be viable for a large scale treatment system. A small pump was installed in the well to use for the water source and is pumping the Haven water at a rate of just over one gallon per minute. None of this treated water is currently going into the drinking water system, it is discharged back to the ground adjacent to the well.

Review of Other Municipal Water Systems Treating PFAS Compounds

The City's engineering consultant has been gathering information on drinking water systems located across the country that are dealing with Per- and Polyfluoroalkyl Substances (PFAS) contamination of their water supplies. Twenty systems have been identified and contacted to request their design and operational criteria. The 20 systems include both public and private utilities with water production ranging from 100,000 to tens of millions of gallons per day. The contamination of these systems' water sources has originated from either Department of Defense bases or industrial/manufacturing sites. Although a variety of PFAS site remediation techniques are currently being investigated, drinking water systems have almost ubiquitously chosen carbon filtration as the preferred treatment method for their drinking water systems. Many of these systems only recently installed treatment systems, therefore, data regarding the performance of these systems is limited. However, our consultant will continue to track this information throughout the design and construction of the final treatment system as this information will provide guidance for long-term operations of the Pease Tradeport treatment system.

Publically available data (mostly from water system websites) evaluated suggests that regarding PFAS compounds, the effected water systems are focused primarily on PFOA and PFOS relative to analytical/sampling efforts and reporting in publicly available documents. None of the 20 systems reviewed had test results readily available for the 23 PFAS compounds routinely sampled for by the City of Portsmouth and the Air Force under investigation activities at Pease. These systems do not analyze for, or do not present the results for, the "less common" or short chain compounds. The reasons are likely:

- The system has decided to focus only on the compounds with an EPA health advisory, PFOA and PFOS.
- The system has decided to focus only on the 14 compounds approved under EPA test method 537 Rev. 1.1, and not use the modified method 537, which is necessary to analyze 23 compounds.
- The system has decided to focus only on the six PFAS compounds sampled as part of EPA's UCMR3 sampling program.

- The system has decided to only test and report compounds typically found in their raw water sources.

With regards to transparency of analytical results, only a few of the systems reviewed readily present their data providing the number of compounds, levels of detection, and the frequency of analysis. Currently, the City of Portsmouth is posting all of their sample results for all PFAS compound sampling to the City's website.

WATER QUALITY UPDATES

The City's updated website now has specific pages dedicated to the Pease Tradeport and Portsmouth Water System PFAS information:

www.cityofportsmouth.com/publicworks/water/pease-tradeport-water-system
www.cityofportsmouth.com/publicworks/water/portsmouth-water-system-pfas-update

ONGOING WATER QUALITY MONITORING

The Air Force's consultant continues to perform routine sampling of the water supply wells in the Pease water system. In addition to these water supply wells, the Air Force's consultant samples other monitoring wells in the surrounding area to track the aquifer and monitor for any PFAS moving toward the supply wells. Currently, with the demonstration filters on line, the supply wells are sampled monthly and eleven monitoring wells are sampled quarterly. Sampling data is posted on the City's website once it has been validated by the Air Force's engineering consultant. Information is also posted on the City's website for the City of Portsmouth's PFAS sampling program.

EPA HEALTH ADVISORY

In May 2016, the EPA issued new health advisories of 0.070 µg/L (micrograms per liter) for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS). The Smith and Harrison wells that supply the Pease Tradeport Water System have combined levels PFOA and PFOS that have consistently been below this limit since sampling began in 2014.

The City will continue to work towards the appropriate water quality monitoring and treatment methods to assure that all drinking water is in compliance with current regulations.

