



Submissions to the State of North Carolina and Cape Fear River Watch

The following table identifies submissions made by Chemours pursuant to the Consent Order for the period of January 1, 2020 through the end of the first quarter on March 31, 2020.<sup>1</sup>

CO Section	Submitted To	Title	Submitted Date
7 & 8	NCDEQ	Thermal Oxidizer Destruction Efficiency Compliance Report, Cover Letter, and Attached Test Reports	3/30/2020
8	NCDAQ	92 Percent Reduction Report CBI Spreadsheet	1/21/2020
8	NCDAQ	92 Percent Reduction Report Letter	1/21/2020
8	NCDAQ	Final - Division Stack Report 11 2019	1/21/2020
8	NCDAQ	Final - E2 Stack Report 12 2019	1/21/2020
11	NCDEQ	PFAS Characterization Quarterly Report Cover Letter	1/31/2020
11	NCDEQ	PFAS Characterization Quarterly Report	1/31/2020
11.2	NCDWR	Sediment Characterization Plan Responses to Comments	1/22/2020
11.2	NCDWR	Sediment Characterization Plan RTC Cover Letter	1/22/2020
11.2	NCDWR	Sediment Characterization Plan Updated Table 1	1/22/2020
12	CFRW	Cape Fear River PFAS Loading Reduction Plan - Supplemental Information Report - Responses to CFRW Comments Cover Letter	1/31/2020
12	CFRW	Cape Fear River PFAS Loading Reduction Plan - Supplemental Information Report - Responses to CFRW Comments	1/31/2020
12	NCDEQ	Cape Fear River PFAS Loading Reduction Plan - Supplemental Information Report - Responses to DEQ Comments Cover Letter	1/31/2020
12	NCDEQ	Cape Fear River PFAS Loading Reduction Plan - Supplemental Information Report - Responses to DEQ Comments	1/31/2020
12	NCDEQ	November 2019 Mass Loading Model Summary Update	3/16/2020
12	NCDEQ	Old Outfall 002 GAC Pilot Addendum and Cover Letter	1/15/2020
28	NCDEQ	Quarterly Progress Report Cover Letter	1/22/2020
28	NCDEQ	Quarterly Progress Report	1/22/2020
32	NCDEQ	Consent Order Coronavirus Letter	3/19/2020

<sup>1</sup> Consent Order submissions by Chemours from lodging of the Proposed Consent Order in November 2018 through March 31, 2019 were presented in the 1<sup>st</sup> quarter report, April 1, 2019 through June 30, 2019 in the 2<sup>nd</sup> quarter report, July 1, 2019 through September 30, 2019 in the 3<sup>rd</sup> quarter report, and October 1, 2019 through December 31, 2019 in the 4<sup>th</sup> quarter report.



2020 First Quarter Residential Summary

Item	Cumberland County (East of River)	Cumberland County (West of River)	Bladen County (East of River)	Bladen County (West of River)	Robeson County	Total
Total Number of Residences Sampled	370	851	22	17	59	1319
Residences Exceeding GAC Criteria (GenX >= 140 ng/L)	2	8	0	1	0	11
Residences Exceeding RO Criteria ( $\Sigma$ PFAS >= 70 ng/L)	177	347	4	13	23	564
Residences Exceeding RO Criteria (PFAS >= 10 ng/L)	120	328	4	1	24	477
Residences Drinking Water Well Detections (Results < 10 ng/L)	7	14	0	0	1	22
Residences Drinking Water Well Non-Detections	73	172	14	3	11	273

Note:

The total number of residences sampled may not equal the sum of the values in each column because (1) the residences sampled may share drinking water wells; therefore there may be more than one filtration system or bottled water delivery per well sampled, (2) the residence's lab results are pending because the sample is still being analyzed at the lab, (3) counts are only included for the timeframe 1/1/2020 through 3/31/2020, and (4) quarterly data is based on sample date.



