



PFAS Private Well Sampling Updates
North Carolina Department of Environmental Quality
November 29, 2022





Discussion Topics

- PFAS and GenX
- Groundwater sampling
- Alternate Water Options
- Additional information

Emerging Compounds: GenX and PFAS

- **GenX = HFPO-DA or C3 Dimer Acid = $C_6HF_{11}O_3$**
- **GenX** is a trade name for a manmade, unregulated chemical used in manufacturing nonstick coatings and for other purposes.
 - Is an *emerging compound* in a family of chemicals known as per- and polyfluoroalkyl substances (PFAS)
 - Produced and emitted by one company in NC – Chemours (formerly Dupont)
 - Has been discharged into the Cape Fear River for 30+ years.
 - Until the past couple of years, labs couldn't measure it.

Emerging compounds:

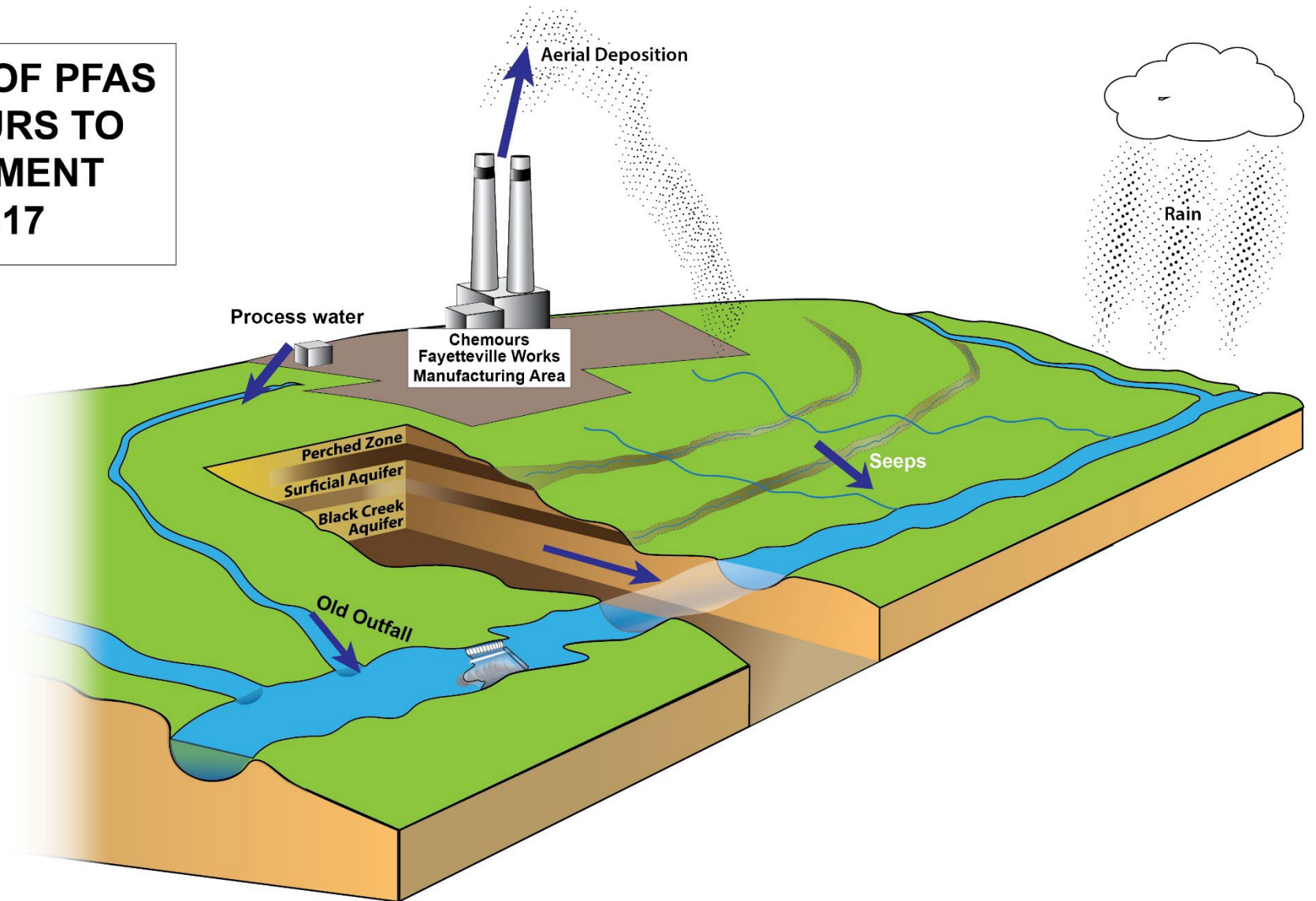
- No (or limited) specific limits in environmental regulations.
- Little is known about how they behave in the environment.
- Little known about their effects on human health and environment.
- In general, animal studies have found that animals exposed to PFAS at high levels resulted in changes in the function of the liver, thyroid, pancreas and hormone levels.
- EPA has set interim and final health goals for several PFAS (PFOA, PFOS, PFBS and Gen X)
- Presents significant challenge for regulatory agencies.

