April 1, 2025

North Carolina Department of Environmental Quality
Expanded Well Sampling Information Session

Agenda

Residents in the expanded area interested in having their wells sampled should call Chemours at (910) 678-1101.

Link for more information, including presentations: https://www.deq.nc.gov/news/key-issues/genx-investigation/genx-information-residents

To ask questions after the information session, please email publicaffairs@deq.nc.gov.

- Presentations:
  - ***Overview of How We Got Here*** by Michael Scott – Director of the Division of Waste Management within the Department of Environmental Quality
  - ***Explanation of the Extended Area*** by Jared Wilson – Environmental Program Analyst with the Office of the Secretary
  - ***Health Impacts Related to PFAS*** by Kennedy Holt – Environmental Toxicologist with the Department of Health and Human Services, Division of Public Health
- Question and Answer Session Panelist
  - Michael Scott – Director of the Division of Waste Management
  - Jared Wilson – Environmental Program Analyst
  - Kennedy Holt – Environmental Toxicologist

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.

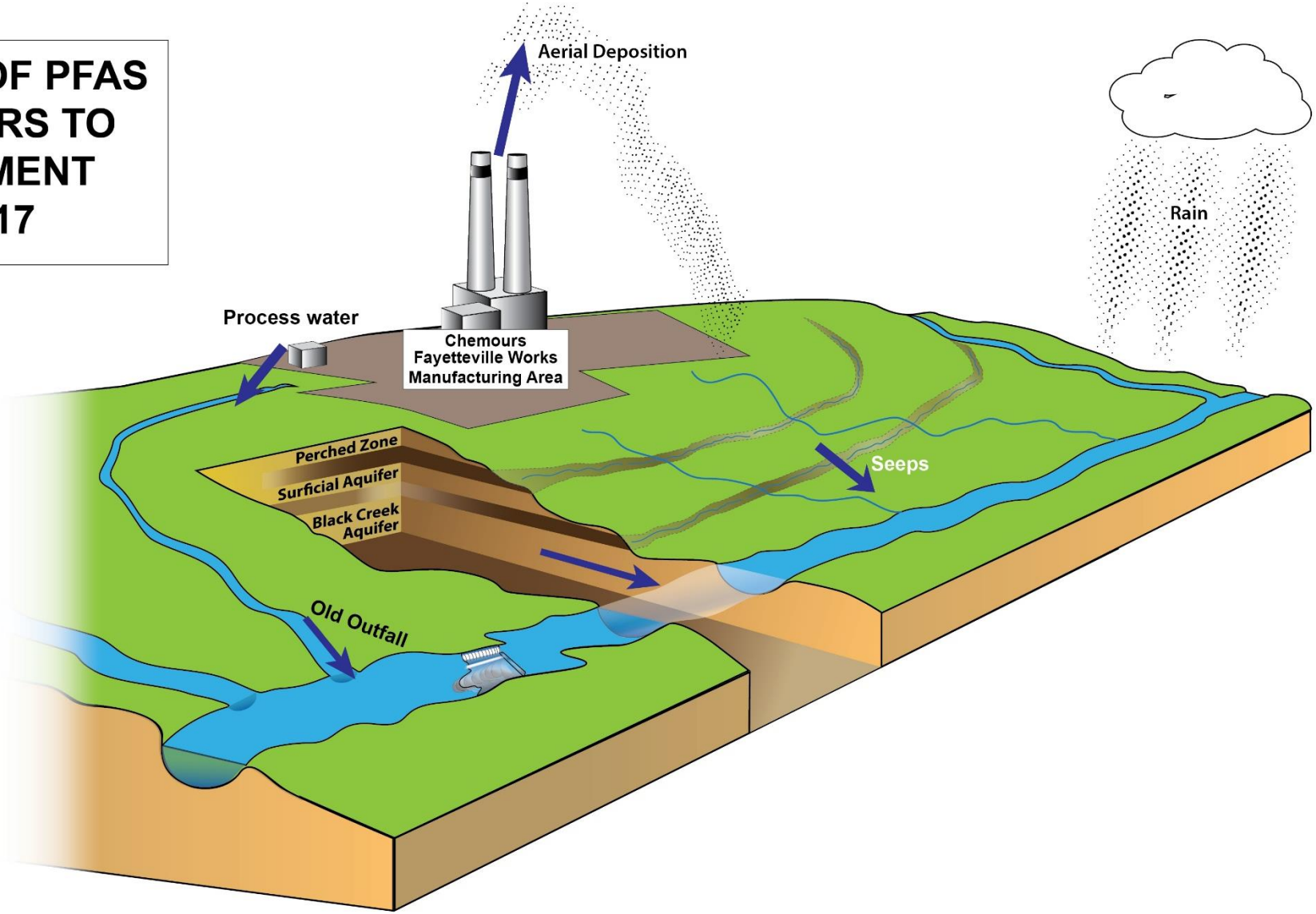
Emerging compounds:

- 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 Maximum Contaminant Levels for public water systems
- 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



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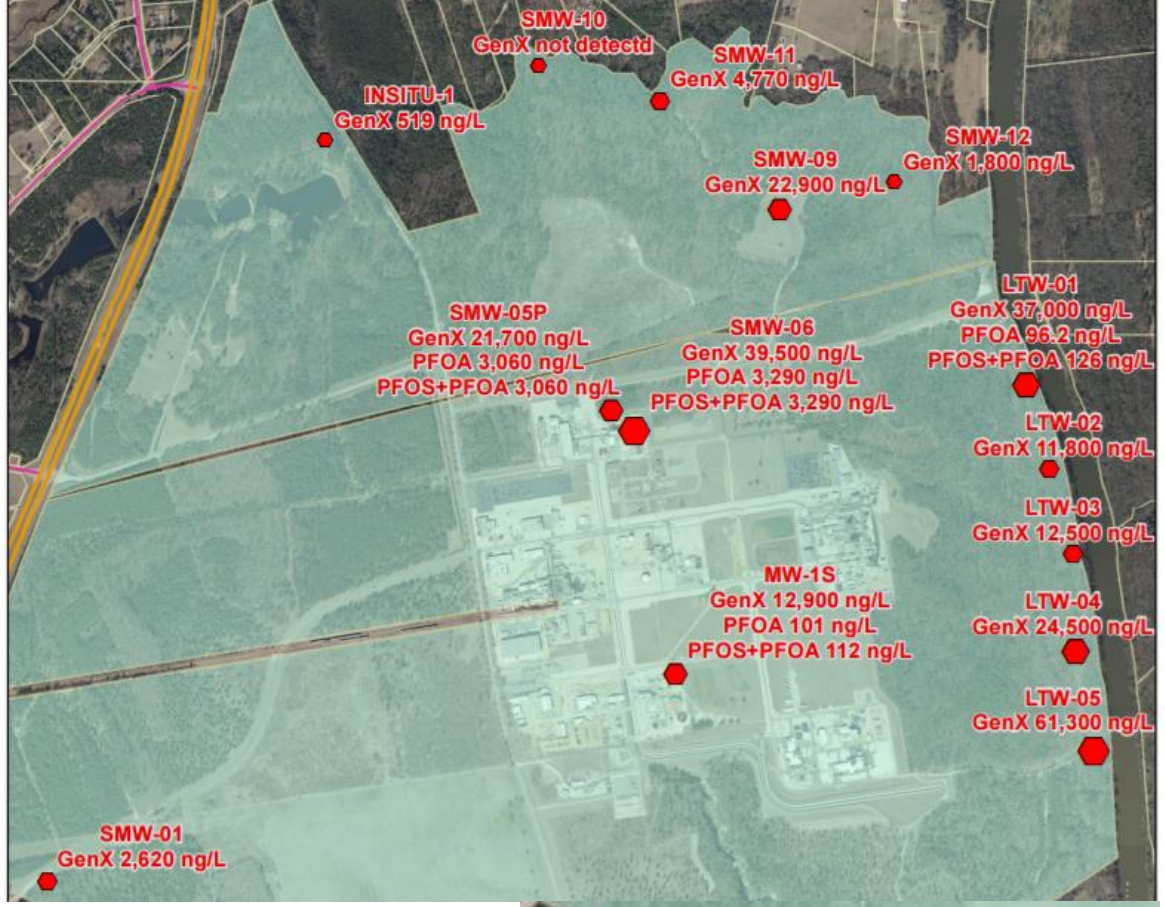
Groundwater Testing

- 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



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.

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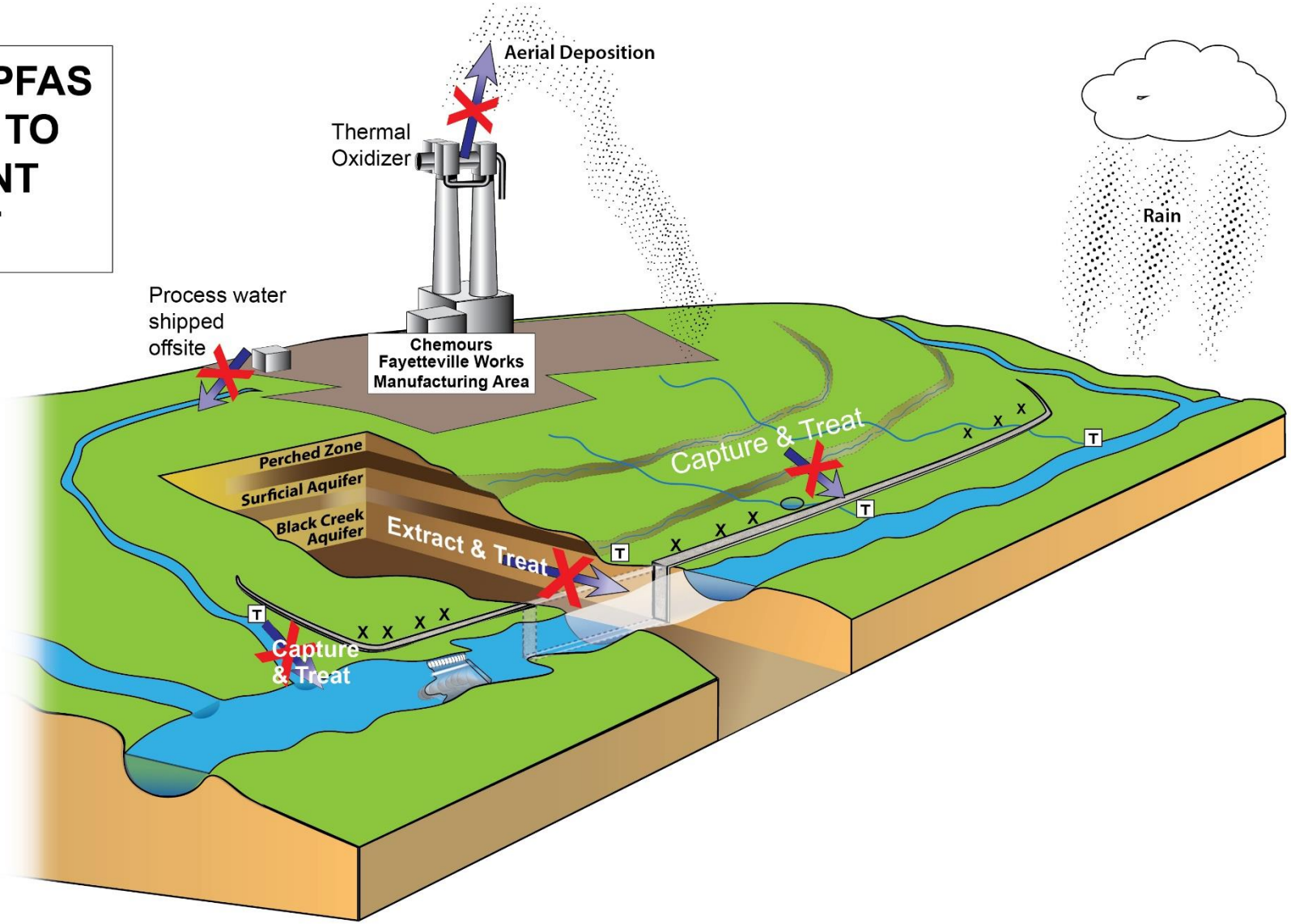
MAIN SOURCES OF PFAS FROM CHEMOURS TO THE ENVIRONMENT 2017 - PRESENT