## Replacement Drinking Water Actions

(Replacement drinking water actions from November 2018<sup>2</sup> - March 31, 2020)

Summary		Number of residents on bottled water	GAC Systems On-line & Confirmation Sampling Complete	Number of Homes Where RO Systems Installed
	Total		2609	78

Bottled Water		Residences Eligible for Bottled Water	Already connected to Public Water *	Eligible Residences Receiving Bottled Water
	Q1 2020	1194	N/A	1185
	Total	2612	5380	2609

GAC		Residences Eligible for GAC	Already connected to Public Water *	Public Water Readily Available	Public Water Feasible	Residents Declined GAC System	GAC Systems to Install	Number of Residences Responded to GAC Offer (Interview Conducted or Declined Offer)	
	Q1 2020	16	N/A	0	0	0	7	5	
	Total	237	5380	12	37	2	231	108	
		Number of GAC Systems to Install but Resident has Not Responded to Offer	System On-line	Confirmation Sampling Complete	GAC Offer Letters Sent to Residents	Call Log Interactions with GAC Residents	GAC Residence Response Rate		
	Q1 2020	16	7	7	16	255	N/A		
Total	123	78	78	224	1771	48%			

RO		Residences Eligible for RO (includes homes with shared wells)	Number of Residences Responded to RO Offer	Residents Declined RO	Homes/Buildings where RO Systems to be Installed but Resident has Not Responded	RO Residence Response Rate	
	Q1 2020	1479	406	3	1228	N/A	
	Total	2966	918	13	2062	31%	
		Number of Homes where RO Systems Installed	Homes/Buildings where RO Systems are to be Installed	Number of RO Offer Letters Sent to Residences	Call Log Interactions with RO Residents		
	Q1 2020	264	1319	1486	2823		
Total	722	2256	2979	6598			

<sup>2</sup> The date the proposed Consent Order was lodged.

## Consent Order Progress Details

This section summarizes the activities that have been undertaken by Chemours pursuant to the Consent Order Compliance Measures for the period from January 1, 2020 through the end of the first quarter of 2020 (March 31, 2020).

### Section 7 Control Technology Improvements

The Thermal Oxidizer (see photo at right) continues to control process emissions from the HFPO, Vinyl Ethers North, Vinyl Ethers South, Polymers, RSU, TFE and MMF processes. Destruction efficiency tests were run in February 2020 and a compliance report showing an average PFAS destruction efficiency of 99.99981% was submitted on March 30, 2020.



### Section 8 GenX Emissions Reduction Milestones

On January 21, 2020, Chemours submitted the 92% GenX Compounds emissions reduction report for Calendar Year 2019. As noted above, during the first quarter of 2020, Chemours also completed and reported the results of testing of the thermal oxidizer.

**Section 10 No Discharge of Process Wastewater from Chemours' Manufacturing Areas**  
Chemours continues to not discharge its process wastewater and to ship its process wastewater offsite for disposal.

### Section 11 Characterization of PFAS in Process and Non-Process Wastewater and Stormwater at the Facility

During the first quarter of 2020, Chemours' consultant Geosyntec prepared the 2019 fourth quarter report describing and analyzing characterization sampling of process water, non-process wastewater and stormwater that occurred in October and December 2019. Chemours submitted the report to NCDEQ on January 31, 2020. Additional sampling under Paragraph 11 was conducted on January 29th and 31st, 2020. Samples were collected from 20 locations during the January 2020 event. Geosyntec is preparing the 2020 first quarter report for submission under separate cover by April 30, 2020 to include data from this event. The quarterly report will include a discussion of data collected from the facility's wastewater treatment plant influent and effluent.



During the first quarter of 2020, Chemours completed non-targeted testing on two sets of samples collected during June, August, October, and December 2019 and January 2020. Samples were collected from eight locations (4, 8, 9, 15, 16, 17, 20 and 42; See Appendix A Figure A-1). There were no detections on any new analytes in samples collected from locations 8, 15, and 20.