Emerging Compounds – GenX Case History in NC

- **Early-mid 2017:** Focus on surface water issues
- **Mid 2017:** Groundwater issues discovered
- **Mid-late 2017:** Air emission contributions
- **Through 2018:** Testing of emissions and drinking wells
- **Feb. 2019:** Consent Order signed
- **Dec. 2019:** Thermal Oxidizer
- **2019-Present:** Ongoing private well testing around the plant
- **Early 2022:** Lower Cape Fear Region well sampling



MAIN SOURCES OF PFAS FROM CHEMOURS TO THE ENVIRONMENT BEFORE 2017



Note: Image is conceptual and is not to scale

Groundwater Testing

- Found high levels of PFAS compounds in onsite monitoring wells at the Chemours plant in Bladen County in 2017
- In 2017, NCDHHS established a GenX drinking water health goal of 140 ng/L (ppt)
- In 2022, EPA established a nationwide health advisory for GenX at 10ppt that has been incorporated into the Chemours Consent Order
- DEQ tested wells on properties adjacent to Chemours first and found high levels
- Asked Chemours to test additional wells in the area to determine extent of contamination
- November 3, 2021: DEQ letter stating that Chemours is responsible for contamination of groundwater monitoring wells and water supply wells in New Hanover County and potentially other counties



Legend

GenX Sampling Locations

- 0 ng/L - 1,800 ng/L
- 1,801 ng/L - 12,500 ng/L
- 12,501 ng/L - 22,900 ng/L
- 22,901 ng/L - 37,000 ng/L
- 37,001 ng/L - 61,300 ng/L

□ Chemours Facility Property

Chemours – Consent Order Feb. 2019

Addressing contamination

- NC DEQ signed a Consent Order with Chemours Feb. 26, 2019:
<https://deq.nc.gov/news/hot-topics/genx-investigation>
- Consent Order included:
 - Requirements to reduce air emissions and to achieve maximum reductions of all remaining PFAS contributions to the Cape Fear River on an accelerated basis, including groundwater.
 - Notify and coordinate with downstream public water utilities when potential discharge of GenX compounds into the Cape Fear River.
 - Sample wells and provide drinking water
 - Additional penalties will apply if Chemours fails to meet the conditions and deadlines established in the order.



Implementing the Chemours Consent Order

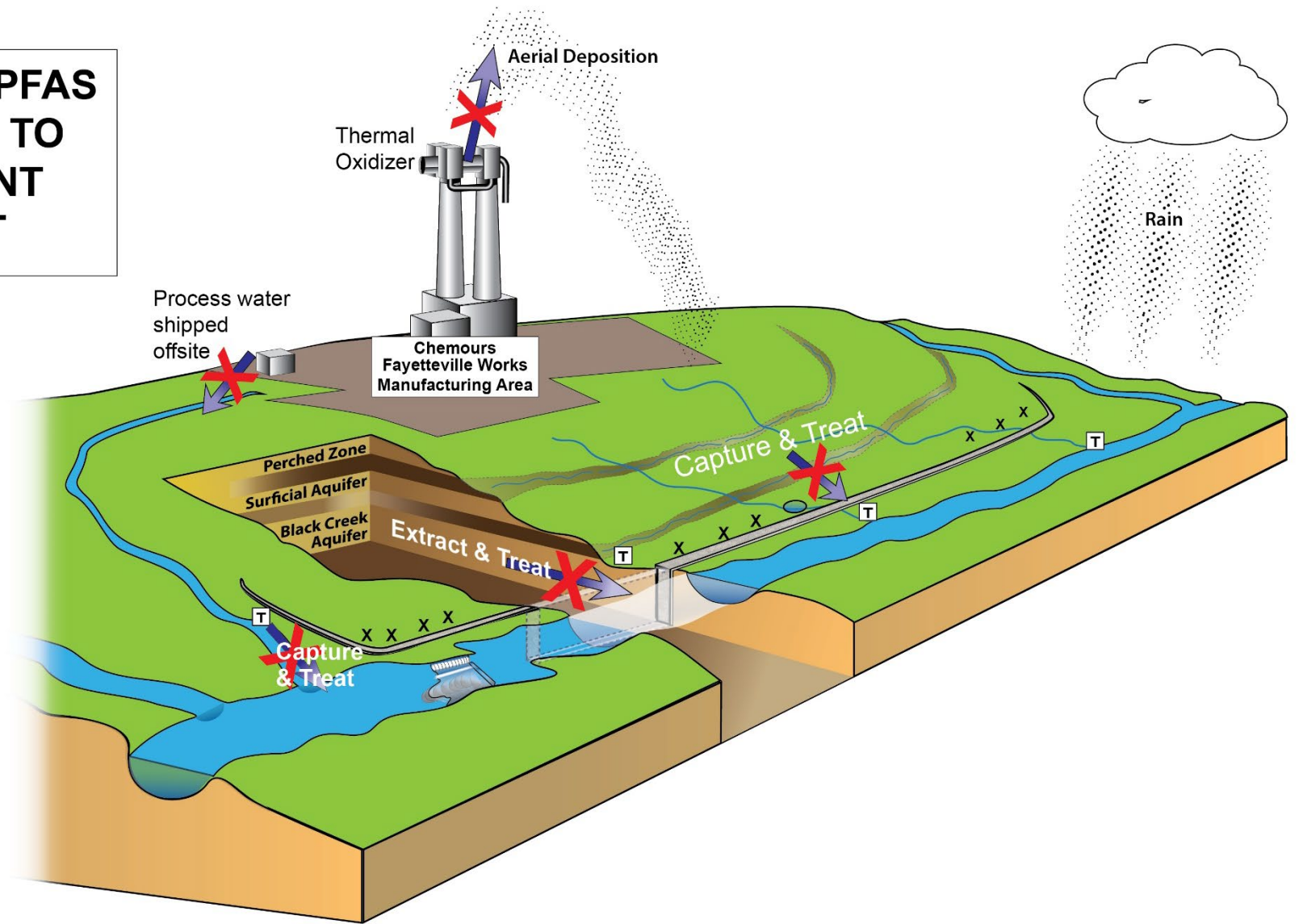
Addressing contamination

Per the 2019 Consent Order and 2020 Addendum, Chemours must also:

- Achieve control technology improvements and meet emissions reduction milestones;
- Determine which PFAS at what amounts are in wastewater and stormwater at the facility;
- Determine which PFAS at what amounts are in river sediment and downstream raw water intakes for drinking water plants;
- Take specific actions to address more than 90 percent of the PFAS entering the Cape Fear River through groundwater from the **residual** contamination on the site.
 - As of 2022, the interim measures required by the Addendum are operational. The final design / implementation of the barrier wall and treatment system is underway.