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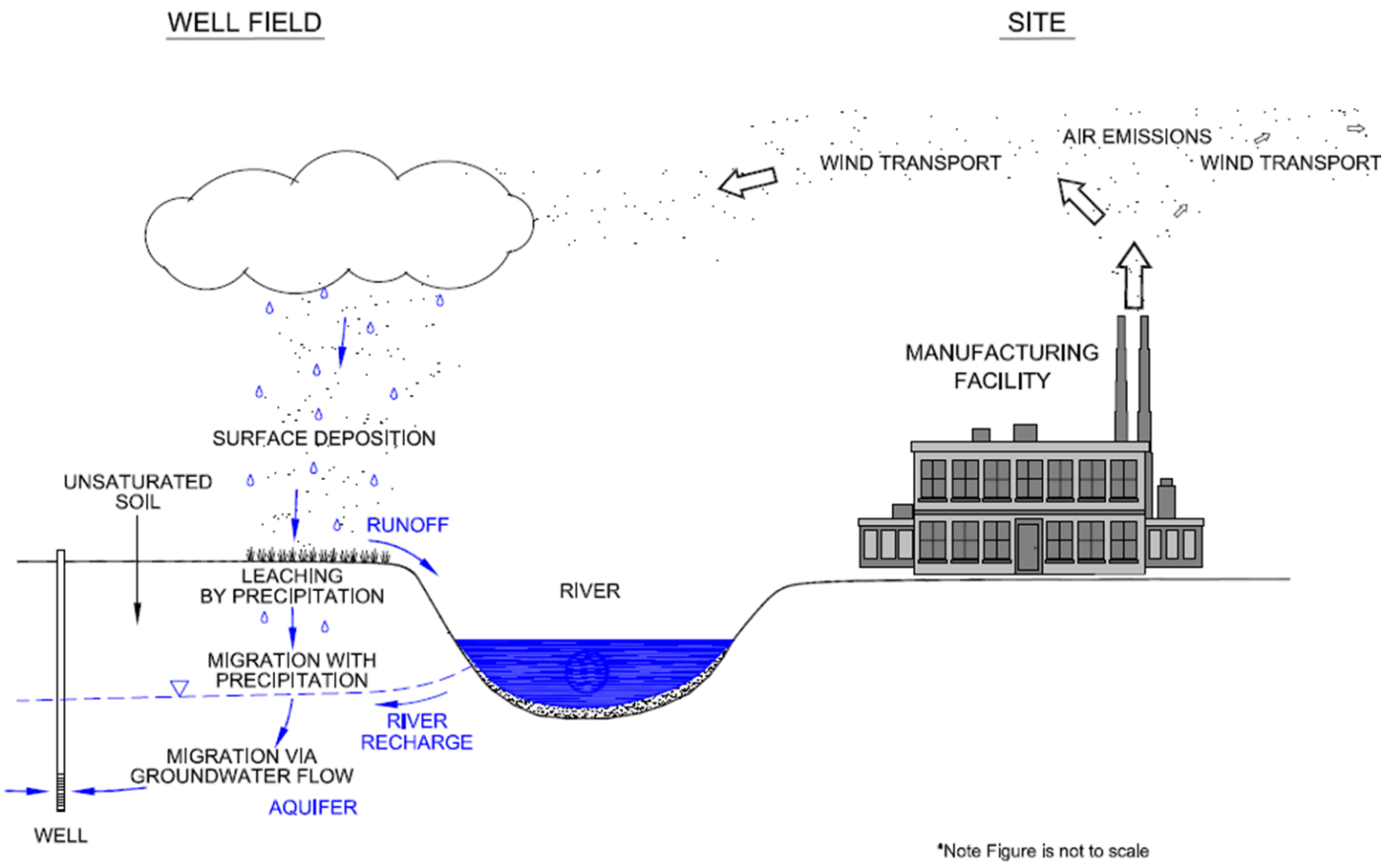
Role of Air Emissions



Air emissions have significantly lowered since Consent Order

- Control technology improvements – Thermal Oxidizer/Scrubber control system installed December 2019
- 99% facility-wide GenX emissions reduction

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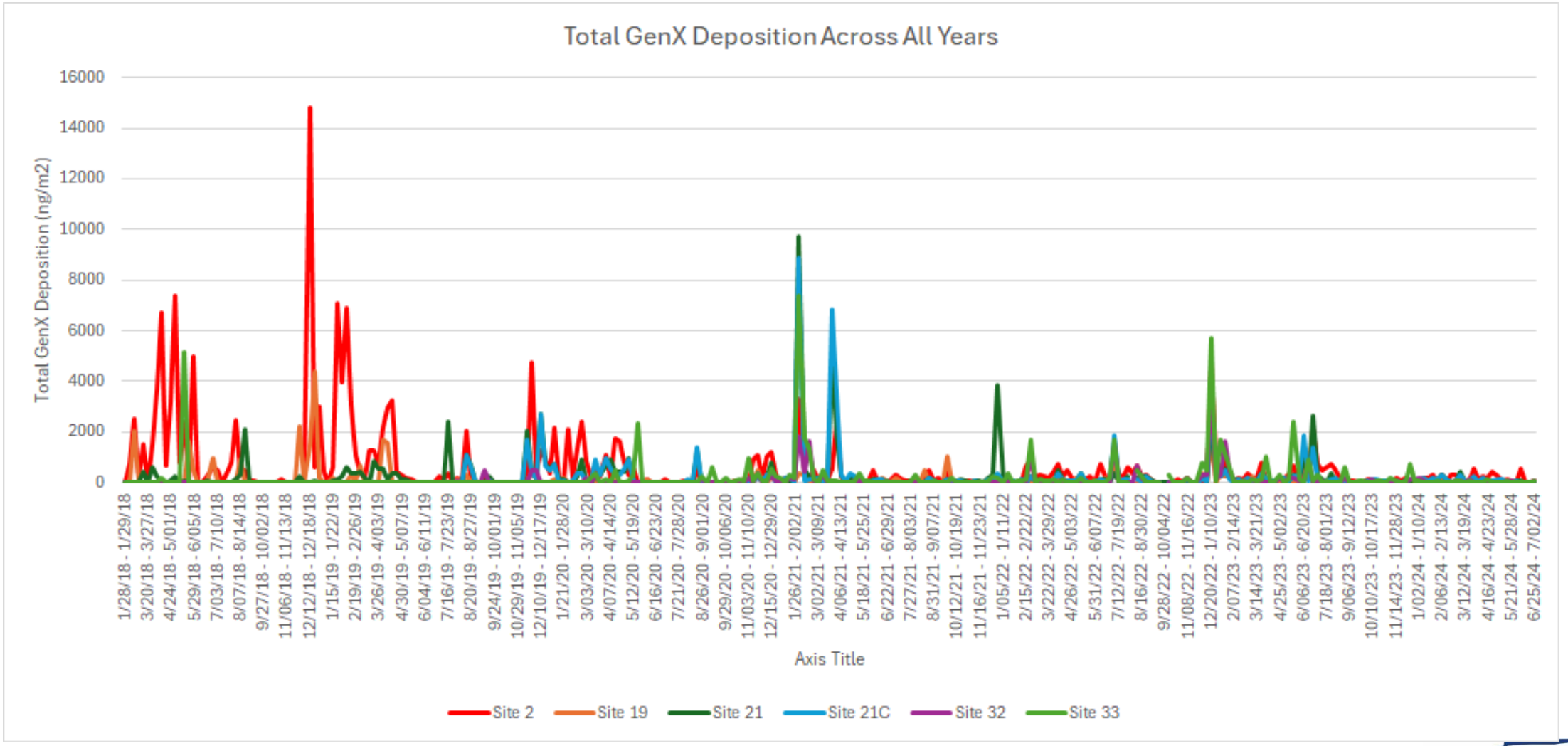
Near-field Site GenX Total Deposition 2018 through mid-2024