Sample Number	Sample Location Description
8	Outfall 001 non-Chemours treated process wastewater discharged to open channel to Outfall 001
15	Combined stormwater and NCCW discharge from eastern portion of the Facility
20	Outfall 002 to Cape Fear River

There were detections in initial testing for analytes in samples collected from locations 4, 9, 16, 17 and 42. Initial testing presented analytes detected that are not on the Table 3+ list. Chemours is in the process of determining the structure of the new analytes and will communicate its findings when available.

Sample Number	Sample Location Description
4	Combined stormwater discharge from Kuraray northern leased area and Chemours PPA area
9	Chemours Monomers IXM NCCW and stormwater discharge including stormwater from Vinyl Ethers South and Vinyl Ethers North
16	Chemours Monomers IXM Area combined process Wastewater
17	Chemours PPA Area combined process wastewater
42	Stormwater from rooftop gutters from the Chemours Monomers IXM area going to the Cooling Water Channel

### Section 11.2 Characterization of PFAS Contamination in River Sediment

Chemours responded to NCDEQ comments on the Sediment Characterization Plan on January 22, 2020. Chemours and NCDEQ representatives also discussed comments on the sampling plan after submittal of the responses to comments. Chemours received NCDEQ approval to proceed with the sampling plan with the inclusion of an additional transect downgradient of Kings Bluff in the Cape Fear River in an e-mail from Mr. Michael Scott dated April 6, 2020. Chemours plans to perform this sampling in the second quarter of 2020.



## Section 12 Accelerated Reduction of PFAS Contamination in the Cape Fear River and Downstream Water Intakes

On January 31, 2020, Chemours submitted responses to both NCDEQ and Cape Fear River Watch in response to letters received from both parties on December 19, 2019. Chemours submitted a memorandum describing the November 2019 Mass Loading Sampling event on March 16, 2020.

## Section 14 Toxicity Studies

Chemours has now procured sufficient quantities for testing of four of the five test substances and will be sending those to the test companies to start the range finding study.

## Section 16 Groundwater Remediation

Chemours conducted a baseline mass loading monitoring event described in the Corrective Action Plan (CAP) by collecting groundwater, surface water and river samples and measuring flows in surface water bodies at and around the Site between late February and early April 2020. These results will be described in the first quarterly report for this program to be submitted in the second quarter of 2020.

## Sections 19 and 20 Provision of Public Water Supplies, Whole Building Filtration Systems, and Reverse Osmosis Drinking Water Systems

Chemours continues to meet the Consent Order requirements. During most of the quarter, Chemours' contractors continued to install GAC whole building filtration systems and RO drinking water systems at residences. Statistics are provided in the "Replacement Drinking Water Actions" section above.

In response to the coronavirus (COVID-19) pandemic, and in alignment with federal and state guidelines limiting personal contact, the routine installation of new RO and GAC systems has been temporarily suspended as of March 26, 2020. During the postponement period, Chemours contractors will continue to provide bottled water and conduct other limited activities, including collecting quarterly performance samples at GAC installations and providing necessary operation and maintenance on existing systems.

## Section 21 Private Well Testing

The Adaptive Step Out and Infill Sampling Program has been ongoing since the 3rd quarter of 2019. Two to five stages of step out sampling have occurred across the sectors and the current step out distance intervals range from 5.5-6.5 miles to 10.5-11.5 miles from the Site. Results for some of the current stage of Step Out sampling are still pending. Two of the sectors have been delineated (i.e., no further step outs for these two sectors are needed). Distance intervals for current infill sampling for all sectors range from 2.5-7.5 miles to 5.5 to 10.5 miles from the Site. Statistics are provided in the "2020 First Quarter Residential Summary" table above.



In response to the coronavirus (COVID-19) pandemic, and in alignment with federal and state guidelines limiting personal contact, the routine sampling program has been temporarily suspended as of March 26, 2020. During the postponement period, Chemours will continue to conduct limited activities, including verifying contact information and obtaining approval to sample drinking water wells once the sampling program resumes.

