PFAS Private Well Sampling Updates

North Carolina Department of Environmental Quality

March 3, 2023

Discussion Topics

- PFAS and GenX
- Groundwater sampling (Chemours)
- Alternate Water Options
- Bernard Allen Work (DEQ)
- 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.

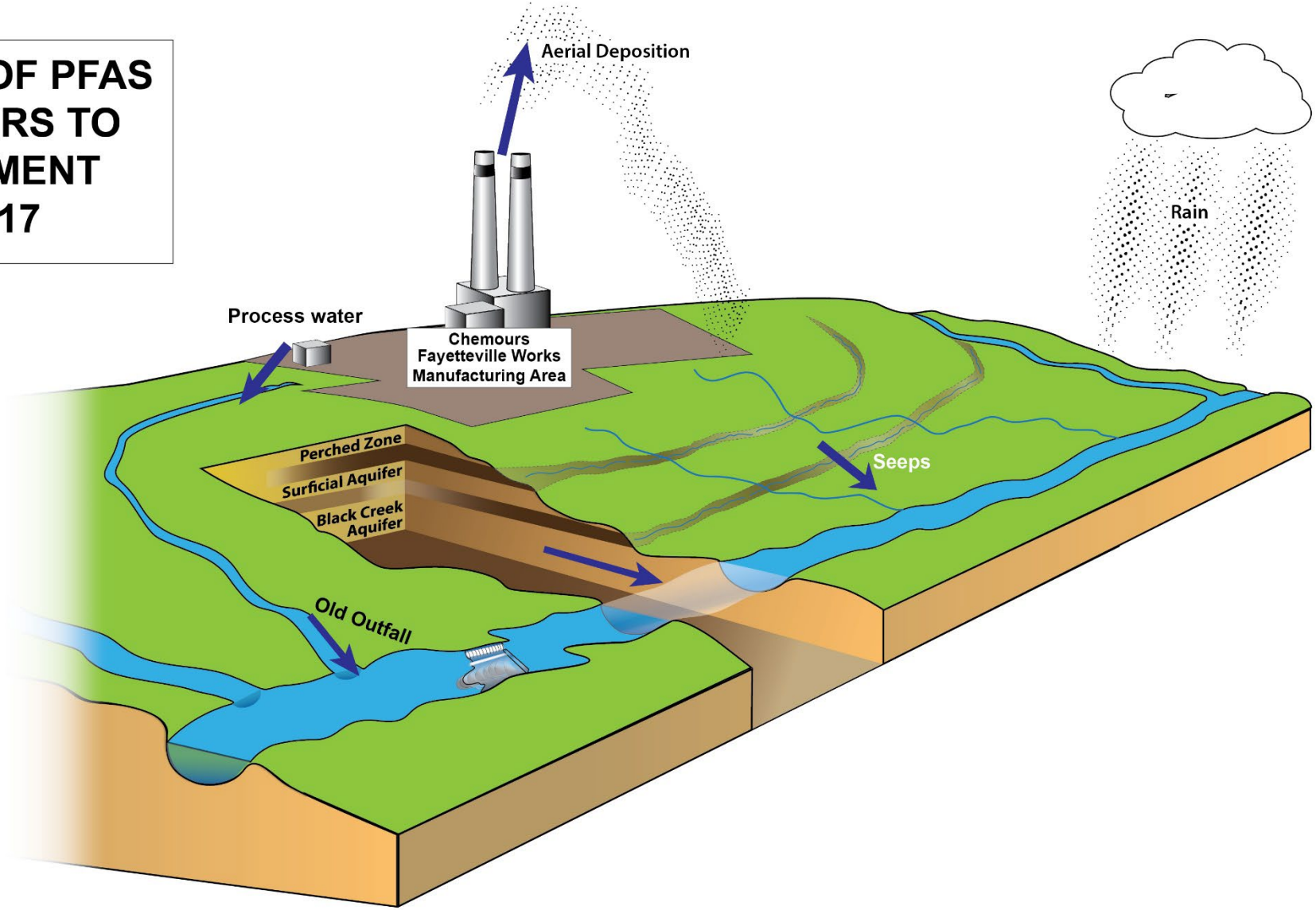
Emerging compounds:

- 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



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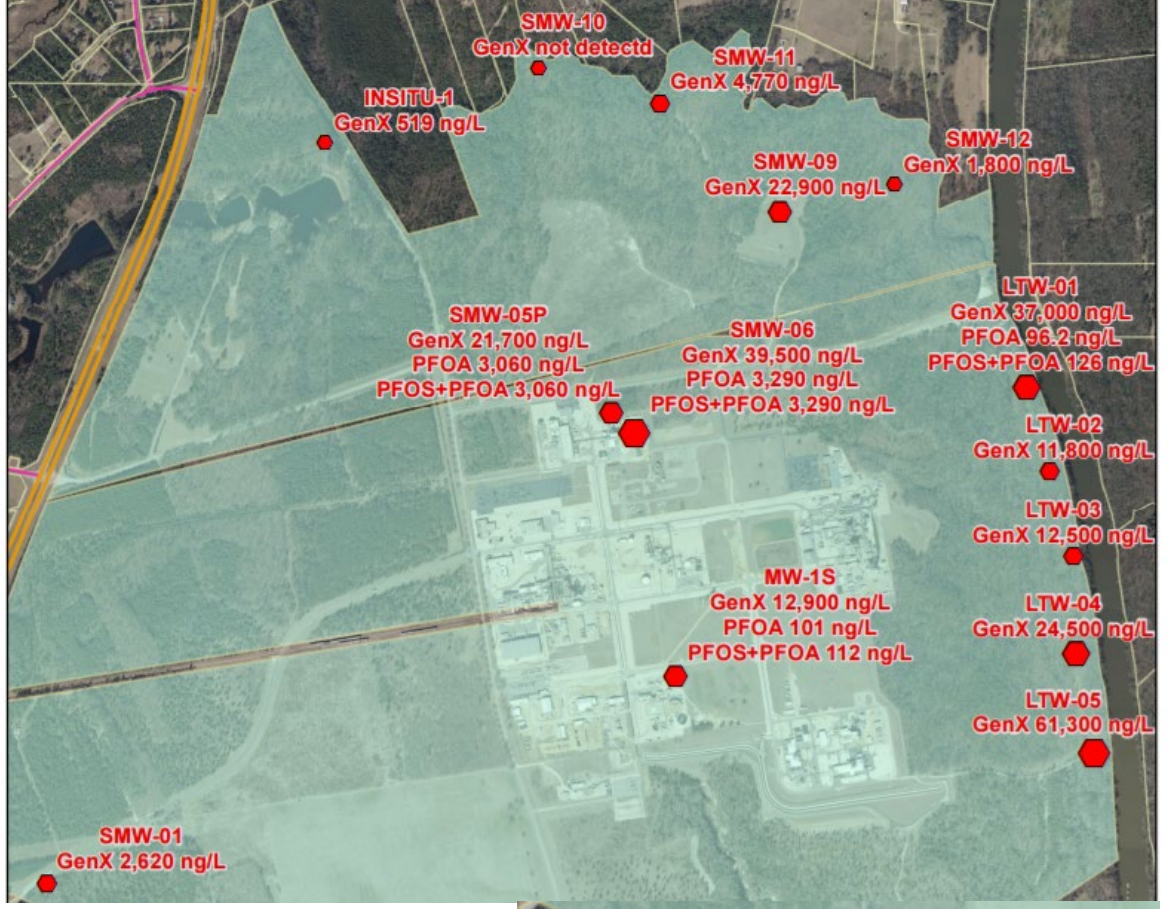
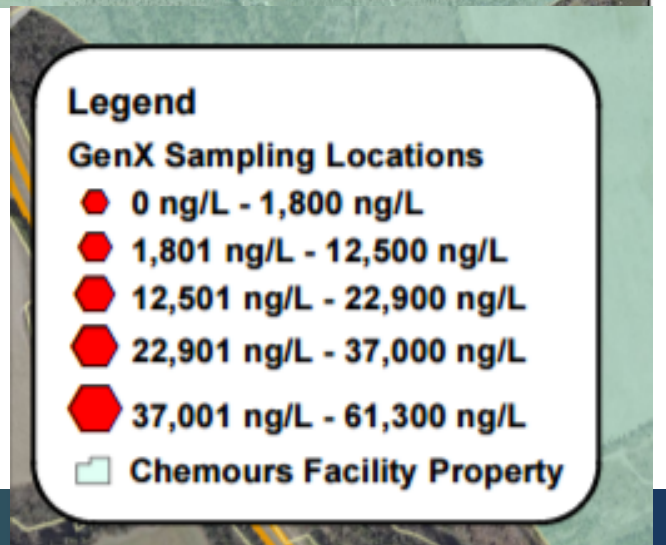
Groundwater Testing

- 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



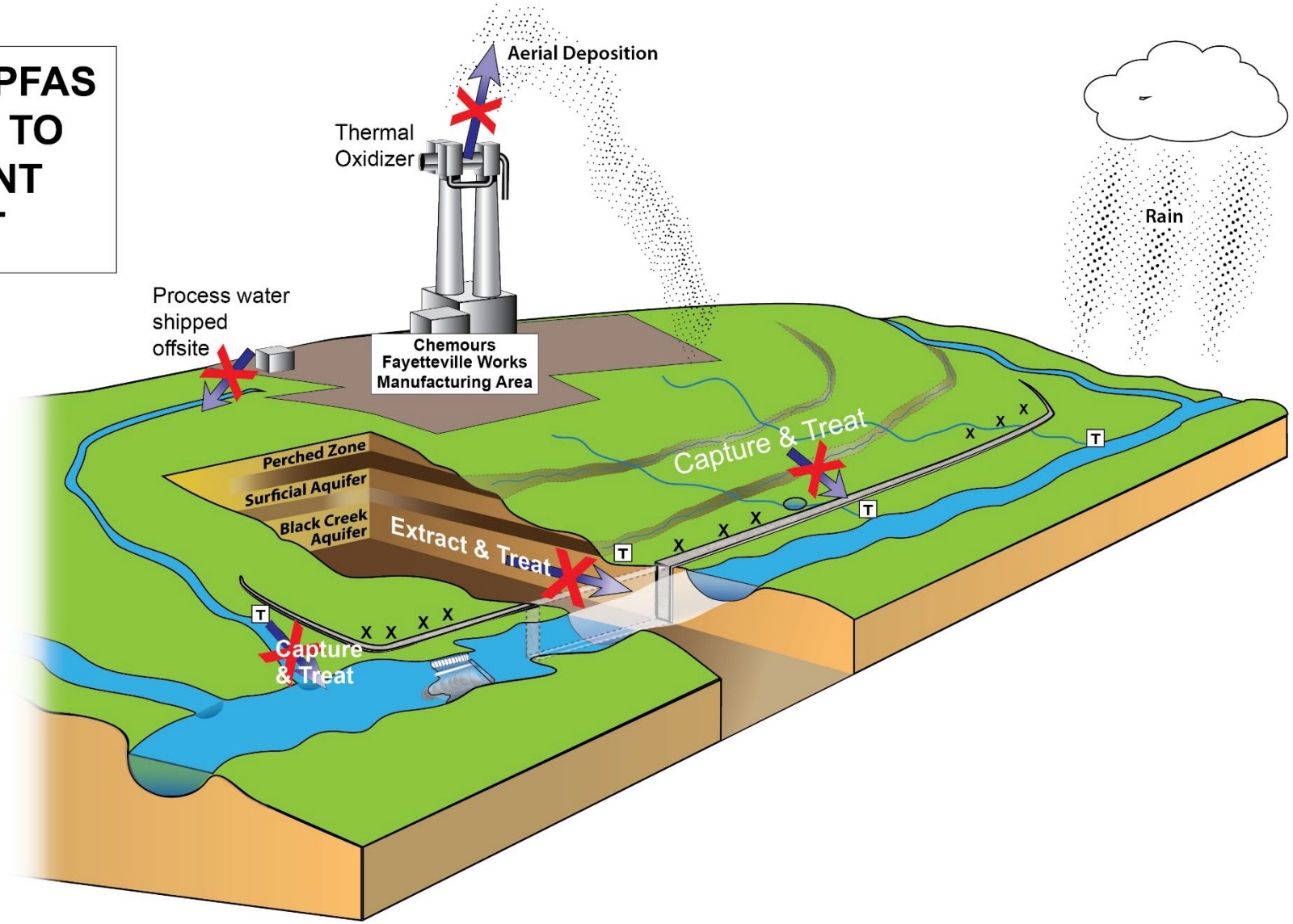


Chemours – Consent Order Feb. 2019

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.

