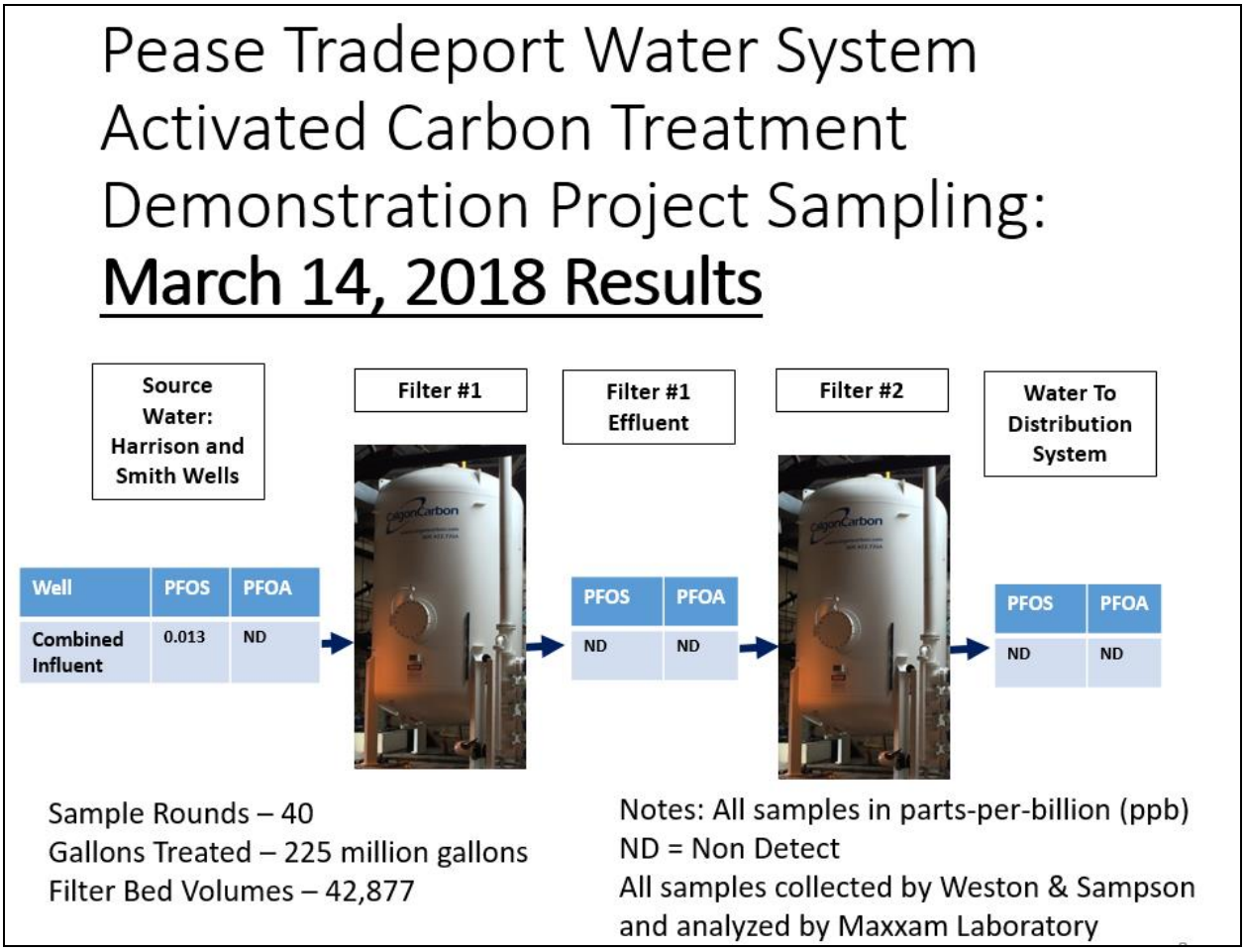
City of
Portsmouth
Department of Public Works

April 4, 2018

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 since September 2016. As of March 14, 2018, 225 million gallons of water from these two wells has been treated through the activated carbon F400 Calgon Filtrasorb Filter media.