Pursuant to Paragraph 21 and the Drinking Water Compliance Plan and the Drinking Water Compliance Plan Responses to Comments, Chemours conducted the annual PFAS contamination extent retest, by randomly selecting and analyzing samples from 20 wells that previously had GenX concentrations that were non-detect and from 20 wells where previous GenX concentrations were between 70 ppt and 140 ppt.

### Section 22 Provision of Sampling Results

Chemours provided (and continues to provide) sampling results to NCDEQ and residences as required under the Consent Order. Chemours has provided sampling results to NCDEQ by sending a courtesy email notification and by uploading sampling results to the state Equis database. Chemours has also provided final lab reports to NCDEQ. Chemours has provided sampling results to residents by including preliminary results with water filtration system initial offer letters and sending the final lab reports to residents within the following 30 days. Chemours has also provided non-detect sampling results to residents.

### Section 23 Interim Replacement of Private Drinking Water Supplies

All residences eligible to receive the interim replacement drinking water supplies have received the supplies (i.e., bottled water). As of March 31, 2020, there are 2,609 residences receiving bottled water.

### Section 26 Total Organic Fluorine

Please see Appendix B for the quarterly progress report from Dr. Susan D. Richardson.

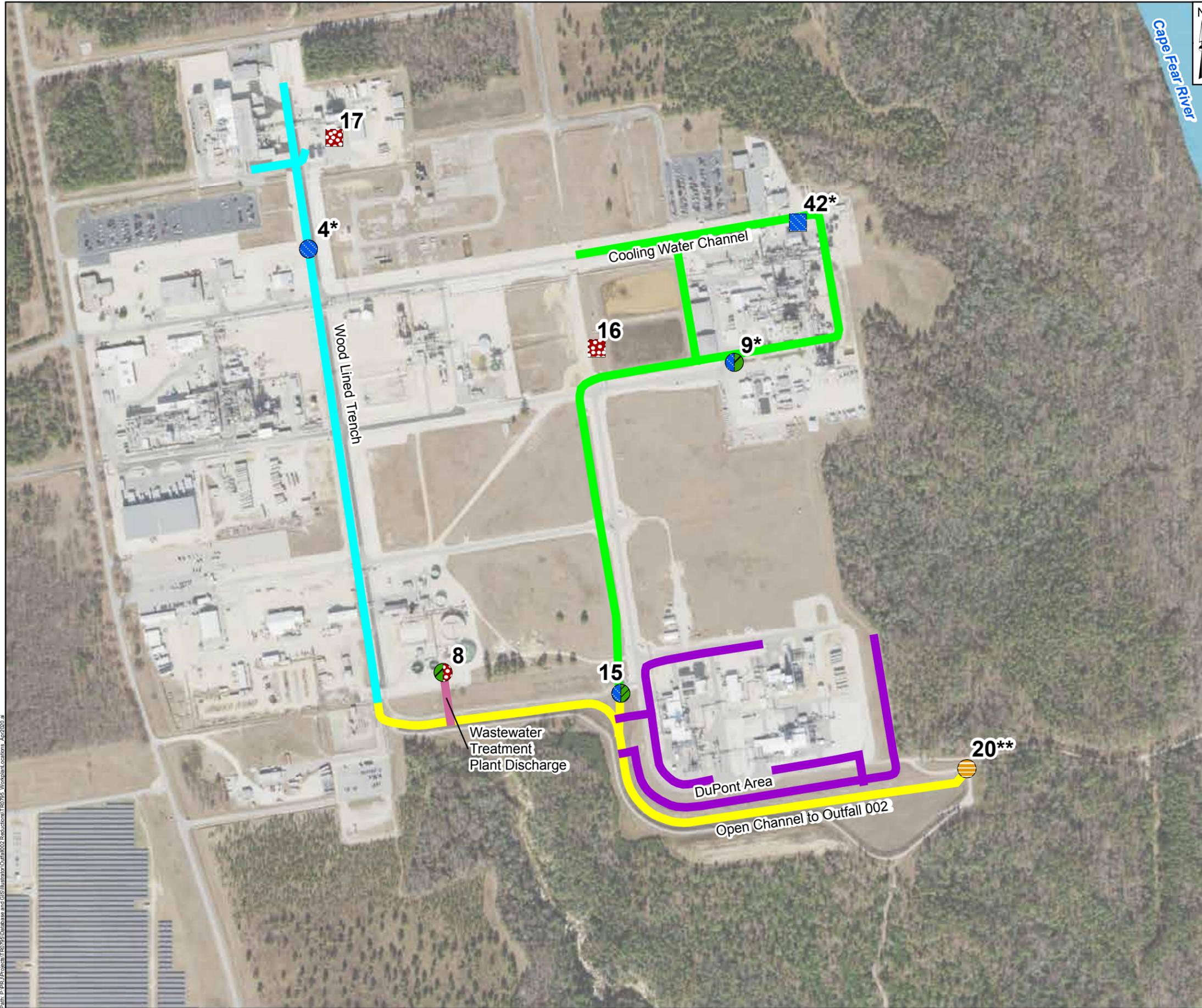
### Section 28 Reporting

Chemours submitted the Consent Order 4th quarter progress report on January 22, 2020.

### Sections 29 and 30 Public Information

Chemours has continued to post its Consent Order submissions at <https://www.chemours.com/Fayetteville-Works/en-us/c3-dimer-acid/compliance-testing/>.

# **Appendix A**



**Legend**

- Temporal Composite Sample
- Grab Sample

**Sample Location Category**

- ▨ Outfall 002
- ▨ Process wastewater
- ▨ Non-process wastewater
- ▨ Stormwater

**Ditch Types**

- ▬ Wood Lined Trench
- ▬ Wastewater Treatment Plant Discharge
- ▬ Cooling Water Channel
- ▬ Open Channel to Outfall 002
- ▬ DuPont Area

