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NORTH CAROLINA

Chemours Overview

Departments of Environmental Quality and Health and Human Services

Public Information Session

December 14, 2017

Discussion Outline

- State and federal resources currently involved at the site and around the region
- Latest surface water and groundwater monitoring results
- Groundwater next steps
- Alternate water discussion
- Information on the air emissions from the Chemours Fayetteville Works facility
- Enforcement update
- Department of Health and Human Services Overview

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Resources

State Resources

1. Division of Water Resources (DEQ)
2. Division of Waste Management (DEQ)
3. Division of Air Quality (DEQ)
4. Department of Health and Human Services

Environmental Quality

Federal Resources

1. EPA

Local Resources

1. Bladen and Cumberland County Health Departments
2. Boards of Commissioners

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Areas of Focus

- Current focus is to address the needs of the surrounding communities.
- Serve as a conduit for the community and local partners to address concerns.
- Fully assess the environmental impact of the fluorinated compounds in the environment.
- Further the knowledge base of fluorinated compounds through collaboration with the DEQ / DHHS Scientific Advisory Board.

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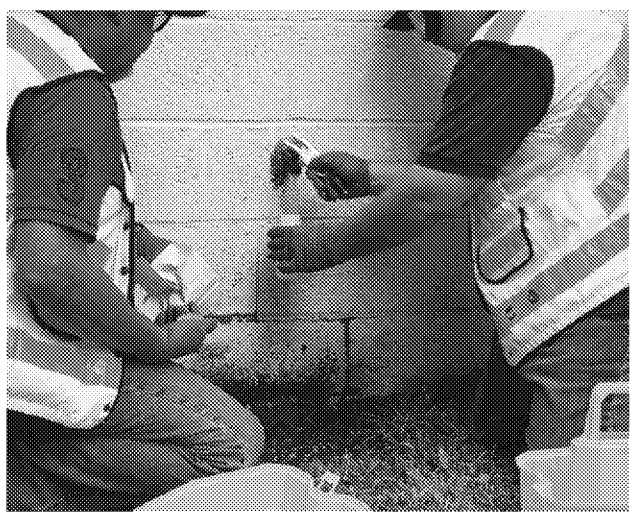
Private Well Sampling Results

Private Wells Sampled (Phase 1):	**141**
Total # wells with exceedance of the Gen X NC DHHS provisional health goal:	**51**
Total # wells reported as non-detect (ND):	**35**
Total # wells with a Gen X detection (including those above the health goal):	**106**
Total # wells with a Gen X detection less than the health goal:	**55**



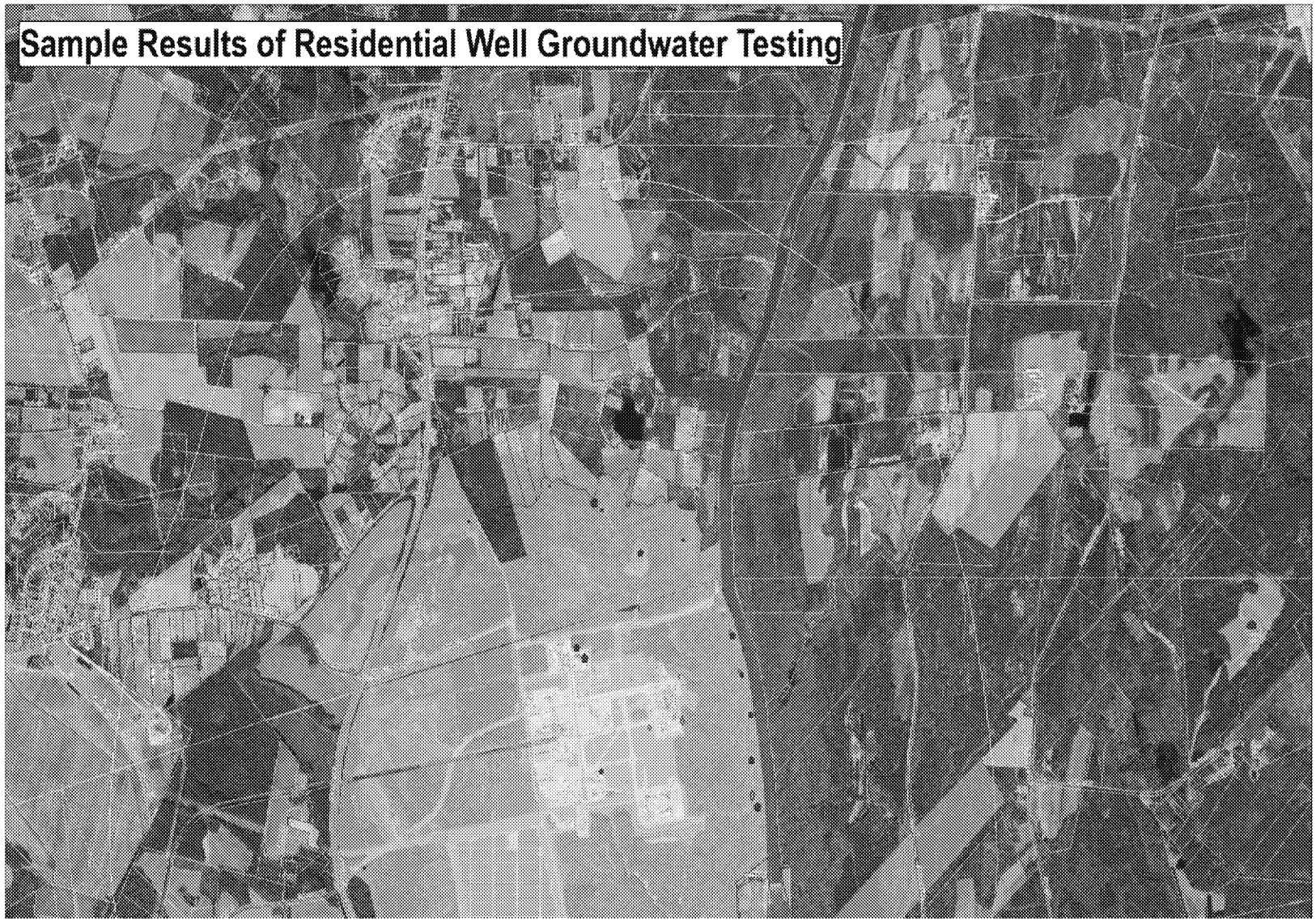
Private Well Sampling Results (Phase 2)