Additional information can be accessed at:

www.cityofportsmouth.com/publicworks/water/pease-tradeport-water-system

Or by calling Al Pratt, Water Resources Manager, at: 603-520-0622 or Brian Goetz, Deputy Director of Public Works at: 603-766-1420

Table 1
Summary of PFC Analytical Results
Demonstration Project
Former Pease Air Force Base, New Hampshire

Sample Location	Collection Date	Filter 1 Volume (MG)	Filter 1 Bed Volumes	6:2 Fluorotelomer sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonate (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EiFOSA)	N-Ethyl perfluorooctane sulfonamide (EiFOSE)	N-Methyl Perfluorooctane Sulfonamide (MEFOSA)	N-Methyl Perfluorooctane Sulfonamide (MEFOSE)	Perfluorobutanesulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecane sulfonate (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoA)	Perfluorooctanoic acid (PFHpA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluorohexanoic acid (PFHxA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (PFOSA)	Perfluorooctanesulfonic acid (PFOS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTriDA)	Perfluoroundecanoic acid (PFUnA)	PFOS+PFOA		
USEPA Health Advisory (HA):				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	0.07	-	-	-	-	0.07	
Method Detection Limit (MDL)				0.0065	0.0055	0.0053	0.0049	0.0040	0.0061	0.0019	0.0066	0.0043	0.0066	0.0057	0.0036	0.0047	0.0040	0.0046	0.0053	0.0046	0.0058	0.0033	0.0036	0.0052	0.0032	0.0037		
Reported Detection Limit (RDL)				0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	0.020	
Harrison Well	13-Sep-16	---	---	ND	ND	NA	NA	NA	NA	0.0029 B	ND	NA	NA	NA	ND	ND	0.0260 B	0.0071 J	0.006 J	ND	ND	0.022 B	0.008 B	NA	NA	NA	0.028	
Smith Well	19-Sep-16	---	---	ND	ND	NA	NA	NA	NA	0.0072 J	0.0067 J	NA	NA	NA	ND	ND	0.0150 J	0.0053 J	0.006 J	ND	ND	0.013 J	0.007 J	NA	NA	NA	0.019 J	
Harrison Well	26-Sep-16	1	249	ND	ND	NA	NA	NA	NA	0.0040 J	ND	NA	NA	NA	0.0042 J	ND	0.0340	0.0100 J	ND	ND	ND	0.024	0.014 J	NA	NA	NA	0.024	
Smith Well	26-Sep-16	1	249	ND	ND	NA	NA	NA	NA	0.0029 J	ND	NA	NA	NA	0.0036 J	ND	0.0140 J	0.0050 J	ND	ND	ND	0.010 J	0.008 J	NA	NA	NA	0.010 J	
Harrison Well	19-Oct-16	6	1,238	ND	ND	NA	NA	NA	NA	0.0038 J	0.0069 J	NA	NA	NA	ND	0.0057 J	0.0320	0.0059 J	ND	ND	ND	0.022	0.009 J	NA	NA	NA	0.022	
Smith Well	19-Oct-16	6	1,238	ND	ND	NA	NA	NA	NA	0.0035 J	ND	NA	NA	NA	ND	ND	0.0130 J	ND	ND	ND	ND	0.010 J	0.005 J	NA	NA	NA	0.010 J	
Harrison Well	17-Nov-16	18	3,358	ND	ND	NA	NA	NA	NA	0.0026 J	0.0072 J	NA	NA	NA	ND	0.0059 J	0.0350	0.0085 J	0.006 J	ND	ND	0.026	0.013 J	NA	NA	NA	0.032	
Smith Well	17-Nov-16	18	3,358	ND	ND	NA	NA	NA	NA	0.0020 J	ND	NA	NA	NA	ND	ND	0.0140 J	ND	ND	ND	ND	0.011 J	0.008 J	NA	NA	NA	0.011 J	
Harrison Well	14-Dec-16	24	4,491	ND	ND	NA	NA	NA	NA	0.0062 J	0.0068 J	NA	NA	NA	ND	ND	0.0350	0.0120 J	0.0078 J	ND	ND	0.026	0.012 J	NA	NA	NA	0.034	
Smith Well	14-Dec-16	24	4,491	ND	ND	NA	NA	NA	NA	ND	ND	NA	NA	NA	ND	ND	0.0150 J	0.0065 J	ND	ND	ND	0.012 J	0.0059 J	NA	NA	NA	0.012 J	