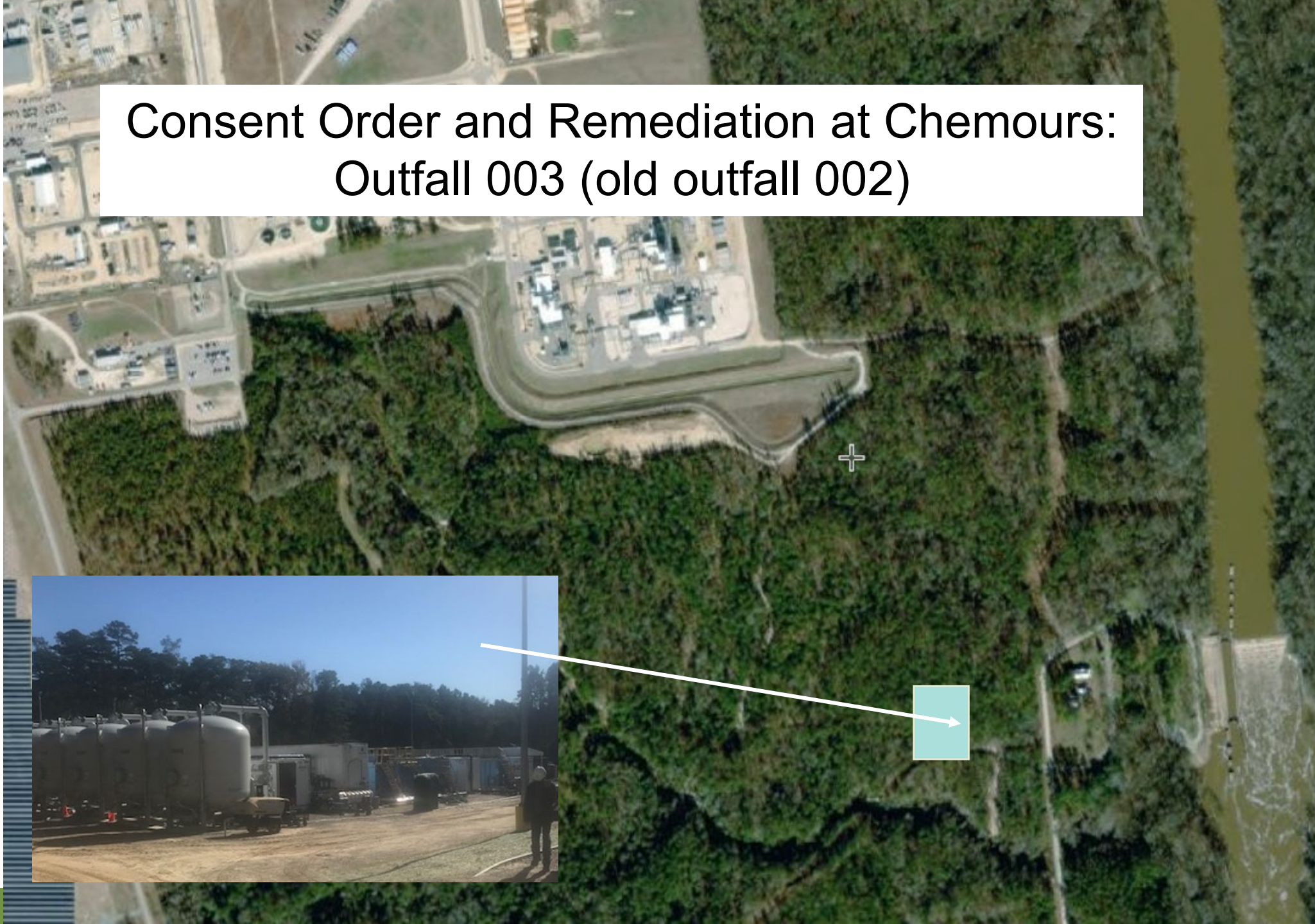


MAIN SOURCES OF PFAS FROM CHEMOURS TO THE ENVIRONMENT 2017 - PRESENT



Note: Image is conceptual and is not to scale

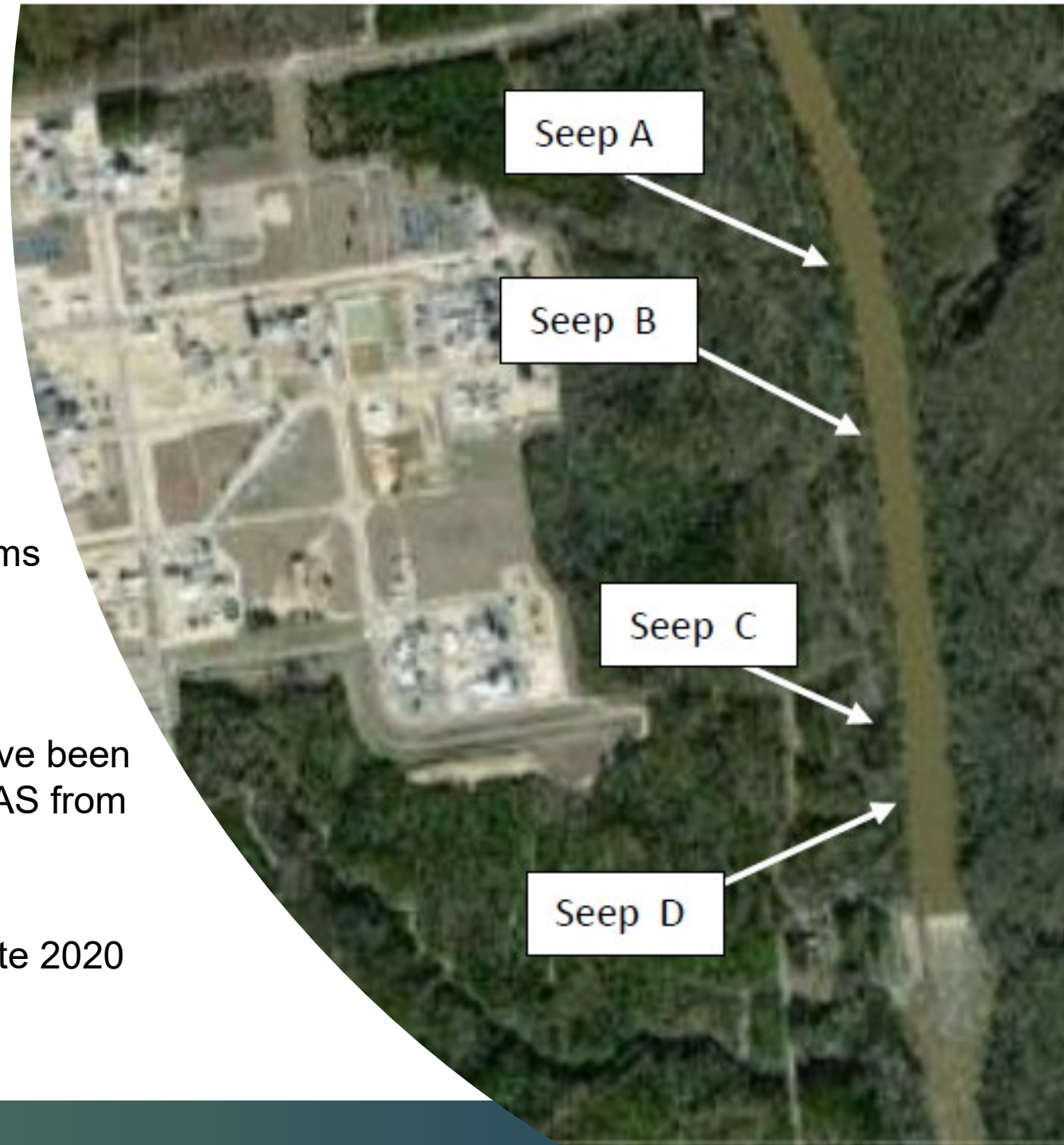