Private Wells Sampled:

208

Total # wells with exceedance of the Gen X NC DHHS provisional health goal:	64
Total # wells reported as non-detect (ND):	55
Total # wells with a Gen X detection (including those above the health goal):	153
Total # wells with a Gen X detection less than the health goal:	89

Sample Results of Residential Well Groundwater Testing

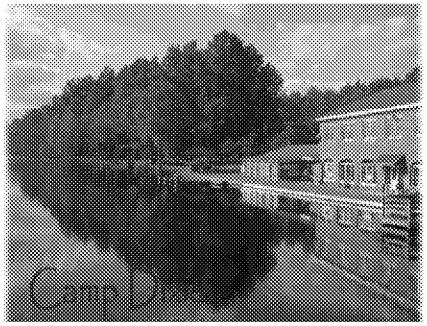


Southern Area of Private Well Sampling

Additional Private Well Sampling

Additional DEQ Sampling

- Two Cumberland County Elementary school wells were sampled. (Gen x levels of 5 ppt and Non detect)
- Surface water samples were collected at Camp Dixie in Bladen County and Marshwood Lake In Cumberland County. (Gen x levels of 620 and 915 ppt)
- DEQ has worked collaboratively with DHHS to address use of recreational areas.
- DEQ has also sampled an athletic field in Cumberland County that used well water onsite.



Alternate Water Update

- Bottle water is currently being provided to Bladen and Cumberland County residents who have GenX above the state's provisional drinking water health goal of 140 parts per trillion.
- Chemours delivers a letter to each residence that has an exceedance with 5 cases of water.
- DEQ reviews lab data and sends a health risk evaluation letter to each well owner noting appropriate uses of the water.
- Each residence is then set up with Cyrstal Springs who provides water dispensers.
- Bottle water is also available at the Chemours plant after an exceedance is detected.

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Groundwater – Next Steps

- Chemours On-Site Investigation
  - Sample some 40 additional on-site monitoring wells for GenX and other compounds of concern to determine groundwater contamination on-site.
  - Install both shallow and deep monitoring wells to refine the groundwater flow model for the site.
  - Conduct shallow and vertical soil profiling of GenX into deeper areas of the subsurface to learn the extent of soil contamination and the ability to impact the groundwater through leaching.
- Determine if Willis Creek is a discharge point for groundwater.
- Conduct Aquifer tests to determine transport characteristics of the subsurface.
- Determine the areas of the site that caused the releases of contaminants.

