



December 4, 2017

*Secretaries' Science Advisory Board  
Meeting*





# SECRETARIES' SCIENCE ADVISORY BOARD AGENDA

- I. Call to Order
- II. Approval of October 23, 2017 SAB Meeting Minutes
- III. Ethics Statement
- IV. Priority Table
- V. Gen X Interim Report
- VI. Gen X Available Health Studies
  - a. DHHS Staff to Highlight Studies
  - b. Discussion of SAB Members and Identification of other studies and information gaps
- VII. DHHS Health Advisories
- VIII. SAB Interaction with the Media
- IX. SAB Principles and Practices
- X. Next Meetings
  - (i) January 29, 2018
  - (ii) March 19, 2018
  - (iii) April 30, 2018



# Interim Report



- **Regulatory framework**
- **Latest surface water monitoring results**
- **Additional emerging compounds**
- **Enforcement action update**
- **Latest groundwater monitoring results**
- **Information on air emissions from the Chemours Fayetteville Works facility**
- **Next steps on emerging compounds**



# Divisions

- Division of Water Resources
- Division of Waste Management
- Division of Air Quality





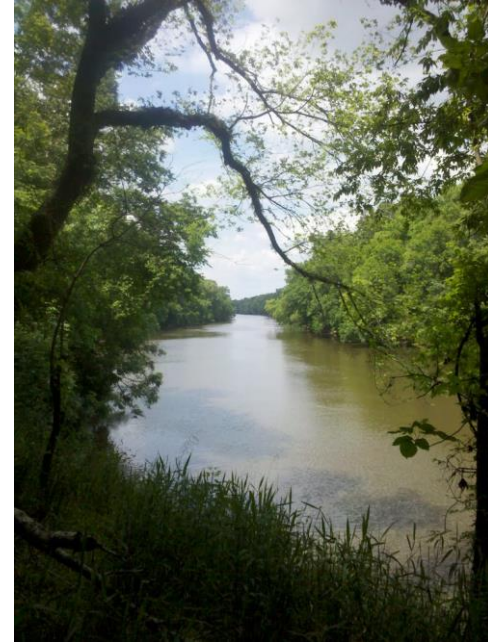


## Division of Water Resources



# Regulatory Program Overviews

- Toxic Substance Control Act
- Clean Water Act
  - NPDES permit (wastewater)
- Safe Drinking Water Act
  - Contaminant Candidate List
  - Unregulated Contaminant Monitoring Rule
- State Surface water and Groundwater Standards



## Recent History of the Cape Fear River Data

- EPA's Third Unregulated Contaminant Monitoring Rule (UCMR) monitoring during 2013-2015 for 28 chemicals including PFOA, PFOS and 1,4-Dioxane.
- NCSU and EPA's National Exposure Research Lab study PFOA, PFOS and other per- and poly-fluorinated chemicals in the Cape Fear River.
- DEQ 2014-2016 study on 1,4-Dioxane, focusing on the Cape Fear River after results indicated higher concentrations than other river basins.
- EPA NERL published a report in 2015 including the presences two compounds attributed to being byproducts of Nafion® manufacturing. Research findings published in Nov. 2016 on PFOA/PFOS, GenX and other related chemicals attributed to the Chemours facility.



# DuPont/Chemours

- DuPont began chemical manufacturing at the plant along the border of Cumberland and Bladen Counties in 1971.
- Around 1980 DuPont began manufacturing products using fluorinated compounds.
- GenX manufacturing began after a 2009 Consent Agreement under TSCA was signed by EPA and the company. GenX has been a byproduct of the vinyl ether production line, and the wastewater discharged through the NPDES outfall into the Cape Fear River.
- DuPont transitions site ownership to Chemours. The NPDES permit includes receives wastewater from tenants at the property, Kuraray and DuPont.