**Notes:**  
 \*- Locations 4, 9, and 42 are collected during rain events only.  
 \*\* - Location 20 is collected during dry and rain events.

Sample numbers 4, 8, 9, 15, 16, 17 and 20 correspond to locations identified in the May 2019 PFAS Characterization Plan. Sample number 42 corresponds to the location identified in the September 2019 Stormwater Grab Sampling Workplan.



**Paragraph 11(a) Non-Targeted Analysis  
 Sample Locations**  
 Chemours Fayetteville Works, North Carolina

<b>Geosyntec</b> consultants	Geosyntec Consultants of NC, P.C. NC License No.: C 3500 and C 295	<b>Figure</b>  <b>A-1</b>
	Raleigh	

Path: P:\PE\Projects\180795 Database and GIS\Editor\Outfall002 Reduction\180795\_Workplan\_locations\_Apr2020.mxd  
 Projection: NAD 1983 StatePlane North Carolina FIPS 3200 Feet; Units in Foot US

# **Appendix B**

**2nd Progress Report**  
**Development of a Total Organic Fluorine (TOF) Method for the Analysis of Process**  
**Wastewater Streams and Air from Fayetteville Works (NC)**  
**Susan D. Richardson and Ying Zhang, University of South Carolina**  
**April 4, 2020**

Since the last progress report (November 27, 2019), we have obtained a newly created low-fluorine activated carbon (from Mitsubishi) and tested its fluorine background, and it is much lower than activated carbons that were available previously. In addition, we also purchased 14 PFAS standards, and along with the standards we already had and Chemours has provided, we have 28 PFAS standards in total, and we plan to test the recoveries of each standard and their mixture. Below is a summary of the TOF method development work up-to-date.

**1. New carbon background and TOF of the system blank**

As we noted in the last report, the activated carbons that were commercially available had relatively high fluorine backgrounds, which will increase the background of the whole system. So, we have been looking for carbons with lower fluorine background. In December 2019, we received the new Mitsubishi carbon (made in Japan), and tested its background. The fluorine background of the carbon is from non-detect (ND) to 26 ng/cartridge (n=6, mean=4.3 ng ).