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Division of Water Resources

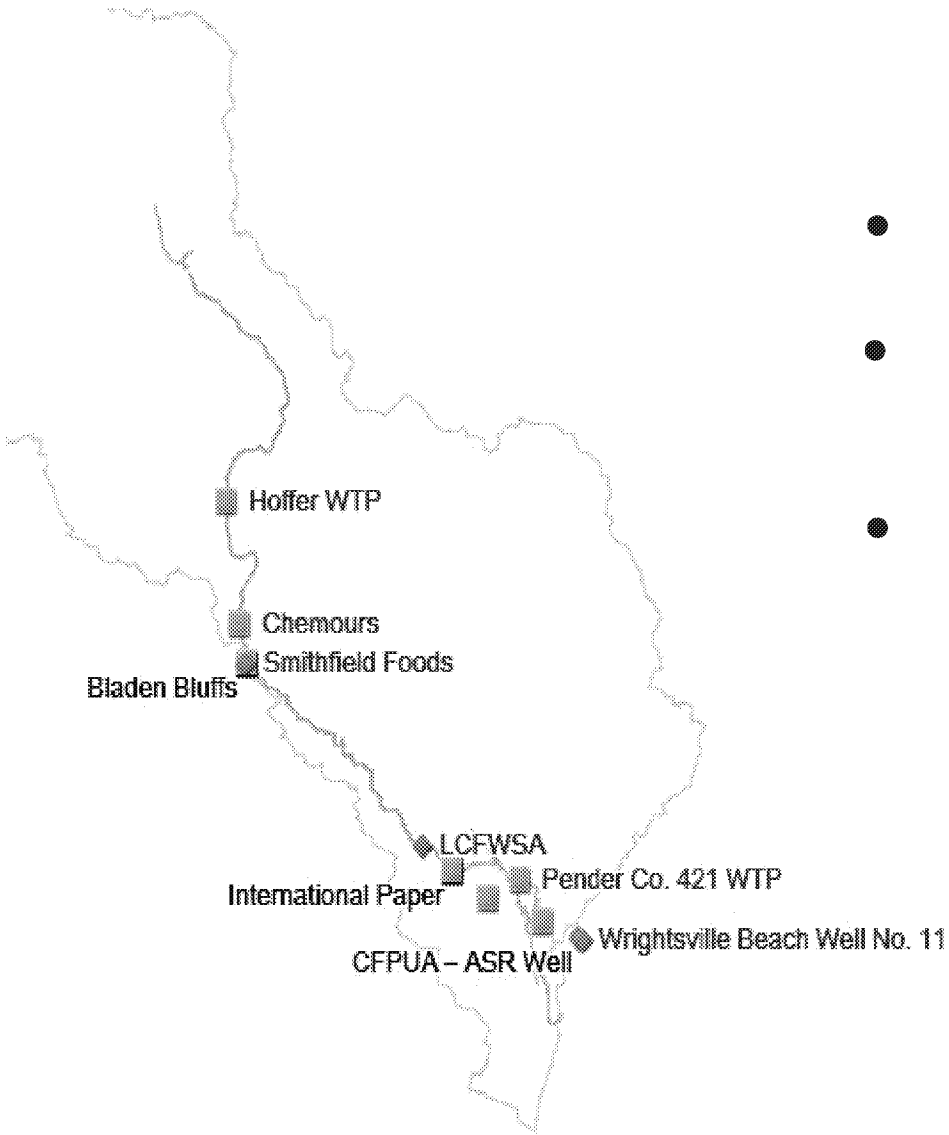
Current Weekly Sampling

Division of Water Resources Staff Conduct Weekly Sampling

- The Chemours outfall 002 has two composite samples:
  Monday - Thursday and Friday - Sunday

- Drinking water facilities downstream are sampled weekly:
  Bladen Bluff
  International Paper
  NW Brunswick
  Pender County
  CFPU Sweeney

DEQ Sampling



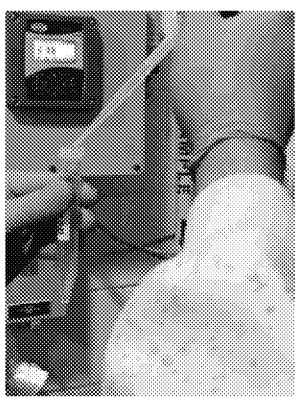
- Process area sampling at Chemours.
- Weekly composite sampling at the Chemours NPDES outfall 002.
- Weekly sampling of finished drinking downstream of the Chemours facility.

Water Sampling Procedures-from EPA Athens Lab

- Fill 2 sample containers for each location to the 5ml mark. (PWS is collecting samples from the finished water tap at the water treatment plant)
- -Close sample container using the cap associated with the bottle.
- -Place samples and sample label in Whirl-Pak bag.
- -Place Whirl-Pak bag in a Ziploc.
- -Place Ziploc in cooler with ice.
- -Samples are sent to the EPA-Athens Lab by FedEx each Thursday afternoon.

Pender Co. Utilities

CFPUA



Brunswick Co. Utilities

Chemicals Analyzed

EPA ATHENS - Collected 10/16/2017, ppt

FRO Location	4:2FTS	6:2FTS	8:2FTS	FOSA	HFPO-DA (GenX)	N-MeFOSAA	PFBA	PFBS	PFDA	PFDoA	PFDS	PFHpA	PFHpS	PFHxA	PFHxS	PFNA	PFNS	PFOA	PFOS	PFPeA	PFPeS	PFTrDA	PFUdA
Hoffer WTP Raw	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U, J, QC-3	53	40 U	88	40 U	40 U	40 U	40 U	19 J, Q-2	78	40 U	40 U	40 U
Chemours outfall 002	40 U	40 U	40 U	40 U	440	40 U	25 J, Q-2	40 U	40 U	40 U	40 U, J, QC-3	36 J, Q-2	40 U	53	40 U	40 U	40 U	40 U	22 J, Q-2	62	40 U	40 U	40 U
Bladen Bluffs Finished	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U, J, QC-3	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U	40 U

EPA ATHENS - Collected 10/18/2017, ppt

FRO Location	4:2FTS	6:2FTS	8:2FTS	FOSA	HFPO-DA (GenX)	N-MeFOSAA	PFBA	PFBS	PFDA	PFDoA	PFDS	PFHpA	PFHpS	PFHxA	PFHxS	PFNA	PFNS	PFOA	PFOS	PFPeA	PFPeS	PFTrDA	PFUdA
Boat Ramp at Lock and Dam #3 CFR	40 U	40 U	40 U	40 U	65	40 U	40 U	40 U	40 U	40 U	40 U, J, QC-3	40 J, Q-2	40 U	40 U	40 U	40 U	40 U	40 U	21 J, Q-2	55	40 U	40 U	40 U

EPA ATHENS - Collected 10/19/2017, ppt

WIRO Location	4:2FTS	6:2FTS	8:2FTS	FOSA	HFPO-DA (GenX)	N-MeFOSAA	PFBA	PFBS	PFDA	PFDoA	PFDS	PFHpA	PFHpS	PFHxA	PFHxS	PFNA	PFNS	PFOA	PFOS	PFPeA	PFPeS	PFTrDA	PFUdA
International Paper Finished	40 U	40 U	40 U	40 U	62	40 U	22 J, Q-2	40 U	40 U	40 U	40 U, J, QC-3	20 J, Q-2	40 U	40 U	40 U	40 U	40 U	40 U	40 U	49	40 U	40 U	40 U
NW Brunswick WTP Finished	40 U	40 U	40 U	40 U	250	40 U	19 J, Q-2	40 U	40 U	40 U	40 U, J, QC-3	25 J, Q-2	40 U	34 J, Q-2	40 U	40 U	40 U	40 U	40 U	48	40 U	40 U	40 U
Pender Co. 421 WTP Finished	40 U	40 U	40 U	40 U	41	40 U	22 J, Q-2	40 U	40 U	40 U	40 U, J, QC-3	18 J, Q-2	40 U	41	40 U	40 U	40 U	40 U	40 U	54	40 U	40 U	40 U
CFPUA Sweeney Finished	40 U	40 U	40 U	40 U	110	40 U	40 U	40 U	40 U	40 U	40 U, J, QC-3	46	40 U	58	40 U	40 U	40 U	40 U	40 U	60	40 U	40 U	40 U

U The analyte was not detected at or above the reporting limit.

J The identification of the analyte is acceptable; the reported value is an estimate.