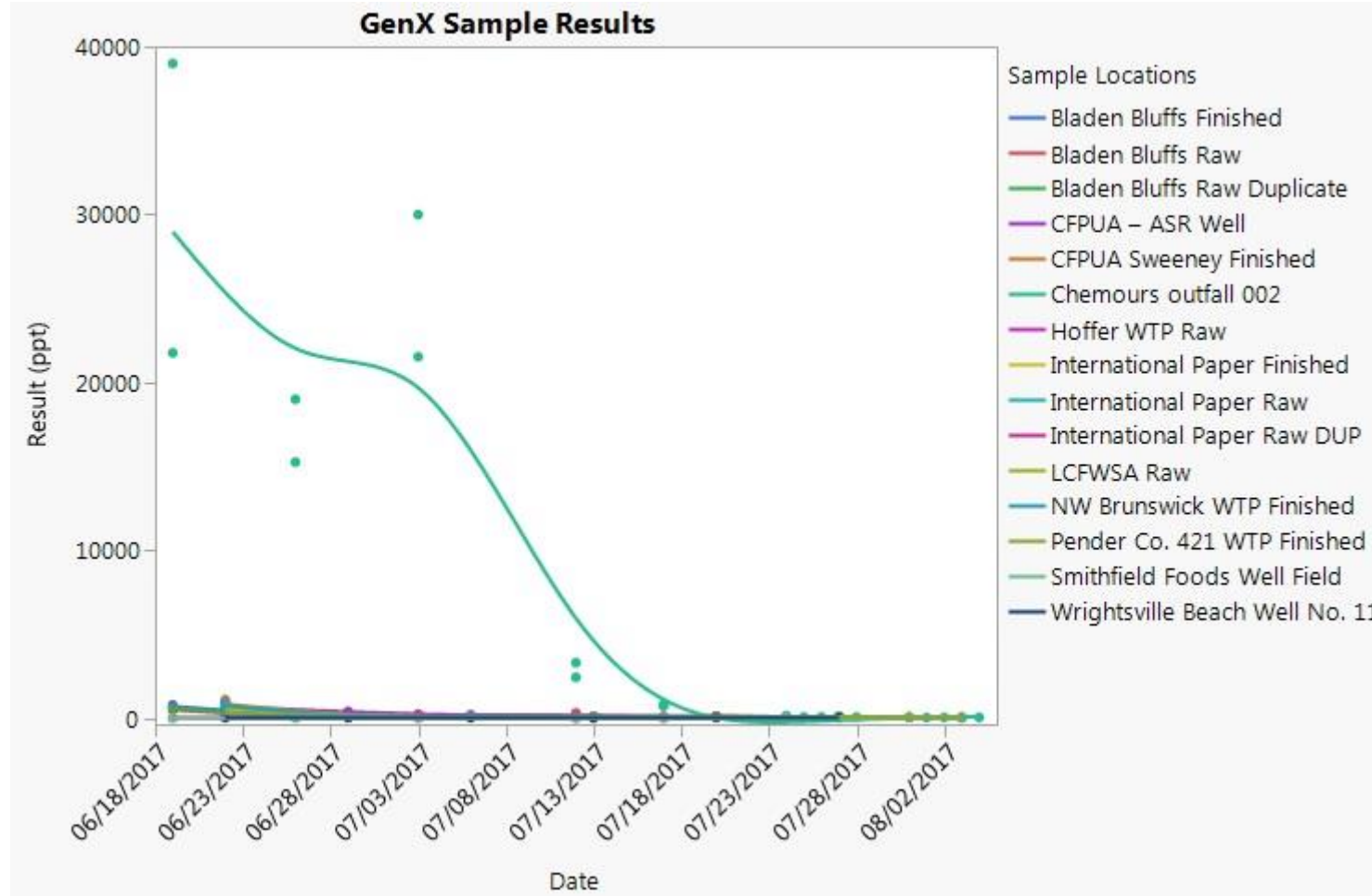


# DEQ Sampling June 19 – August 4, 2017

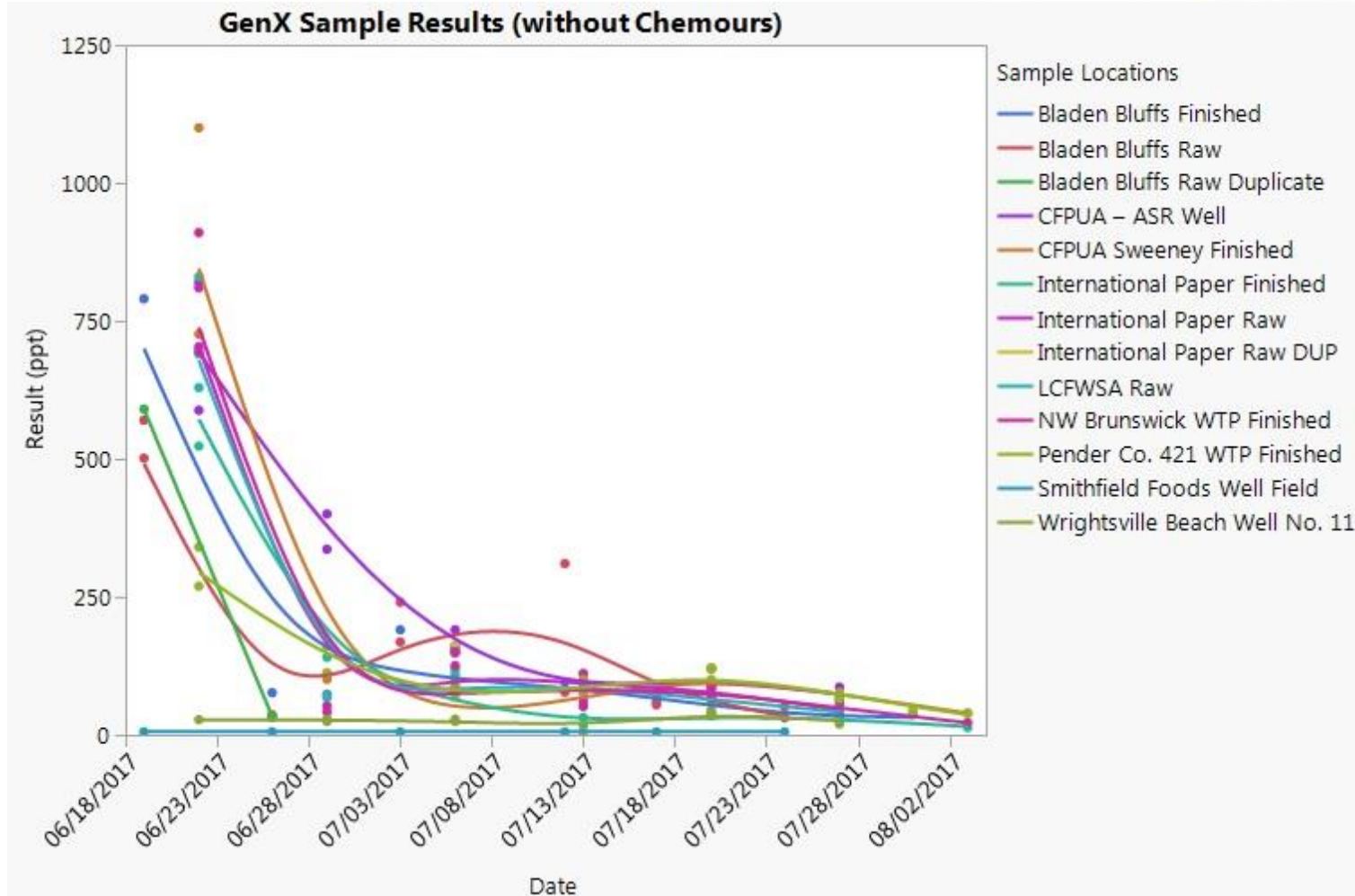


- Weekly sampling at the Chemours NPDES outfall 002.
- Weekly sampling of raw water and finished drinking water upstream and downstream of the Chemours facility.