Smith Well (Dup)	14-Dec-16	24	4,491	ND	ND	NA	NA	NA	NA	0.0055 J	ND	NA	NA	NA	ND	ND	0.0150 J	0.0057 J	ND	ND	ND	0.012 J	0.006 J	NA	NA	NA	0.012 J	
Harrison Well	11-Jan-17	31	5,845	ND	ND	NA	NA	NA	NA	0.0090 J	0.008 J	NA	NA	NA	ND	0.006 J	0.0380	0.0180 J	0.009 J	ND	ND	0.024	0.0160 J	NA	NA	NA	0.033	
Smith Well	11-Jan-17	31	5,845	ND	ND	NA	NA	NA	NA	0.0080 J	ND	NA	NA	NA	ND	ND	0.0170	0.0100 J	ND	ND	ND	0.012 J	0.0080 J	NA	NA	NA	0.012 J	
Harrison Well	17-Feb-17	39	7,388	ND	ND	NA	NA	NA	NA	0.0020 J	ND	NA	NA	NA	ND	ND	0.0360	0.0060 J	0.009 J	ND	ND	0.027	0.0130 J	NA	NA	NA	0.036	
Smith Well	17-Feb-17	39	7,388	ND	ND	NA	NA	NA	NA	ND	ND	NA	NA	NA	ND	ND	0.0100 J	ND	ND	ND	ND	0.013 J	0.0070 J	NA	NA	NA	0.013 J	
Harrison Well	23-Mar-17	50	9,568	ND	ND	NA	NA	NA	NA	ND	ND	NA	NA	NA	ND	ND	0.0270	0.0052 J	ND	ND	ND	0.0210	0.0095 J	NA	NA	NA	0.021	
Smith Well	23-Mar-17	50	9,568	ND	ND	NA	NA	NA	NA	ND	ND	NA	NA	NA	ND	ND	0.0093 J	ND	ND	ND	ND	0.0072 J	ND	NA	NA	NA	0.007 J	
Filter 2 Effluent	22-Sep-16	0	70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	06-Oct-16	3	646	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 2 Effluent	06-Oct-16	3	646	ND	ND	ND	ND	0.0065 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	14-Oct-16	5	996	ND	ND	ND	ND	ND	ND	0.0022 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	14-Oct-16	5	996	ND	ND	ND	ND	ND	ND	0.0021 B	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 2 Effluent	14-Oct-16	5	996	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0053 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	20-Oct-16	7	1,325	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	20-Oct-16	7	1,325	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 2 Effluent	20-Oct-16	7	1,325	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	28-Oct-16	10	2,002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0082 J	ND	ND	ND	0.0062 J	ND	0.0052 J	ND	ND	ND	ND	0.0082 J	0.0084 J	ND	
Filter 1 Effluent	28-Oct-16	10	2,002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0049 J	ND	ND	ND	ND	0.0078 J	0.0081 J	ND	
Filter 2 Effluent	28-Oct-16	10	2,002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0040 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	10-Nov-16	16	3,066	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	10-Nov-16	16	3,066	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	28-Nov-16	20	3,795	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	28-Nov-16	20	3,795	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	27-Dec-16	27	5,143	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	27-Dec-16	27	5,143	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	16-Jan-17	32	6,056	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	16-Jan-17	32	6,056	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	10-Feb-17	37	7,117	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	10-Feb-17	37	7,117	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	07-Mar-17	43	8,206	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	07-Mar-17	43	8,206	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

