

3225 MAIN STREET • P.O. BOX 226  
BARNSTABLE, MASSACHUSETTS 02630

---

(508) 362-3828 • Fax (508) 362-3136 • [www.capecodcommission.org](http://www.capecodcommission.org)



CAPE COD  
COMMISSION

September 6, 2017

Angela Gallagher  
Site Remediation Section  
Southeast Regional Office  
Department of Environmental Protection  
20 Riverside Drive  
Lakeville, MA 02347

Re: WSA-4-26179  
Immediate Response Action  
PFOS/PFOA in Groundwater

Dear Ms. Gallagher:

This is the ninth IRA monthly remedial monitoring and status report for the IRA approved by the Department in a letter dated November 10, 2016. This report includes a status report on the pump and treat and the post Soil Removal monitoring.

### **Pump and Treat System**

The pump and treat system operated continuously throughout the month after an initial nine day shut down. The system was found to have a blown electrical contactor on August 1<sup>st</sup>. I received the PO approval for the carbon exchange on the same day and scheduled the work for August 9<sup>th</sup>. The system remained off until the carbon was exchanged due to the increasing PFOS concentration in the effluent and that the down time would not be so extensive as to allow the hot spot plume to migrate more than 10

BFTA

1

Immediate Response Action

September 6, 2017

feet from the recovery well. The influent PFOS and PFOA concentrations for the two round of samples this month was 3000 ng/l and 2900 ng/l (PFOS) and 110 and 100 ng/l (PFOA) respectively. The effluent concentrations were below the MRL or Non-Detect. The monthly pump volume was 1.15 Million Gallons with an estimated removal of 17.2 grams of PFOS.

The Influent from PRW-4 (recovery well) was tested for iron and total organic carbon. The treatment system is subject to iron fouling requiring that the well and force mains are treated and purged approximately every three months. In addition to the iron fouling the carbon vessels exchange frequency increased to two to three months in 2017. The influent was tested for total organic carbon to assess its effect on the carbon vessel capacity. The iron and TOC concentrations were 0.61 and 1 mg/l respectively. This data will be reviewed by our carbon engineers.

### Post Soil Removal Monitoring

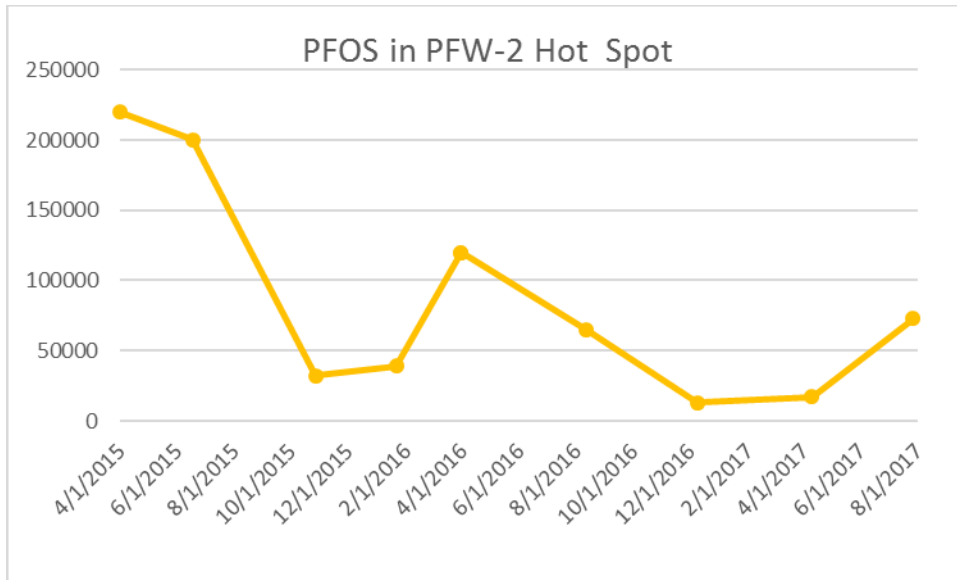
These efforts follow up on the discussion in the May 2017 RMR report on the post soil removal monitoring. Three monitoring wells in the Hot Spot were sampled for PFAS and Aluminum on July 27th. Flintrock Pond was sampled August 16th. The Aluminum concentrations in PFW-2 remained at approximately 0.5 mg/l. The pre-soil removal Aluminum concentration was 2.3 mg/l. The Aluminum concentrations in HS-1 and HS-2 decreased by ½ from 3.8 mg/l to 1.6 and from 3.8 mg/l to 1.2 mg/l respectively. Flintrock Pond had increased from 0.014 mg/l to 0.61 mg/l. Aluminum is a ubiquitous element and the pre-soil removal monitoring indicated a concentration of 2.3 in PFW-2. The area of the soil removal included fill and the sump introduced constituents from runoff into the soil. The post monitoring result does not show significant aluminum increases from the use of the Rembind stabilization material.