# Cape Fear River - Sampling



# Cape Fear River - Sampling



# Current Weekly Sampling

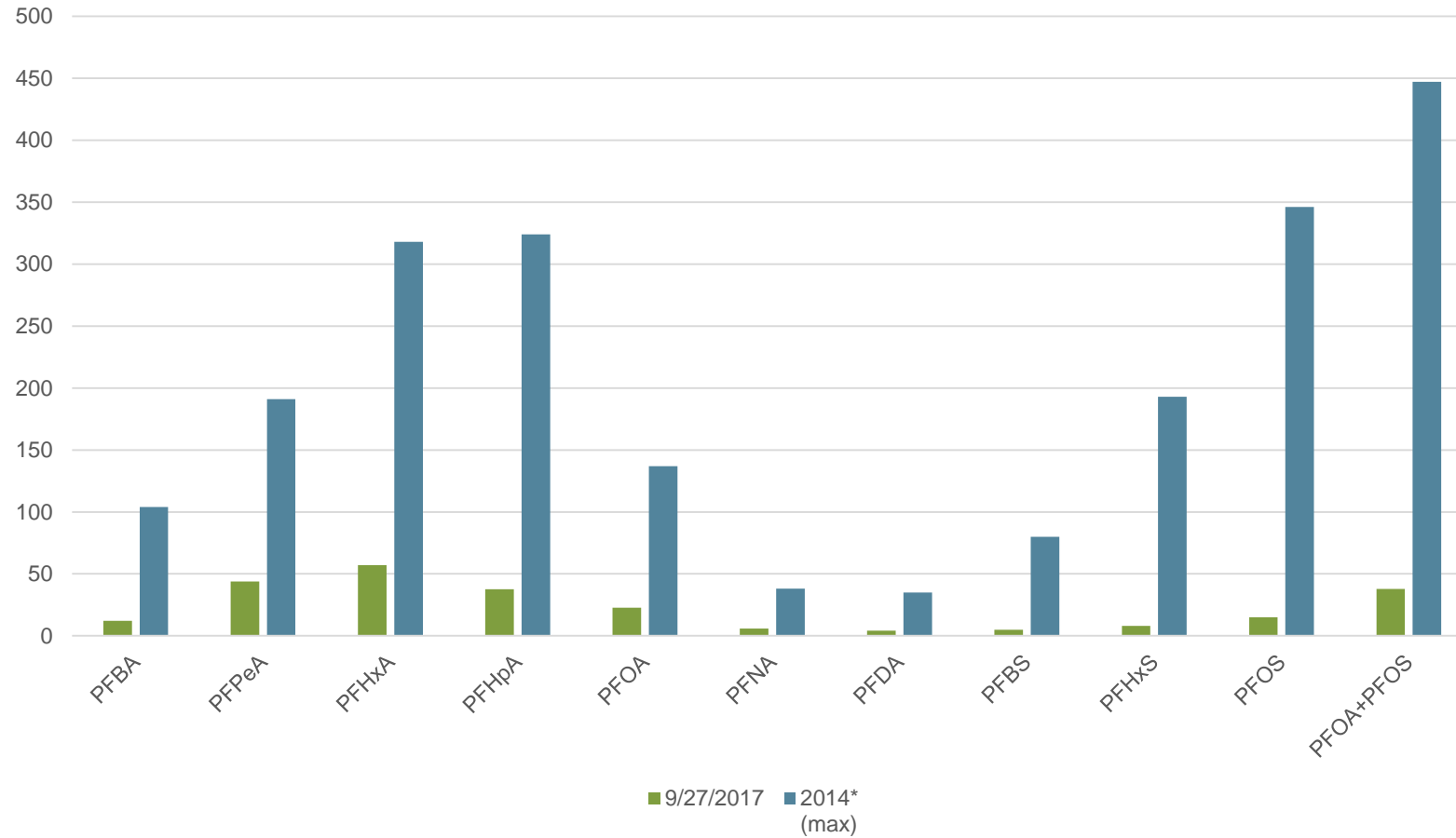
## Division of Water Resources Staff Conduct Weekly Sampling