Q-2 Result greater than MDL but less than MRL

QC-3 Analyte calibration criteria not met

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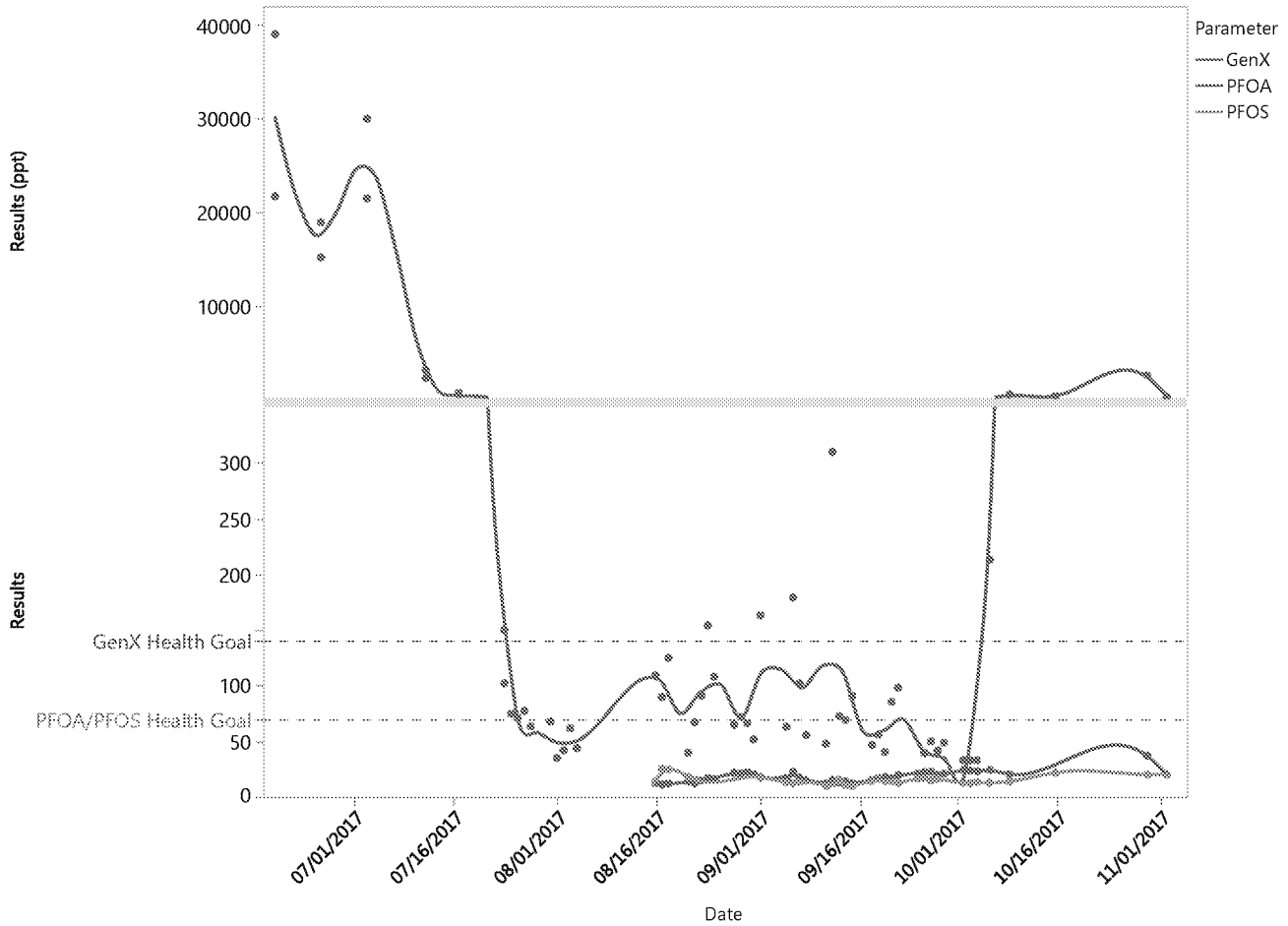
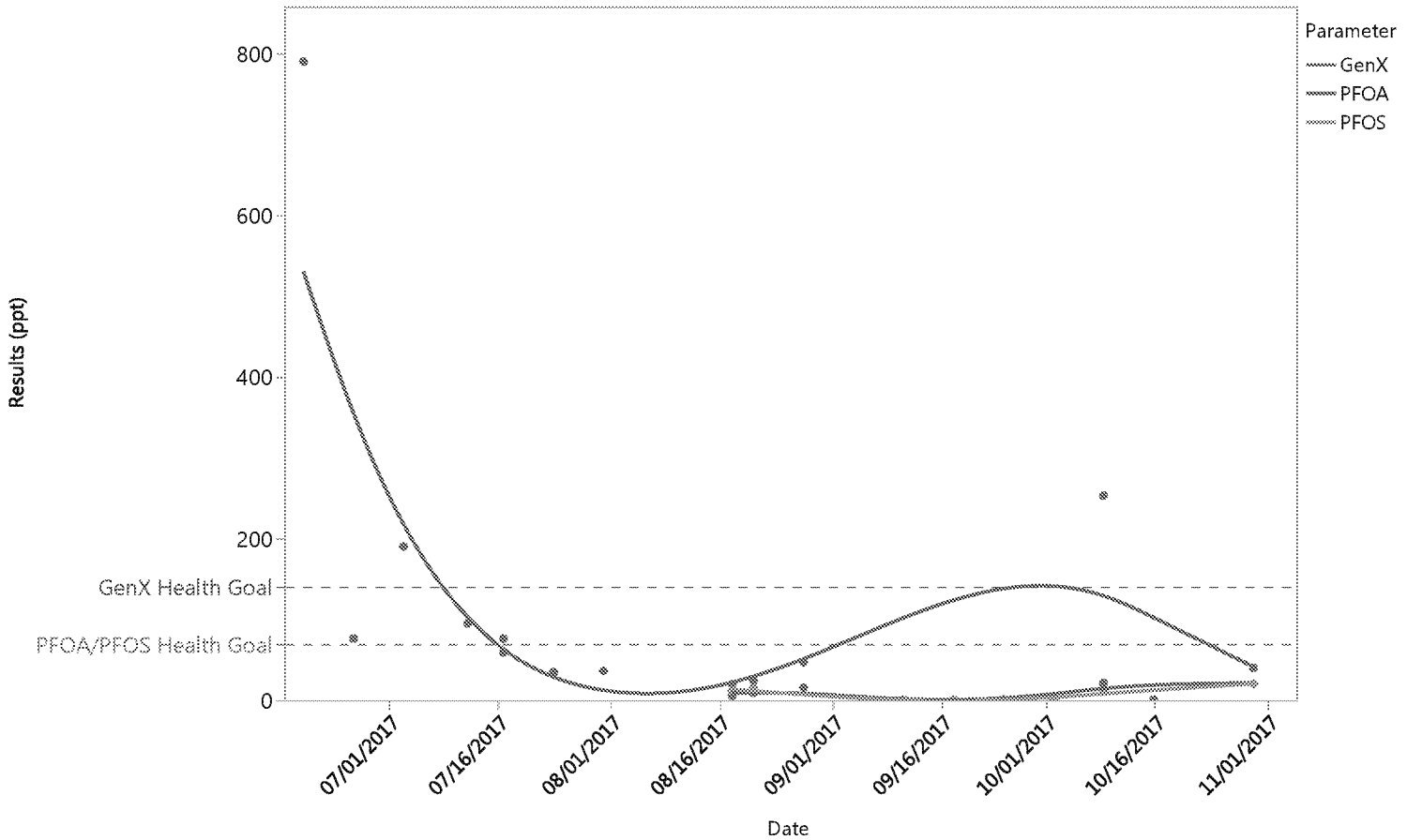
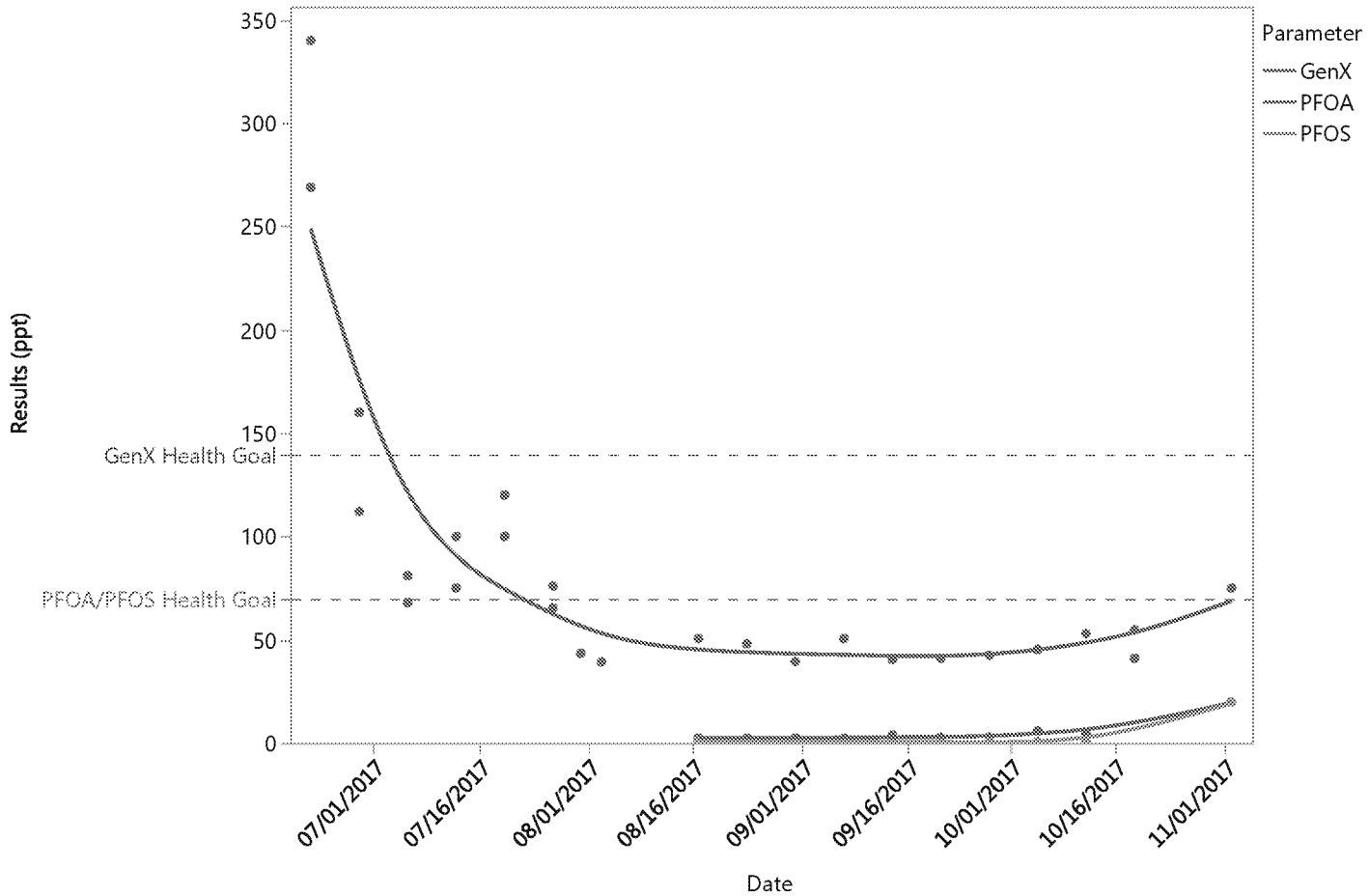
Chemours Outfall 002