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Summary of PFC Analytical Results
Demonstration Project
Former Pease Air Force Base, New Hampshire**

Sample Location	Collection Date	Filter 1 Volume (MG)	Filter 1 Bed Volumes	6:2 Fluorotelomer sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonate (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EiFOSA)	N-Ethyl perfluorooctane sulfonamide (EiFOSE)	N-Methyl Perfluorooctane Sulfonamide (MEFOSA)	N-Methyl Perfluorooctane Sulfonamide (MEFOSE)	Perfluorobutanesulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecane sulfonate (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoA)	Perfluorooheptane sulfonate (PFHpS)	Perfluorooheptanoic acid (PFHpA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluorohexanoic acid (PFHxA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (PFOSA)	Perfluorooctanesulfonic acid (PFOS)	Perfluoropentanoic acid (PFPeA)	Perfluorotridecanoic acid (PFTDA)	Perfluoroundecanoic acid (PFUnA)	PFOS+PFOA		
				USEPA Health Advisory (HA):			-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	0.07	-	-	-	0.07	
Filter 1 - 25%	20-Mar-17	48	9,235	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	20-Mar-17	48	9,235	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	27-Mar-17	52	9,886	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 50%	27-Mar-17	52	9,886	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0056 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	27-Mar-17	52	9,886	ND	ND	0.0097 J	ND	ND	0.0052 J	ND	ND	ND	ND	ND	ND	ND	0.0068 J	ND	ND	ND	ND	ND	0.0036 J	ND	ND	0.0033 J	ND	
Filter 1 Effluent Rerun	27-Mar-17	52	9,886	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	12-Apr-17	60	11,362	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	12-Apr-17	60	11,362	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 - 25%	21-Apr-17	64	12,273	ND	ND	ND	ND	ND	ND	ND	0.0068 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0100 J	ND	ND	ND	
Filter 1 Effluent	21-Apr-17	64	12,273	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0052 J	ND	ND	ND	ND	
Filter 1 Effluent	21-Apr-17	64	12,273	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Combined Raw	24-Apr-17	66	12,521	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0240	0.0064 J	0.0049 J	ND	ND	ND	ND	0.0150 J	0.0053 J	ND	ND	ND	ND	
Filter 1 - 25%	01-May-17	69	13,169	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	01-May-17	69	13,169	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 2 Effluent	01-May-17	69	13,169	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Combined Raw	12-May-17	75	14,263	ND	ND	ND	ND	ND	ND	0.0071 J	ND	ND	ND	ND	0.0040 J	0.0270	0.0087 J	0.0081 J	ND	ND	ND	0.0190 J	0.0084 J	ND	ND	ND	ND	
Filter 1 - 25%	12-May-17	75	14,263	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0067 J	ND	ND	ND	
Filter 1 Effluent	12-May-17	75	14,263	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 2 Effluent	12-May-17	75	14,263	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Combined Raw	22-May-17	80	15,254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0055 J	0.0280	0.0072 J	0.0088 J	ND	ND	0.0048 J	0.0230	0.0089 J	ND	ND	ND	ND	
Filter 1 - 25%	22-May-17	80	15,254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0048 J	0.0230	0.0089 J	ND	ND	ND	
Filter 1 Effluent	22-May-17	80	15,254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 2 Effluent	22-May-17	80	15,254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Combined Raw	02-Jun-17	85	16,282	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0280	0.0090 J	0.0081 J	ND	ND	ND	ND	0.0200 J	0.0077 J	ND	ND	ND	ND	
Filter 1 - 25%	02-Jun-17	85	16,282	ND	ND	0.0089 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	02-Jun-17	85	16,282	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 2 Effluent	02-Jun-17	85	16,282	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Combined Raw	14-Jun-17	92	17,512	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0230	0.0063 J	0.0055 J	ND	ND	ND	ND	0.0190 J	0.0068 J	ND	ND	ND	ND	
Filter 1 - 25%	14-Jun-17	92	17,512	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0052 J	ND	ND	ND	
Filter 1 Effluent	14-Jun-17	92	17,512	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 2 Effluent	14-Jun-17	92	17,512	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Combined Raw	28-Jun-17	99	18,951	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0280	0.0080 J	0.0080 J	ND	ND	ND	ND	0.0170 J	0.0086 J	ND	ND	ND	ND	
Filter 1 - 25%	28-Jun-17	99	18,951	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0035 J	ND	ND	ND	ND	ND	0.0065 J	ND	ND	ND	ND	
Filter 1 Effluent	28-Jun-17	99	18,951	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0058 J	ND	ND	ND	ND	ND	ND	ND	
Filter 2 Effluent	28-Jun-17	99	18,951	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Combined Raw	07-Jul-17	104	19,916	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0240	0.0110 J	0.0064 J	ND	ND	ND	ND	0.0210	0.0085 J	ND	ND	ND	ND	
Filter 1 - 25%	07-Jul-17	104	19,916	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0075 J	ND	ND	ND	
Filter 1 - 50%	07-Jul-17	104	19,916	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 1 Effluent	07-Jul-17	104	19,916	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Filter 2 Effluent	07-Jul-17	104	19,916	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Combined Raw	19-Jul-17	112	21,313	Sample damaged during shipping; analysis not possible.																								
Filter 1 - 25%	19-Jul-17	112	21,313	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0052 J	ND	ND	ND	ND
Filter 1 Effluent	19-Jul-17	112	21,313	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 Effluent	19-Jul-17	112	21,313	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	26-Jul-17	116	22,162	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0034 J	0.0250	0.0076 J	ND	ND	ND	ND	0.0130 J	0.0073 J	ND	ND	ND	ND	