Consent Order and Remediation at Chemours: Outfall 003 (old outfall 002)



Consent Order and Remediation:

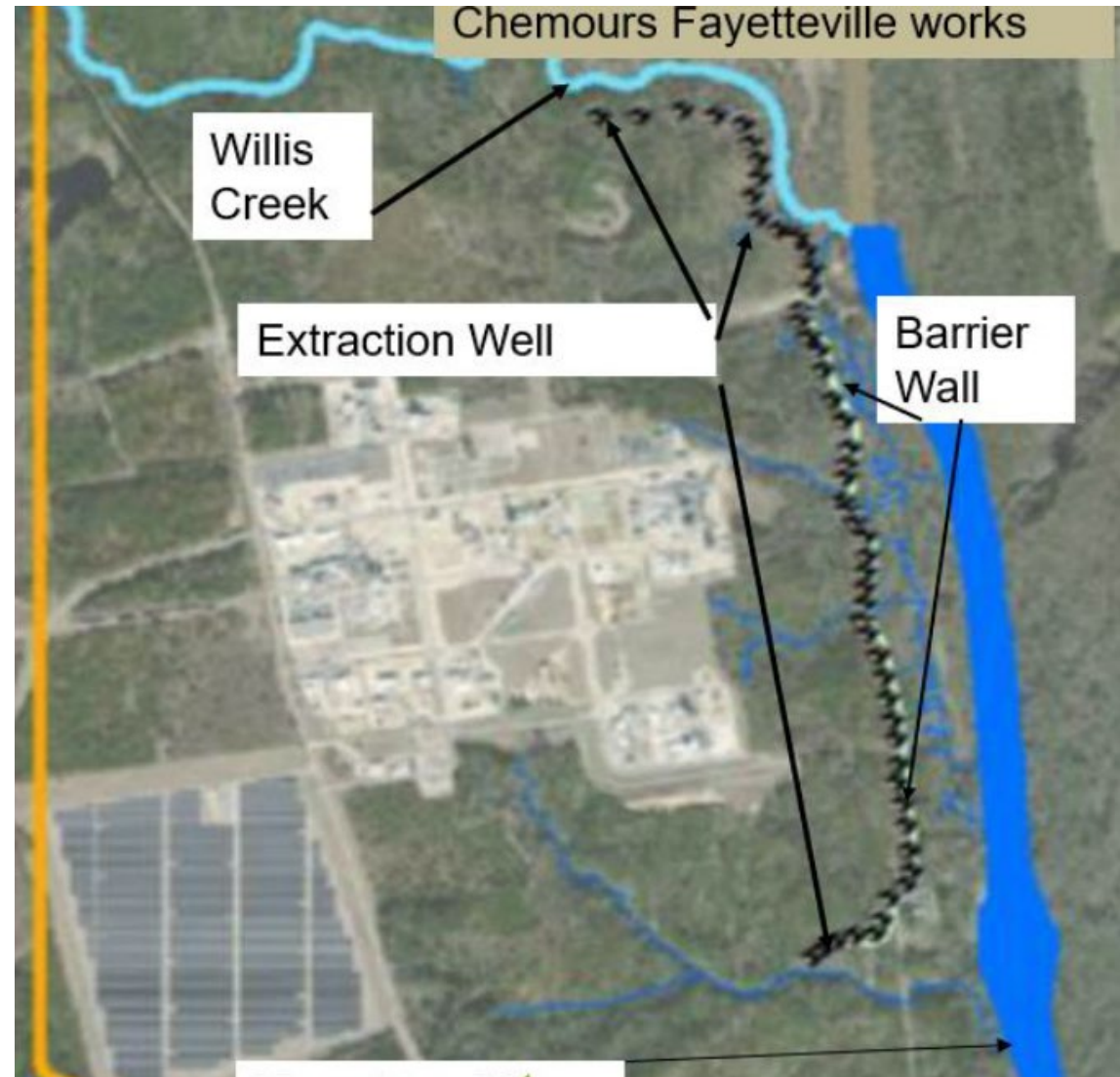
Flow Through Cells (seeps)