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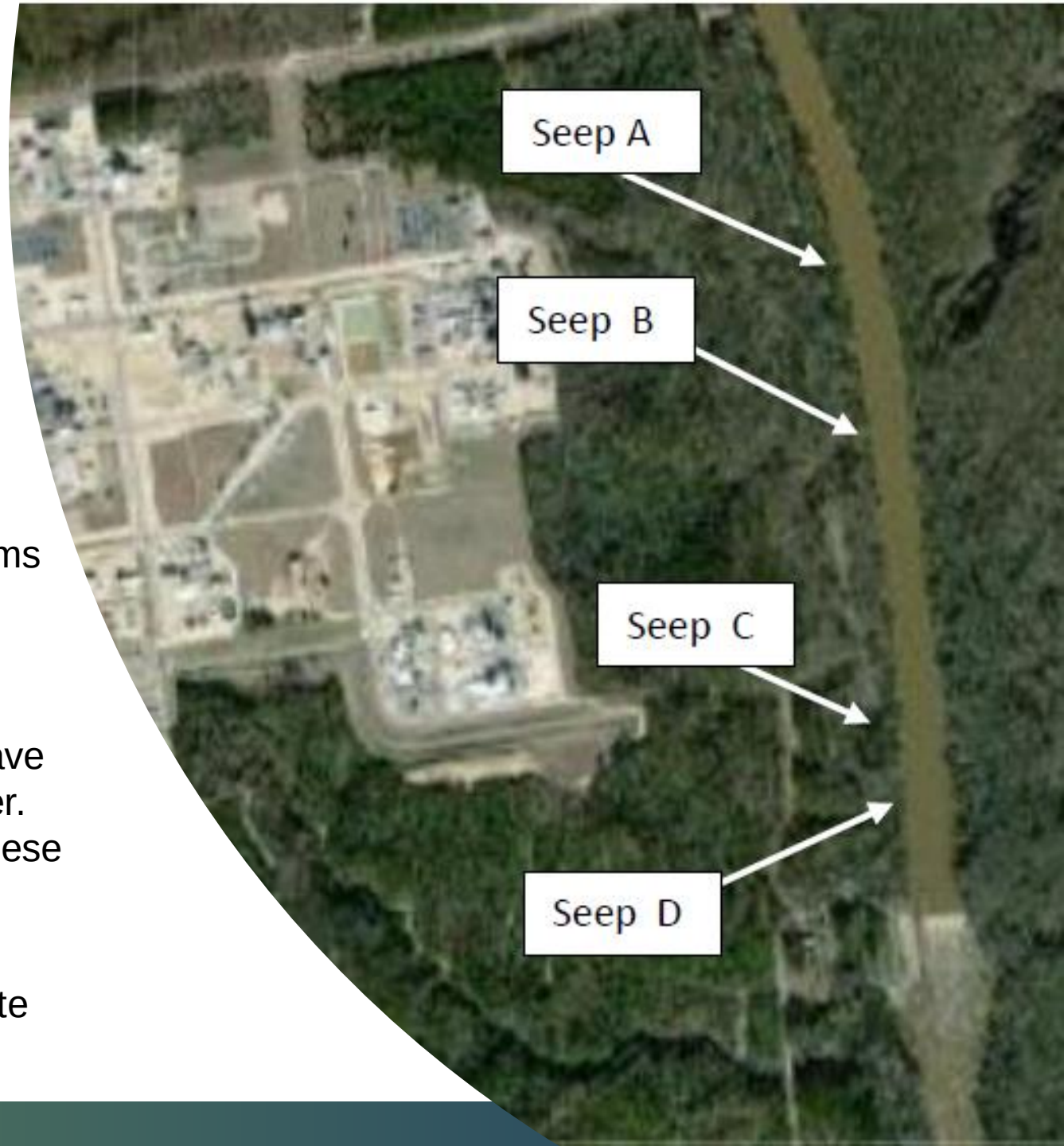
Consent Order and Remediation at Chemours: Outfall 003 (old outfall 002)

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.

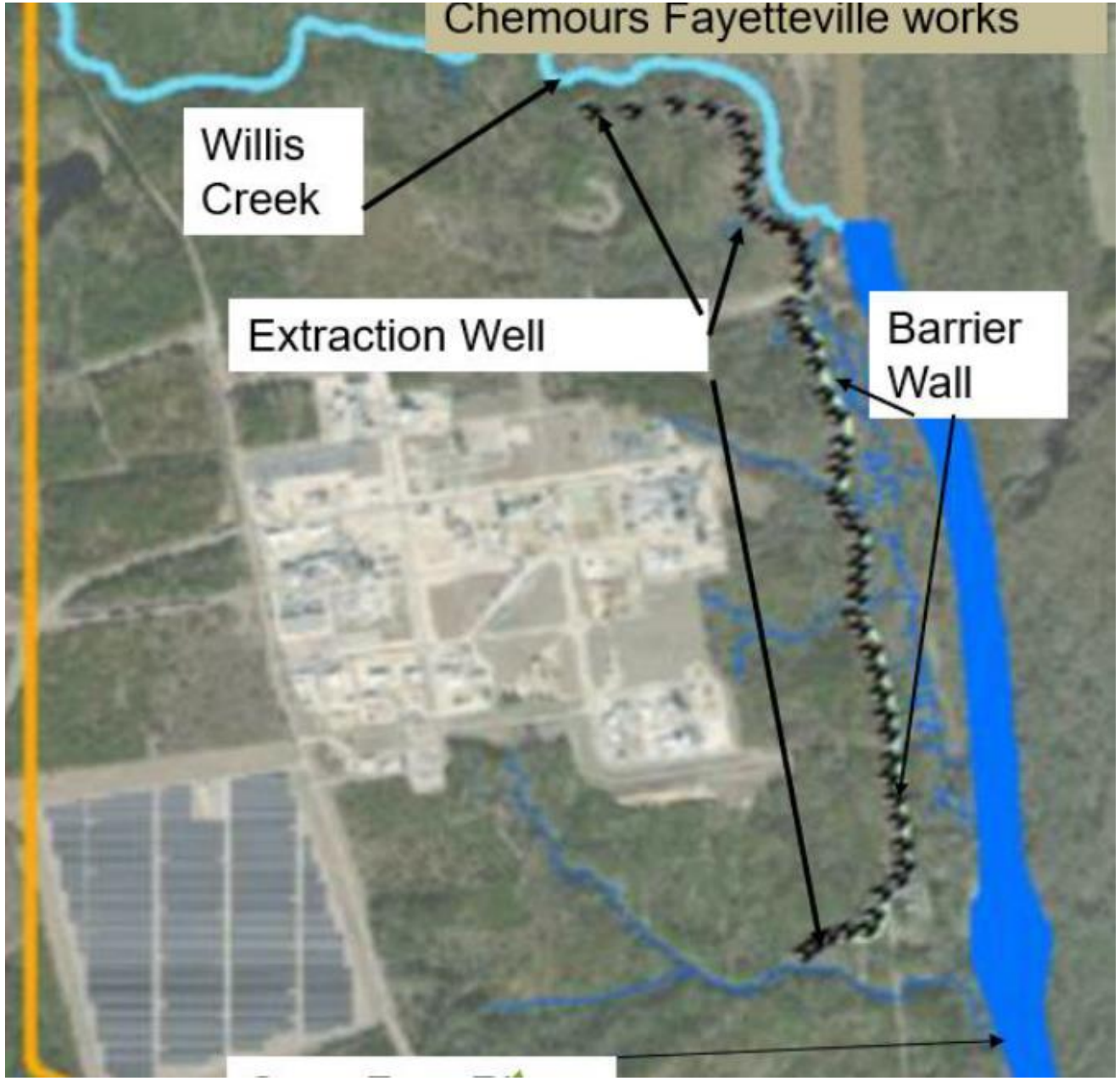
- There are four onsite seeps (A, B, C, and D) that have been identified that discharge into the Cape Fear River. PFAS from the site reach the Cape Fear River from these seeps.

- The four treatment systems were installed during late 2020 though late spring 2021.



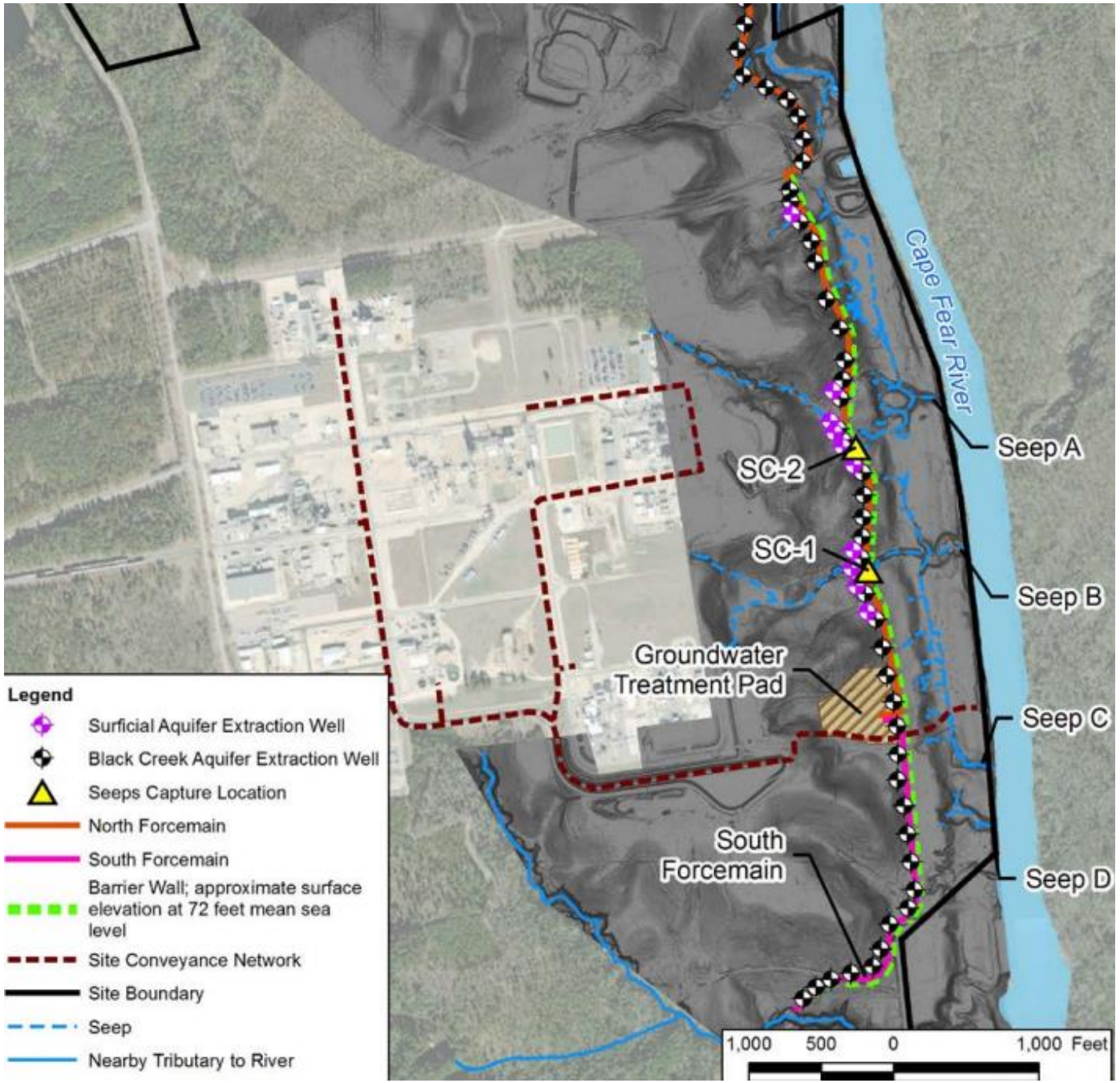
Barrier Wall: design

- 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:
  - 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

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 Cape Fear Region (Bladen, Robeson, Sampson, Cumberland, Hoke and Harnett Counties) call Chemours at: **910-678-1101**
- DEQ can also assist residents in the Cape Fear Region with well sampling questions
- Parsons Environment and Infrastructure – known as “Parsons” – is the independent water testing contractor for Chemours.