	6-Aug-17			16-Aug-17
	mg/l	mg/l	mg/l	mg/l
	PFW-2	HS-1a	HS-2a	Flintrock
<b>Aluminum</b>	0.51	1.6	1.2	0.061
<b>DO</b>	0.13	0.13	0.11	8.2
<b>pH</b>	5.99	5.95	5.98	6.7
<b>Spec Cond</b>	130	109	130	75

<b>Temp</b>	12.5	13.4	12.5	28.7
	<b>7/27/2017</b>			<b>8/16/2017</b>
<b>PFOS</b>	73000	24000	21000	2000
<b>PFOA</b>	910	350	370	92

Flintrock pond is up gradient of the soil removal area and the results indicate no significant increases of aluminum in the pond water. In fact, the general field measurements show a distinct difference in the geochemistry as related to Dissolved oxygen, specific conductance, pH and Temperature. Given the results, I conclude that metals are not an issue of concern with the Rembind stabilization product at this site. Performance monitoring of the hot spot for PFAS response will continue a quarterly basis.

The Post Soil Removal monitoring of PFAS indicates a significant increase of PFOS in PFW-2. The increase may have had to do with the two – near hundred year storms that occurred over the last month(s) that caused a release of PFOS in the soil. Interestingly, the PFOS concentrations at the soil removal area HS1 and HS2 showed a decrease from 38,000 to 24,000 for HS1 and from 28,000 to 21,000 for HS2. The decrease in PFOS was likely due to the soil removal and Rembind stabilization material. It is also possible that the increase of PFOS at PFW-2 could have been appreciably higher without the hot spot soil removal. In any event the post Hot Spot monitoring program indicates measured success. However due to the substantial concentrations a more expansive soil removal including material to the watertable and/or innovative treatment piloting and plume reduction is recommended.



The Comprehensive sampling assessment of April 2017 indicated a significant concentration PFOA at 2,000 ng/ in groundwater from well OW-8a. This well is located at the north-east portion of the BCFRTA track at the site of the old “Tank” pit. This is the highest level outside of the Hot Spot source area (PFW-2) which since April 2015 has decreased from 5,200 ng/l to 910 ng/l. OW-8a was resampled on August 16, 2017 and the PFOS concentration was 120 ng/l. The PFOA concentration appears to have either a significant fluctuation or that there may have been sampling error. The well is located downgradient of the effluent discharge area and two Quonset huts for BCFRTA equipment. It may be possible that the rainproof vinyl material of the Quonset hut includes PFOA. This will be further evaluated and the well directly downgradient (MW-28s) will be sampled again. The last time MW-28s was sampled there was a PFOA detection of 90 ng/l in April 2015

Sampling Date	Constituent	Well ID	PFOA ng/l
11/22/2013	Perfluoro-n-Octanoic Acid (PFOA)	OW-8A	430
6/3/2014	Perfluoro-n-Octanoic Acid (PFOA)	OW-8A	1000
4/11/2017	Perfluoro-n-Octanoic Acid (PFOA)	OW-8A	2000
8/16/2017	Perfluoro-n-Octanoic Acid (PFOA)	OW-8A	120

We are scheduled for a meeting with DEP to discuss our cleanup progress at the BCFRTA site in September. We have been in contact with the Town of Barnstable and Barnstable Fire District to discuss the regional aspects of our collective data and findings.

Please contact me if you have any questions on this submittal.

Sincerely,

Tom Cambareri  
Technical Services Director for Water Resources  
LSP #3788

Cc: Gerard Martin, DEP-SERO  
Jack Yunits, County Administrator