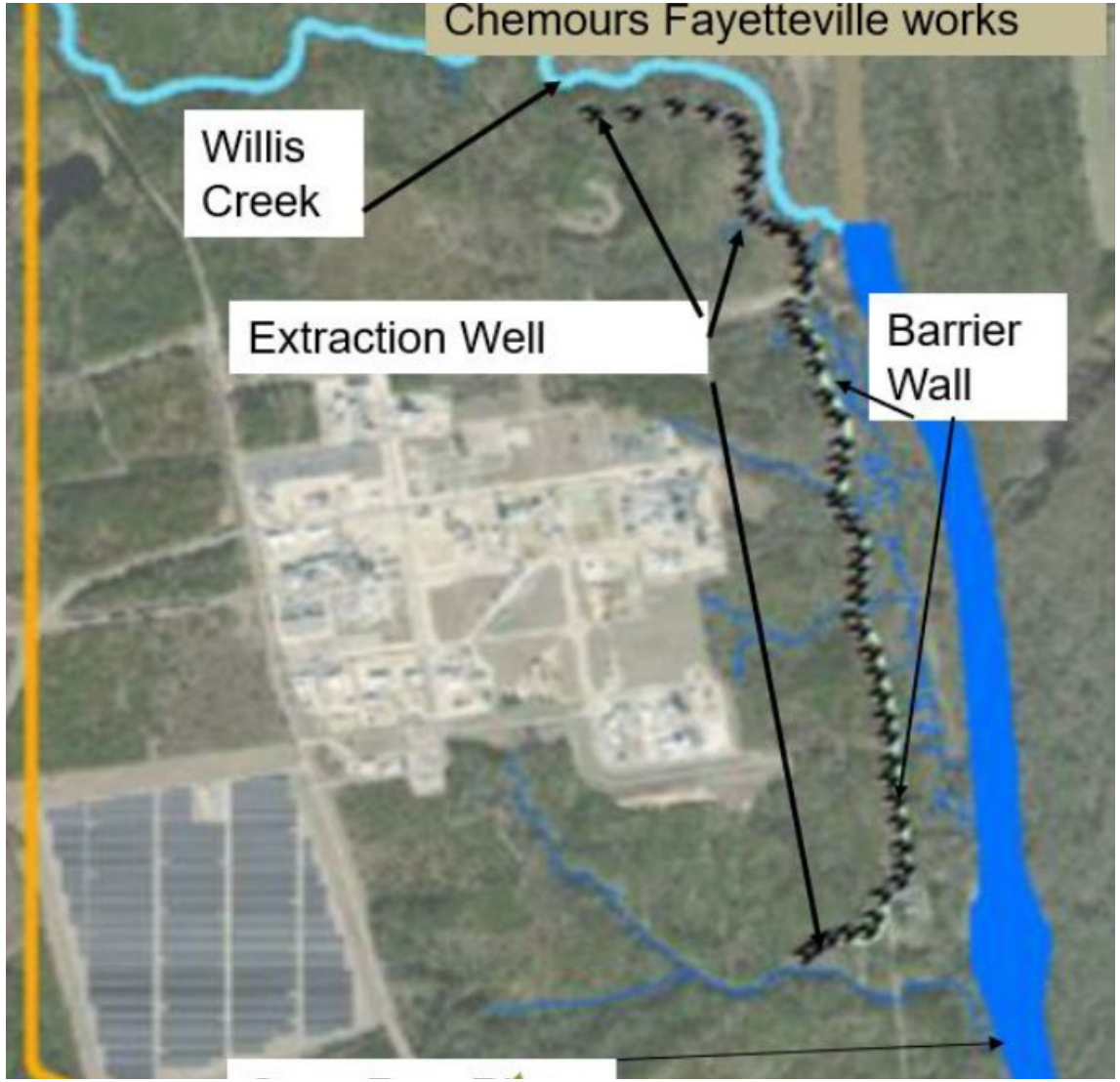
MAIN SOURCES OF PFAS FROM CHEMOURS TO THE ENVIRONMENT 2017 - PRESENT



Note: Image is conceptual and is not to scale

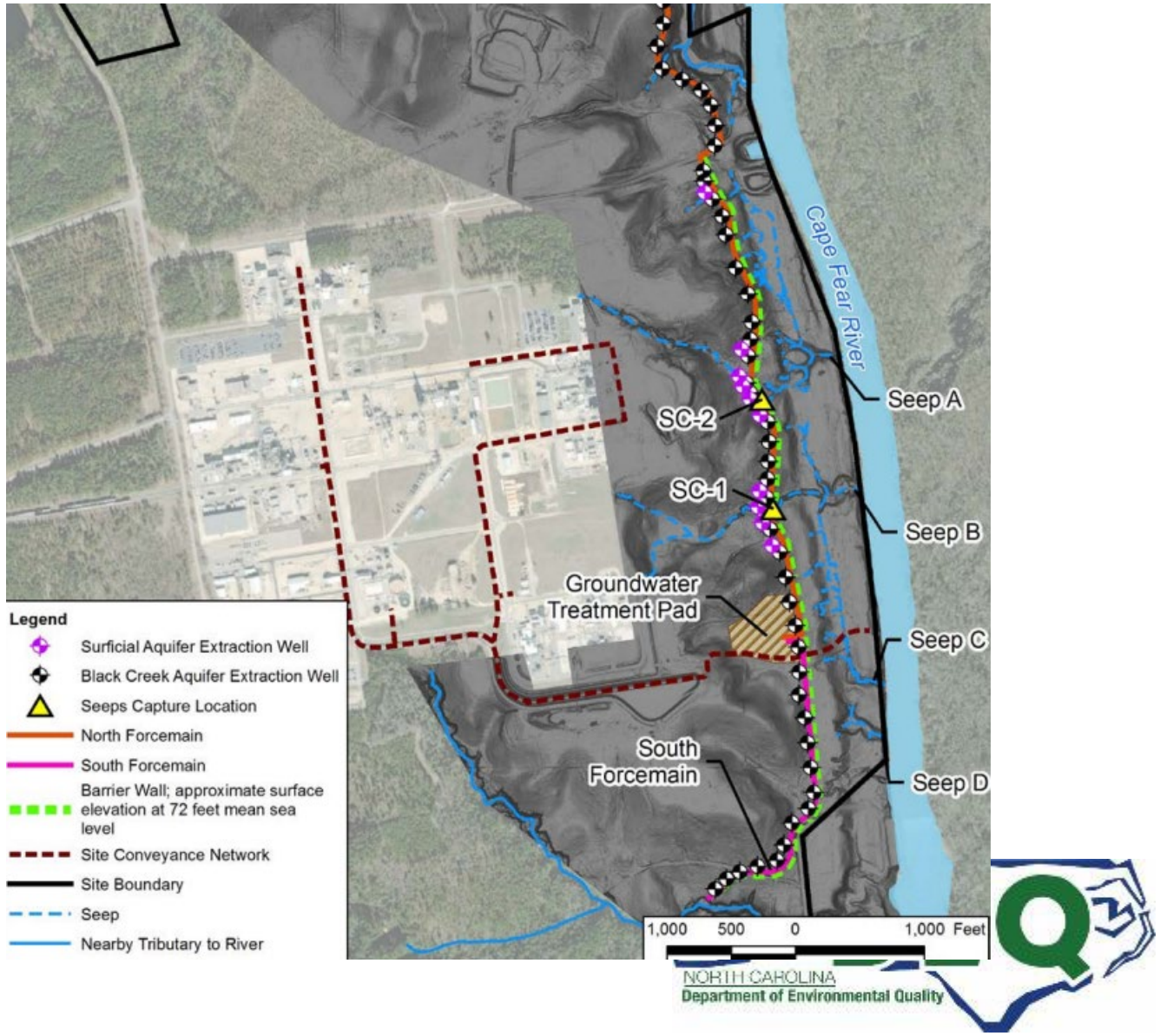
Barrier Wall: design

- 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

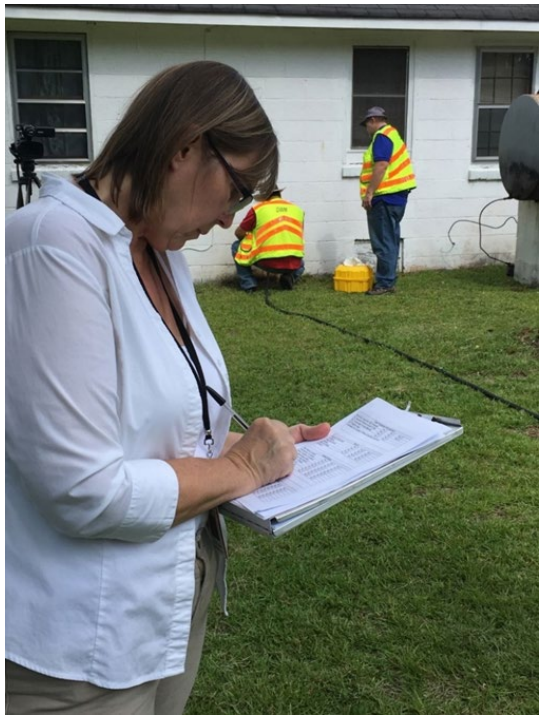
- For those with combined PFAS levels above 70 parts per trillion or any individual PFAS compound above 10 parts per trillion:
  - Provide, install and maintain up to three under-sink RO systems per residence

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.

Protecting Private Wells

- Ensuring the sampling capability and expertise are within DEQ for PFAS sampling.
- PFAS sampling is different at ppt or ng/L levels. Clean hand / dirty hand approaches have to be considered.
- Cost of sampling / types of analytes



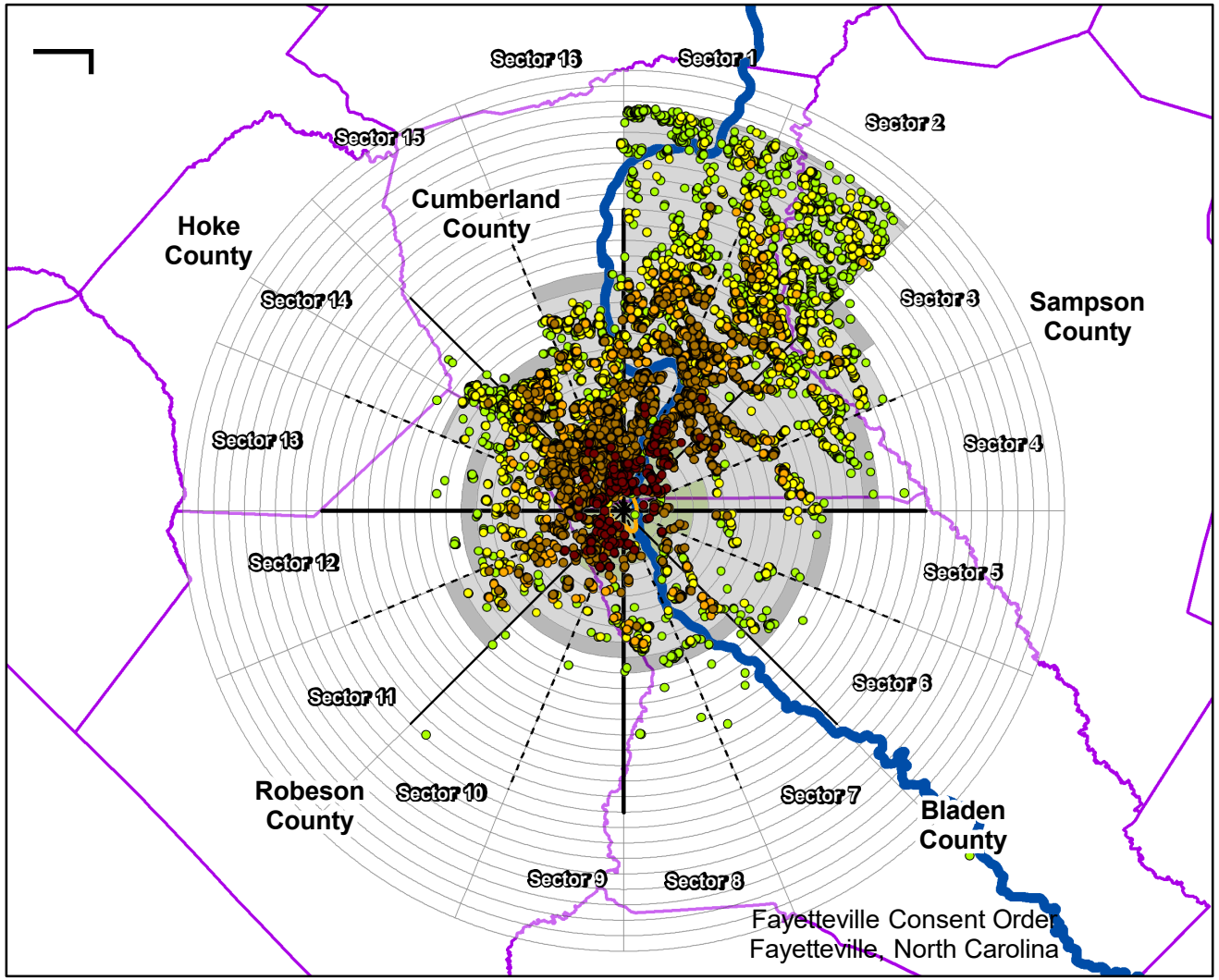
DEQ
NORTH CAROLINA
Department of Environmental Quality