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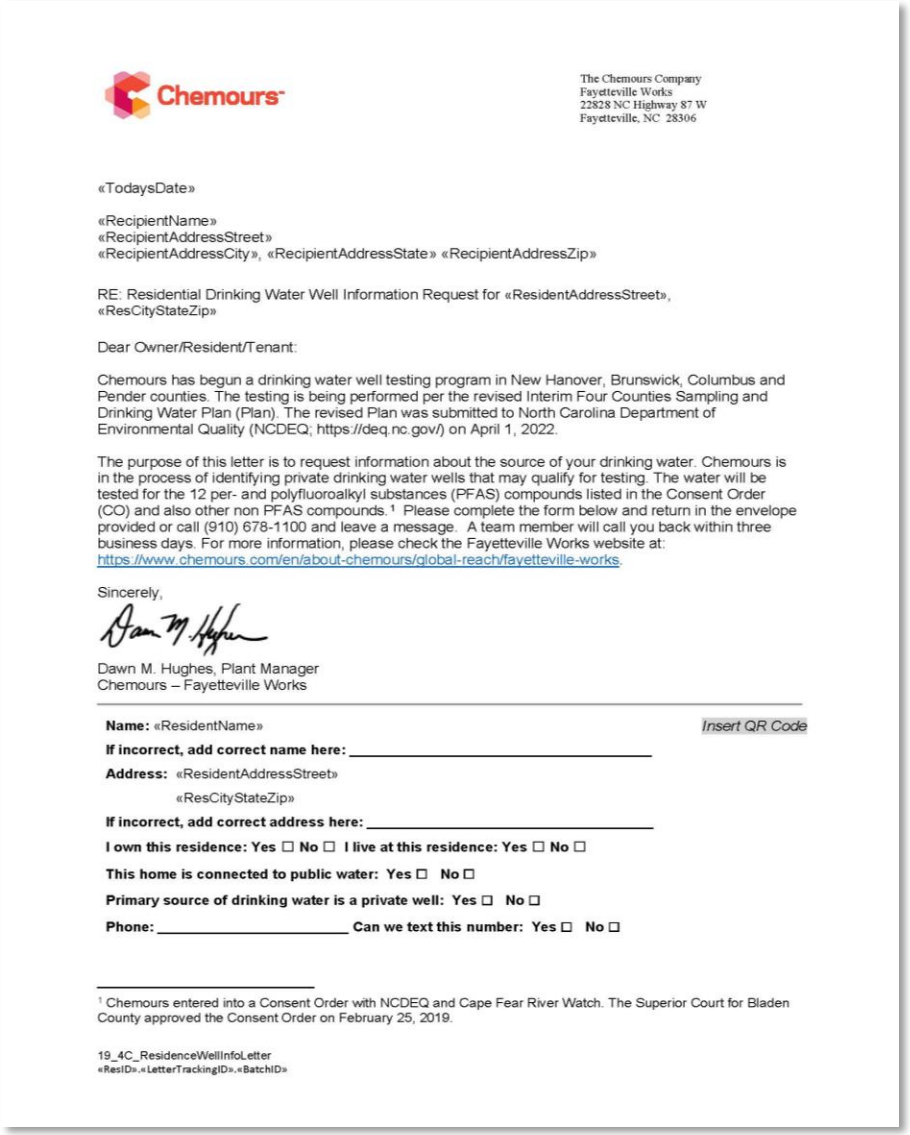
Department of Environmental Quality

Letter to Private Well Users

- Chemours has mailed out 150,000 letters to private well owners in the Cape Fear Region. Bladen, Cumberland, Robeson, Sampson, Hoke and Harnett Counties
- Letters are being sent to well owners based on a geographical area where atmospheric deposition of Chemours PFAS could occur
- These letters from Chemours ask for information about the private well and request contact information from the well owner to assist with scheduling sampling
- Chemours is required to test for 12 PFAS compounds in well water: 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)



Chemours

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

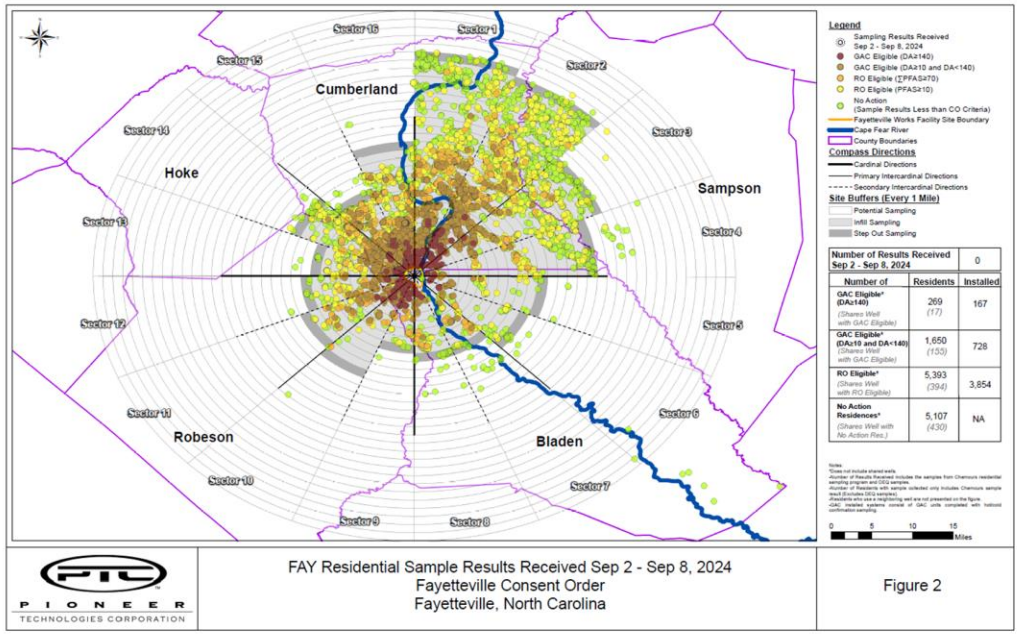
Name: «ResidentName» *Insert QR Code*
If incorrect, add correct name here: _____
Address: «ResidentAddressStreet»
«ResCityStateZip»
If incorrect, add correct address here: _____
I own this residence: Yes ☐ No ☐ I live at this residence: Yes ☐ No ☐
This home is connected to public water: Yes ☐ No ☐
Primary 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.

19_4C_ResidenceWellInfoLetter
«ResID».«LetterTrackingID».«BatchID»

Updated Private Well Sampling Numbers

- Chemours has reported that 7374 residences in the Cape Fear Region currently qualify for alternate water based on well sampling.
- 5437 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. Chemours will cover the installation and maintenance costs for the filters for 20 years.
- 1937 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.



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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

Alternate Water 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 at or above 10 ppt, bottled water or a voucher card 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/lowercapefear-wellsampling

- Consent Order documents
- Frequently asked questions
- Filtration system information
- Translated documents

Next Steps

- Continued private well sampling in Bladen, Cumberland, Sampson, Robeson, Harnett and Hoke Counties.
- Please share recommendations on making the well testing information available to your community.
- Evaluation of municipal water connections in coordination with local utilities.
- Additional environmental assessment related to Chemours