- Per the 2019 Consent Order and 2020 Addendum, Chemours has installed in situ treatment systems to remove PFAS from the seeps. These treatment systems consist of flow through cells containing granular activated carbon.
- There are four onsite seeps (A, B, C and D) that have been identified that discharge into the Cape Fear River. PFAS from the site reach the Cape Fear River from these seeps.
- The four treatment systems were installed during late 2020 though late spring 2021.



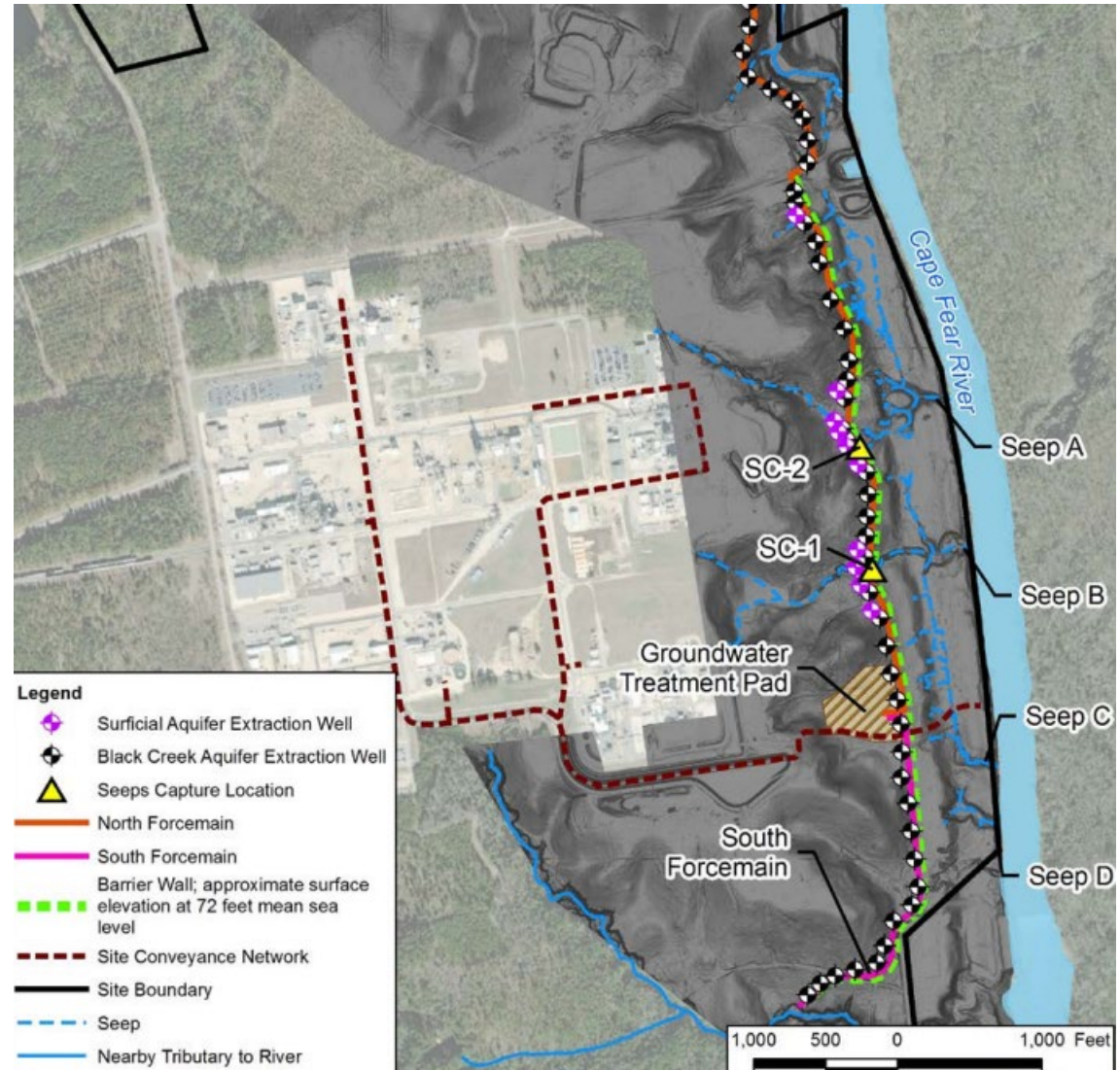
Barrier Wall: design

- 6,050 feet long and 75-100 feet deep. Keyed into Upper Cape Fear Confining Unit
- Wall is approx. 36 inches thick
- One-pass installation mixes soil and bentonite/cement mix continuously during construction



Groundwater extraction system

- 70 Extraction Wells – Wells are located along entire length of barrier wall and extending approx. 1,000 feet north of the termination of barrier wall.
- Two force-mains to convey extracted groundwater to treatment system
- Design total flow rate = 980 gpm



Sample Wells and Provide Drinking Water for impacted private drinking water wells