Community Interest and Need for Well Sampling

- Sampling costs for homeowners
- Options for alternate water

Community Outreach

- **Communication**
  - Public information sessions
  - Responding to community concerns
- **Transparency**
  - Post data, enforcement docs, letters etc. on the GenX webpage: https://deq.nc.gov/news/hot-topics/genx-investigation
- **Ongoing Efforts**
  - Ongoing testing, investigation and enforcement
  - Daily communication with individuals and the community



Legend

Sampling Results Received Apr 24 - Apr 30, 2023

CO Criteria

- GAC Eligible (DA≥140)
- GAC Eligible (DA≥10 and DA<140)
- RO Eligible (∑PFAS≥70)
- RO Eligible (PFAS≥10)
- No Action (Sample Results Less than CO Criteria)
- Fayetteville Works Facility Site Boundary
- Cape Fear River
- County Boundaries

Compass Directions

- Cardinal Directions
- Primary Intercardinal Directions
- Secondary Intercardinal Directions

Site Buffers (Every 1 Mile)

- Potential Sampling
- In Fill Sampling
- Step Out Sampling
- Sampled or Offered to Sample All Residences
- Delineated

Number of Results Received Apr 24 - Apr 30, 2023		0
Number of	**Residents**	**Installed**
GAC Eligible* (DA≥140) *(Shares Well with GAC Eligible)*	254 *(17)*	113
GAC Eligible* (DA≥10 and DA<140) *(Shares Well with GAC Eligible)*	1,614 *(150)*	36
RO Eligible* *(Shares Well with RO Eligible)*	5,155 *(357)*	3,953
No Action Residences* *(Shares Well with No Action Res.)*	4,369 *(381)*	NA

Notes:
*Does not include shared wells.
-Residential sample results presented on the figure represent the residential location where the sample was collected. Residents who use a neighboring well are not presented on the figure.
-GAC installed systems consist of GAC units completed with hot/cold confirmation sampling.
-RO Eligible counts do not include DA≥10 Resideces.
CO = Consent Order
DA = HFPO Dimer Acid
GAC = Granular Activated Carbon
HFPO = Hexafluoropropylene Oxide
RO = Reverse Osmosis
∑ = Total (Summation)

0 2 4 6 Miles

PIONEER TECHNOLOGIES CORPORATION

FAY Residential Sample Results Received Apr 24 - Apr 30, 2023

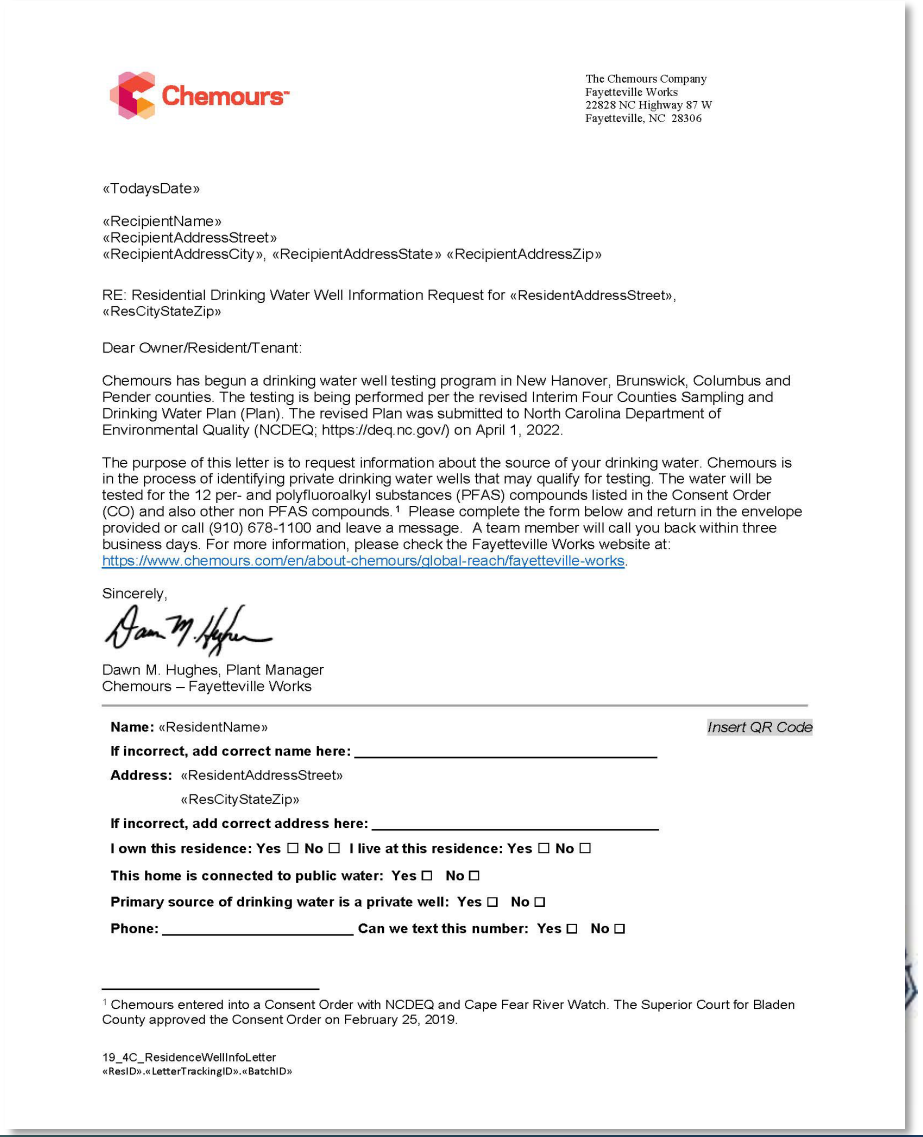
Sampling Your Drinking Water Well (Chemours)

- 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 or 910-678-1101 in the Bladen area**
- 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.

NORTH CAROLINA
Department of Environmental Quality

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
- 2,277 properties are currently eligible for well sampling in Pender County. 1852 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)



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 ☐**

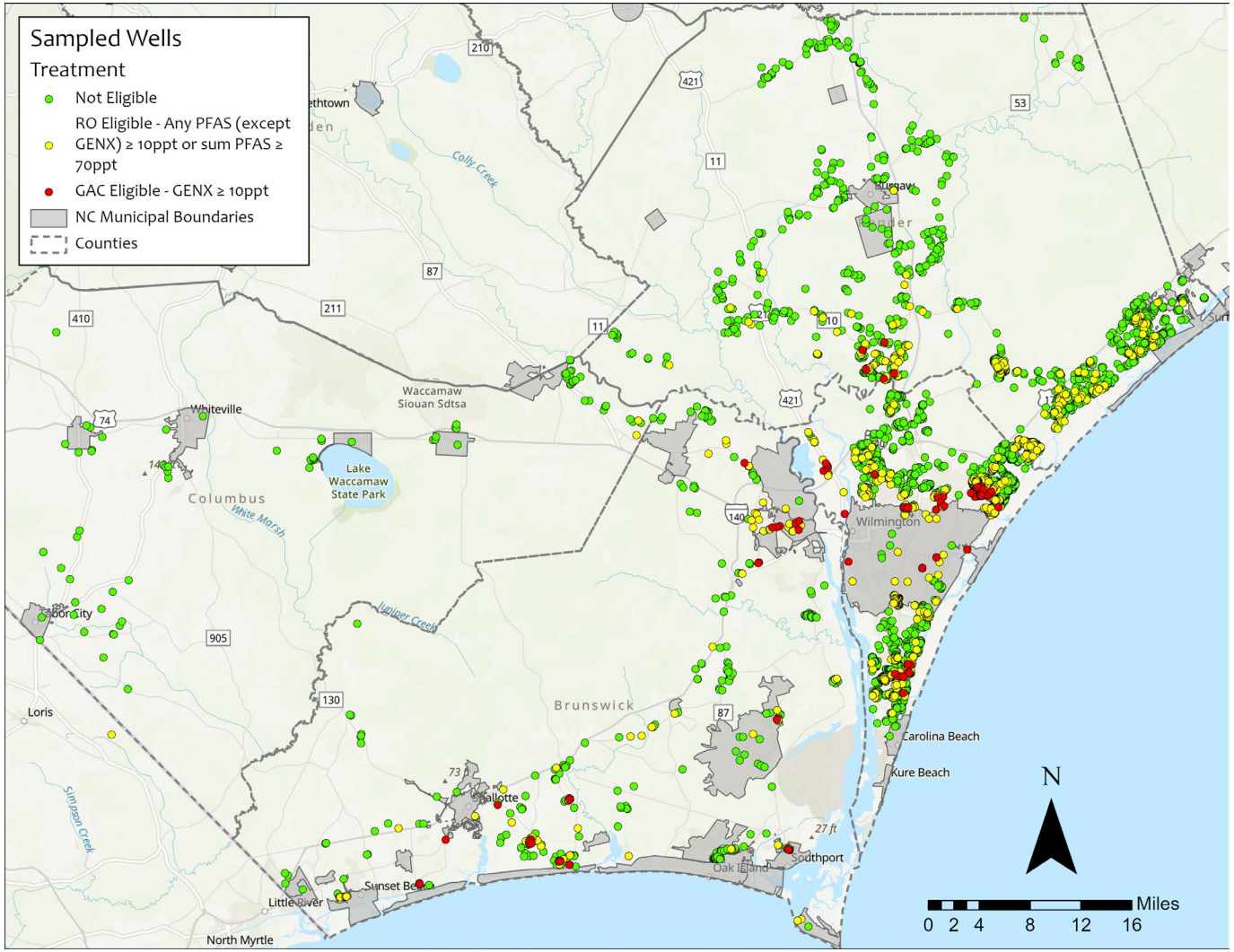
[1] Chemours entered into a Consent Order with NCDEQ and Cape Fear River Watch. The Superior Court for Bladen County approved the Consent Order on February 25, 2019.

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

Updated Private Well Sampling Numbers (Chemours Lower Cape Fear Region)

- Chemours has reported that 1192 residences in the Lower Cape Fear Region qualify for alternate water. 4951 sampling results have been received.
- 1052 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.
- 140 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.