Table 1
Summary of PFC Analytical Results
Demonstration Project
Former Pease Air Force Base, New Hampshire

Sample Location	Collection Date	Filter 1 Volume (MG)	Filter 1 Bed Volumes	6:2 Fluorotelomer sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonate (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EiFOSA)	N-Ethyl perfluorooctane sulfonamide (EiFOSE)	N-Methyl perfluorooctane sulfonamide (MEFOSA)	N-Methyl perfluorooctane sulfonamide (MEFOSE)	Perfluorobutanesulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecane sulfonate (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoA)	Perfluorooheptane sulfonate (PFHpS)	Perfluorooheptanoic acid (PFHpA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluorohexanoic acid (PFHxA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (PFOSA)	Perfluorooctanesulfonic acid (PFOS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTDA)	Perfluorotridecanoic acid (PFTDA)	Perfluoroundecanoic acid (PFUnA)	PFOS+PFOA	
USEPA Health Advisory (HA):				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	0.07	-	-	-	-	0.07
Filter 1 - 25%	26-Jul-17	116	22,162	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 1 Effluent	26-Jul-17	116	22,162	ND	ND	ND	ND	ND	ND	ND	0.0047 J	ND	ND	ND	ND	0.0049 J	ND	ND	ND	ND	ND	ND	ND	0.0062 J	ND	ND	ND	ND
Filter 2 Effluent	26-Jul-17	116	22,162	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0036 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	02-Aug-17	121	23,021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0300	0.0099 J	0.0077 J	ND	ND	ND	ND	0.0190 J	0.0120 J	ND	ND	ND	ND
Filter 1 - 25%	02-Aug-17	121	23,021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0092 J	ND	ND	ND	ND
Filter 1 Effluent	02-Aug-17	121	23,021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 Effluent	02-Aug-17	121	23,021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	18-Aug-17	131	24,999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0310	0.0120 J	0.0140 J	ND	ND	ND	0.0240	0.0130 J	ND	ND	ND	ND
Filter 1 - 25%	18-Aug-17	131	24,999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0100 J	0.0110 J	ND	ND	ND	ND	ND	0.0140 J	ND	ND	ND	ND
Filter 1 - 50%	18-Aug-17	131	24,999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0068 J	ND	ND	ND	ND
Filter 1 Effluent	18-Aug-17	131	24,999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 Effluent	18-Aug-17	131	24,999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0170 J	ND	ND	ND	ND	ND
Combined Raw	25-Aug-17	135	25,806	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0066 J	0.0310	0.0130 J	ND	ND	ND	ND	0.0190 J	ND	ND	ND	ND	ND
Filter 1 - 25%	25-Aug-17	135	25,806	ND	ND	ND	ND	ND	ND	ND	0.0160 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 1 - 50%	25-Aug-17	135	25,806	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 1 Effluent	25-Aug-17	135	25,806	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 Effluent	25-Aug-17	135	25,806	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	01-Sep-17	140	26,644	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0410	0.0088 J	0.0087 J	ND	ND	ND	ND	0.0210	0.0130 J	ND	ND	ND	ND
Filter 1 - 25%	01-Sep-17	140	26,644	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0110 J	ND	ND	ND	ND
Filter 1 - 50%	01-Sep-17	140	26,644	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 1 Effluent	01-Sep-17	140	26,644	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 Effluent	01-Sep-17	140	26,644	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	12-Sep-17	146	27,795	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0042 J	0.0340	0.0098 J	0.0069 J	ND	ND	ND	0.0220	0.0140 J	ND	ND	ND	ND