- Sample drinking water wells
 - ¼ mile beyond the closest well that had PFAS levels above 10 parts per trillion
 - Annually retest wells that were previously sampled
 - Bottled water in 3 days if exceed a Consent Order limit
- For those with GenX above **10 parts per trillion (New EPA Health Advisory)**:
 - Provide permanent drinking water supply
 - Options: Public waterline connection where feasible, whole-building GAC filtration system, reverse osmosis (RO) units installed on every bathroom and kitchen sink
- For those with combined PFAS levels above 70 parts per trillion or any individual PFAS compound above 10 parts per trillion:
 - Provide, install and maintain up to three under-sink RO systems per residence

Lower Cape Fear Region Well Sampling

- November 3, 2021 letter from DEQ to Chemours
 - <https://deq.nc.gov/genx/consentorder/deq-notice-chemours-about-downstream-counties/download?attachment>
- Requirement to submit a plan within 90 days to conduct a comprehensive assessment of groundwater contamination in New Hanover County and other affected counties in accordance with 2L and the 2019 Consent Order.
- Requirement to submit an updated drinking water compliance plan within 90 days pursuant to the Chemours Consent Order. The plan shall provide for sampling of drinking water wells in downstream counties to identify affected parties entitled to provision of replacement water supplies.
- DEQ responded with additional comments to the Chemours drinking water compliance plan on May 2, 2022, requiring further revision, expedited sampling and shared recent DEQ groundwater data from the region.



Sampling Your Drinking Water Well

- Most wells can be sampled without entering a residence.
- Personal protective equipment and social distancing guidelines are being used.
- To request well testing in the Lower Cape Fear Region, call Chemours at: **910-678-1100**
- DEQ can also assist residents in the Lower Cape Fear with well sampling questions
- Parsons Environment and Infrastructure – known as “Parsons” – is the independent water testing contractor for Chemours.
- Parsons and Chemours are prioritizing private wells for sampling based on several criteria: proximity to the Cape Fear River, groundwater wells with known PFAS detections, and municipal water and sewer lines.



Letter to Private Well Users

- Chemours has mailed out 100,000 letters to private well owners in the Lower Cape Fear Region
- Letters are being sent to well owners based on initial criteria to include: proximity to the Cape Fear River and municipal water and sewer lines; known detections of PFAS in groundwater wells
- These letters from Chemours ask for information about the private well and request contact information from the well owner to assist with scheduling sampling
- 79 properties are currently eligible for well sampling in Columbus County. 55 properties have been scheduled for sampling
- Chemours is required to test for 12 PFAS compounds: PFMOAA, PMPA, PFO2HXA, PEPA, PFO3OA, PFO4DA, Nafion BP 1 (PS Acid), Nafion BP 2 (Hydro PS Acid), PFECA-G, PFO5DA, PFHpA, Gen X (HFPO-DA)



The Chemours Company
Fayetteville Works
22828 NC Highway 87 W
Fayetteville, NC 28306

«TodaysDate»

«RecipientName»

«RecipientAddressStreet»

«RecipientAddressCity», «RecipientAddressState» «RecipientAddressZip»

RE: Residential Drinking Water Well Information Request for «ResidentAddressStreet», «ResCityStateZip»

Dear Owner/Resident/Tenant:

Chemours has begun a drinking water well testing program in New Hanover, Brunswick, Columbus and Pender counties. The testing is being performed per the revised Interim Four Counties Sampling and Drinking Water Plan (Plan). The revised Plan was submitted to North Carolina Department of Environmental Quality (NCDEQ; <https://deq.nc.gov/>) on April 1, 2022.

The purpose of this letter is to request information about the source of your drinking water. Chemours is in the process of identifying private drinking water wells that may qualify for testing. The water will be tested for the 12 per- and polyfluoroalkyl substances (PFAS) compounds listed in the Consent Order (CO) and also other non PFAS compounds.¹ Please complete the form below and return in the envelope provided or call (910) 678-1100 and leave a message. A team member will call you back within three business days. For more information, please check the Fayetteville Works website at: <https://www.chemours.com/en/about-chemours/global-reach/fayetteville-works>.

Sincerely,

Dawn M. Hughes, Plant Manager
Chemours – Fayetteville Works

Name: «ResidentName»

[Insert QR Code](#)

If incorrect, add correct name here: _____

Address: «ResidentAddressStreet»

«ResCityStateZip»