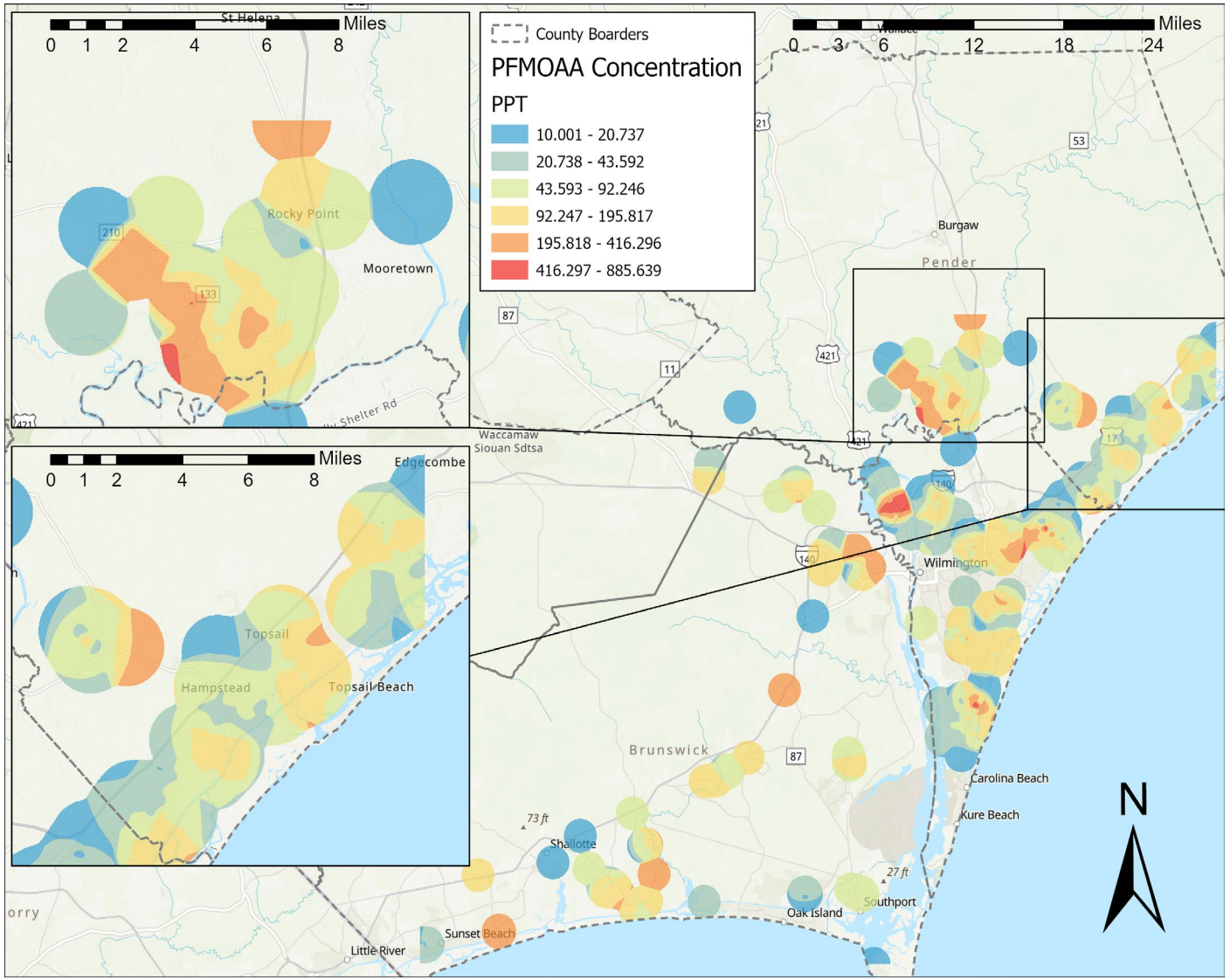
Lower Cape Fear Private Well Sampling



Lower Cape Fear Private Well Testing

PFMOAA concentrations

Source water locations



Next Steps if Chemours PFAS are detected

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

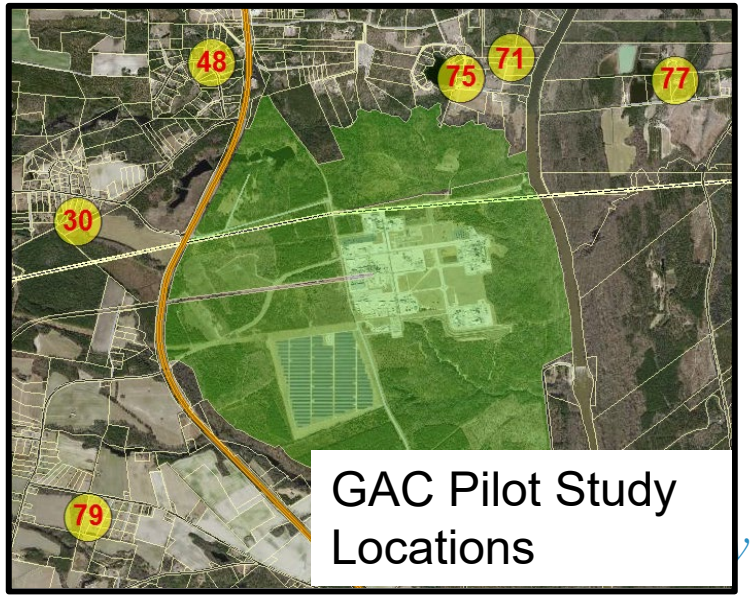
- Two types of well water treatment systems are used
- Whole-house treatment (GAC) and under-the-sink (RO) versions
- DEQ has tested both systems for their effectiveness
- Maintenance

Whole-House Granular Activated Carbon system

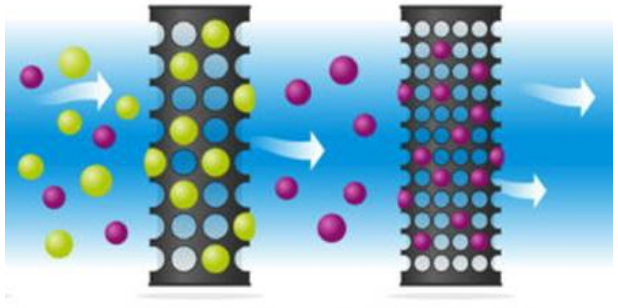
Reverse Osmosis System

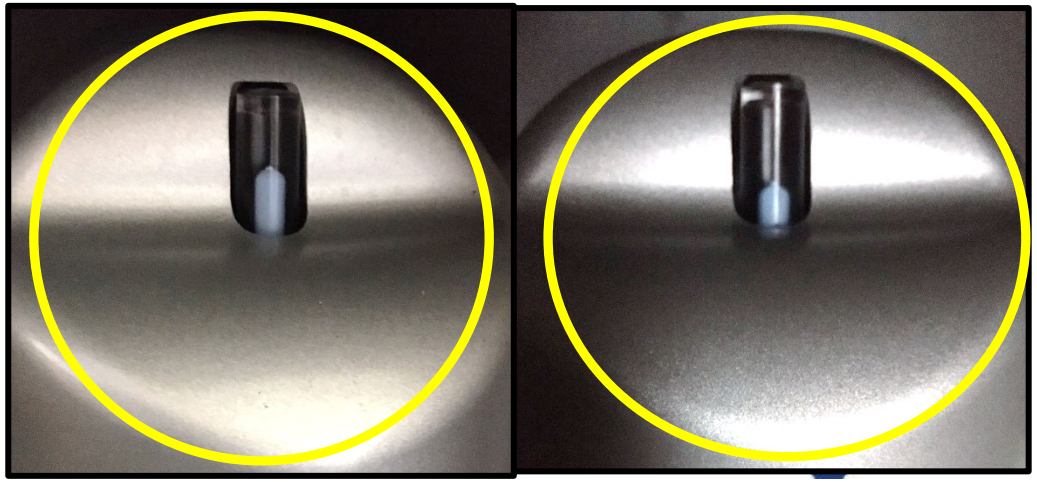
NC DEQ Filtration System Studies

Residential filtration studies

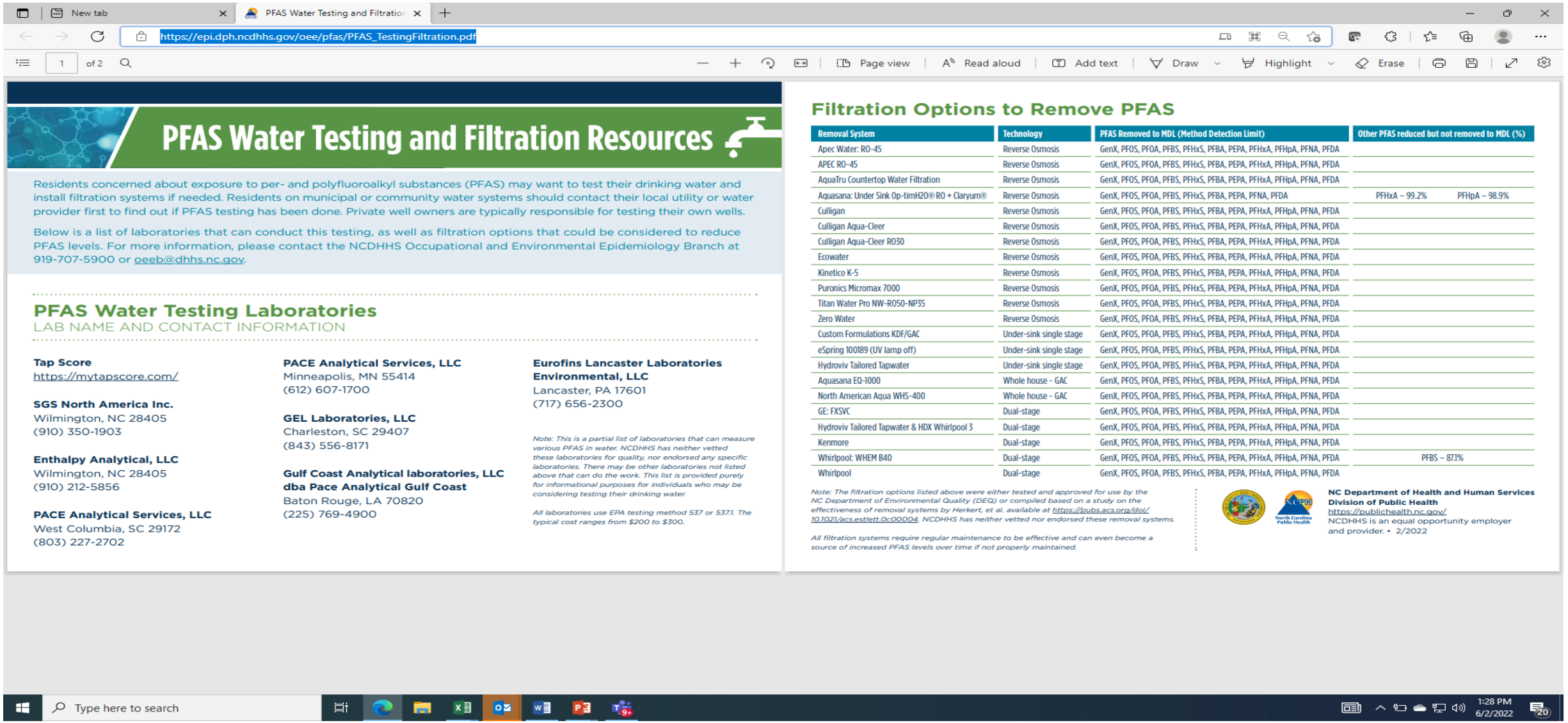


GAC Pilot Study Locations





PFAS Testing Resources and Filters



PFAS Water Testing and Filtration Resources

Residents concerned about exposure to per- and polyfluoroalkyl substances (PFAS) may want to test their drinking water and install filtration systems if needed. Residents on municipal or community water systems should contact their local utility or water provider first to find out if PFAS testing has been done. Private well owners are typically responsible for testing their own wells.

Below is a list of laboratories that can conduct this testing, as well as filtration options that could be considered to reduce PFAS levels. For more information, please contact the NCDHHS Occupational and Environmental Epidemiology Branch at 919-707-5900 or oeeb@dhhs.nc.gov.

PFAS Water Testing Laboratories

LAB NAME AND CONTACT INFORMATION

Tap Score
https://mytapscore.com/

SGS North America Inc.
Wilmington, NC 28405
(910) 350-1903

Enthalpy Analytical, LLC
Wilmington, NC 28405
(910) 212-5856

PACE Analytical Services, LLC
West Columbia, SC 29172
(803) 227-2702

PACE Analytical Services, LLC
Minneapolis, MN 55414
(612) 607-1700

GEL Laboratories, LLC
Charleston, SC 29407
(843) 556-8171

Gulf Coast Analytical laboratories, LLC dba Pace Analytical Gulf Coast
Baton Rouge, LA 70820
(225) 769-4900

Eurofins Lancaster Laboratories Environmental, LLC
Lancaster, PA 17601
(717) 656-2300

Note: This is a partial list of laboratories that can measure various PFAS in water. NCDHHS has neither vetted these laboratories for quality, nor endorsed any specific laboratories. There may be other laboratories not listed above that can do the work. This list is provided purely for informational purposes for individuals who may be considering testing their drinking water.

All laboratories use EPA testing method 537 or 537.1. The typical cost ranges from $200 to $300.

