



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 and Addendum (COA) for the period of July 1, 2021 through the end of the third quarter on September 30, 2021.¹

CO Section	Title	Submitted Date
11	PFAS Non-Targeted Analysis and Methods Interim Report #3	07/30/2021
11	Characterization of PFAS in Process and Non-Process Wastewater and Stormwater – Ongoing Sampling - 2021 Quarters 1 and 2 Semi-Annual Report	09/29/2021
12 – COA 1b	Cape Fear River PFAS Mass Loading Assessment Report – Second Quarter 2021	09/30/2021
12 – COA 2a	Interim Seep Remediation Operation and Maintenance Report #3	07/30/2021
12 – COA 2a	Seep A Effectiveness Demonstration Report	08/26/2021
12 – COA 2a	Interim Seep Remediation Operation and Maintenance Report #4	09/30/2021
12 – COA 3b	Groundwater and Seeps Remedy 60% Design Submittal	08/13/2021
12 – COA 4c	Stormwater Treatment System Capture and Removal Efficiency Report	09/30/2021
28	Consent Order Quarterly Progress Report	07/29/2021

¹ Consent Order submissions by Chemours from lodging of the Proposed Consent Order in November 2018 through March 31, 2019 were presented in the 2019 1st quarter report, April 1, 2019 through June 30, 2019 in the 2019 2nd quarter report, July 1, 2019 through September 30, 2019 in the 2019 3rd quarter report, October 1, 2019 through December 31, 2019 in the 2019 4th quarter report, January 1, 2020 through March 31, 2020 in the 2020 1st quarter report, April 1, 2020 through June 30, 2020 in the 2020 2nd quarter report, July 1, 2020 through September 30, 2020, in the 2020 3rd quarter report, October 1, 2020 through December 31, 2020 in the 2020 4th quarter report, January 1, 2021 through March 31, 2021 in the 2021 1st quarter report, and April 1, 2021 through June 30, 2021 in the 2021 2nd quarter report.



2021 Third 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	Sampson County	Total
Total Number of Residences Sampled	372	110	14	8	17	7	528
Residences Exceeding GAC Criteria (GenX \geq 140 ng/L)	0	0	0	1	0	0	1
Residences Exceeding RO Criteria (Σ PFAS \geq 70 ng/L)	51	17	5	2	4	0	79
Residences Exceeding RO Criteria (PFAS \geq 10 ng/L)	160	46	3	2	11	0	222
Residences Drinking Water Well Detections (Results $<$ 10 ng/L)	78	31	2	2	0	6	119
Residences Drinking Water Well Non-Detections	83	16	4	1	2	1	107



Replacement Drinking Water Actions

(Replacement drinking water actions from November 2018² - September 30, 2021)

Summary		Number of residents on bottled water	GAC Systems On-line & Confirmation Sampling Complete	Number of Homes Where RO Systems Installed
	Total		2491	103

Bottled Water		Residences Eligible for Bottled Water	Already connected to Public Water	Eligible Residences Receiving Bottled Water
	Q3 2021	321	0	382
	Total	2491	152	2491

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)
	Q3 2021	1	Data Not Available	0	0	0	1	0
	Total	266	24	Data Not Available	Data Not Available	7	129	121

	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
Q3 2021	Not Applicable	0	2	1	244	Not Applicable
Total	107	105	103	266	3974	45%

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
	Q3 2021	387	380	0	150	Not Applicable
	Total	5222	3470	110	1482	66%

	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
Q3 2021	186	387	387	1670
Total	2659	2204	5222	22528

² 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 and Addendum for the period from July 1, 2021 through the end of the third quarter of 2021 (September 30, 2021). On August 13, 2020, Chemours signed the Addendum to Consent Order Paragraph 12, and the Addendum was entered by the Bladen County Superior Court on October 12, 2020.

Section 7 Control Technology Improvements

The thermal oxidizer (see photo at right) continues to control process emissions at an average PFAS destruction efficiency exceeding 99.99%.



Section 10 No Discharge of Process Wastewater from Chemours' Manufacturing Areas

Chemours does not discharge its process wastewater and instead collects and ships its process wastewater offsite for disposal or recycles treated water internally within several manufacturing processes.

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

During the third quarter of 2021, two sampling events were conducted, one during August 17 – August 23, 2021 (the August 2021 event) and the other during September 21 - 24, 2021 (the September 2021 event). Samples were collected from 26 locations during the August 2021 event and from 27 locations during the September 2021 event.

Results from three sampling events collected during January – June 2021 were reported in the first semi-annual report of paragraph 11(d), ongoing sampling, which Chemours submitted on September 29, 2021. Findings from the first semi-annual period were consistent with previous reporting under the paragraph 11 sampling program.