- **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**

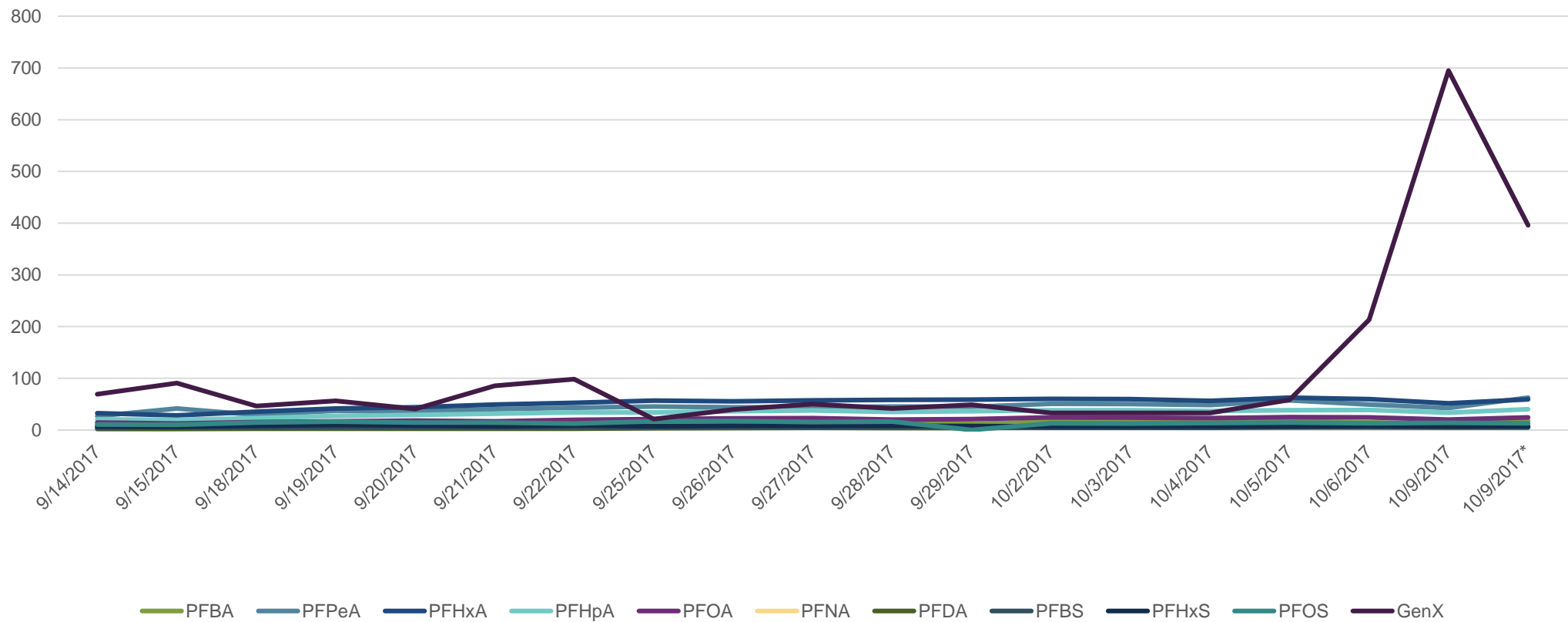




# Historic Comparison



# Data at Chemours Outfall 002 (parts per trillion)



# Site inspection



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



# Enforcement Summary

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



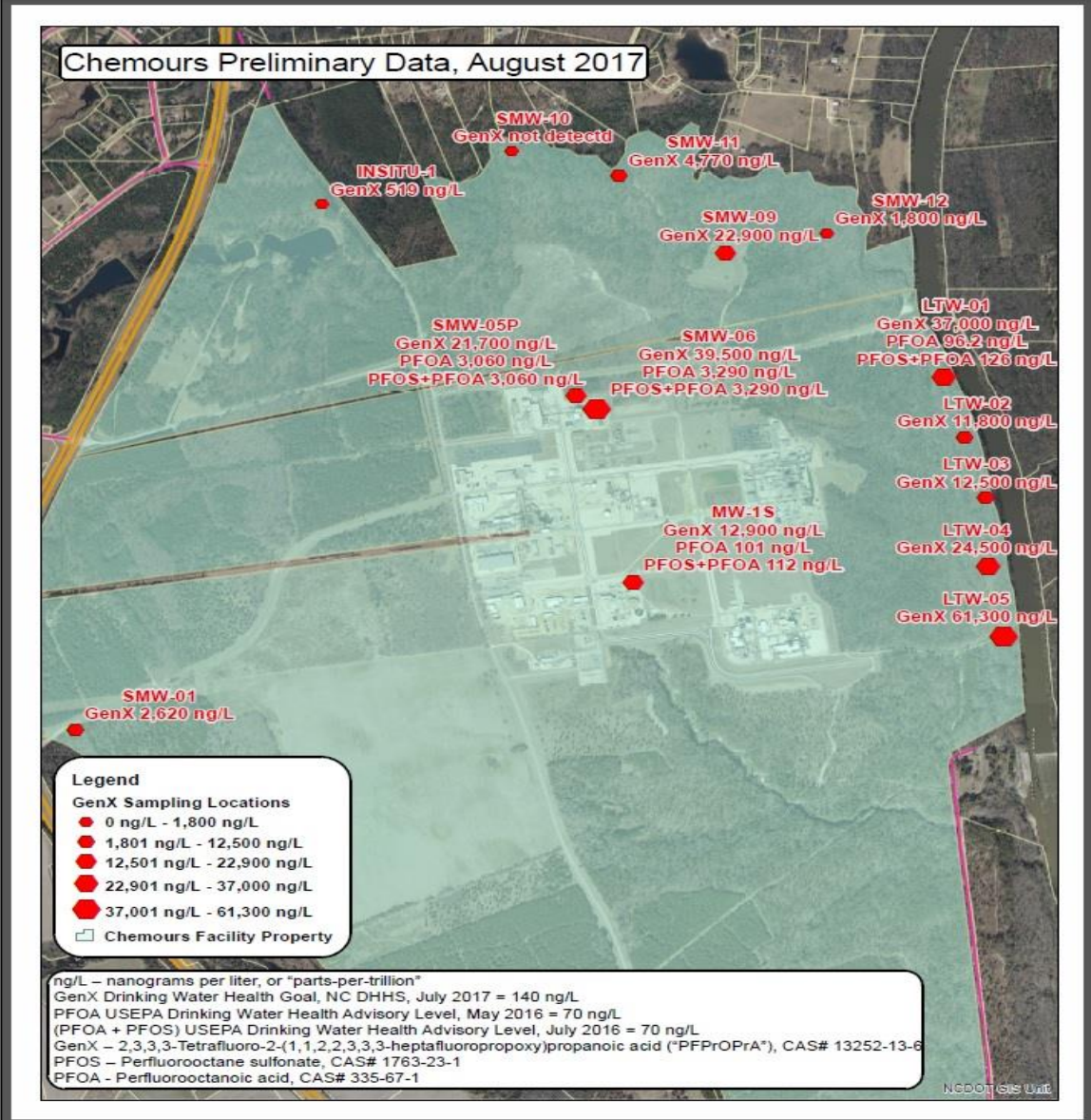




# Division of Waste Management



# Groundwater Data at Chemours





# Private Well Sampling Results

|  |      |
|--|------|
| Private Wells Sampled (Phase 1):   | 141  |
| Total # wells with exceedance of the GenX NCDHHS provisional health goal:    | 51   |
| Total # wells reported as non-detect (ND):                                   | 35   |