Bladen Bluffs WTP



Pender County WTP



Site inspection

Area of Chemours plant where Oct. 6th release occurred and entered the waterway that discharges to outfall 002.

Division of Water Resources
Resources devoted to the monitoring, analysis, and regulation of emerging compounds

- Staff from the Fayetteville and Wilmington Regional Offices continue to conduct sampling initiated June 19
- Onsite verification of wastewater containment
- Review of health studies and consultation with state and federal agencies
- Review of national and international water standards
- Research on wastewater and drinking water treatment technologies and effectiveness
- Coordination with laboratory support for analysis – EPA NERL, EPA SESD and private laboratories
- Quality assurance review of lab data and research on test methods
- Organizing a workshop to help design future sampling plans to evaluate other end points – sediment, fish tissue, etc.
- Participating in public information meetings to ensure health directors, water utilities and the public have available information

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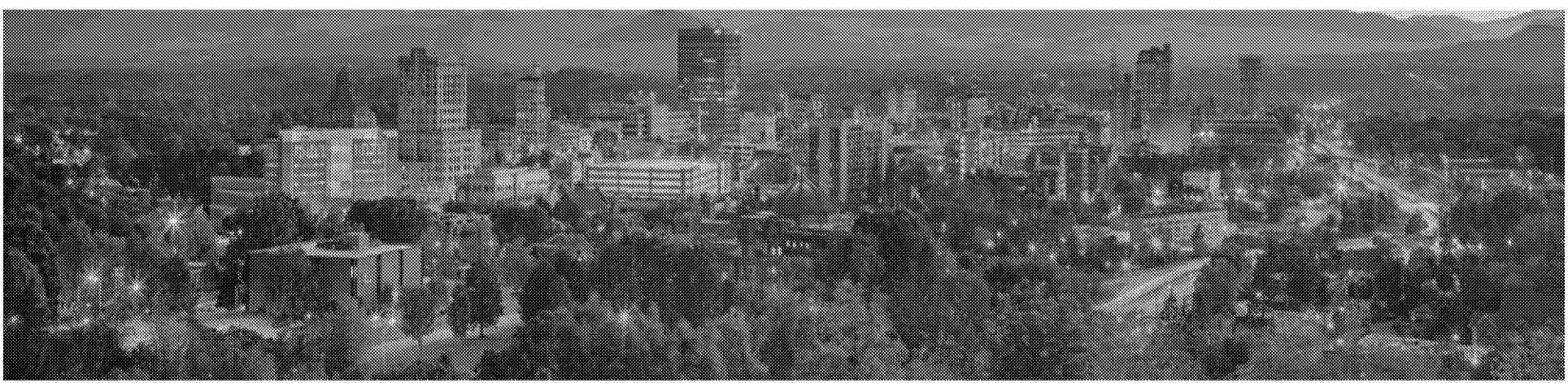
Division of Air Quality



Department of Environmental Quality
Division of Air Quality

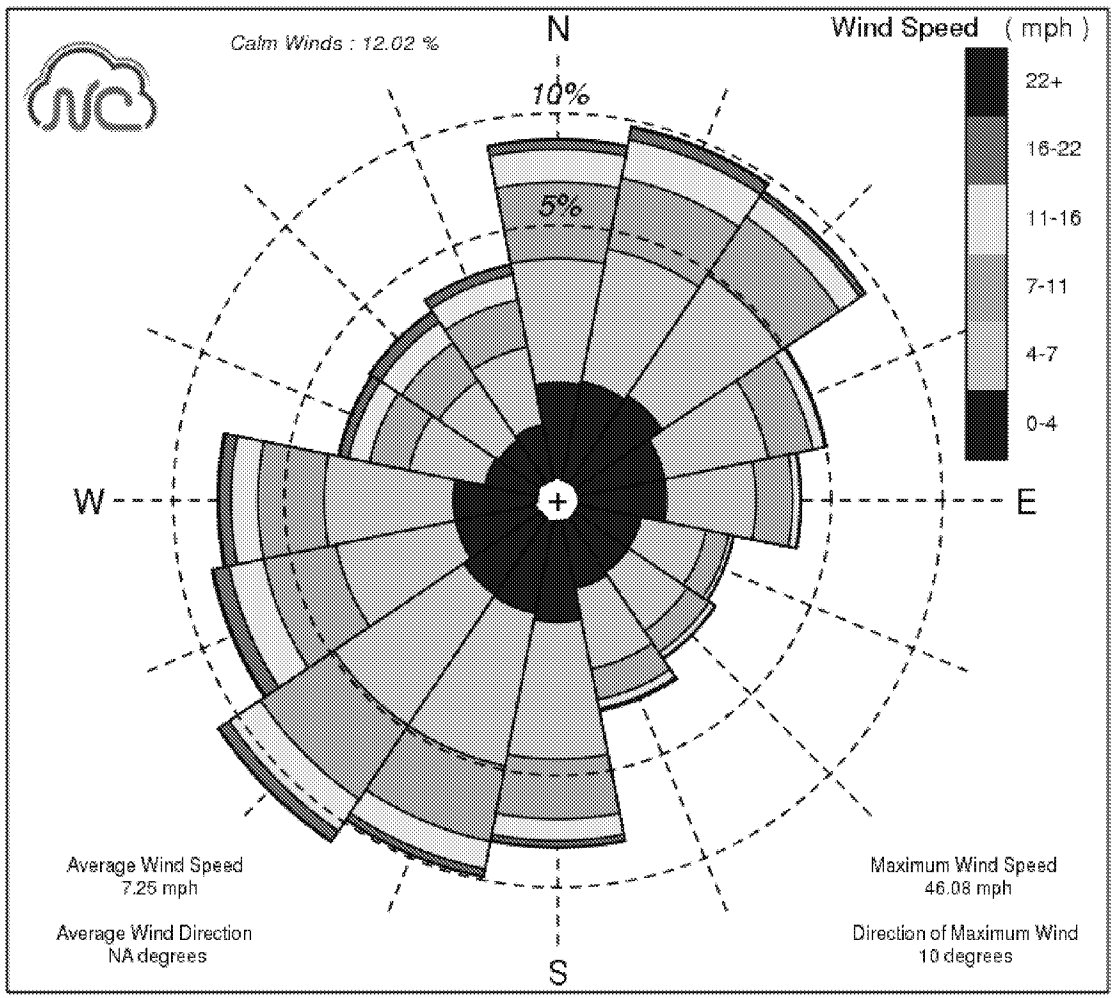
Chemours reported air emissions (pounds per year)