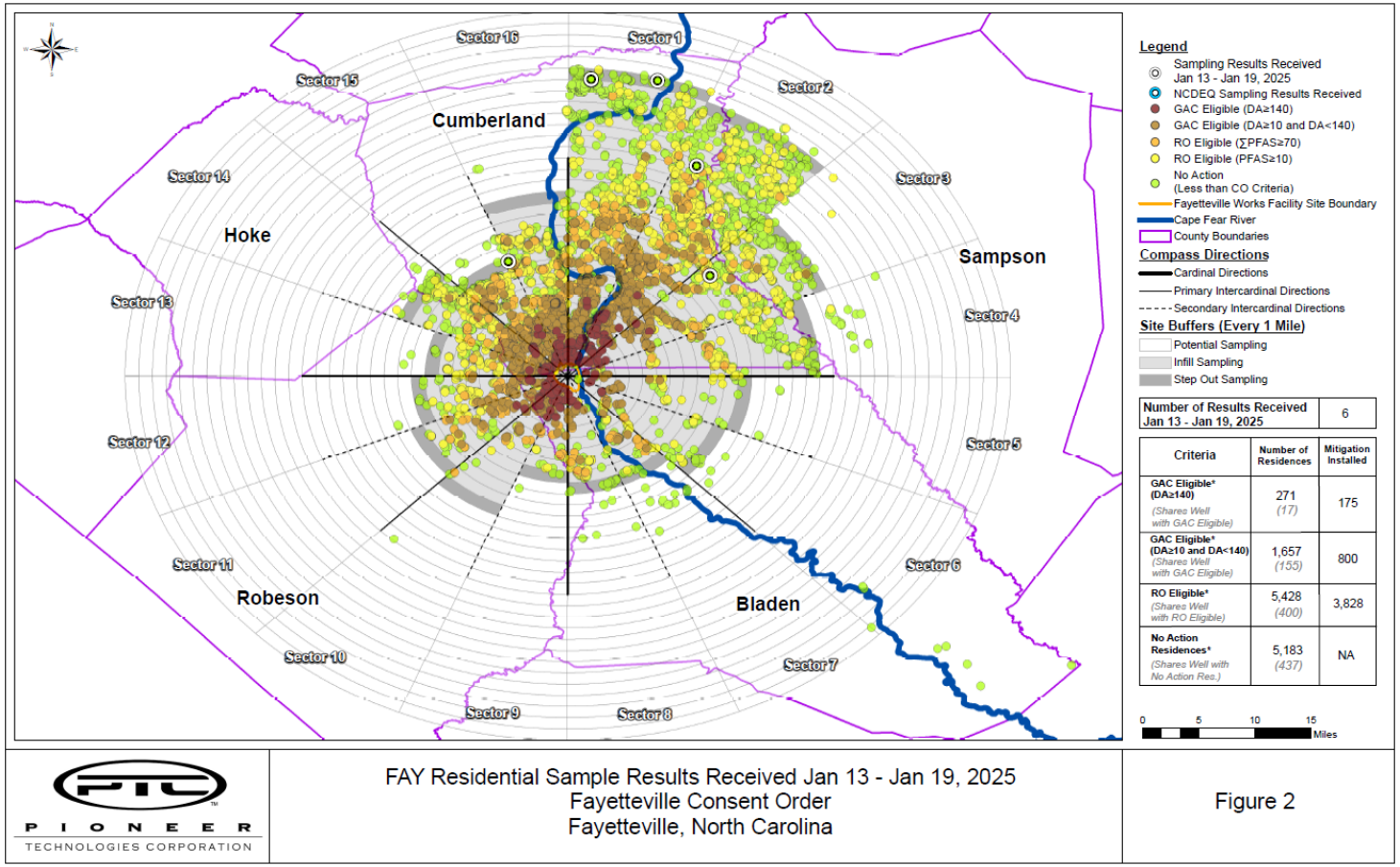
Waste Management

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

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

https://www.deq.nc.gov/about/divisions/waste-management

Near Site Sampling Approach 2018-February 2025



PIONEER TECHNOLOGIES CORPORATION

FAY Residential Sample Results Received Jan 13 - Jan 19, 2025
Fayetteville Consent Order
Fayetteville, North Carolina

Figure 2

- >10,000 Private wells sampled in areas directly around the facility
- 27.5 miles from the facility
- Step wise approach to “step out”
  - Sample 10 “exploratory” samples in each 1 mile step
    - If no homes qualify for water treatment, sample 10 more “confirmatory” samples
    - If there are homes that qualify for water treatment, step out to next 1 mile quadrant, and restart process.

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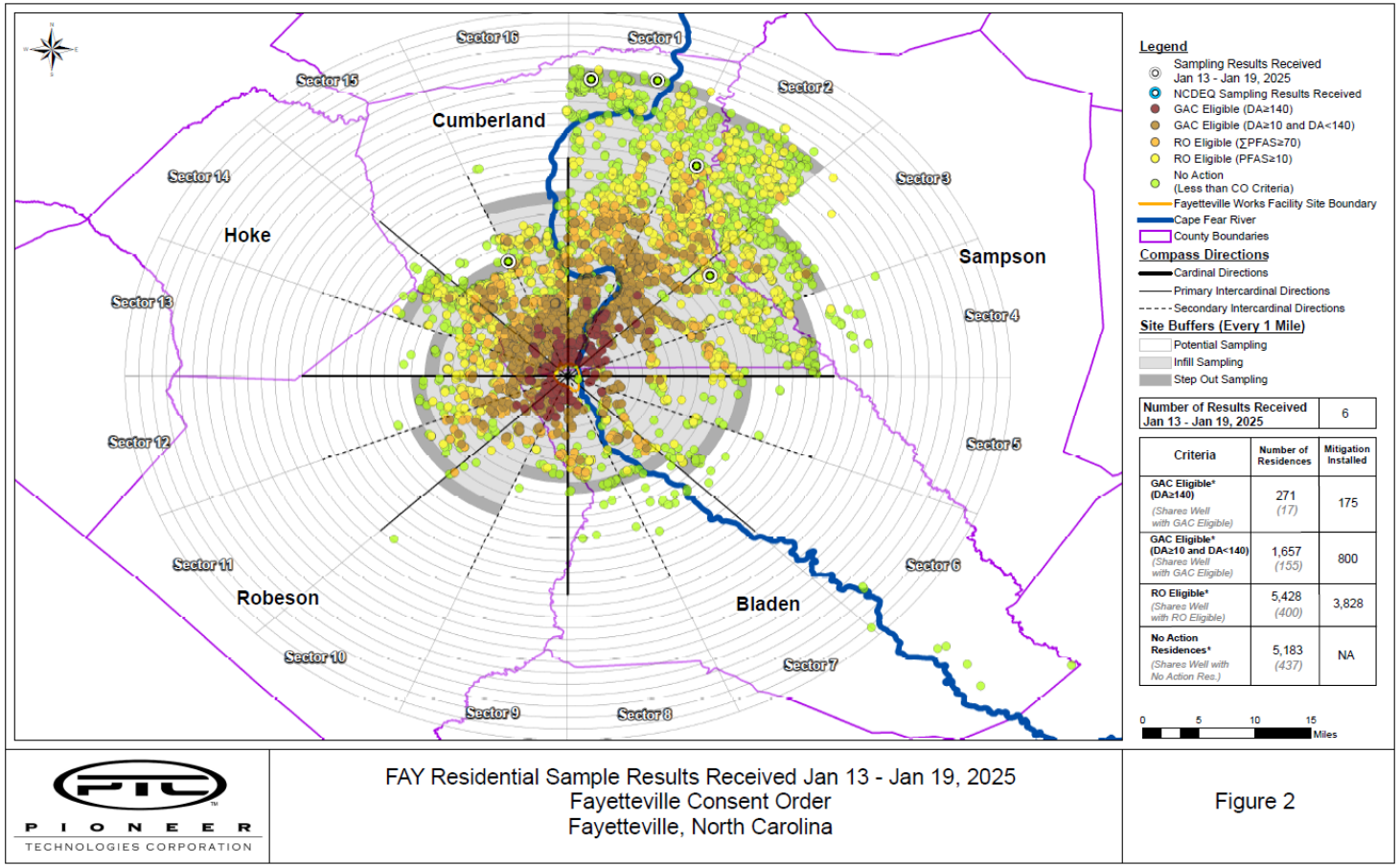
Near Site Sampling Approach 2018-February 2025



PIONEER TECHNOLOGIES CORPORATION

FAY Residential Sample Results Received Jan 13 - Jan 19, 2025
Fayetteville Consent Order
Fayetteville, North Carolina

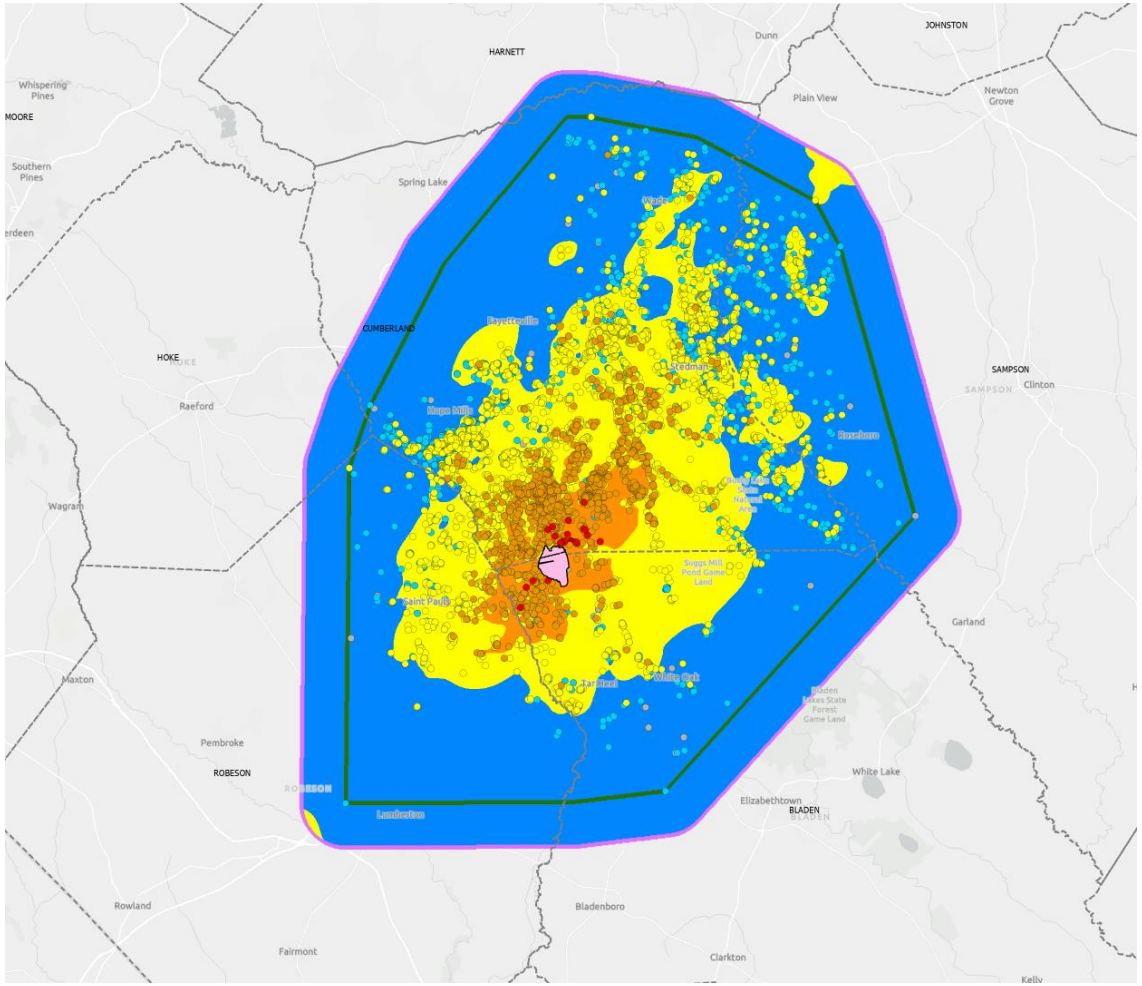
Figure 2

- Hurdles:
  - Steps increase as distance from facility increases
  - Private well density variations – Public water supply availability in cities reduces homes on private wells, while parcel size in rural areas means fewer nearby homes