If incorrect, add correct address here: _____

I own this residence: Yes No I live at this residence: Yes No

This home is connected to public water: Yes No

Primary source of drinking water is a private well: Yes No

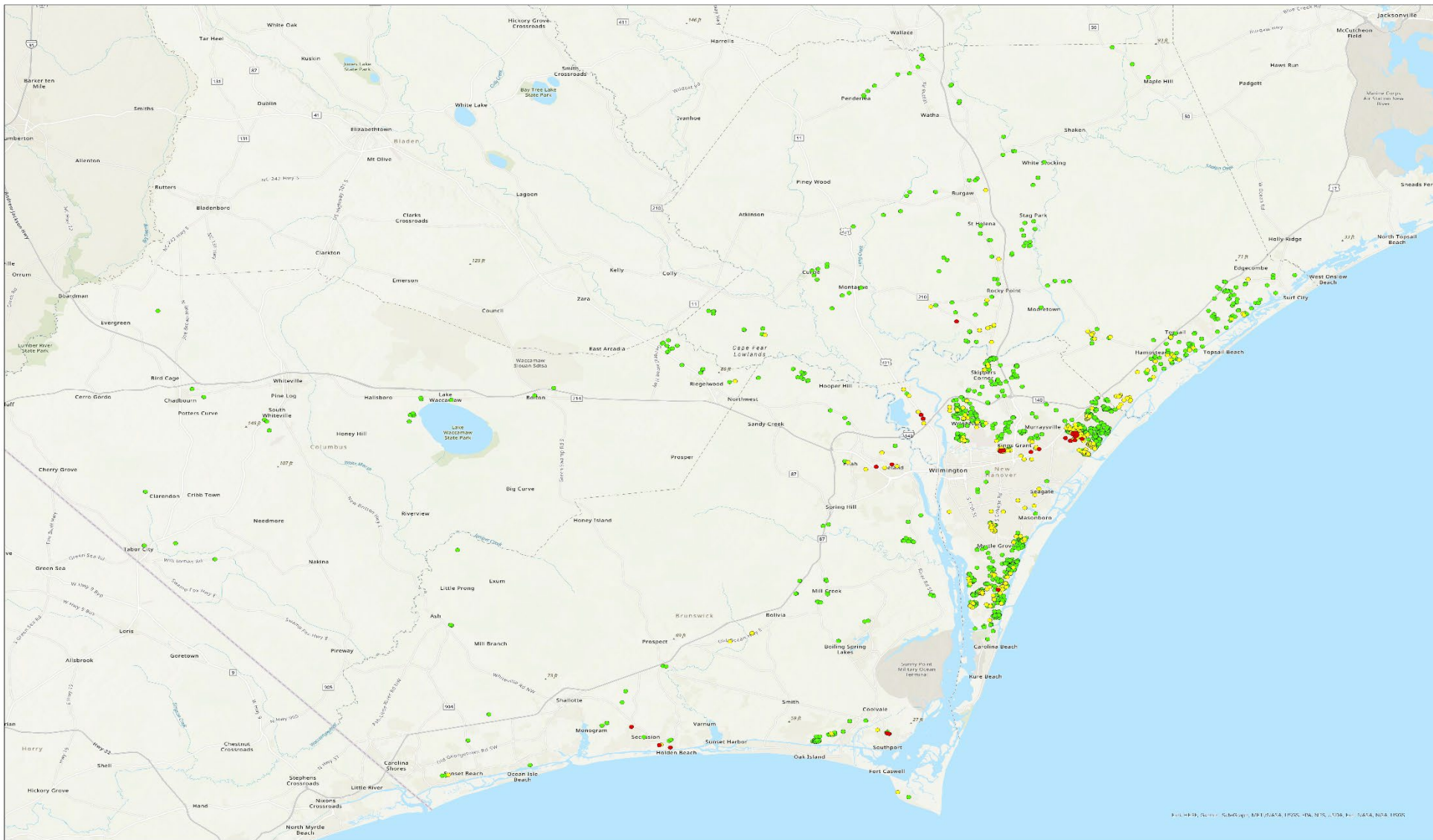
Phone: _____ Can we text this number: Yes No

¹ Chemours entered into a Consent Order with NCDEQ and Cape Fear River Watch. The Superior Court for Bladen County approved the Consent Order on February 25, 2019.

Updated Private Well Sampling Numbers

- Chemours has reported that **595 residences** in the Lower Cape Fear Region qualify for alternate water (1 in Columbus County).
- **532** private wells have one of more of the Chemours attachment C PFAS at or above 10 ppt for a single compound or combined levels at or above 70ppt
- These residences qualify for three reverse osmosis filters
- **63** private wells have the compound Gen X at or above 10 ppt
- These residences qualify for whole house granular activated carbon filtration systems or reverse osmosis units at every kitchen and bathroom sink or connection to municipal water
- Chemours will cover the installation and maintenance costs for the filters for 20 years or the connection to municipal water (water bill is paid for 20 years up to \$75/month for Gen X qualifying residences) if public water is feasible.





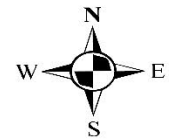
Sampled Residences

● No Detections or No PFAS ≥ 10 ppt; These homes do not qualify for water treatment (1,080)

● Any PFAS (Except GenX) ≥ 10 ppt or Total Sum PFAS ≥ 70 ppt; These homes qualify for RO treatment system (271)

● GenX ≥ 10 ppt; These homes qualify for GAC system or municipal water (38)