	2012	2013	2014	2015	2016
C3 dimer acid fluoride	500	539	545	669	591
C3 dimer acid (GenX)	1	3	4	3	3
C3 dimer acid ammonium salt	1	3	3	2	2

- **All data based on chemical process computational model.**

Department of Environmental Quality
Division of Air Quality

Wind Rose for Fayetteville Airport (KFAY)
Jan. 10, 1998 to Sep. 29, 2017



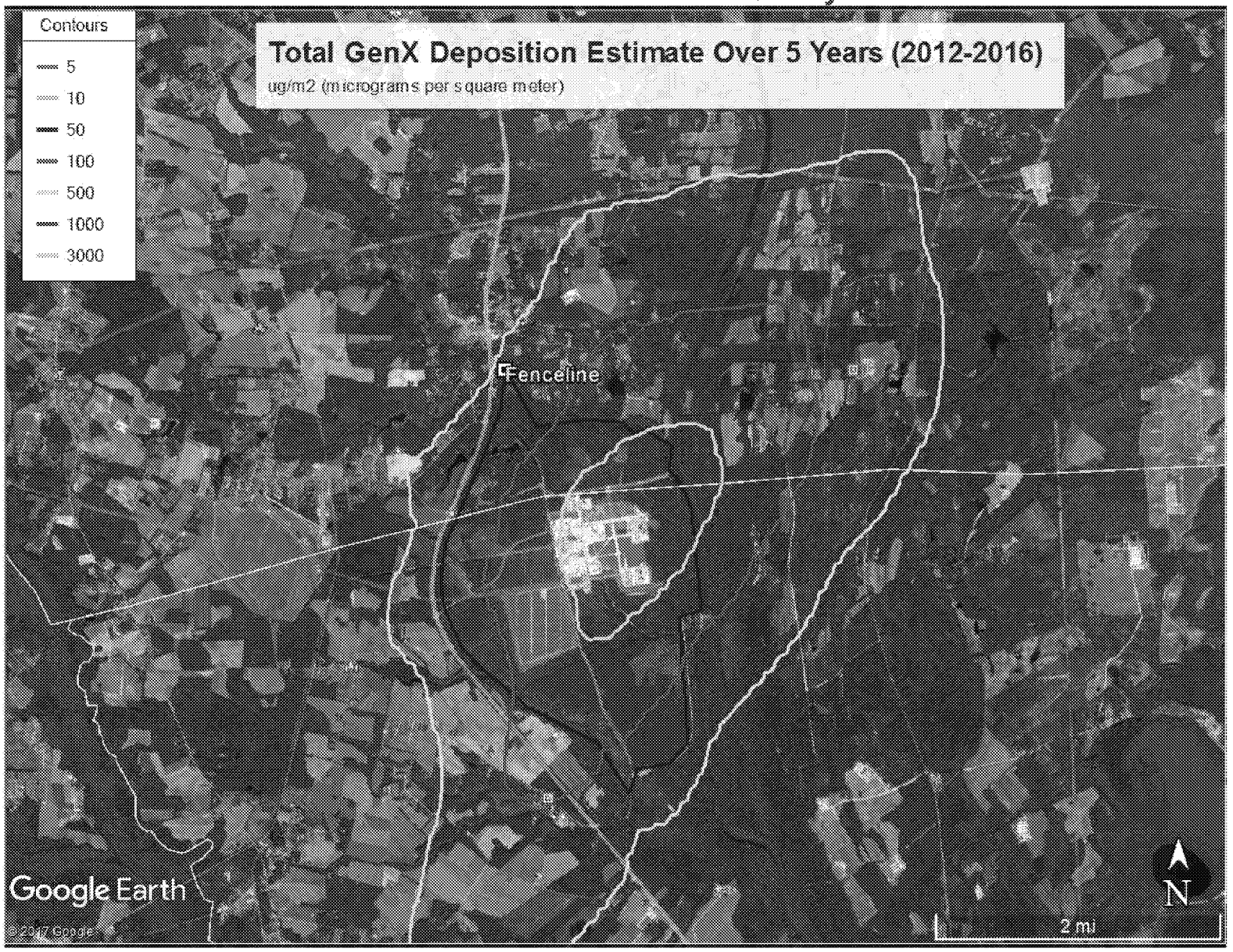
Department of Environmental Quality
Division of Air Quality

Air Dispersion Modeling

- Chemours actual air emissions for 2012-2016
  - GenX compounds only
- Actual stack characteristics
- Actual hourly meteorology over the 5-year period

Department of Environmental Quality

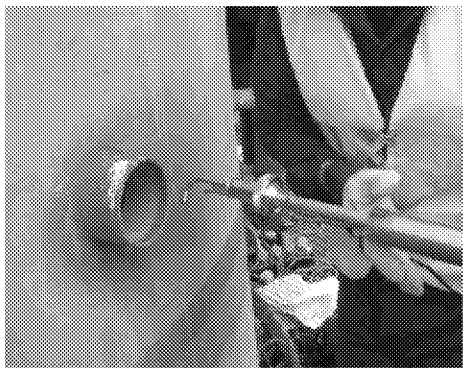
Division of Air Quality



Department of Environmental Quality

Division of Air Quality

Air Emissions Testing or "Stack Testing"



Capture and quantification of specific pollutants being emitted to the atmosphere from a process through the stack.