Filtration Options to Remove PFAS

Removal System	Technology	PFAS Removed to MDL (Method Detection Limit)	Other PFAS reduced but not removed to MDL (%)	
Apec Water: RO-45	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
APEC RO-45	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
AquaTru Countertop Water Filtration	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Aquasana: Under Sink Op-timH20® RO + Claryum®	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFNA, PFDA	PFHxA – 99.2%	PFHpA – 98.9%
Culligan	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Culligan Aqua-Cleer	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Culligan Aqua-Cleer RO30	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Ecowater	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Kinetico K-5	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Puronics Micromax 7000	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Titan Water Pro NW-RO50-NP35	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Zero Water	Reverse Osmosis	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Custom Formulations KDF/GAC	Under-sink single stage	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
eSpring 100189 (UV lamp off)	Under-sink single stage	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Hydroviv Tailored Tapwater	Under-sink single stage	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Aquasana EQ-1000	Whole house - GAC	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
North American Aqua WHS-400	Whole house - GAC	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
GE: FXSVC	Dual-stage	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Hydroviv Tailored Tapwater & HDX Whirlpool 3	Dual-stage	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Kenmore	Dual-stage	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		
Whirlpool: WHEM B40	Dual-stage	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA	PFBS – 87.1%	
Whirlpool	Dual-stage	GenX, PFOS, PFOA, PFBS, PFHxS, PFBA, PEPA, PFHxA, PFHpA, PFNA, PFDA		

Note: The filtration options listed above were either tested and approved for use by the NC Department of Environmental Quality (DEQ) or compiled based on a study on the effectiveness of removal systems by Herkert, et al. available at https://pubs.acs.org/doi/10.1021/acs.estlett.0c00004. NCDHHS has neither vetted nor endorsed these removal systems.

All filtration systems require regular maintenance to be effective and can even become a source of increased PFAS levels over time if not properly maintained.

NC Department of Health and Human Services
Division of Public Health
https://publichealth.nc.gov/
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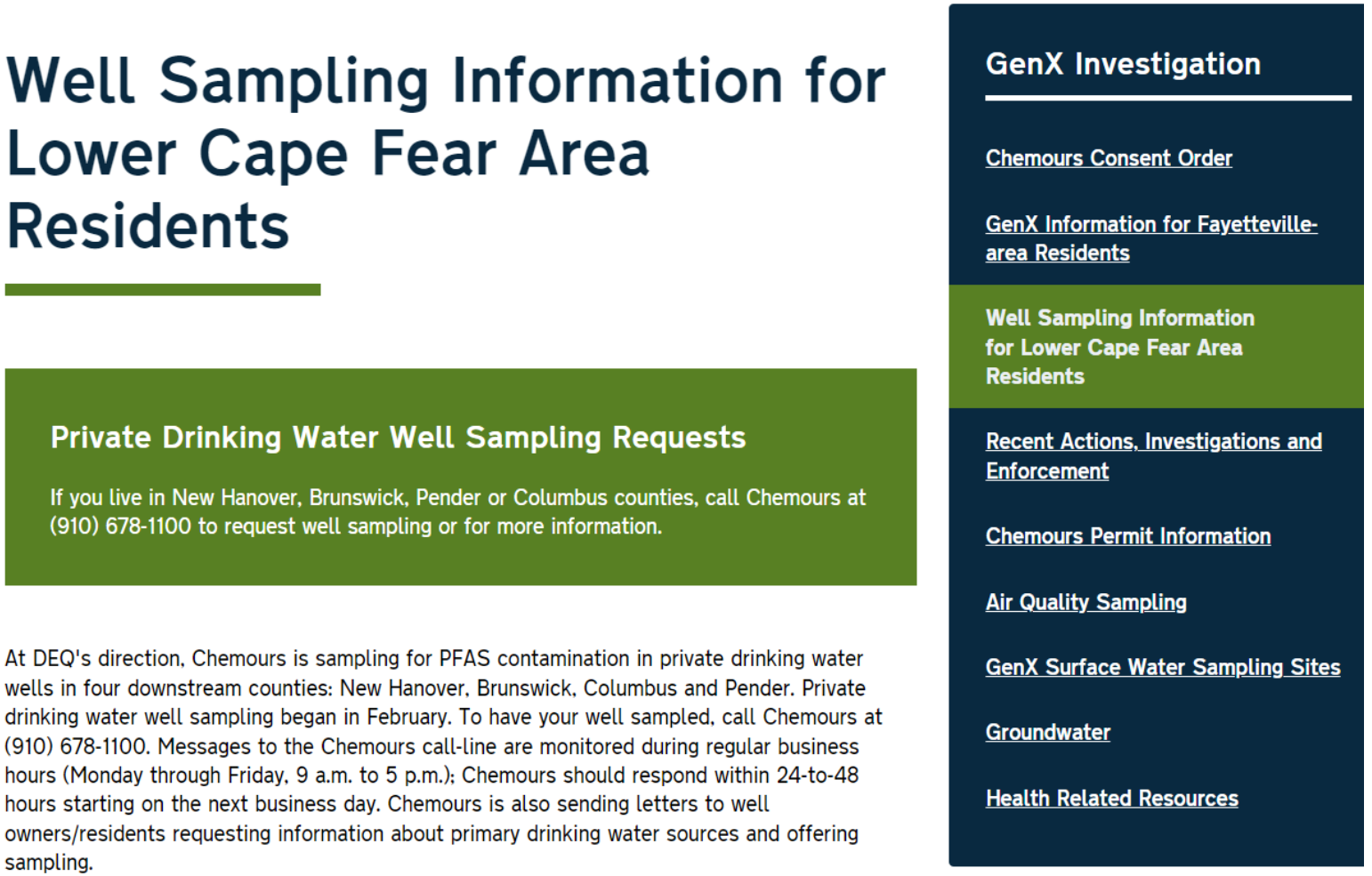
Bottled Water and Sampling Information (Chemours)

- 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/lowercapefear-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

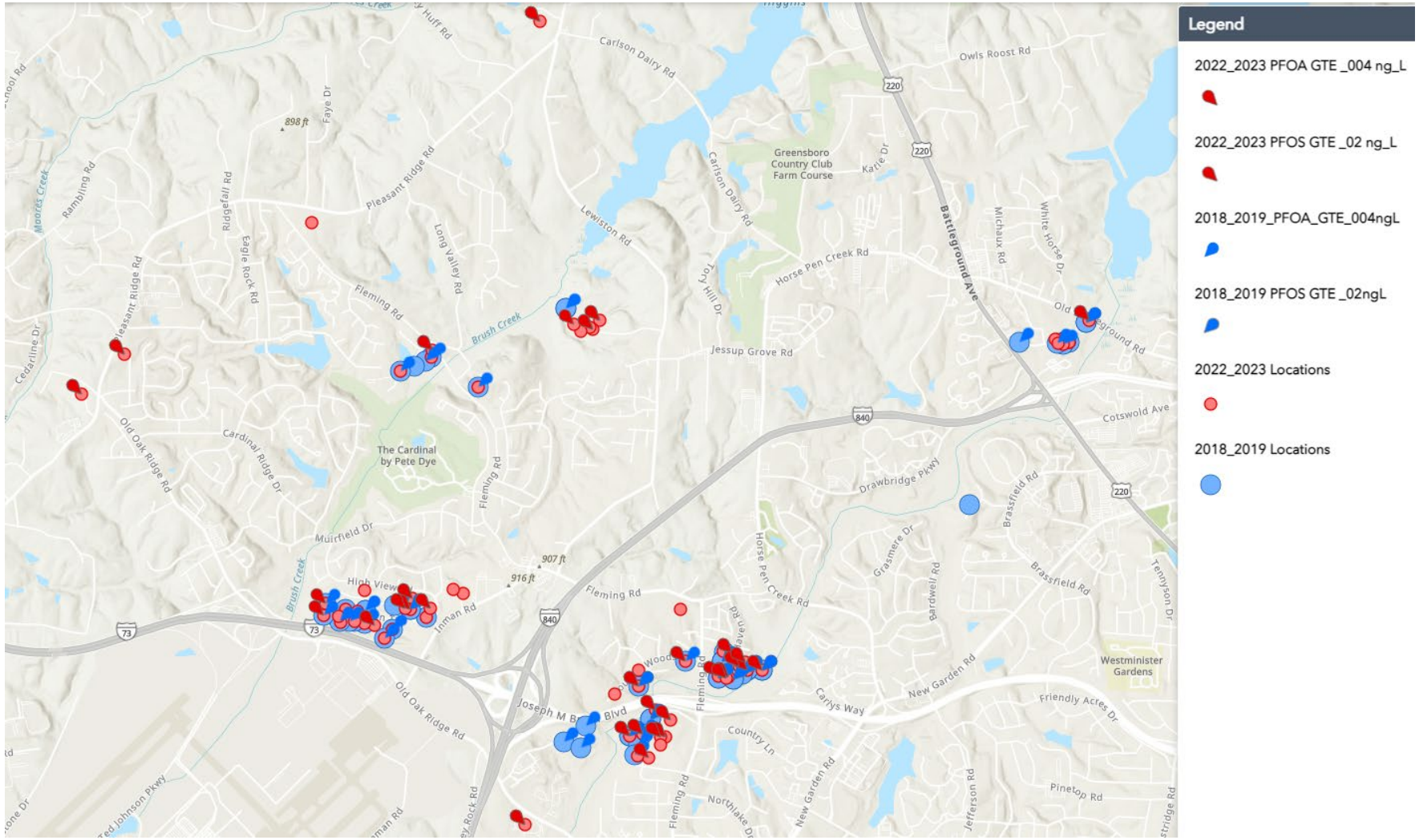
Air Quality Sampling

GenX Surface Water Sampling Sites

Groundwater

Health Related Resources

Greensboro Airport Area Private Well Sampling for PFAS (DEQ Bernard Allen Program)



Next Steps

- Continued private well sampling in four Lower Cape Fear counties: New Hanover, Columbus, Pender and Brunswick. Please share recommendations on making the well testing information available to your community.

- 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

- Additional private well sampling work by DEQ in areas with known PFAS impacts

Waste Management

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Questions???

NORTH CAROLINA
Department of Transportation

NCDOT: NC Clean Transportation Plan

Paula Hemmer

May 4, 2023

Connecting people, products and places safely and efficiently with customer focus, accountability and environmental sensitivity to enhance the economy and vitality of North Carolina

Executive Orders

EO 80 (2018)

- Reduce economy wide emissions by 40% below 2005 levels by 2025
- **Increase total number of registered ZEVs to at least 80,000 by 2025**
- Reduce energy consumption in state-owned buildings by **40%** below 2002-2003 levels

EO 246 (2022)

- Reduce economy wide emissions by 50% below 2005 levels by 2030 and achieve net-zero emission no later than 2050
- **Increase total number of registered ZEVs to at least 1.25 million by 2030**
- **Increase the sale of passenger ZEVs so that 50% of in-state sales are zero emission by 2030**

EO 271 (2022)

- **Propose a NC Advanced Clean Trucks rule by May 2023**
- Develop and prioritize statewide complementary strategies
- **Complete a ZEV infrastructure needs assessment**

Plan Purpose

The Clean Transportation Plan is the state of North Carolina's Plan to meet Executive Order 246.

The plan should:

- Be a plan for all of North Carolina
- Advocate for public, private, and non-profit participation
- Consider all layers of governance
- Focus on equitable outcomes

NCCTP Partners => 220 participants

- Clean transportation practices and technologies change rapidly.
- NCCTP collaborated with a diverse group covering a wide range of interests.