NORTH CAROLINA Department of Environmental Quality

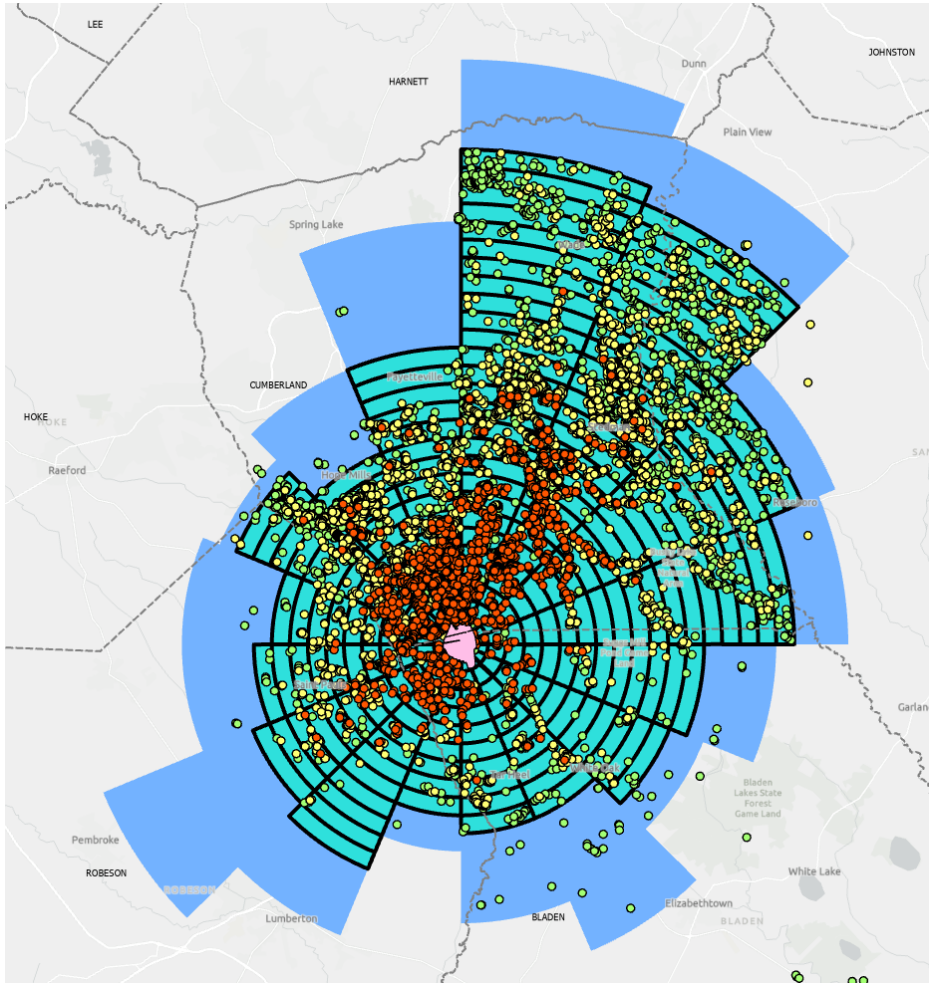
Near Site Sampling Approach Moving Forward

- Model 1: measured expected values in areas already sampled, increased 10% beyond current sampling area



Near Site Sampling Approach Moving Forward

- Model 2: Measured the rate of exceedance in each sector-mile, to estimate where 0% of homes would trip an exceedance



Near Site Sampling Approach Moving Forward

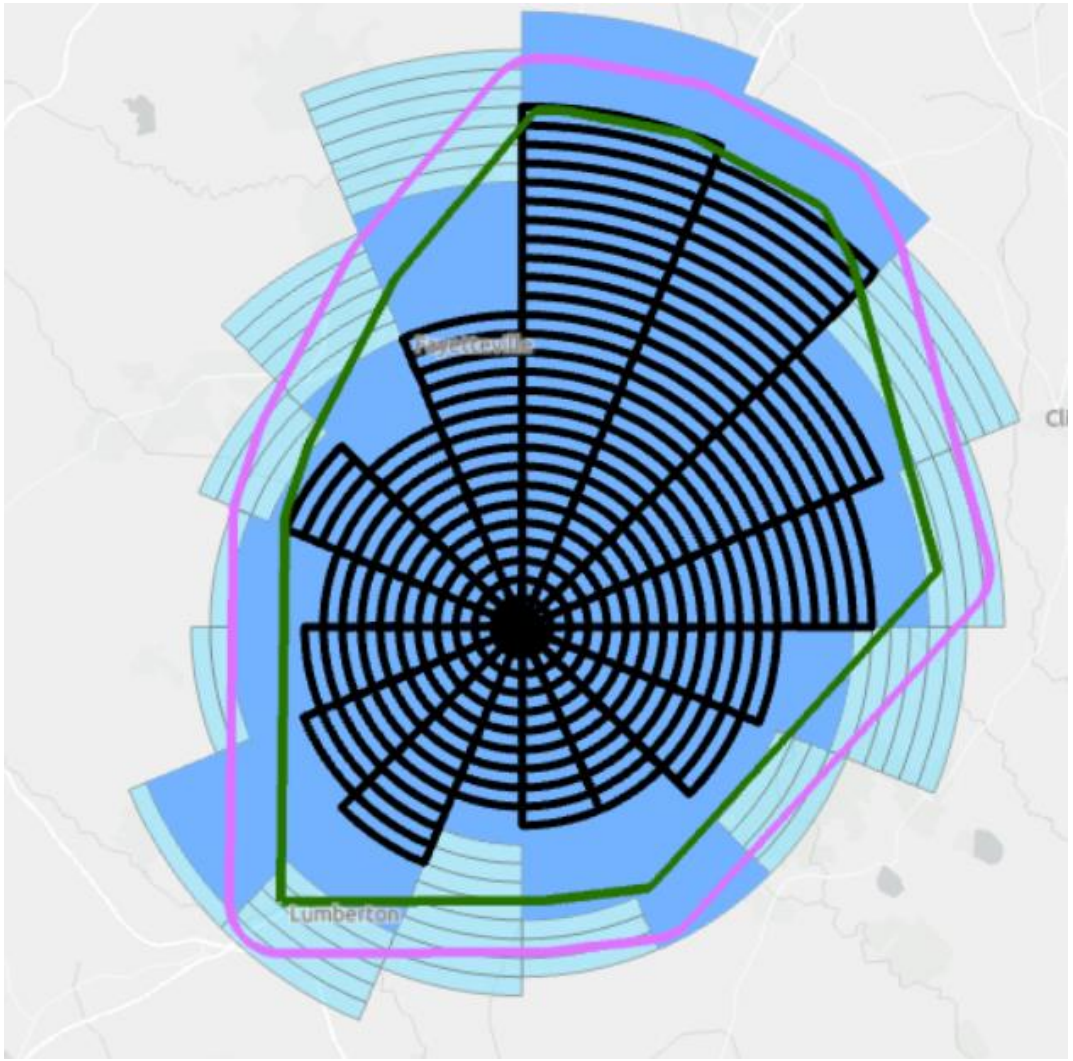
Summary:

Expanded via 2 modeling approaches

- Model 1: Geospatial model measuring expected values in areas already sampled
- Model 2: Linear model of the rate of exceedance in sector-mile steps to identify where 0% of homes would trip an exceedance

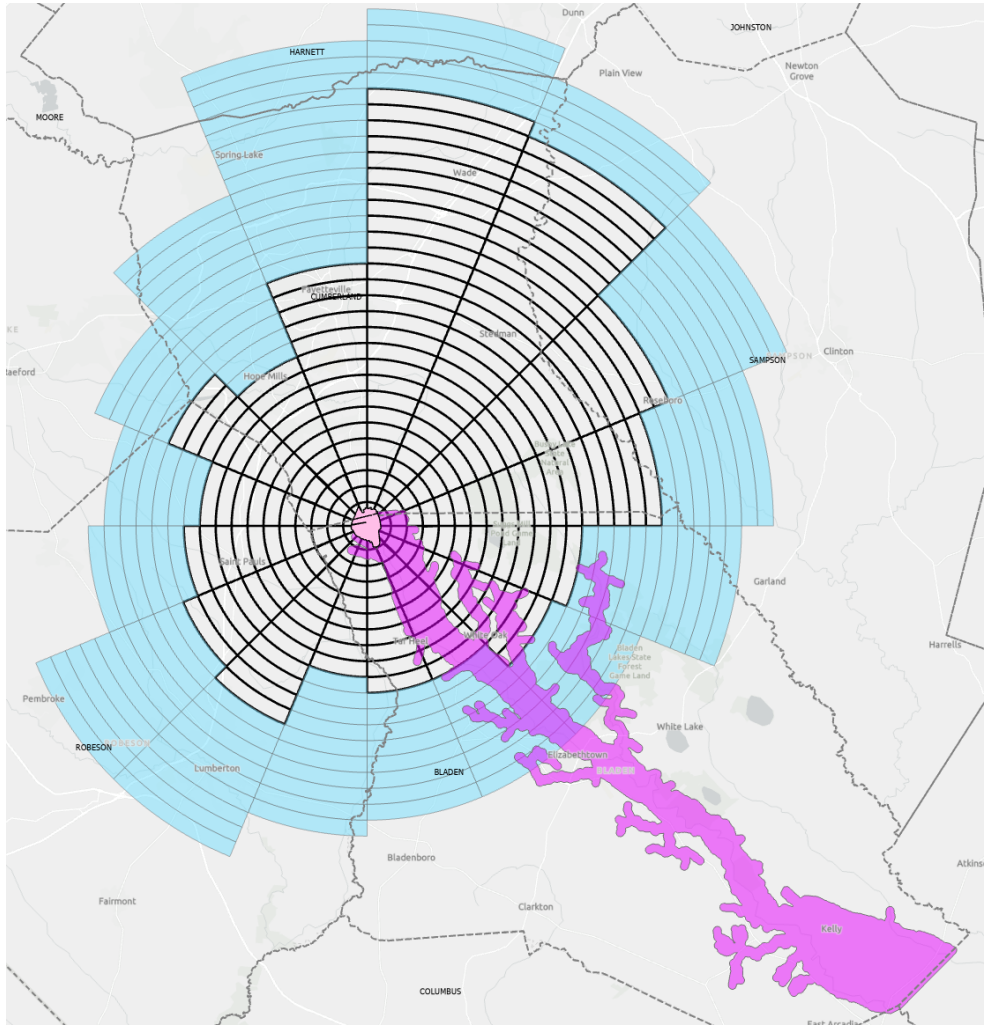
Consensus: Using the greater distance of the 2 models, identified sector-mile steps where a projected delineation boundary could be drawn.