Chemours has submitted a protocol to define which sources they will test, which test method they will use and which contaminant they will target for quantification.

Department of Environmental Quality

Division of Air Quality

- Learning from others
  - States and Countries
- Atmospheric fate of contaminants?
  - Coordinating with EPA and Universities.
- Control technologies?
  - How can we eliminate or destroy the compounds of concern?
- Ambient monitoring?
  - Wet deposition sampling campaign being designed.

Enforcement Summary

- Sept. 5th - 60-day Notice of Intent to Suspend NPDES Permit
- Sept. 6th - NOV & Intent to Assess Civil Penalty for Groundwater Violation
- Sept. 8th – Partial Consent Order, Bladen County Superior Court
- Oct. 24th – Lifted Sept. 5th Intention to Suspend NPDES Permit
- Nov. 13th – NOV & Intent to Assess Civil Penalty related to release on Oct. 6th
- Nov. 16th – Notice of Partial Suspension and 60-Day Notice of Intent to Partially Revoke NPDES Permit

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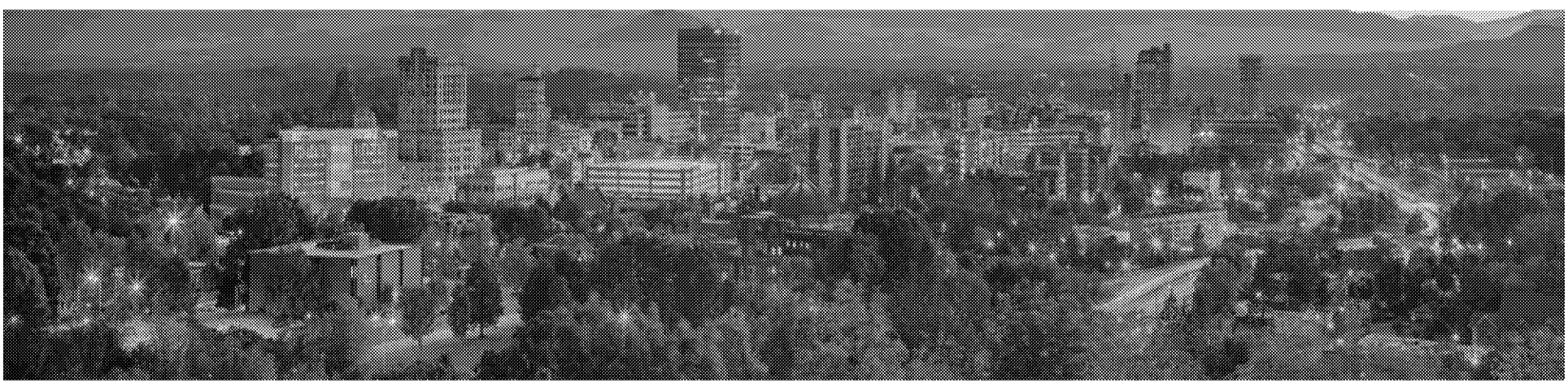
Recap Activities

- Monitoring the facility for surface water and groundwater, and Air emissions modeling
- Continuing to delineate off-site groundwater contamination and its potential sources
- Reviewing private well water data from Chemours and DEQ for data analysis, data quality check, HREs, planning and mapping
- Evaluating chemical pathways (chemicals created and transformed)
- Determine future sampling needs
- Continuing to host community meetings
- Engaging federal, state and international partners

N.C. Department of Health and Human Services

Division of Public Health



Per- and Polyfluoroalkyl Substances (PFAS): Health Effects

- Legacy PFAS (such as PFOA and PFOS) could have the following effects:
  - Affect growth and behavior of children
  - Interfere with the body's natural hormones
  - Increase cholesterol levels
  - Affect the immune system
  - Increase the risk of certain types of cancers
- Different PFAS could have different effects

Per- and Polyfluoroalkyl Substances (PFAS): Health Effects

- GenX
  - No human data available
  - Limited animal studies in mice and rats
    - Negative effects to the liver and blood
    - Cancer of the liver, pancreas, and testicles

- Other emerging PFAS (such as Nafion byproducts)
  - No human data available
  - Limited or no animal studies

Public Health Role

- Determine whether compounds detected through environmental sampling could pose a risk to human health
- Provide health-based guidance on levels of exposure to such contaminants
- Conduct risk assessments and risk communication

Early Public Health Actions

1. Rapidly reviewed all available health information and consulted with the EPA, other agencies
2. Calculated a provisional health goal of 140 parts per trillion (ppt) for GenX in drinking water
3. Reviewed cancer incidence rates during 1996–2015 for counties in lower Cape Fear region

What is a Health Goal?

- Level of contamination below which no adverse health effects would be expected over a lifetime of exposure
- Calculated based on the most vulnerable population
- Non-regulatory, non-enforceable
- Change as new information becomes available

Health Goal: Requirements

- Must have sufficient health-related information
  - Animal studies
  - Epidemiologic studies (human health)
  - Other laboratory studies
- Health-related information often lacking for emerging compounds

Use Recommendations: GenX >140ppt

- Do not use well water for drinking, cooking, or preparing baby formula
- Can continue to use well water for bathing, washing dishes and laundry
  - Per CDC, only a very small amount can get into the body through the skin
  - Little exposure expected during swimming, bathing, or showering

Ongoing Public Health Actions

- Continue to review all new and ongoing environmental testing results
- Evaluate all new and updated health information; coordinate with CDC, EPA, NIEHS
- Monitor and respond to results of epidemiologic studies and testing of clinical specimens

Ongoing Public Health Actions

- Provide communities with information and assist with outreach and health education
- Provide information and input to N.C. Secretaries' Science Advisory Board

Questions ?