Past sample results show that some of the PFAS compounds are beginning to come through the first filter. Results from the December 26, 2017 sample round showed a detection of PFBA coming through the second filter. This was an early indicator that the filter media is starting to reach its useful life. Based on other operating systems like ours this is what we expected to see. 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 PFOS and PFOA 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.

In order to continue the demonstration project and to also assure treatment of the PFAS compounds, the City proposed changing out Filter Number 2 with new carbon. The Air Force did not agree to pay for covering the cost of the replacement of carbon but did not object to the City proceeding with this on our own. Therefore, we proceeded to order the new carbon and it was installed during the week of March 26, 2018. We will continue our discussions with the Air Force about potential reimbursement of the cost of this work.

March 28, 2018 – New Carbon for Pease Demonstration Filter No. 2

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 provided on the City's website.

Haven Well Water Pilot Treatment System

Haven Well Pump

Pilot Treatment System

In order to better assess the treatment capability for treating the PFAS compounds and the Haven Well a small pilot treatment system has been up and running since October 27, 2017. A small scale filter system, utilizing the same F400 carbon as the demonstration project, was installed at the Haven Well pumphouse. Additionally, a filter with resin media has been running concurrently 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. Initial sampling results of the filter system show that the resin has good performance in removing PFAS compounds and has recently been proposed to the Air Force by the City to be included in part of the final treatment system design.

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. After piloting the Resin Filters and presenting this information to the Air Force, they agreed to modify our treatment design to include both resin and carbon filtration for PFAS treatment. Design utilizing those parameters continues. We anticipate the design will be completed by the end of the summer in 2018 with bidding and construction to commence in late 2018 or early 2019.

City staff provided an update to the public at the Pease Restoration Advisory Board's (RAB) meeting on March 14, 2018 at Great Bay Community College.

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.

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 (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)	Perfluoroheptane sulfonate (PFHpS)	Perfluoroheptanoic 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 (PFTrDA)	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	
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	######
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	######
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	ND	0.0053 J	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	ND	0.0040 J	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

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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)	Perfluoroheptane sulfonate (PFHpS)	Perfluoroheptanoic 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 (PFTrDA)	Perfluoroundecanoic acid (PFUnA)	PFOS+PFOA
USEPA Health Advisory (HA):				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	0.07	-	-	-	-	0.07
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
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	ND	0.0056 J	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	0.0036 J	ND	ND	0.0033 J	ND	0.0036 J
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	0.0100 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	0.0052 J	ND	ND	ND	ND	0.0052 J
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	ND	ND	0.0240	0.0064 J	0.0049 J	ND	ND	0.0150 J	0.0053 J	ND	ND	ND	0.0199 J
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	ND	0.0071 J	ND	ND	ND	ND	0.0040 J	0.0270	0.0087 J	0.0081 J	ND	ND	0.0190 J	0.0084 J	ND	ND	ND	0.0271
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	0.0067 J	ND	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	ND	0.0055 J	0.0280	0.0072 J	0.0088 J	ND	ND	0.0230	0.0089 J	ND	ND	ND	0.0318
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	0.0048 J	ND	ND	ND	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	ND	ND	0.0280	0.0090 J	0.0081 J	ND	ND	0.0200 J	0.0077 J	ND	ND	ND	0.0281
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	ND	ND	0.0230	0.0063 J	0.0055 J	ND	ND	0.0190 J	0.0068 J	ND	ND	ND	0.0245
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	0.0052 J	ND	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	ND	ND	0.0280	0.0080 J	ND	ND	ND	0.0170 J	0.0086 J	ND	ND	ND	0.0170 J
Filter 1 - 25%	28-Jun-17	99	18,951	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0035 J	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	ND	0.0058 J	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