| Total # wells with a GenX detection (including those above the health goal): | 106  |
| Total # wells with a GenX detection less than the health goal:               | 55   |
| The maximum detected GenX concentration (ppt) is:                            | 1300 |



# Private Well Sampling Results (Phase 2)

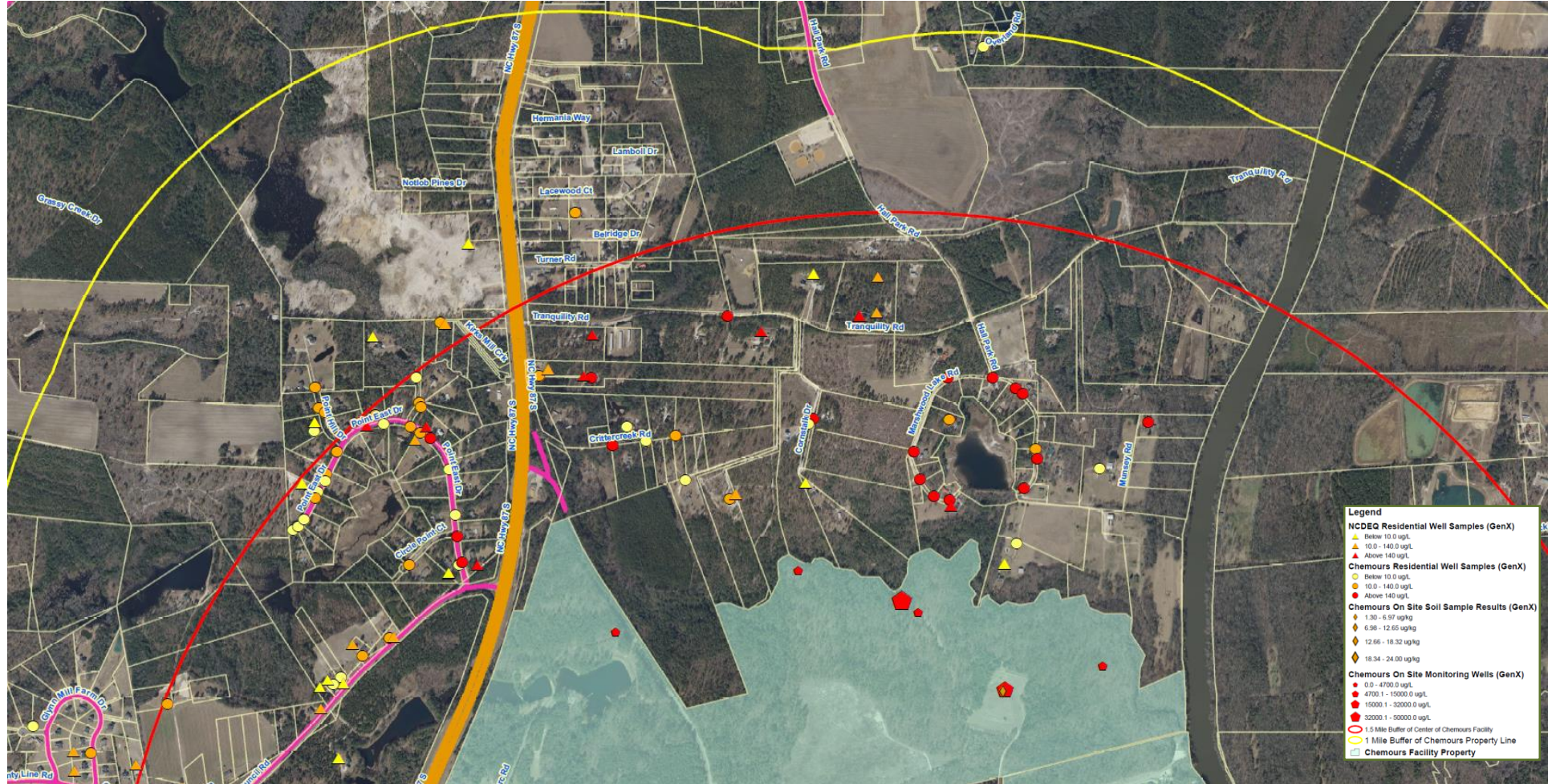
|  |            |
|--|------------|
| <b>Private Wells Sampled:</b>  | <b>107</b> |
| Total # wells with exceedance of the GenX NCDHHS provisional health goal:    | 34         |
| Total # wells reported as non-detect (ND):                                   | 25         |
| Total # wells with a GenX detection (including those above the health goal): | 82         |
| Total # wells with a GenX detection less than the health goal:               | 48         |