Also, in order to improve the accuracy of the TOF method, we adjusted the pre-flushing protocol. Before sample testing, the adsorption unit was flushed with Milli-Q water at ten times the sample volume (usually 500 mL, pH<2), and the whole fluorine system background decreased to ND-13.5 ppb (n=6, mean=6 ppb).

**2. Recoveries of several standards**

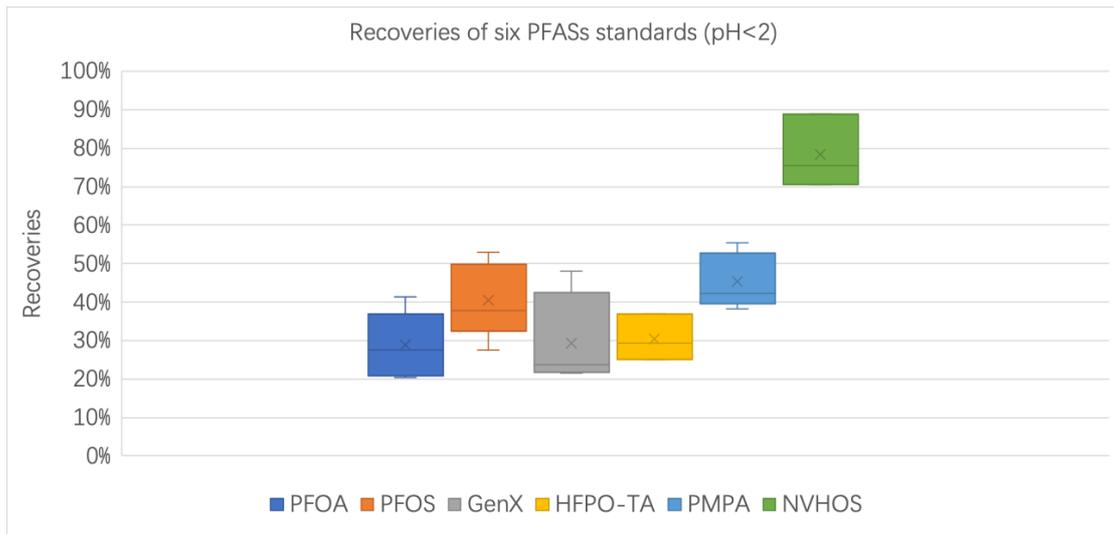
The PFAS standards in our lab are listed in Table 1.

**Table 1.** List of PFASs standards

<b>Compound</b>	<b>Formula</b>	<b>CAS number</b>
PFPrA	C <sub>3</sub> H <sub>5</sub> F <sub>5</sub> O <sub>2</sub>	422-64-0
PFBA	C <sub>4</sub> H <sub>7</sub> F <sub>7</sub> O <sub>2</sub>	375-22-4