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)	Perfluoroheptane sulfonate (PFHpS)	Perfluoroheptanoic 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 (PFTrDA)	Perfluoroundecanoic acid (PFUnA)	PFOS+PFOA
USEPA Health Advisory (HA):				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	0.07	-	-	-	-	0.07
Combined Raw	07-Jul-17	104	19,916	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0240	0.0110 J	0.0064 J	ND	ND	0.0210	0.0085 J	ND	ND	ND	0.0274
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	0.0075 J	ND	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	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
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
Combined Raw	26-Jul-17	116	22,162	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0034 J	0.0250	0.0076 J	ND	ND	ND	0.0130 J	0.0073 J	ND	ND	ND	0.0130 J
Filter 1 - 25%	26-Jul-17	116	22,162	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0038 J	ND	ND	ND	ND	0.0062 J	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	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
Combined Raw	02-Aug-17	121	23,021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0300	0.0099 J	0.0077 J	ND	ND	0.0190 J	0.0120 J	ND	ND	ND	0.0267
Filter 1 - 25%	02-Aug-17	121	23,021	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0069 J	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
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
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	0.0240	0.0130 J	ND	ND	ND	0.0380
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	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	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
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	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	0.0190 J	ND	ND	ND	ND	0.0190 J
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
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	0.0053 J	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
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
Combined Raw	01-Sep-17	140	26,644	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0410	0.0088 J	0.0087 J	ND	ND	0.0210	0.0130 J	ND	ND	ND	0.0297
Filter 1 - 25%	01-Sep-17	140	26,644	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0065 J	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
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
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
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	0.0220	0.0140 J	ND	ND	ND	0.0289
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	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	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
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
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
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	0.0130 J	0.0078 J	ND	ND	ND	0.0195 J
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	0.0099 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 (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)	Perfluoroheptane sulfonate (PFHpS)	Perfluoroheptanoic 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 (PFTrDA)	Perfluoroundecanoic acid (PFUnA)	PFOS+PFOA
USEPA Health Advisory (HA):				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	0.07	-	-	-	-	0.07
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	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	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
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	0.0210	0.0150 J	ND	ND	ND	0.0340
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	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	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
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
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	0.0250	0.0100 J	ND	ND	ND	0.0338
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	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	0.0098 J	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	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	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
Combined Raw	30-Oct-17	171	32,619	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0089 J	0.0470	0.0140 J	0.0110 J	ND	ND	0.0280	0.0150 J	ND	ND	ND	0.0390