Section 12 Accelerated Reduction of PFAS Contamination in the Cape Fear River and Downstream Water Intakes, and Addendum to Consent Order Paragraph 12

During the third quarter of 2021, Chemours continued operation of the treatment system for the Old Outfall (Outfall 003) pursuant to Consent Order Paragraph 12(e) and a NPDES permit issued by NCDEQ.

As noted above, the Addendum to Consent Order Paragraph 12 was signed in the third quarter of 2020 and entered by the Court during the fourth quarter of 2020. Chemours' Addendum implementation activities during the third quarter of 2021 included:

Consent Order Addendum Paragraph 1

On September 30, 2021, Chemours submitted to NCDEQ and Cape Fear River Watch the Cape Fear River PFAS Mass Loading Assessment – Second Quarter 2021 Report pursuant to Consent Order Addendum Paragraph 1(b). The report describes sampling activities and mass loading results for the Cape Fear River and PFAS loading pathways from the second quarter of 2021. This submission was also pursuant to quarterly reporting of mass loading sampling outlined in the Corrective Action Plan (Paragraph 16). In each of July, August and September 2021, Chemours conducted monthly mass loading sampling required by Consent Order Addendum Paragraph 1.

Consent Order Addendum Paragraph 2

During the third quarter of 2021, Chemours operated and maintained the four flow-through cells, i.e., the interim remediation systems, at Seeps A-D. On July 30 and September 30, 2021, Chemours submitted the Interim Seep Remediation Operation and Maintenance Reports #3 and #4, respectively. The Operation and Maintenance reports describe the operations and maintenance activities at the flow-through cells over the bimonthly reporting periods of May/June and July/August, respectively. Additionally, on August 26, 2021, Chemours submitted the Interim Seep Remediation Seep A Effectiveness Demonstration Report. This report provided a record of construction completion and demonstration of interim effectiveness for the Seep A system.

Consent Order Addendum Paragraph 3

As required by the Addendum, the Black Creek Aquifer interim measure system to extract groundwater from the seven existing Black Creek Aquifer monitoring wells (BCA-01, BCA-02, PW-11, PW-14, PW-15R, PIW-9D, and PIW-10DR) continued to operate in the third quarter as designed. During the third quarter of 2021 (July, August, and September), the system extracted 438,375 gallons of water for a total of 1,250,900 gallons since startup on November 30, 2020 through the last reading taken in September on the 27th. During the last two weeks of September, electric submersible pumps were removed and replaced with piston pumps at the four deeper extraction wells (BCA-01, BCA-02, PW-14, and PW-15R). The new pumps are expected to provide reliable service in these wells. Otherwise, the wells have continued to operate as designed with only minor, routine shutdowns for maintenance or equipment issues.

On August 13, 2021, Chemours submitted to NCDEQ the 60 percent design submittal package pursuant to Consent Order Addendum Paragraph 3(b). This design report provides the 60 percent design of the groundwater interception remedy, the ex-situ capture remedy and the groundwater treatment plant. This submittal package included a cover report, summarizing the remedy design, and had seven appended reports (Appendix A through Appendix G) detailing the design basis and 60 percent designs of the individual remedy components.

On September 15, 2021, Chemours received a conditional approval and comments from NCDEQ on the 60% design submittal and PDI report. During the second half of September, Chemours was preparing responses to NCDEQ's comments for submittal in early October 2021.

Consent Order Addendum Paragraph 4

Operation of the stormwater treatment system began on June 30, 2021. Consistent with the Stormwater Sampling Plan, Chemours conducted three sampling events in July 2021, four sampling events in August 2021, and two sampling events in September 2021 to evaluate the treatment system's effectiveness in removing indicator parameters HFPO-DA, PFMOAA, and PMPA. Results from the July



2021 and August 2021 sampling events indicated the treatment system removed all three indicator parameters to greater than 99%; September 2021 results are pending. The treatment system also appears to have consistently captured stormwater runoff from precipitation events of up to the 1-inch, 24-hour design storm.

Pursuant to CO Addendum paragraph 4(c), Chemours submitted a report to NCDEQ on September 30, 2021 summarizing the stormwater treatment system capture and removal efficiency during the July – August 2021 evaluation period.

Section 14 Toxicity Studies

Updated protocols for the aquatic toxicology studies were submitted to NCDEQ on August 19 and September 21, 2021. A meeting was scheduled (and held) with NCDEQ on October 14, 2021 to address remaining open questions and comments.

Section 16 Groundwater Remediation

On September 30, 2021, Chemours submitted to NCDEQ and Cape Fear River Watch the Cape Fear River PFAS Mass Loading Assessment – Second Quarter 2021 Report pursuant to Consent Order Addendum Paragraph 1(b). This submission was also pursuant to quarterly reporting of mass loading sampling outlined in the Corrective Action Plan (Paragraph 16). On-going groundwater remediation activities are being conducted pursuant to Consent Order Addendum Paragraph 3 and are described earlier in this document under that paragraph. Pursuant to Corrective Action Plan monitoring recommendations, annual groundwater sampling for Table 3+ PFAS and EPA Method 537 perfluoroalkyl carboxylic acids (PFCAs) was conducted during the third quarter of 2021.