- Models are informed by data, and these will need to be re-evaluated based on new data after first year of data gathering



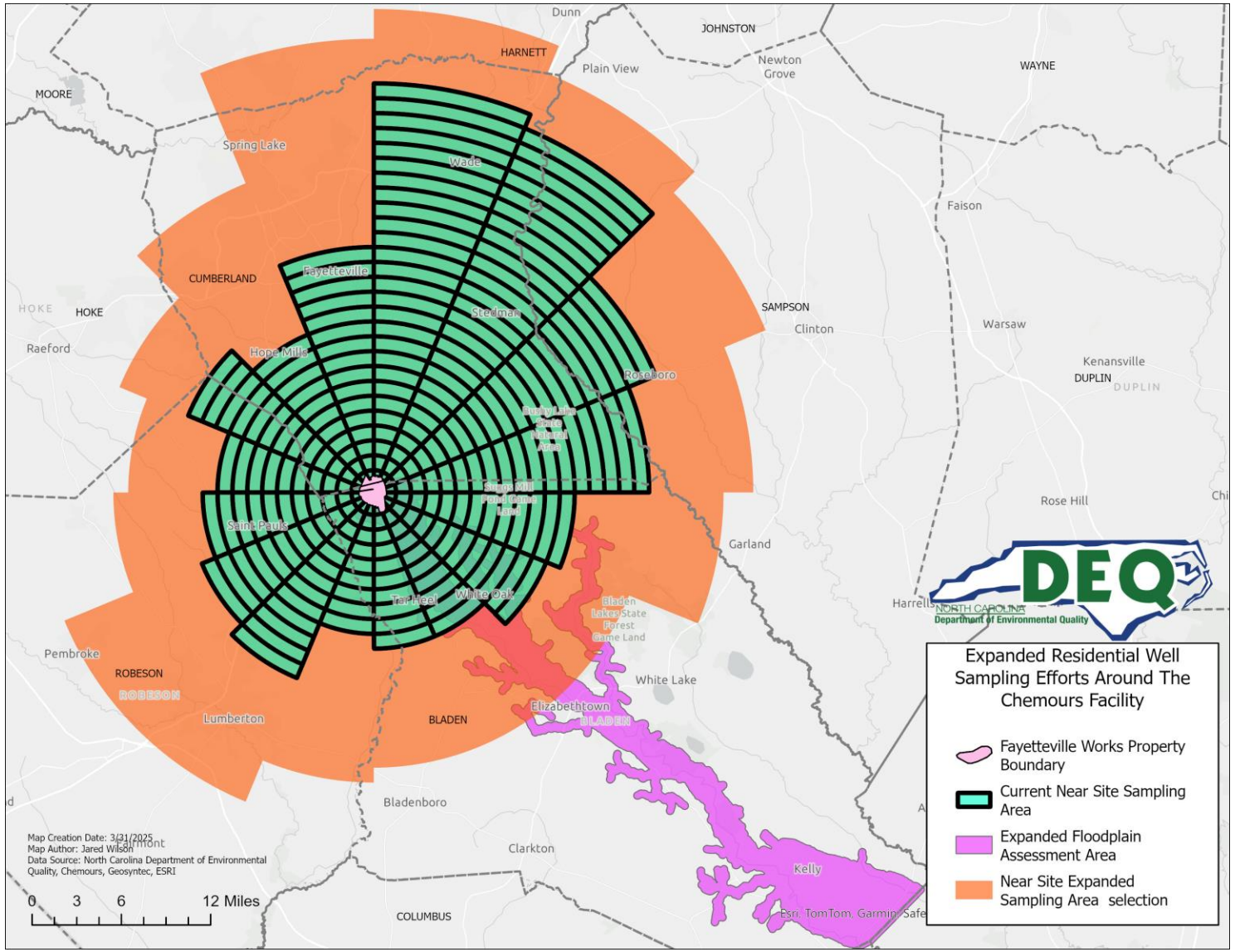
Near Site Sampling Approach Moving Forward

- Carryover from Four County Assessment work
  - Floodplain hypothesis was supported by the work done in the Four County Assessment, homes in the ~55 mile stretch through Bladen County now eligible for sampling



Overall Sampling Approach: ***Moving Forward***

- >2x sampling area near site, >9,000 homes added to eligibility list
- Bladen county floodplain buffer added, >800 homes added to eligibility list







NC Department of Health and Human Services

Health Impacts Related to PFAS

Kennedy Holt: Environmental Toxicologist

April 1, 2025

Health Impacts of PFAS

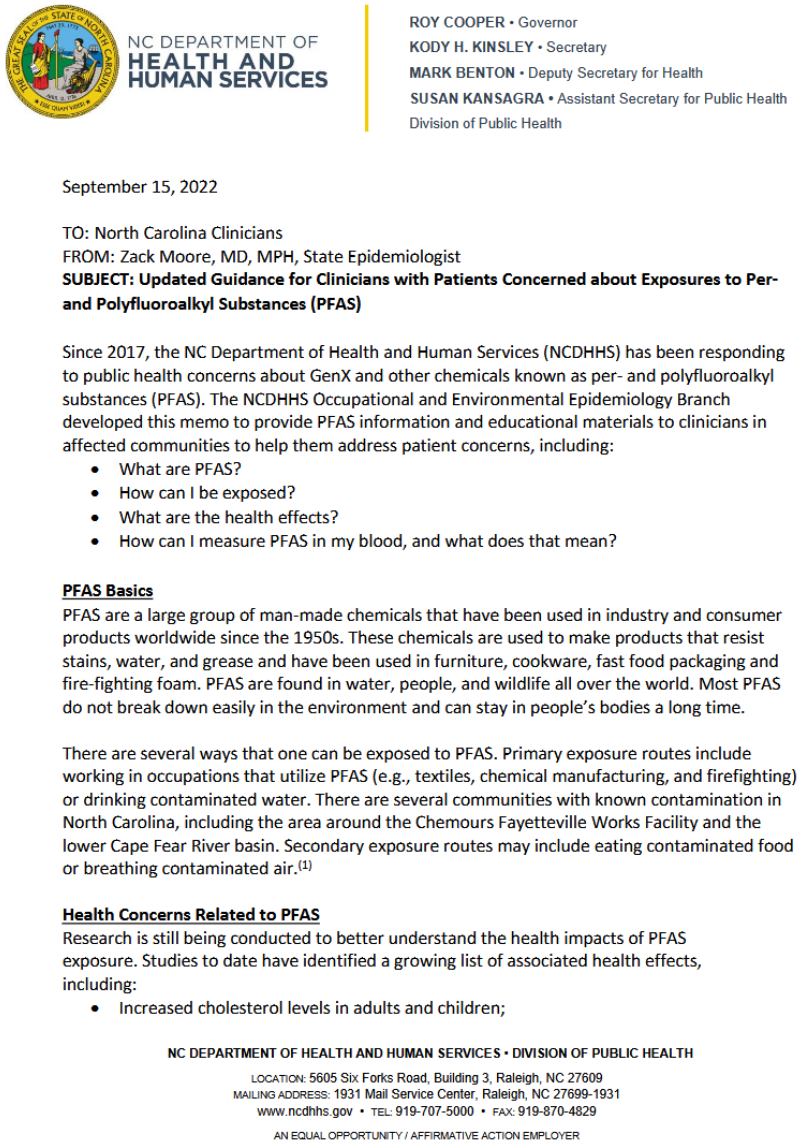
In adults, children and pregnant women

- Increased cholesterol levels
- Decreased vaccine response in children
- Changes in liver enzymes
- Increased risk of high blood pressure or pre-eclampsia in pregnant women
- Small decreases in infant birth weights
- Increased risk of kidney or testicular cancer

DHHS PFAS Resources

Clinician Memo

- Useful for talking with your healthcare provider about PFAS exposures.
- Contains information about resources for getting tested for PFAS.
- Available in Spanish.



NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

ROY COOPER • Governor
KODY H. KINSLEY • Secretary
MARK BENTON • Deputy Secretary for Health
SUSAN KANSAGRA • Assistant Secretary for Public Health
Division of Public Health

September 15, 2022

TO: North Carolina Clinicians
FROM: Zack Moore, MD, MPH, State Epidemiologist
SUBJECT: Updated Guidance for Clinicians with Patients Concerned about Exposures to Per- and Polyfluoroalkyl Substances (PFAS)

Since 2017, the NC Department of Health and Human Services (NCDHHS) has been responding to public health concerns about GenX and other chemicals known as per- and polyfluoroalkyl substances (PFAS). The NCDHHS Occupational and Environmental Epidemiology Branch developed this memo to provide PFAS information and educational materials to clinicians in affected communities to help them address patient concerns, including:

- What are PFAS?
- How can I be exposed?
- What are the health effects?
- How can I measure PFAS in my blood, and what does that mean?

PFAS Basics

PFAS are a large group of man-made chemicals that have been used in industry and consumer products worldwide since the 1950s. These chemicals are used to make products that resist stains, water, and grease and have been used in furniture, cookware, fast food packaging and fire-fighting foam. PFAS are found in water, people, and wildlife all over the world. Most PFAS do not break down easily in the environment and can stay in people's bodies a long time.