Filter 1 - 25%	30-Oct-17	171	32,619	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0076 J	ND	ND	ND	ND	0.0087 J	ND	ND	ND	ND
Filter 1 - 50%	30-Oct-17	171	32,619	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0095 J	ND	ND	ND	ND
Filter 1 - 75%	30-Oct-17	171	32,619	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	30-Oct-17	171	32,619	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	30-Oct-17	171	32,619	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-Nov-17	177	33,846	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0330	0.0093 J	0.0110 J	ND	ND	0.0190	ND	ND	ND	ND	0.0300
Filter 1 - 25%	14-Nov-17	177	33,846	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0067 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 1 - 50%	14-Nov-17	177	33,846	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 - 75%	14-Nov-17	177	33,846	ND	ND	ND	ND	ND	ND	ND	0.0057 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 1 Effluent	14-Nov-17	177	33,846	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 - 50%	14-Nov-17	177	33,846	ND	ND	ND	ND	ND	ND	ND	0.0056 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 Effluent	14-Nov-17	177	33,846	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	27-Nov-17	183	34,959	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0330	0.0043 J	0.0055 J	ND	ND	0.0120 J	ND	ND	ND	ND	0.0175 J
Filter 1 - 25%	27-Nov-17	183	34,959	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0056 J	0.0037 J	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 1 - 50%	27-Nov-17	183	34,959	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 - 75%	27-Nov-17	183	34,959	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-Nov-17	183	34,959	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 - 50%	27-Nov-17	183	34,959	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	27-Nov-17	183	34,959	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	08-Dec-17	188	35,903	ND	ND	ND	ND	ND	ND	ND	0.0086 J	ND	ND	ND	ND	ND	0.0330	0.0140 J	0.0083 J	ND	ND	0.0160 J	0.0120 J	ND	ND	ND	0.0243
Filter 1 - 25%	08-Dec-17	188	35,903	ND	ND	ND	ND	ND	ND	ND	0.0090 J	ND	ND	ND	ND	ND	0.0100 J	0.0130 J	0.0047 J	ND	ND	ND	0.0140 J	ND	ND	ND	0.0047 J
Filter 1 - 50%	08-Dec-17	188	35,903	ND	ND	ND	ND	ND	ND	ND	0.0091 J	ND	ND	ND	ND	ND	ND	0.0110 J	ND	ND	ND	ND	0.0130 J	ND	ND	ND	ND
Filter 1 - 75%	08-Dec-17	188	35,903	ND	ND	ND	ND	ND	ND	ND	0.0099 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0100 J	ND	ND	ND	ND
Filter 1 Effluent	08-Dec-17	188	35,903	ND	ND	ND	ND	ND	ND	ND	0.0100 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0100 J	ND	ND	ND	ND
Filter 2 - 25%	08-Dec-17	188	35,903	ND	ND	ND	ND	ND	ND	ND	0.0099 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	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 (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)	Perfluoroheptane sulfonate (PFHpS)	Perfluoroheptanoic 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 (PFTrDA)	Perfluoroundecanoic acid (PFUnA)	PFOS+PFOA
USEPA Health Advisory (HA):				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	0.07	-	-	-	-	0.07
Filter 2 - 50%	08-Dec-17	188	35,903	ND	ND	ND	ND	ND	ND	ND	0.0100 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 - 75%	08-Dec-17	188	35,903	ND	ND	ND	ND	ND	ND	ND	0.0100 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 Effluent	08-Dec-17	188	35,903	ND	ND	ND	ND	ND	ND	ND	0.0095 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	26-Dec-17	193	37,215	ND	ND	ND	ND	ND	ND	0.0057 J	0.0056 J	ND	ND	ND	ND	ND	0.0160 J	0.0076 J	0.0059 J	ND	ND	0.0110 J	ND	ND	ND	ND	0.0169 J
Filter 1 - 25%	26-Dec-17	193	37,215	ND	ND	ND	ND	ND	ND	0.0059 J	0.0056 J	ND	ND	ND	ND	ND	0.0100 J	0.0110 J	0.0042 J	ND	ND	ND	0.0100 J	ND	ND	ND	0.0042 J
Filter 1 - 50%	26-Dec-17	193	37,215	ND	ND	ND	ND	ND	ND	ND	0.0058 J	ND	ND	ND	ND	ND	ND	0.0088 J	ND	ND	ND	ND	0.0110 J	ND	ND	ND	ND
Filter 1 - 75%	26-Dec-17	193	37,215	ND	ND	ND	ND	ND	ND	ND	0.0075 J	ND	ND	ND	ND	ND	ND	0.0054 J	ND	ND	ND	ND	0.0120 J	ND	ND	ND	ND
Filter 2 - 50%	26-Dec-17	193	37,215	ND	ND	ND	ND	ND	ND	ND	0.0097 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 - 75%	26-Dec-17	193	37,215	ND	ND	ND	ND	ND	ND	ND	0.0093 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	10-Jan-18	199	38,386	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0098 J	ND	ND	ND	ND	0.0076 J	ND	ND	ND	ND	0.0076 J