Work Group Topic Areas => +3,300 Ideas

Light Duty ZEV

Focus on light-duty vehicle **transition**, vehicle **availability**, **incentives**, and **affordability**

Medium/ Heavy-Duty ZEV

Builds off the **multistate M/HD MOU**

Fleet Transition

Includes **public** entities, **private** entities, and **school** buses

Vehicle Miles Traveled

Builds off existing **VMT Task Force** and includes **non-vehicular modes**

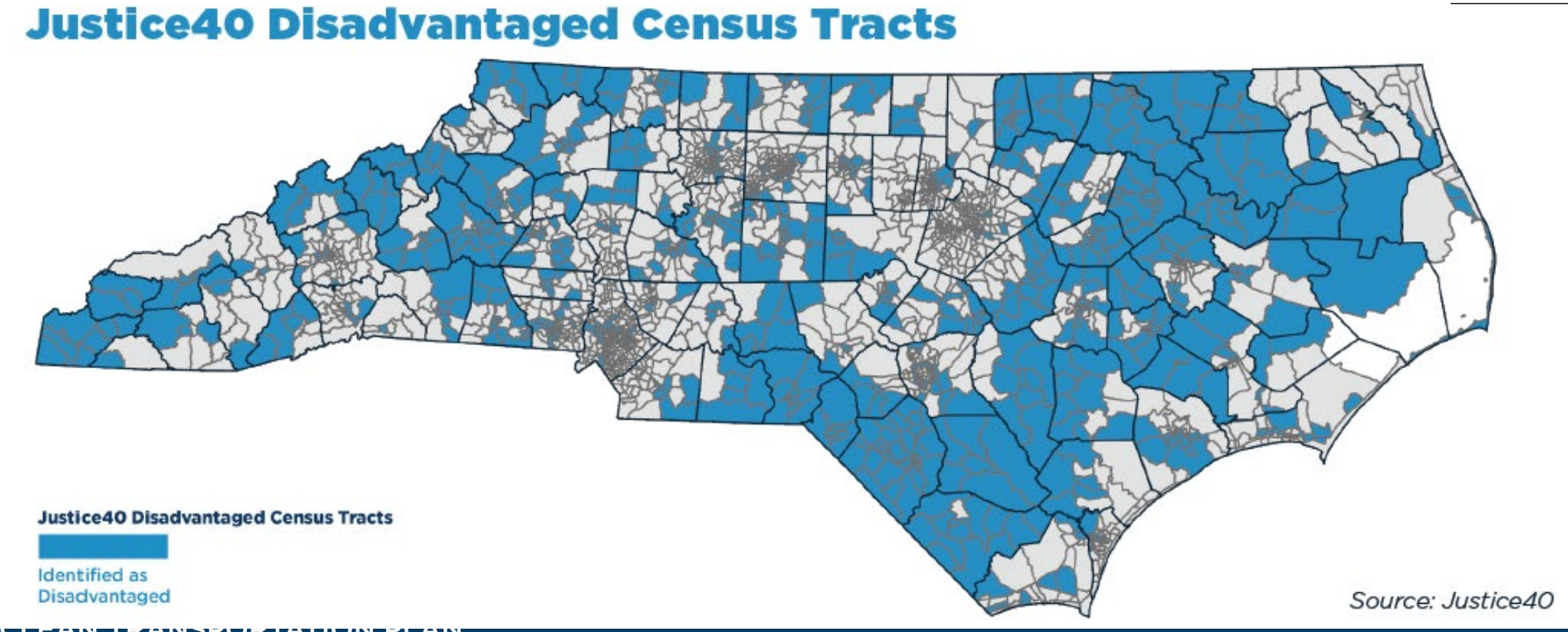
Infrastructure

Includes **charging** infrastructure, **alternative fuel** infrastructure, and identifying **gaps**

Affordability in NC

- 6% of households do not have access to a vehicle
- 30% of census tracts are considered transportation disadvantaged
- Over half the population currently lives in 13 counties

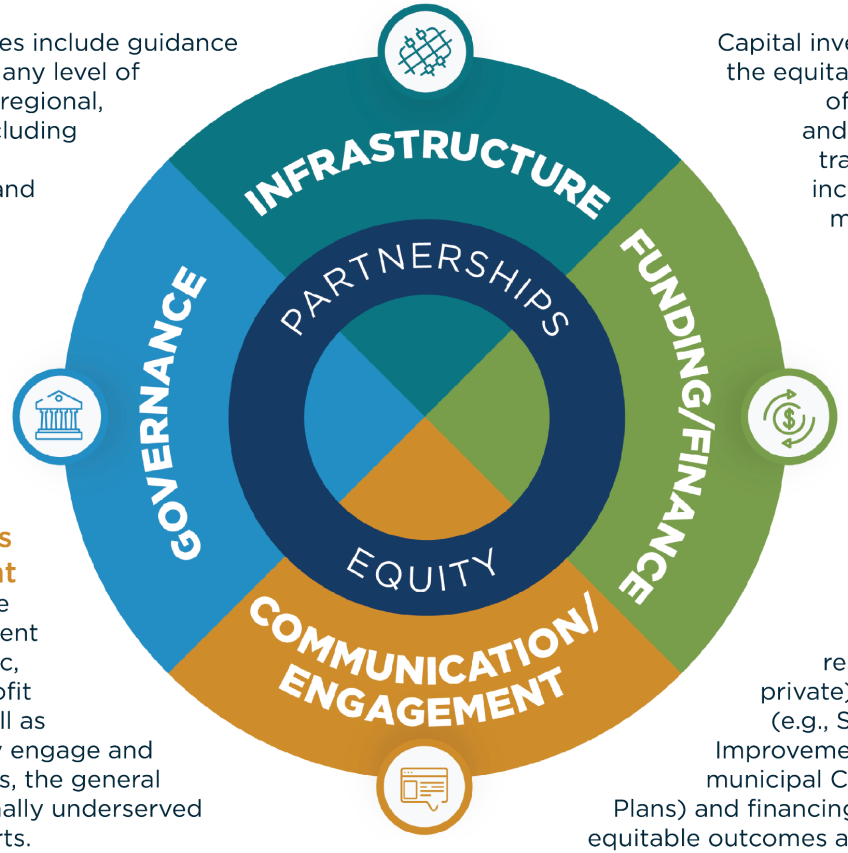
Race	Percent w/o Access to Vehicle
Black	8%
People of Color	10%
American Indian	12%
Mixed/other	7%
Asian/Pacific Islander	5%
Latino	5%
White	4%



Focus Areas

Partnerships
Bringing government, industry, advocates and the public together to advance clean transportation solutions.

Governance
Governance activities include guidance that could occur at any level of government (local, regional, state or federal) including legislation, policy, codes, ordinances and mechanisms that promote equitable outcomes.



Infrastructure
Capital investment resulting in the equitable implementation of increased capacity and connectivity of our transportation system including EV charging, modernization of the electric grid, active transportation and transit supportive infrastructure.

Communications and Engagement
Methods to increase equitable engagement and empower public, private and non-profit effectiveness as well as methods to directly engage and involve stakeholders, the general public and traditionally underserved demographic cohorts.

Funding and Finance
These programs include financial resources (public and private), funding programs (e.g., State Transportation Improvement Program, grants, municipal Capital Improvement Plans) and financing tools that support equitable outcomes and implementation.

Equity
Improving access to clean transportation and equitable outcomes for all with a focus on traditionally underserved populations.

Key Recommendations

Governance Activity

- Create a dedicated NCDOT clean transportation team
- Align statewide policy through a Clean Transportation Interagency Task Force
- ***Increase equitable outcomes in transportation planning projects***
- ***Ensure access and affordability to clean transportation***
- Evaluate and update project prioritization programs
- Partner with utilities to promote clean transportation

Communication and Engagement Activity

- ***Establish a coordinated clean transportation communication strategy***

Funding and Finance Activity

- Maximize existing funding to support clean transportation outcomes
- Evaluate new funding that advances clean transportation outcomes

Infrastructure Activity

- Evaluate and deploy clean transportation infrastructure to support all types of fleet vehicles and applications
- Expand transportation demand management strategies

Governance Activity

Timeframe: *Near- to Mid-Term*

Increase equitable outcomes in transportation planning projects

State Action

N.C. Dept of Transportation and the Clean Transportation Interagency Task Force will work to **enhance existing environmental justice efforts** and **promote equitable outcomes** by doing the following:

- Involve **environmental justice partners** to inform implementation of the NCCTP
- Identify **equity metrics** to incorporate into projects and promote accountability. This includes metrics for
  1) target population identification,
  2) investment decision-making and
  3) program impact assessment

Supporting Strategy

Supporting partners will be asked to:

- Assist with creating **new** engagement and decision-making processes
- Partner with community-based organizations (CBOs)
- Partner with healthcare, economic development and workforce training institutions to **align initiatives**
- Work with communities to **listen to and address concerns** with NCCTP-related investments
- Explore the creation of **zero-emission delivery zones**

Governance Activity

Timeframe: *Near- to Mid-Term*

Ensure access and affordability to clean transportation

State Action

NCDOT will develop policies and programs that promote **access and affordability** to clean transportation options and will **prioritize infrastructure investments** for traditionally underserved communities.

- Address **Justice40* targets** and include access and affordability into federal procurement processes
- Incorporate access to and affordability of charging and fueling infrastructure for ZEVs (**E.O. 271**)
- Pursue competitive **grant resources** under the "Grants for Charging and Fueling Infrastructure" federal grant program
- Provide **technical assistance and partnership** to **businesses and small fleet owners** to assist the transition to zero-emission vehicles (ZEV)

Supporting Strategy

The Clean Transportation Team and NCCTP Work Groups will continue researching ways to:

- Create **incentives and advantages** for clean transportation projects proposed in traditionally underserved communities
- Deploy **rebates, incentives or other support** for traditionally underserved populations
- Provide **technical support for local communities and employers** to secure grants and funding to support clean transportation advancements

**The Justice40 Initiative is a government-wide initiative to ensure 40% of program/project benefits reach traditionally underserved communities as determined by the Justice40 census tract*

Communication and Engagement Activity

Timeframe: *Near-Term*

Establish a coordinated clean transportation communication strategy

State Action

NCDOT - Clean Transportation Interagency Task Force will seek dedicated funding opportunities to support a coordinated communication strategy.

- Identifying resources, staff and partnerships to develop and implement an education and awareness campaign
- **Developing tailored and accessible messaging for traditionally underserved communities**
- Coordinating with each state agency to include clean transportation initiatives within annual public involvement plans
- **Conduct workshops in coordination with local leaders**

Supporting Strategy

- Develop training materials to further educate and engage stakeholders
- Develop publicly available tools and dashboards that improve transparency and access to information
- **Work with non-profit advocacy groups to connect clean transportation messaging and resources with a diversity of demographic cohorts**
- Promote and provide outreach for electric vehicle (EV) demonstrations and promotional events
- Coordinate with MPOs and RPOs on local outreach to community members
- **Ensure equitable access to transportation events and public participation opportunities**

Maintaining Momentum

NCDOT is starting next phase of CTP

Recognize that transportation is not centrally focused

- **Interagency Task Force**
- **NCDOT Clean Transportation Team**
- **Work Groups will be reconvened to facilitate near-term strategies**
- **Work with Local Planning Organizations to utilize federal funding**

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Thank you!

Advanced Clean Trucks Rule – Environmental Justice Analysis Proposal

May 4, 2023

Department of Environmental Quality

Agenda

- **ACT and Environmental Justice Analysis Goal**
- **Methods**
  - Route-based sources
  - Point sources
  - Sociodemographic Indicators
- **Conclusion**

ACT and EJ Analysis Goal

- **As part of Gov. Roy Cooper's Executive Order 271, the ACT rule would require medium- and heavy-duty (M/HD) manufacturers to sell an increasing percentage of zero-emission vehicles (ZEVs) over time.**

- **The ACT rule would lead to reduced air pollution emissions across the state.**

ACT and EJ Analysis – Research Questions

GOAL

Understand where emissions reduction benefits may occur from an increase in zero-emission medium- and heavy-duty vehicles in the state

1. **Where in the state are M/HD vehicles potentially contributing more emissions?**

2. **What populations are in these areas?**

Methods

1. **Where in the state are M/HD vehicles potentially contributing more emissions?**

   - **Route-based sources – roads that M/HD vehicles traverse**
     - **Ex:** interstates, arterials, local routes

   - **Idling sources – areas where there may be more M/HD vehicles idling**
     - **Ex:** Freight centers, wholesale distribution & manufacturing centers, etc.