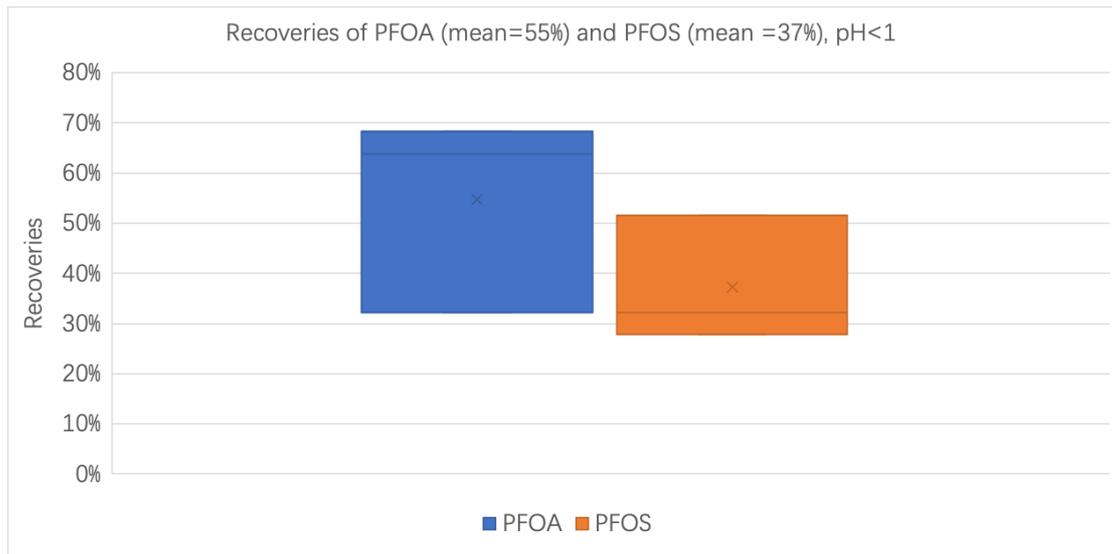
PFPeA	C5HF9O2	2706-90-3
PFHxA	C6HF11O2	307-24-4
PFHpA	C7HF13O2	375-85-9
PFOA	C8HF15O2	335-67-1
PFNA	C9HF17O2	375-95-1
PFDA	C10HF19O2	335-76-2
PFUdA	C11HF21O2	2058-94-8
PFDoA	C12HF23O2	307-55-1
PFTeDA	C14HF27O2	376-06-7
PFBS	C4HF9O3S	375-73-5
PFHxS	C6HF13O3S	355-46-4
PFOS	C8HF17O3S	1763-23-1
GenX	C6HF11O3	13252-13-6
HFPO-TA	C9HF17O4	13252-14-7
PFO3OA	C5HF9O5	39492-89-2
PFO4DA	C6HF11O6	39492-90-5
PFO5DA (PFO5DoA)	C7HF13O7	39492-91-6
PEPA	C5HF9O3	863090-89-5
PMPA	C4HF7O3	13140-29-9
EVE Acid	C8HF13O4	69087-46-3
Hydro-EVE Acid	C8H2F14O4	Produced by Chemours
R-EVE	C8H2F12O5	Produced by Chemours
NVHOS	C4H2F8O4S	Produced by Chemours
Byproduct 4 (BP4)	C7H2F12O6S	Produced by Chemours
Byproduct 5 (BP5)	C7H3F11O7S	Produced by Chemours
Byproduct 6 (BP6)	C6H2F12O4S	Produced by Chemours

Up to now, we have tested recoveries of six PFAS standards (Figure 1). The average recoveries of PFASs are 29% for PFOA, 40% for PFOS, 29% for GenX, 30% for HFPO-TA, 45% for PMPA, and 78% for NVHOS.



**Figure 1.** Recoveries of six PFASs standards (pH<2, compound concentration = 50 ppb)

Because the recoveries are not very high, we are adjusting some parameters to improve it. First, we changed the sample pH from <2 to <1. We expect a lower pH to aid adsorption on the activated carbon for those compounds that have low  $pK_a$ . This is because neutral molecules should sorb better on the carbon than charged species, which will favor partitioning in the water. After that sample pH adjustment, we were only able to test PFOA and PFOS once (triplicates) due to our shortage of low-F activated carbons and the outbreak of Covid-19 (see Figure 2). Note that we had ordered more low-F activated carbons from Mitsubishi several weeks ago, but they have not yet been delivered. With the lower sample pH prior to adsorption on the activated carbon, we observed an increase of the recoveries (average recovery of PFOA is 55%, and that of PFOS is 37%). However, the results are not consistent, and we will test more times to confirm. Note that PFOS, which contains a negatively charged sulfonate group, is an anion at pH <1 (it has a negative  $pK_a$  estimated to be -3.3), so there may be a limit to how well we can recover low-  $pK_a$  compounds such as PFOS.



**Figure 2.** Recoveries of PFOA and PFOS (pH<1, compound concentration = 50 ppb)