There are several ways that one can be exposed to PFAS. Primary exposure routes include working in occupations that utilize PFAS (e.g., textiles, chemical manufacturing, and firefighting) or drinking contaminated water. There are several communities with known contamination in North Carolina, including the area around the Chemours Fayetteville Works Facility and the lower Cape Fear River basin. Secondary exposure routes may include eating contaminated food or breathing contaminated air.[1]

Health Concerns Related to PFAS

Research is still being conducted to better understand the health impacts of PFAS exposure. Studies to date have identified a growing list of associated health effects, including:

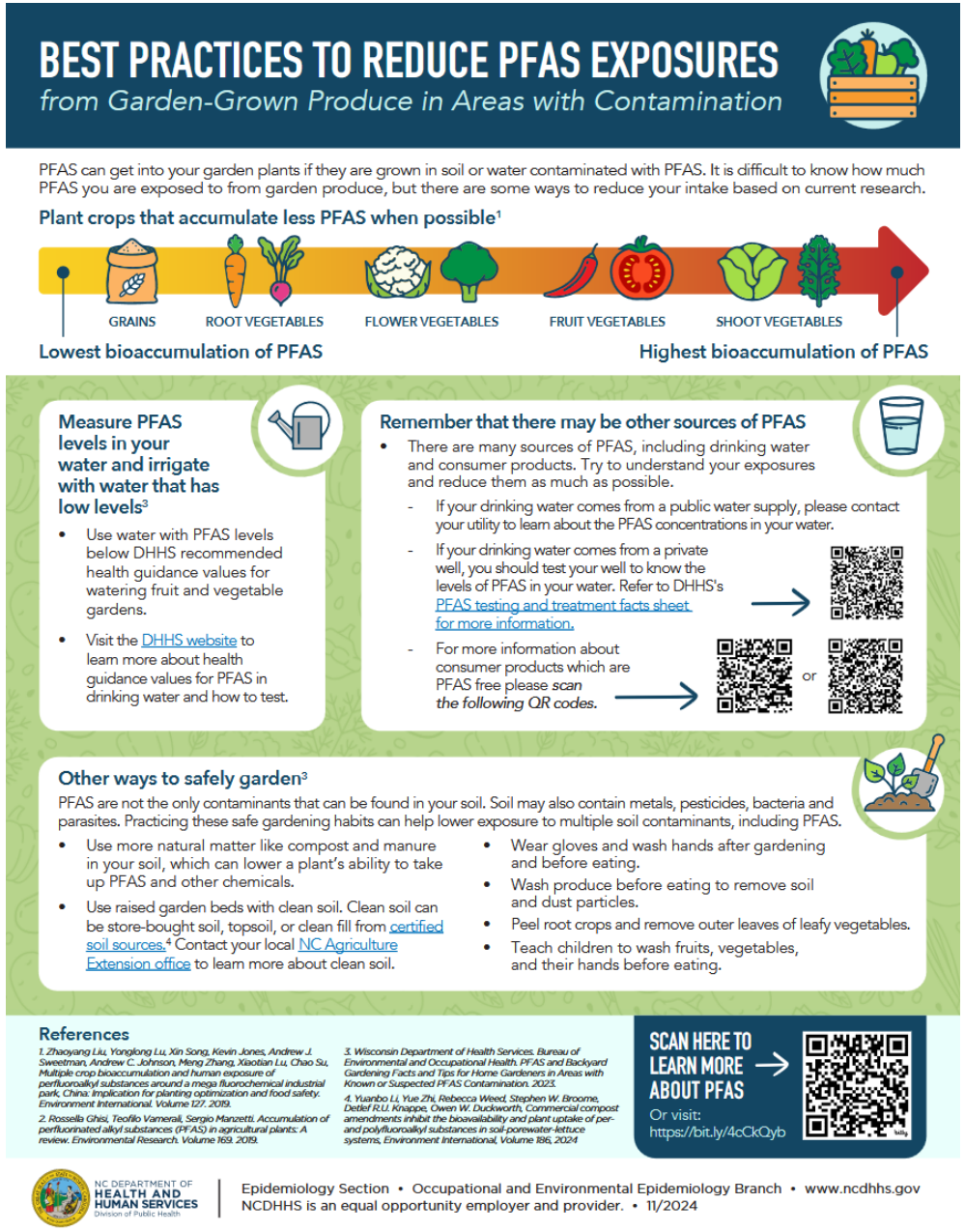
- Increased cholesterol levels in adults and children;

NC DEPARTMENT OF HEALTH AND HUMAN SERVICES • DIVISION OF PUBLIC HEALTH
LOCATION: 5605 Six Forks Road, Building 3, Raleigh, NC 27609
MAILING ADDRESS: 1931 Mail Service Center, Raleigh, NC 27699-1931
www.ncdhhs.gov • TEL: 919-707-5000 • FAX: 919-870-4829
AN EQUAL OPPORTUNITY / AFFIRMATIVE ACTION EMPLOYER

https://epi.dph.ncdhhs.gov/oee/a_z/pfas.html

Gardening Factsheet

- Information about suggested crops.
- Tips for mitigating exposures from gardening.



BEST PRACTICES TO REDUCE PFAS EXPOSURES

from Garden-Grown Produce in Areas with Contamination

PFAS can get into your garden plants if they are grown in soil or water contaminated with PFAS. It is difficult to know how much PFAS you are exposed to from garden produce, but there are some ways to reduce your intake based on current research.

Plant crops that accumulate less PFAS when possible[1]

GRAINS · ROOT VEGETABLES · FLOWER VEGETABLES · FRUIT VEGETABLES · SHOOT VEGETABLES

Lowest bioaccumulation of PFAS — Highest bioaccumulation of PFAS

Measure PFAS levels in your water and irrigate with water that has low levels[3]

- Use water with PFAS levels below DHHS recommended health guidance values for watering fruit and vegetable gardens.
- Visit the DHHS website to learn more about health guidance values for PFAS in drinking water and how to test.

Remember that there may be other sources of PFAS

- There are many sources of PFAS, including drinking water and consumer products. Try to understand your exposures and reduce them as much as possible.
  - If your drinking water comes from a public water supply, please contact your utility to learn about the PFAS concentrations in your water.
  - If your drinking water comes from a private well, you should test your well to know the levels of PFAS in your water. Refer to DHHS's PFAS testing and treatment facts sheet for more information.
  - For more information about consumer products which are PFAS free please *scan the following QR codes.* or

Other ways to safely garden[3]

PFAS are not the only contaminants that can be found in your soil. Soil may also contain metals, pesticides, bacteria and parasites. Practicing these safe gardening habits can help lower exposure to multiple soil contaminants, including PFAS.

- Use more natural matter like compost and manure in your soil, which can lower a plant's ability to take up PFAS and other chemicals.
- Use raised garden beds with clean soil. Clean soil can be store-bought soil, topsoil, or clean fill from certified soil sources.[4] Contact your local NC Agriculture Extension office to learn more about clean soil.
- Wear gloves and wash hands after gardening and before eating.
- Wash produce before eating to remove soil and dust particles.
- Peel root crops and remove outer leaves of leafy vegetables.
- Teach children to wash fruits, vegetables, and their hands before eating.

References

1. Zhaoyang Liu, Yonglong Lu, Xin Song, Kevin Jones, Andrew J. Sweetman, Andrew C. Johnson, Meng Zhang, Xiaotian Lu, Chao Su, Multiple crop bioaccumulation and human exposure of perfluoroalkyl substances around a mega fluorochemical industrial park, China: Implication for planting optimization and food safety. Environment International. Volume 127. 2019.

2. Rossella Ghisi, Teofilo Vamerali, Sergio Manzetti. Accumulation of perfluorinated alkyl substances (PFAS) in agricultural plants: A review. Environmental Research. Volume 169. 2019.

3. Wisconsin Department of Health Services. Bureau of Environmental and Occupational Health. PFAS and Backyard Gardening Facts and Tips for Home Gardeners in Areas with Known or Suspected PFAS Contamination. 2023.

4. Yuanbo Li, Yue Zhi, Rebecca Weed, Stephen W. Broome, Detlef R.U. Knappe, Owen W. Duckworth, Commercial compost amendments inhibit the bioavailability and plant uptake of per- and polyfluoroalkyl substances in soil-porewater-lettuce systems, Environment International, Volume 186, 2024

SCAN HERE TO LEARN MORE ABOUT PFAS → Or visit: https://bit.ly/4cCkQyb

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https://epi.dph.ncdhhs.gov/oee/a_z/pfas.html

Private Well Information

- Information about routine maintenance and testing of your private well.

Epidemiology: Occupational and Environmental

Private Wells

New! Private Well Water Results Tool

Most private wells provide a clean, safe supply of water for many people in North Carolina. But sometimes contaminants can get into your well water and make you sick. As a private well owner, it is up to you to test your water to ensure it is safe to use.

The majority of private drinking water wells in North Carolina are supplied by groundwater. Our groundwater is typically composed of rain and snowmelt that seeps into the ground and flows between the soil, clay, and small cracks in underground rocks before it finally becomes groundwater and enters the well supply. Because contaminants can also follow this pathway and influence the quality of the well water, private well owners must take special precautions to ensure the protection and maintenance of their drinking water supplies.

! The most important thing private well owners can do to ensure the safety of their drinking water is regular water testing.

+ Expand All | - Collapse All

+ Private Well User Surveys

+ How to Test Your Well

+ Maintaining, Protecting, and Treating Your Well

+ Well Water Contaminants

+ Groundwater and Contaminants in North Carolina

+ Permitting and Well Construction

Private Wells Pages

Facts and Figures

Frequently Asked Questions (Testing)

Test Results

Related OEEB Programs

- Chemical Preparedness and Response Surveillance (ChPRS) Program
- Health Assessment, Consultation and Education Program
- Medical Evaluation and Risk Assessment Program

Additional Resources

- Environmental Health Section
- State Laboratory of Public Health
- Water Quality (DEQ)
- N.C. Well Contractors Certification Commission
- U.S. Environmental Protection Agency

https://epi.dph.ncdhhs.gov/oee/programs/wellwater.html

Contact Information for DHHS

General Contact Information
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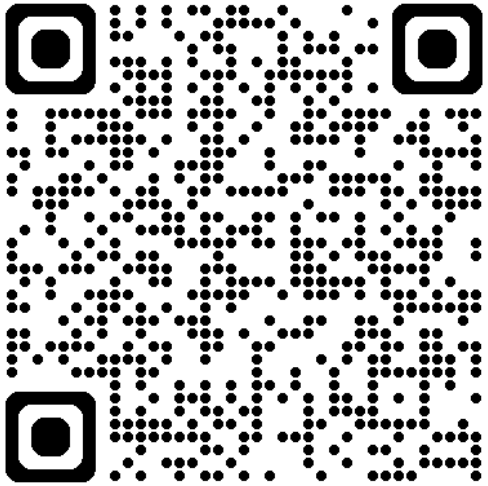
Recap

- Residences within the expanded area, where well water is your primary source of drinking water and would like your well tested, call Chemours at (910) 678-1101.
- Please send additional questions to: publicaffairs@deq.nc.gov
- Future in person information session.
- Link for more information, including presentations: https://www.deq.nc.gov/news/key-issues/genx-investigation/genx-information-residents
  - “Community Updates” towards the bottom of the page



Department of Environmental Quality