Methods

2. What populations are in these areas?

- **Connection to sociodemographic data**
- **Sociodemographic indicators of interest:**
  - Race & Ethnicity
  - Age & Sex
  - Poverty
  - Household Income
  - Disability
  - Limited English Proficiency
  - Tribal Organization

Methods – Route-based Sources

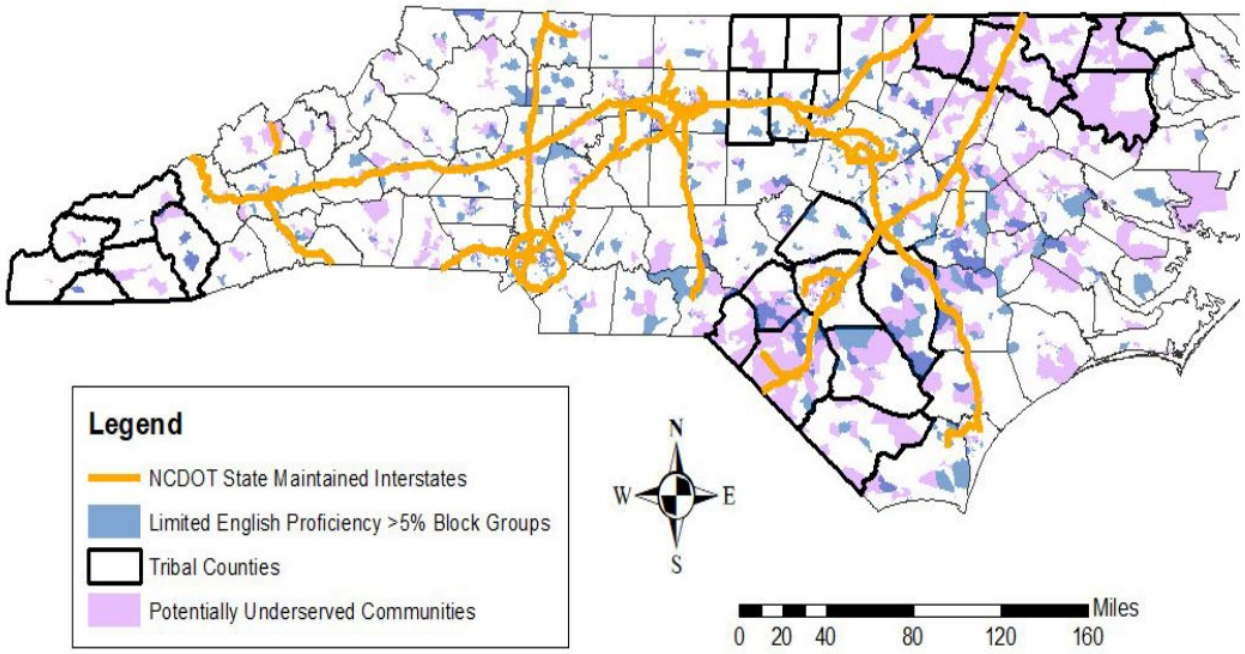
Vehicle Miles Traveled (VMT) – total miles traveled by vehicles in a specific area over a period of one year.

- Higher VMT → Higher emissions
- Lower VMT → Lower emissions

Generate VMT totals for census tracts using 2019 Traffic Data

Methods – Route-based Sources

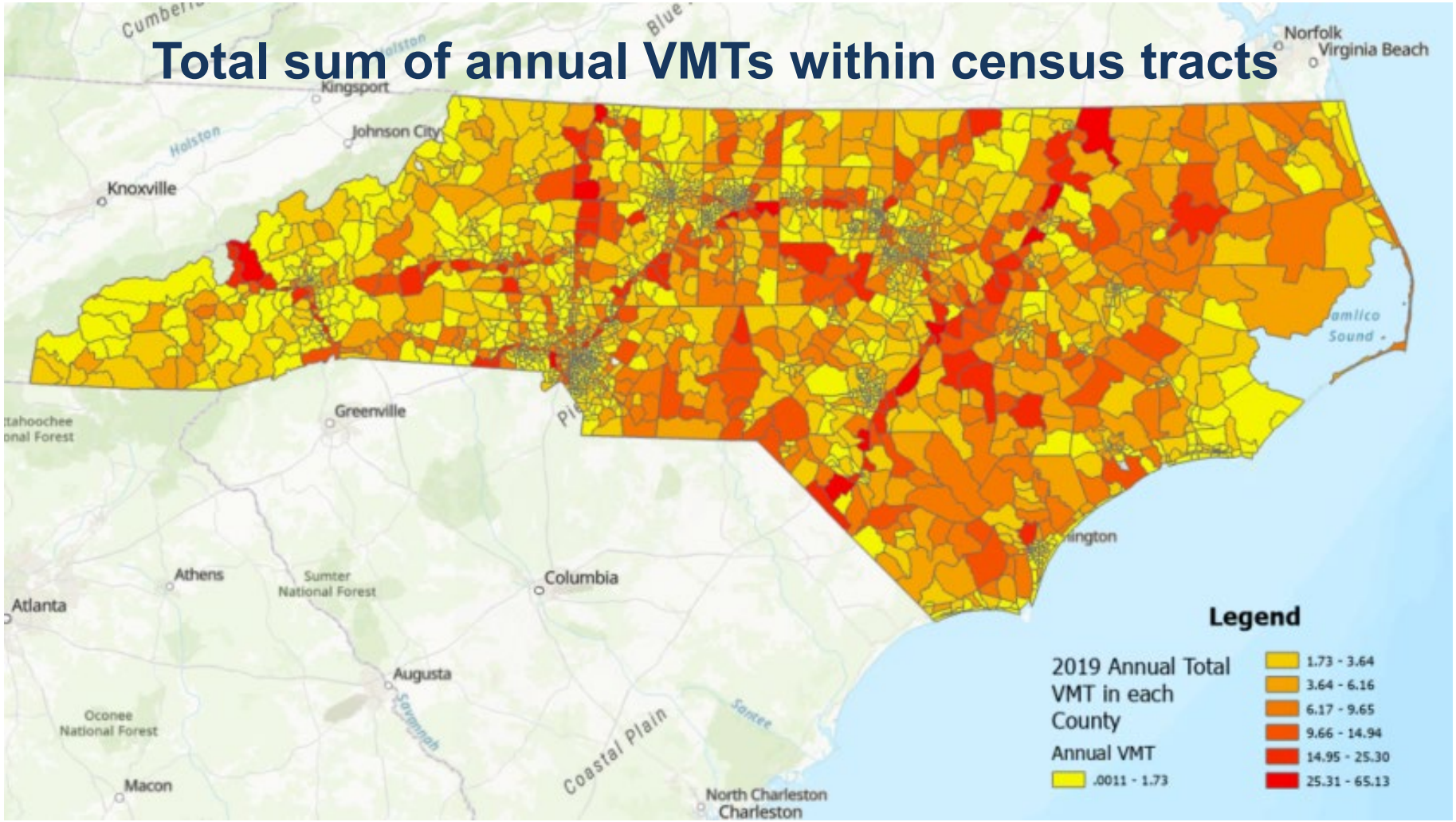
NC Interstates and Sociodemographic Indicator Groups



The Potentially Underserved Communities layer is comprised of groups that meet criteria for both race/ethnicity AND poverty.

2014 Average Annual Daily Truck Traffic

Methods – Route-based Sources



Analysis – Route-based Sources

DRAFT ANALYSIS – For Illustration Purposes Only

	Indicator	All Census Tracts in North Carolina (n=2195)			Census Tracts > 10,000,000 VMT (n=144)		
		Average	95% Confidence Interval		Average	95% Confidence Interval	
RACE/ ETHNICITY	White alone	2630	2571	2690	2851	2637	3065
	Black or African American	811	775	848	781	634	927
	American Indian or Alaska Native	43	34	53	**108**	**54**	**162**
	Asian	153	139	166	112	93	131
	Native Hawaiian and Other Pacific Islander	2.96	2.66	3.26	1.57	1.25	1.89
	Some Other Race	20	19	20	18	16	20
	Population of two or more races	168	164	172	169	157	182
INCOME	Household income	$75,337	$73,867	$76,808	$75,337	$70,514	$80,161
	Total Households Income < $10,000	7	6.71	7.17	6.94	6.19	7.70

Additional indicators for consideration: Limited English Proficiency, Educational Attainment, Disability

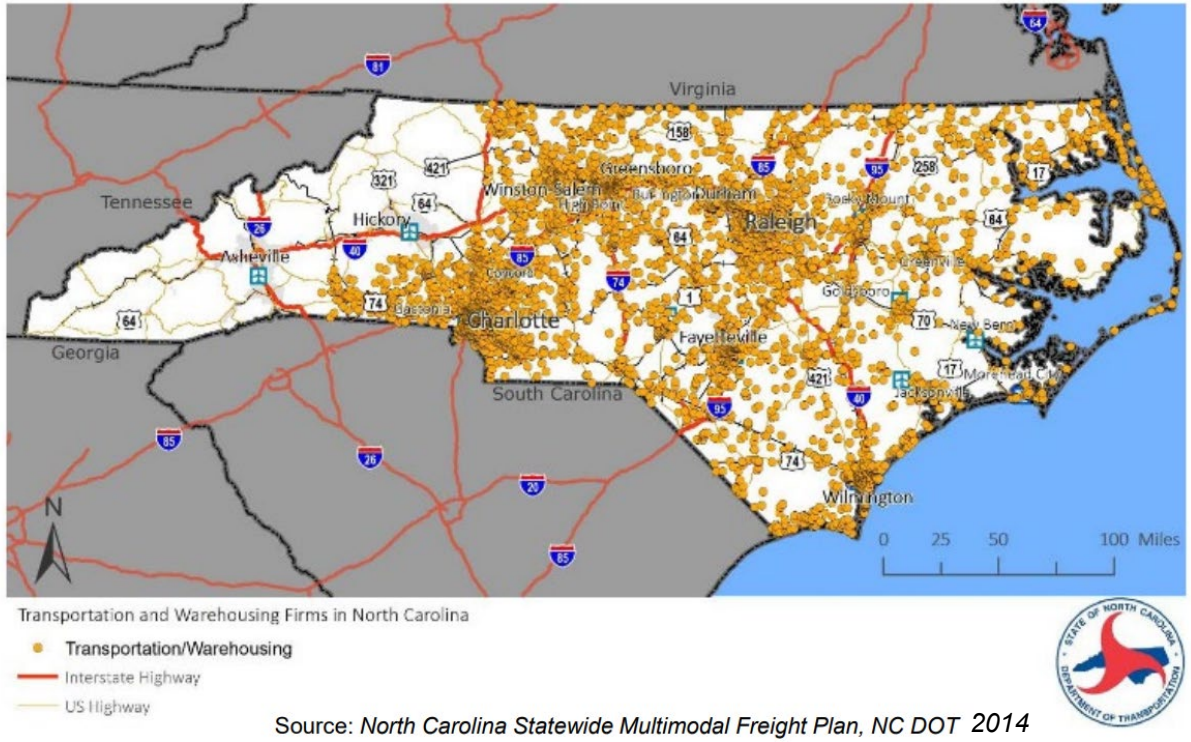
Methods – Idling Sources

- **Idling sources - areas where there may be more M/HD vehicles idling**
  - Increased count of idling sources → Increased vehicle idling → Increased air emissions
  - Potential for air quality to improve with ACT

- **Areas of interest:**
  - Freight centers
  - Wholesale distribution and manufacturing centers
  - Delivery and sorting fulfillment centers
  - Ports
  - Air cargo delivery sites
  - Military bases