Filter 1 - 25%	10-Jan-18	199	38,386	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%	10-Jan-18	199	38,386	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 - 75%	10-Jan-18	199	38,386	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 - 100%	10-Jan-18	199	38,386	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 - 50%	10-Jan-18	199	38,386	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 - 100%	10-Jan-18	199	38,386	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	25-Jan-18	206	39,311	ND	ND	ND	ND	ND	ND	ND	0.0063 J	ND	ND	ND	0.0084 J	0.0110 J	0.0400	0.0150 J	0.0055 J	ND	ND	0.0130 J	0.0130 J	ND	ND	ND	0.0185 J
Filter 1 - 25%	25-Jan-18	206	39,311	ND	ND	ND	ND	ND	ND	ND	0.0064 J	ND	ND	ND	ND	0.0081 J	0.0120 J	0.0130 J	ND	ND	ND	ND	0.0120 J	ND	ND	ND	ND
Filter 1 - 50%	25-Jan-18	206	39,311	ND	ND	ND	ND	ND	ND	ND	0.0069 J	ND	ND	ND	ND	ND	ND	0.0088 J	ND	ND	ND	ND	0.0120 J	ND	ND	ND	ND
Filter 1 - 75%	25-Jan-18	206	39,311	ND	ND	ND	ND	ND	ND	ND	0.0071 J	ND	ND	ND	ND	ND	ND	0.0041 J	ND	ND	ND	ND	0.0098 J	ND	ND	ND	ND
Filter 1 - 100%	25-Jan-18	206	39,311	ND	ND	ND	ND	ND	ND	ND	0.0069 J	ND	ND	ND	ND	ND	ND	0.0048 J	ND	ND	ND	ND	0.0087 J	ND	ND	ND	ND
Filter 2 - 50%	25-Jan-18	206	39,311	ND	ND	ND	ND	ND	ND	ND	0.0074 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Filter 2 - 100%	25-Jan-18	206	39,311	ND	ND	ND	ND	ND	ND	ND	0.0074 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	15-Feb-18	214	40,868	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0074 J	0.0350	0.0110 J	0.0085 J	ND	ND	0.0170 J	0.0110 J	ND	ND	ND	0.0255 J
Filter 1 - 25%	15-Feb-18	214	40,868	ND	ND	ND	ND	ND	ND	ND	0.0063 J	ND	ND	ND	ND	ND	0.0120 J	0.0120 J	0.0051 J	ND	ND	ND	0.0130 J	ND	ND	ND	0.0051 J
Filter 1 - 50%	15-Feb-18	214	40,868	ND	ND	ND	0.0110 J	ND	0.0140 J	ND	0.0084 J	ND	ND	ND	ND	ND	ND	0.0099 J	ND	ND	ND	ND	0.0140 J	ND	ND	ND	ND
Filter 1 - 75%	15-Feb-18	214	40,868	ND	ND	ND	ND	ND	ND	ND	0.0120 J	ND	ND	ND	ND	ND	ND	0.0088 J	0.0038 J	ND	ND	ND	0.0160 J	ND	ND	ND	ND
Filter 1 - 100%	15-Feb-18	214	40,868	ND	ND	ND	ND	ND	ND	ND	0.0071 J	ND	ND	ND	ND	ND	ND	0.0043 J	ND	ND	ND	ND	0.0110 J	ND	ND	ND	ND
Filter 2 - 50%	15-Feb-18	214	40,868	ND	ND	ND	0.0082 J	ND	ND	ND	0.0120 J	ND	ND	ND	ND	ND	ND	0.0047 J	ND	ND	ND	ND	0.0084 J	ND	ND	ND	ND
Filter 2 - 100%	15-Feb-18	214	40,868	ND	ND	ND	ND	ND	ND	ND	0.0056 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Combined Raw	01-Mar-18	220	41,910	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0460	0.0160 J	0.0095 J	ND	ND	0.0180 J	0.0150 J	ND	ND	ND	0.0275 J
Filter 1 - 25%	01-Mar-18	220	41,910	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0130 J	0.0130 J	ND	ND	ND	ND	0.0120 J	ND	ND	ND	ND
Filter 1 - 50%	01-Mar-18	220	41,910	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%	01-Mar-18	220	41,910	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 - 100%	01-Mar-18	220	41,910	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 - 50%	01-Mar-18	220	41,910	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 - 100%	01-Mar-18	220	41,910	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-Mar-18	225	42,877	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0390	0.0083 J	ND	ND	ND	0.0130 J	0.0095 J	ND	ND	ND	0.0130 J
Filter 1 - 25%	14-Mar-18	225	42,877	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0110 J	0.0056 J	ND	ND	ND	ND	0.0097 J	ND	ND	ND	ND
Filter 1 - 50%	14-Mar-18	225	42,877	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0050 J	ND	ND	ND	ND	0.0080 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 (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)	Perfluoroheptane sulfonate (PFHpS)	Perfluoroheptanoic 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 (PFTrDA)	Perfluoroundecanoic acid (PFUnA)	PFOS+PFOA
USEPA Health Advisory (HA):				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07	-	-	0.07	-	-	-	-	0.07
Filter 1 - 75%	14-Mar-18	225	42,877	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0077 J	ND	ND	ND	ND
Filter 1 - 100%	14-Mar-18	225	42,877	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 - 50%	14-Mar-18	225	42,877	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 - 100%	14-Mar-18	225	42,877	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:

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