Filter 1 - 25%	12-Sep-17	146	27,795	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0062 J	0.0064 J	ND	ND	ND	ND	ND	0.0130 J	ND	ND	ND	ND
Filter 1 - 50%	12-Sep-17	146	27,795	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0120 J	ND	ND	ND	ND
Filter 1 - 75%	12-Sep-17	146	27,795	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 1 Effluent	12-Sep-17	146	27,795	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 Effluent	12-Sep-17	146	27,795	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	21-Sep-17	151	28,783	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0240	0.0075 J	0.0065 J	ND	ND	ND	0.0130 J	0.0078 J	ND	ND	ND	ND
Filter 1 - 25%	21-Sep-17	151	28,783	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0088 J	0.0075 J	ND	ND	ND	ND	ND	0.0099 J	ND	ND	ND	ND
Filter 1 - 50%	21-Sep-17	151	28,783	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0089 J	ND	ND	ND	ND
Filter 1 Effluent	21-Sep-17	151	28,783	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0071 J	ND	ND	ND	ND
Filter 2 Effluent	21-Sep-17	151	28,783	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	02-Oct-17	157	29,951	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0110 J	0.0340	0.0110 J	0.0130 J	ND	ND	ND	0.0210	0.0150 J	ND	ND	ND	ND
Filter 1 - 25%	02-Oct-17	157	29,951	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0120 J	0.0100 J	ND	ND	ND	ND	ND	0.0150 J	ND	ND	ND	ND
Filter 1 - 50%	02-Oct-17	157	29,951	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0140 J	ND	ND	ND	ND
Filter 1 Effluent	02-Oct-17	157	29,951	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 Effluent	02-Oct-17	157	29,951	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	13-Oct-17	163	31,126	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0490	0.0150 J	0.0088 J	ND	ND	ND	0.0250	0.0100 J	ND	ND	ND	ND
Filter 1 - 25%	13-Oct-17	163	31,126	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0048 J	0.0038 J	ND	ND	ND	ND	ND	0.0087 J	ND	ND	ND	ND
Filter 1 - 50%	13-Oct-17	163	31,126	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0074 J	ND	ND	ND	ND
Filter 1 - 75%	13-Oct-17	163	31,126	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0042 J	ND	ND	ND	ND
Filter 1 Effluent	13-Oct-17	163	31,126	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0058 J	ND	ND	ND	ND
Filter 2 Effluent	13-Oct-17	163	31,126	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND




Notes:

**Table 1
Summary of PFC Analytical Results
Demonstration Project
Former Pease Air Force Base, New Hampshire**

Sample Location	Collection Date	Filter 1 Volume (MG)	Filter 1 Bed Volumes	6:2 Fluorotelomer sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonate (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl Perfluorooctane Sulfonamide (MEFOSA)	N-Methyl Perfluorooctane Sulfonamidoethanol (MEFOSE)	Perfluorobutanesulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecane sulfonate (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoA)	Perfluorooctanoic acid (PFHxA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (PFOSA)	Perfluorooctanesulfonic acid (PFOS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTriDA)	Perfluoroundecanoic acid (PFUnA)	PFOS+PFOA	
USEPA Health Advisory (HA):				-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	-	0.07	-	-	-	-	0.07

Grey text indicates the parameter was not analyzed or not detected.
All concentrations in µg/L - micrograms per liter (ppb)
J - The result is an estimated value.
B - Detected in Blank.

USEPA - Environmental Protection Agency
NA - Not Analysed or Not Applicable
ND - Not detected
-- - No Health Advisory available

 - Denotes 'B' value, detected in blank
 - Denotes raw water influent sample
 - Denotes short chain compound