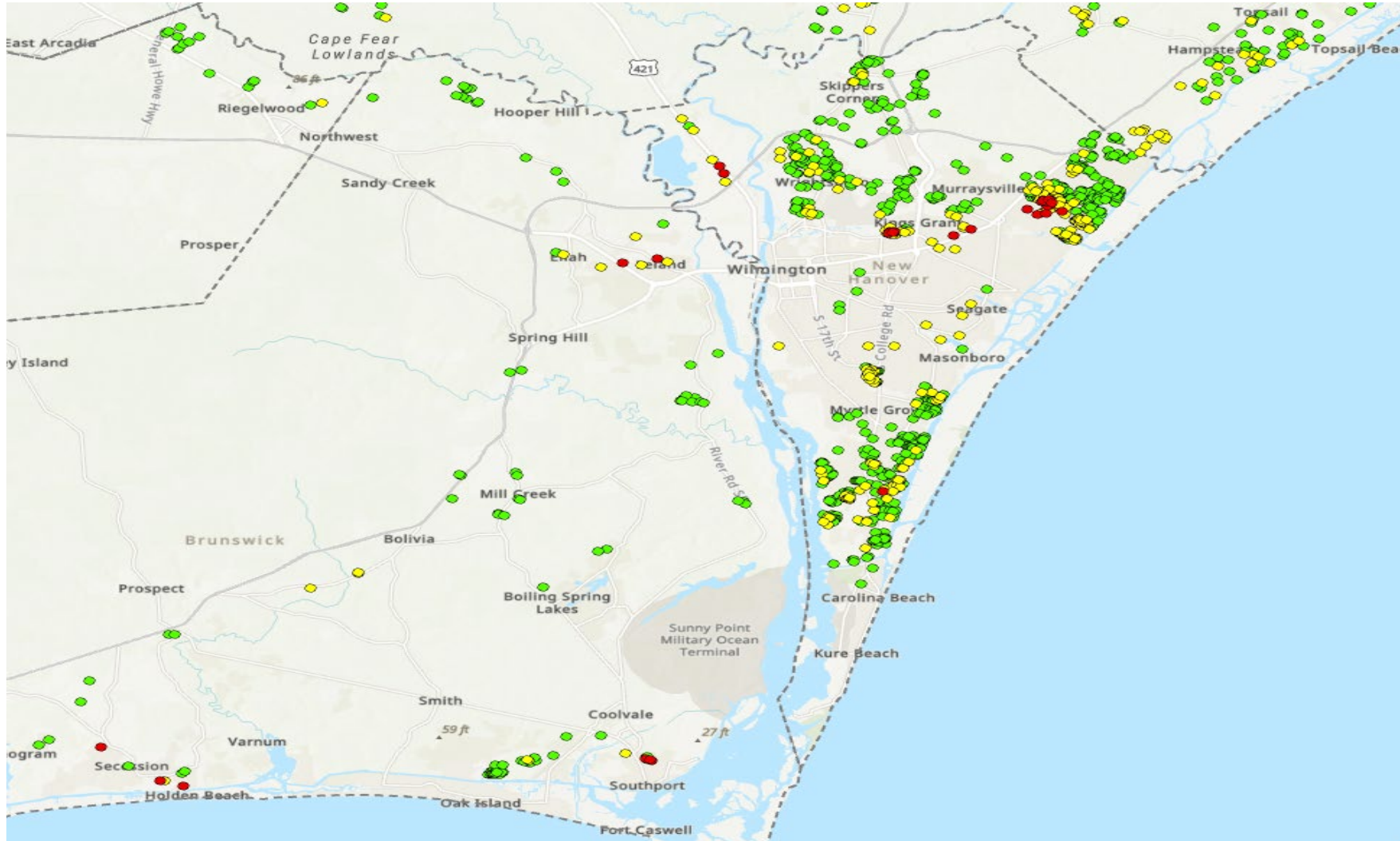
*NOTES: To date, more than 1,000 residences have been sampled in the Lower Cape Fear Four Counties region, consisting of Pender, Columbus, New Hanover, and Brunswick counties. Data reflected above may not include the most up-to-date information as new information is continuously being uploaded into the NCDEQ database. For more information or if you do not see your well listed, please contact the Division of Waste Management at (919) 707-8200.



PFAS Residential Well Sampling Lower Cape Fear Region Results through 10/2022

Map Creation Date: 10/10/2022
Map Author: Jared Wilson
Data Sources: North Carolina Department of Environmental Quality, Chemours, ESRI

PFAS Residential Well Sampling



Next Steps if Chemours PFAS are detected



Installation of water treatment systems if Chemours PFAS are detected at or above 10ppt including GenX

- Two types of well water treatment systems are used
- Whole-house treatment (GAC) and under-the-sink (RO) versions
- DEQ has tested both systems for their effectiveness
- Maintenance



Whole-House Granular Activated Carbon system

Reverse Osmosis System

Bottled Water and Sampling Information

- Well Sampling Results can take 4-6 weeks to receive
- If a private well is tested by Chemours / Parsons and found to have Chemours PFAS above 10ppt bottle water will be provided to the resident within 3 days.
- Chemours is using a new bottled water voucher system that may help some residents with their requests for different water volume sizes.
- The voucher card would allow residents to purchase the type of water and size of container they prefer with pre-paid money voucher cards provided by Chemours.
- The Consent order establishes timeframes for filter installation or connection to municipal water

Online Resources

- DEQ website dedicated to Chemours / GenX Investigation
 - <https://deq.nc.gov/news/key-issues/genx-investigation>
- Website with specific Lower Cape Fear Region information
 - <https://deq.nc.gov/lowercape-fear-wellsampling>

Well Sampling Information for Lower Cape Fear Area Residents

Private Drinking Water Well Sampling Requests

If you live in New Hanover, Brunswick, Pender or Columbus counties, call Chemours at (910) 678-1100 to request well sampling or for more information.

At DEQ's direction, Chemours is sampling for PFAS contamination in private drinking water wells in four downstream counties: New Hanover, Brunswick, Columbus and Pender. Private drinking water well sampling began in February. To have your well sampled, call Chemours at (910) 678-1100. Messages to the Chemours call-line are monitored during regular business hours (Monday through Friday, 9 a.m. to 5 p.m.); Chemours should respond within 24-to-48 hours starting on the next business day. Chemours is also sending letters to well owners/residents requesting information about primary drinking water sources and offering sampling.

GenX Investigation

[Chemours Consent Order](#)

[GenX Information for Fayetteville-area Residents](#)

[Well Sampling Information for Lower Cape Fear Area Residents](#)

[Recent Actions, Investigations and Enforcement](#)

[Chemours Permit Information](#)

[Air Quality Sampling](#)

[GenX Surface Water Sampling Sites](#)

[Groundwater](#)

[Health Related Resources](#)

Next Steps

- Continued private well sampling in four Lower Cape Fear counties: New Hanover, Columbus, Pender and Brunswick.
- Evaluation of municipal water connections in coordination with local utilities
- Continued work on the current and proposed remediation systems at the Chemours plant to include the barrier wall and groundwater extraction system.
- Additional environmental assessment in the lower Cape Fear Region-Aquifer recharge areas, biosolid sites, direct application or injection areas of Cape Fear River water, leaking water or sewer lines that convey water sources from the Cape Fear River

Waste Management

Michael E. Scott, Director
217 W. Jones Street
1464 Mail Service Center
Raleigh, NC 27699-1646

919-707-8246
DWM main number 919-707-8200

<http://portal.ncdenr.org/web/wm>

Questions???