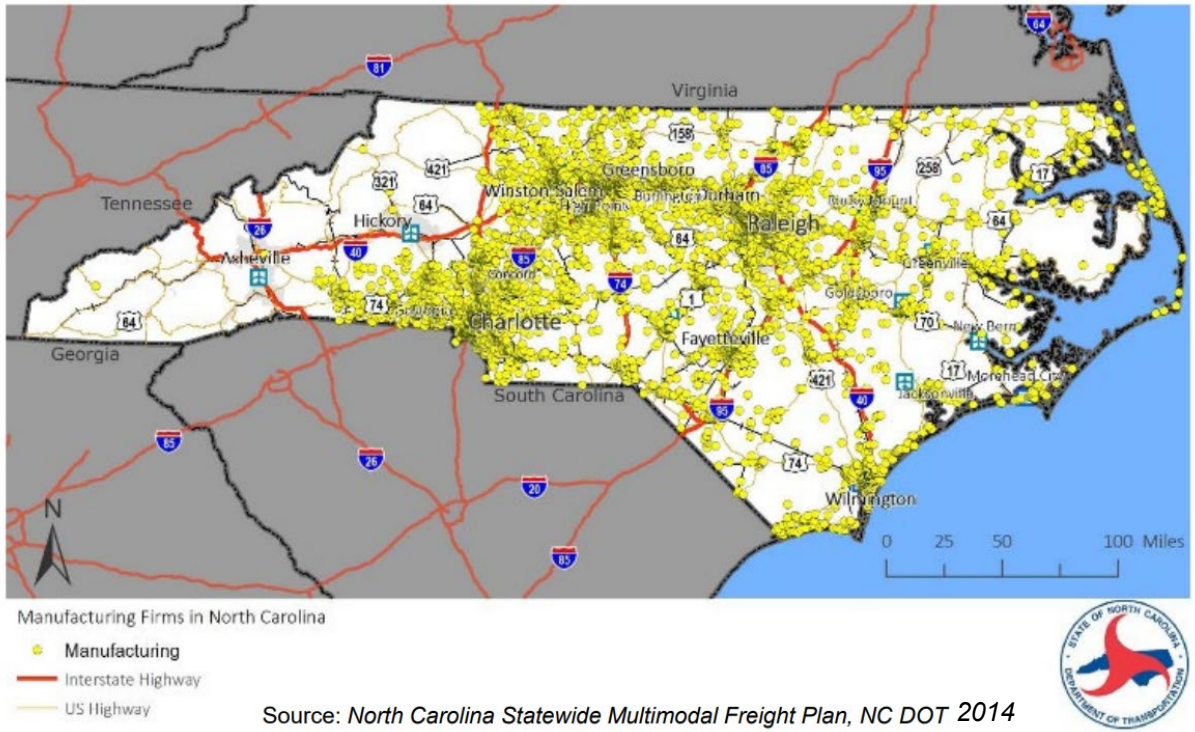
Methods – Idling Sources

Transportation/Warehousing Firms in NC



Source: *North Carolina Statewide Multimodal Freight Plan, NC DOT 2014*

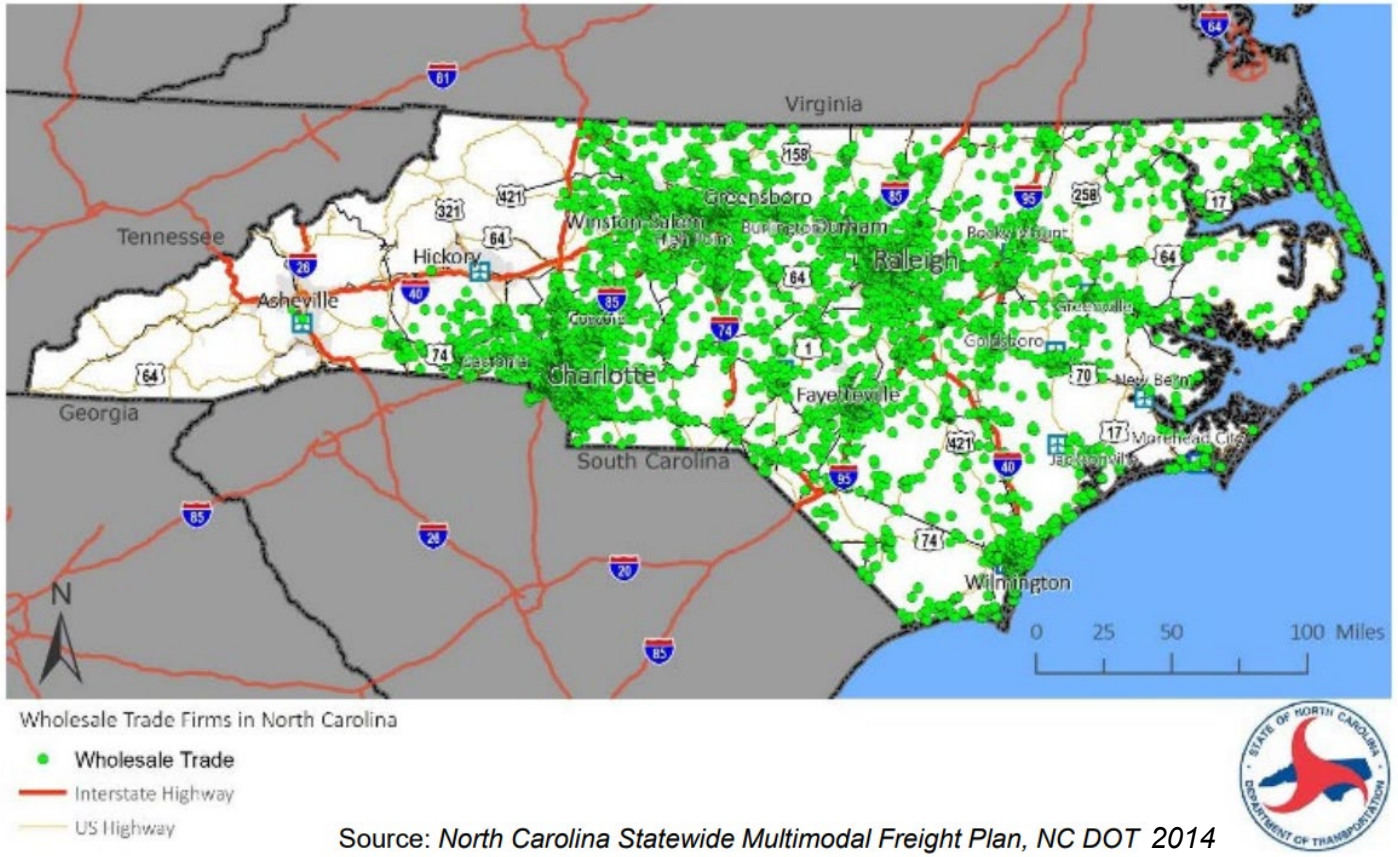
Manufacturing Firms in NC



Source: *North Carolina Statewide Multimodal Freight Plan, NC DOT 2014*

Methods – Idling Sources

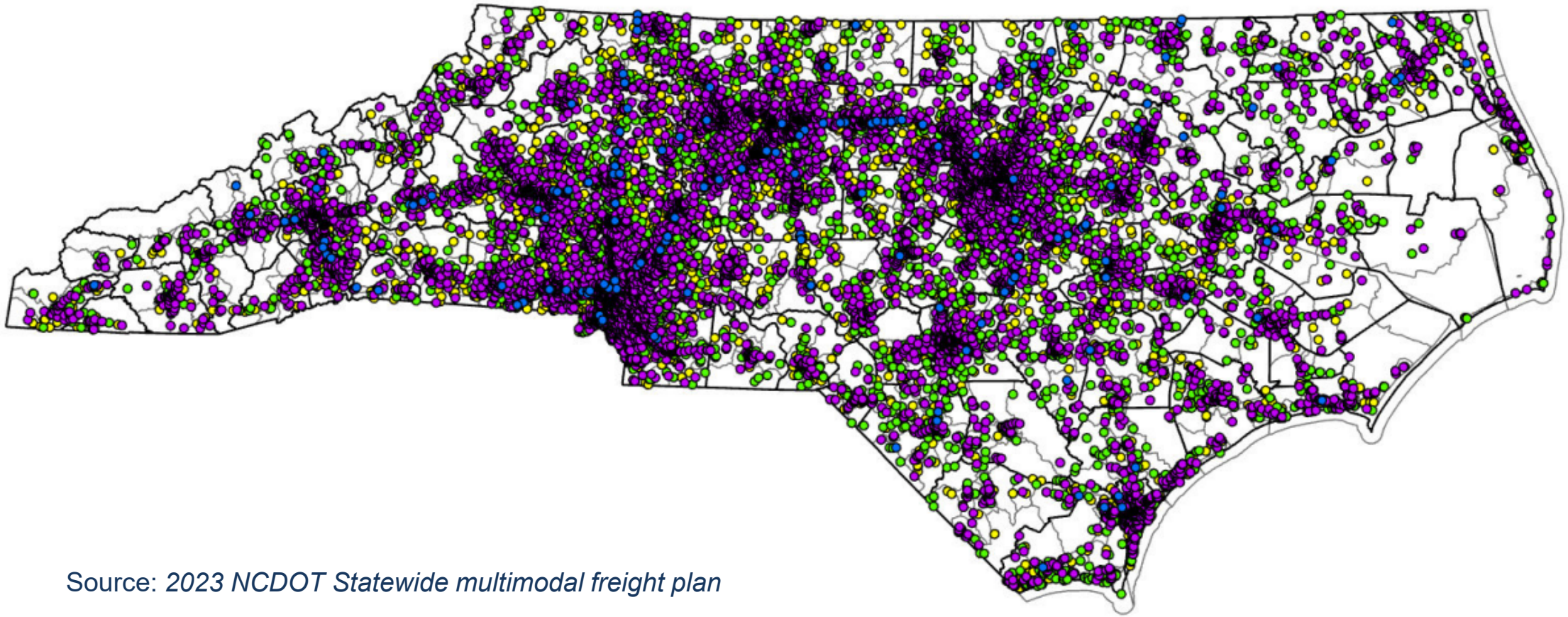
Wholesale Trade Firms in NC



Source: *North Carolina Statewide Multimodal Freight Plan, NC DOT 2014*

Methods – Idling Sources

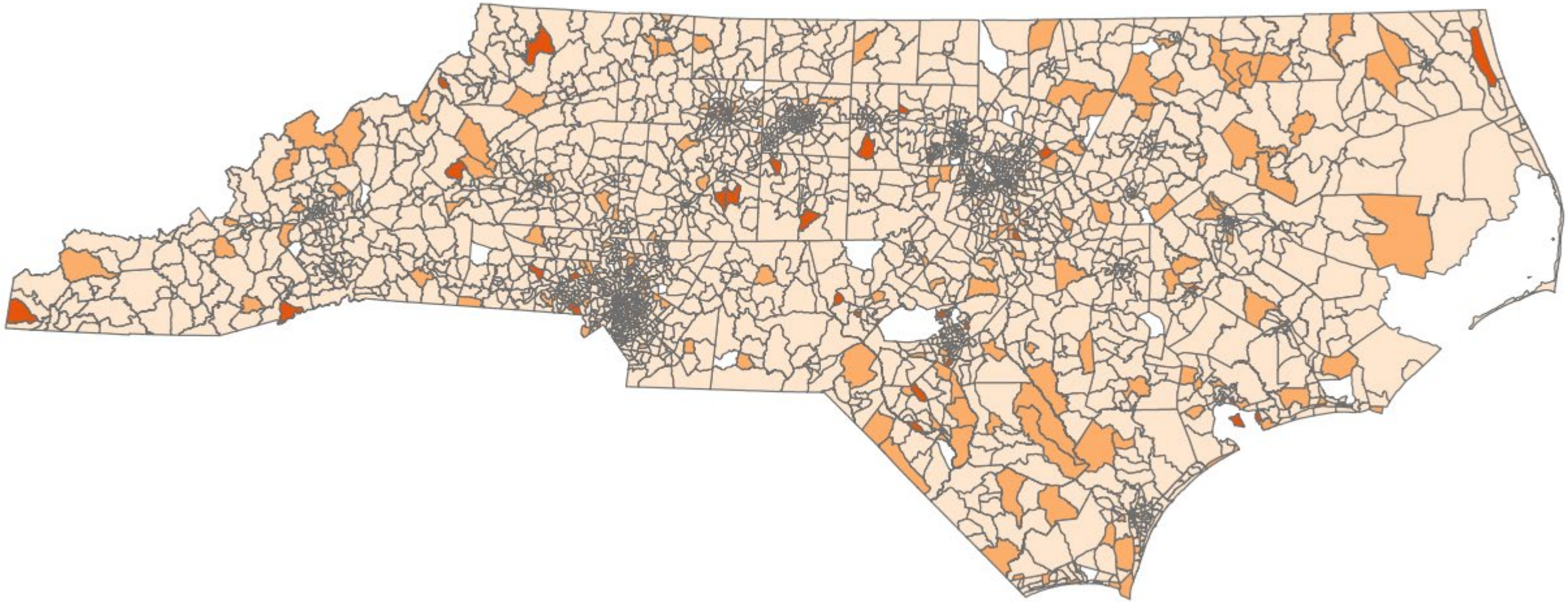
Combined idling sources



Source: *2023 NCDOT Statewide multimodal freight plan*

Analysis – Idling Sources

Census Tracts with Different Types of Idling Sources



Conclusion

1. **Where in the state are M/HD vehicles potentially contributing more emissions?**
   - **Route-based sources → emissions while in transit**
   - **Idling sources → emissions while idling**
2. **What populations are in these areas?**
   - **Sociodemographic data (race/ethnicity, income, disability, age, educational attainment, etc.)**

Conclusion - Outcome

Understand where emissions reduction benefits may occur from an increase in zero-emission medium- and heavy-duty vehicles as a result of the ACT rule in the state

QUESTIONS?