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

As shown in the summary tables above, Chemours continues to make significant progress in implementing the Consent Order requirements of Paragraphs 19 and 20. Since resuming RO installations in June 2020, following the COVID-19 postponement period, the pace of RO acceptance rates and installations has been on the rise. O&M activities for installed GAC systems continues uninterrupted. Bottled water services continue uninterrupted for 2,491 homes. In September 2021, Chemours entered into an agreement with Bladen County to fund public water system upgrades and connections associated with providing permanent replacement drinking water supplies under the Consent Order.

Section 21 Private Well Testing

To date, 12,203 residences have been identified within the current study area, of which 7,380 have been sampled and 2,847 residences have received at least one initial sample offer letter. Results of sampling that occurred throughout the third quarter of 2021 (528 residences) are presented at the beginning of this progress report. Current Step-out and Infill distance intervals range from 2.5 miles to 17.5 miles from the Site.

Chemours continues to follow the private well cold calling protocol (i.e., to confirm residences, tenant/owner name and phone number, addresses, not connected to public water, and residents' willingness to have a sample collected from their drinking water well).

Section 22 Provision of Sampling Results

Chemours provided (and continues to provide) sampling results to NCDEQ and residents 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 or voucher card for bottled water). As of September 30, 2021, there are 2,491 residences receiving bottled water services.

Section 24 Drinking Water Compliance Plan

As discussed above, the off-site replacement drinking water program continues. The Drinking Water Compliance Plan is currently under review and some of the protocols are being revised based on discussions with NCDEQ in recent weeks. The revised Drinking Water Compliance Plan will be submitted to NCDEQ in the coming weeks. The following revised procedures are currently implemented based on approval by NCDEQ:

- Point-of-Use (POU) Granular Activated Carbon (GAC) filtration systems for commercial establishments that were eligible for RO systems, pursuant to NCDEQ's approval letter dated January 5, 2021.
- Chemours connected six homes in Cumberland County to public water as part of a pilot program and a report was submitted to NCDEQ on June 25, 2021 and approved by NCDEQ on September 22, 2021. The program will now expand to include additional residences for public water connection in the study area.
- Starting in the second quarter of 2020, the GAC OM&M sampling has been revised to include quarterly sampling in between the lead and lag carbon vessel and one annual raw water sample.

Section 26 Total Organic Fluorine

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

Section 28 Reporting

Chemours submitted the Consent Order second quarter 2021 progress report on July 29, 2021.

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

8th Progress Report
Development of a Total Organic Fluorine (TOF) Method for the Analysis of
Processed Wastewater Streams and Air from Fayetteville Works (NC)
Susan D. Richardson, Alexandria L. Forster, University of South Carolina
October, 2021

Since the last progress report in July, focus has been on finalizing the Adsorbable Organic Fluorine (AOF) method and further optimization of the Extractable Organic Fluorine (EOF) method.

1. Adsorbable Organic Fluorine (AOF)

The focus since July for the AOF method has been on wrapping up method parameter optimization and moving towards using the optimized method to calculate percent recoveries for individual PFAS standards and a mix of PFAS standards in ultra-pure water and river water. To help improve inorganic fluoride background levels, a carbon pre-rinse step was tested before loading the sample onto the carbons to understand if an anionic solution used before loading the sample would lower the adsorption ability of inorganic fluoride to the carbons. After testing this step, experiments were aimed at using the optimized method to test for percent recoveries for all 39 PFAS standards in ultra-pure water. Percent recoveries ranged from 64-112% with smaller chain PFAS compounds having a lower percent recovery as expected. A PFAS standard mix was also spiked into river water collected in Columbia, South Carolina to test for percent recovery in a more realistic matrix. Percent recovery for the PFAS standard mix using the optimized method was 87%.

Focus in further experiments will be to quantify percent recovery of the 39 PFAS standards individually in river water. Sample storage time has also been tested for one and two weeks after collecting samples, and experiments will be repeated at the one-month interval. An LOQ and LOD was also calculated for this method, but further optimization is being done to help lower these values.

2. Extractable Organic Fluorine (EOF)

Method parameter optimization experiments have been continued for the EOF method since the last progress report. These experiments have included the optimization of the conditioning, equilibration, sample load, wash, drying, and elution step for composition, volume, and pH. Pre-soaking the cartridges before eluting has also been tested at varies times.

Focus in further experiments will be on the continuation of optimizing the EOF method parameters and moving into using the optimized method for percent recoveries of all 39 PFAS standards individually and in a mix in ultra-pure water and river water just as mentioned above in the AOF method for comparison. Sample storage will also be tested over several time intervals as above, and LOQ and LOD values will also be calculated.