**The maximum detected Gen X concentration is: 1200 ppt**



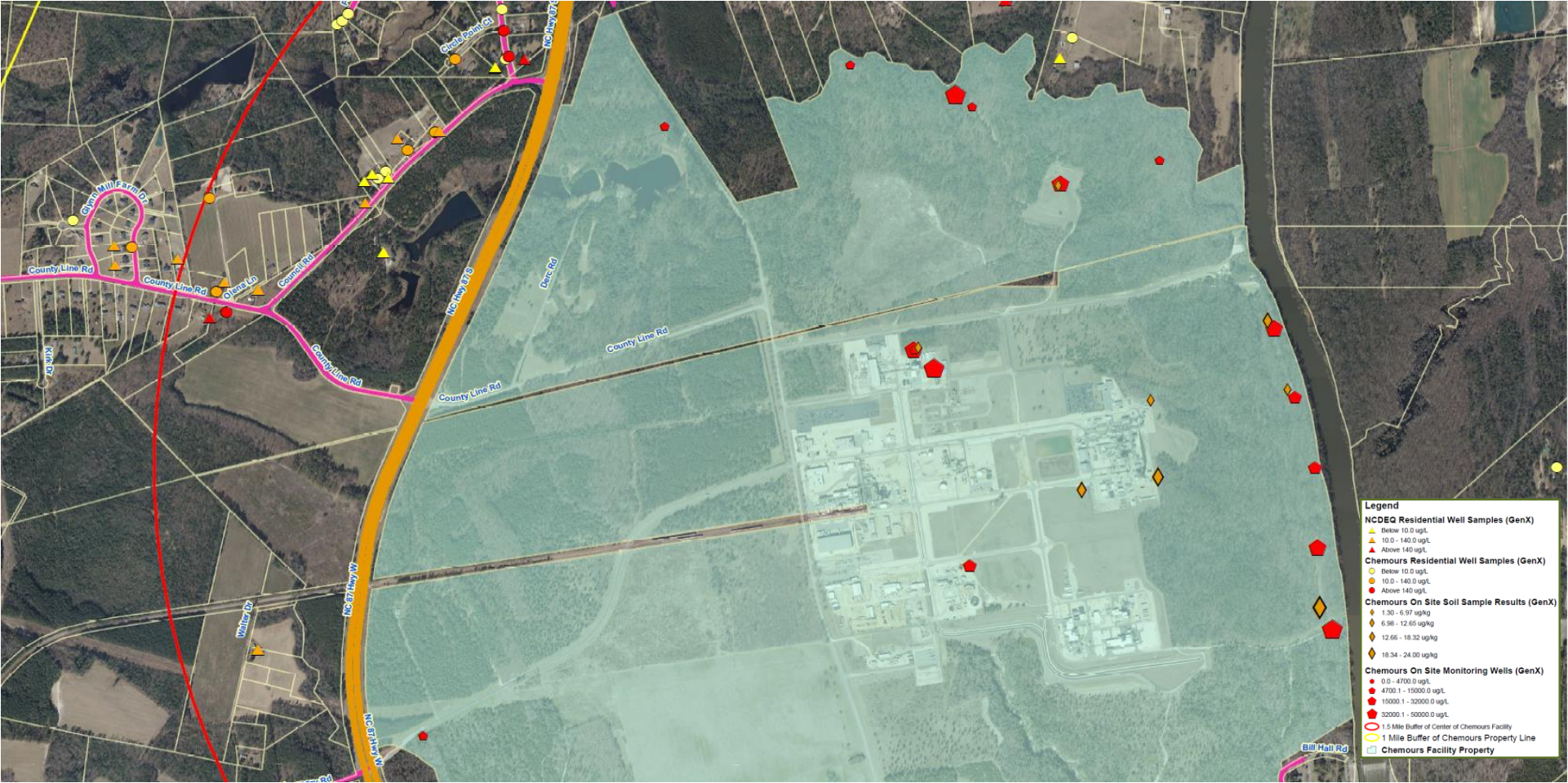


# Chemours Sampling Map (Northern Area)



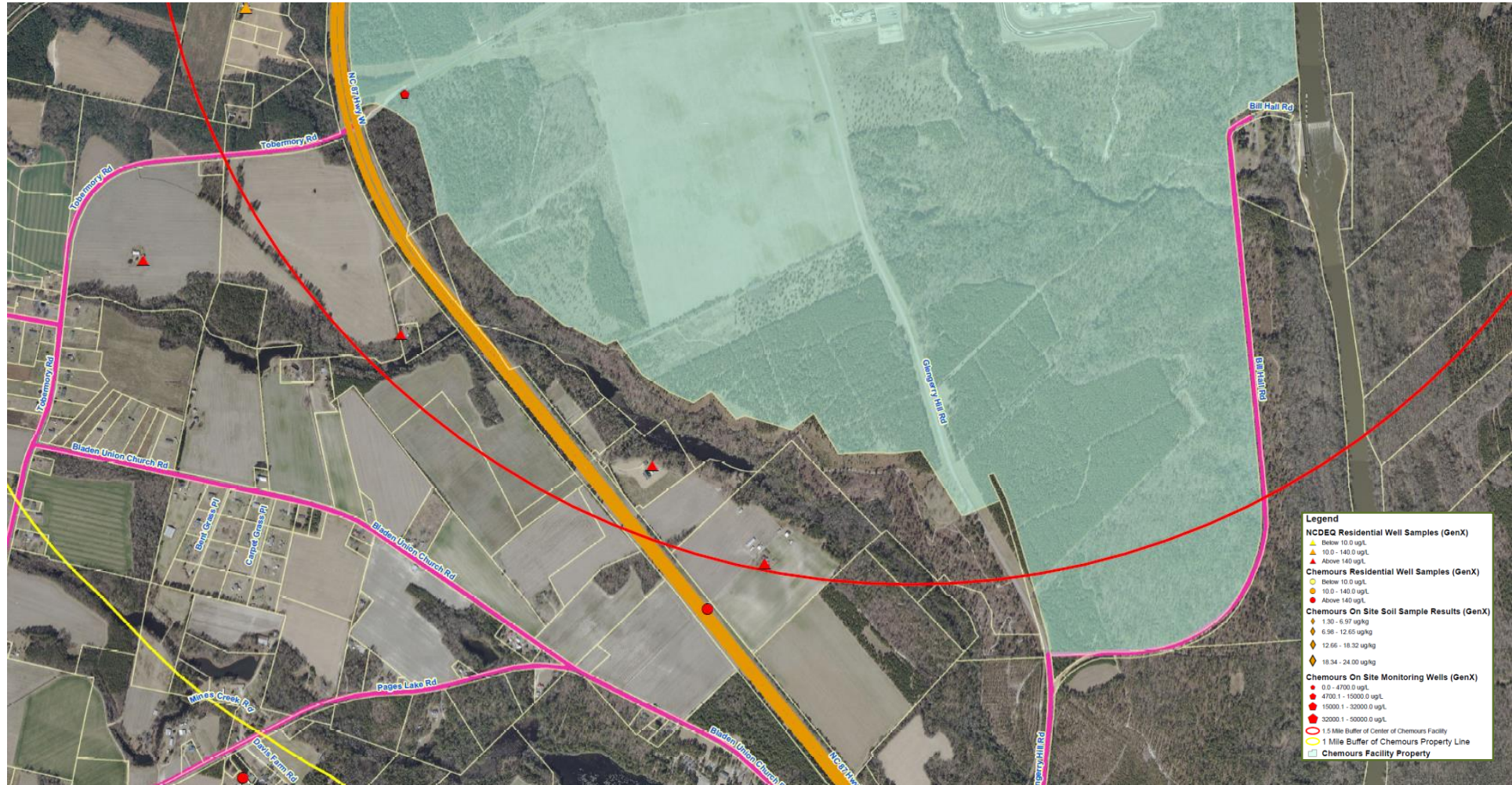


# Chemours Sampling Map (Central Area)





# Chemours Sampling Map (Southern Area)



# 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 Crystal Springs who provides water dispensers.
- Bottle water is also available at the Chemours plant after an exceedance is detected.



# 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.**



# 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

### What's the role of air emissions?

- Wind data
- Air dispersion modeling

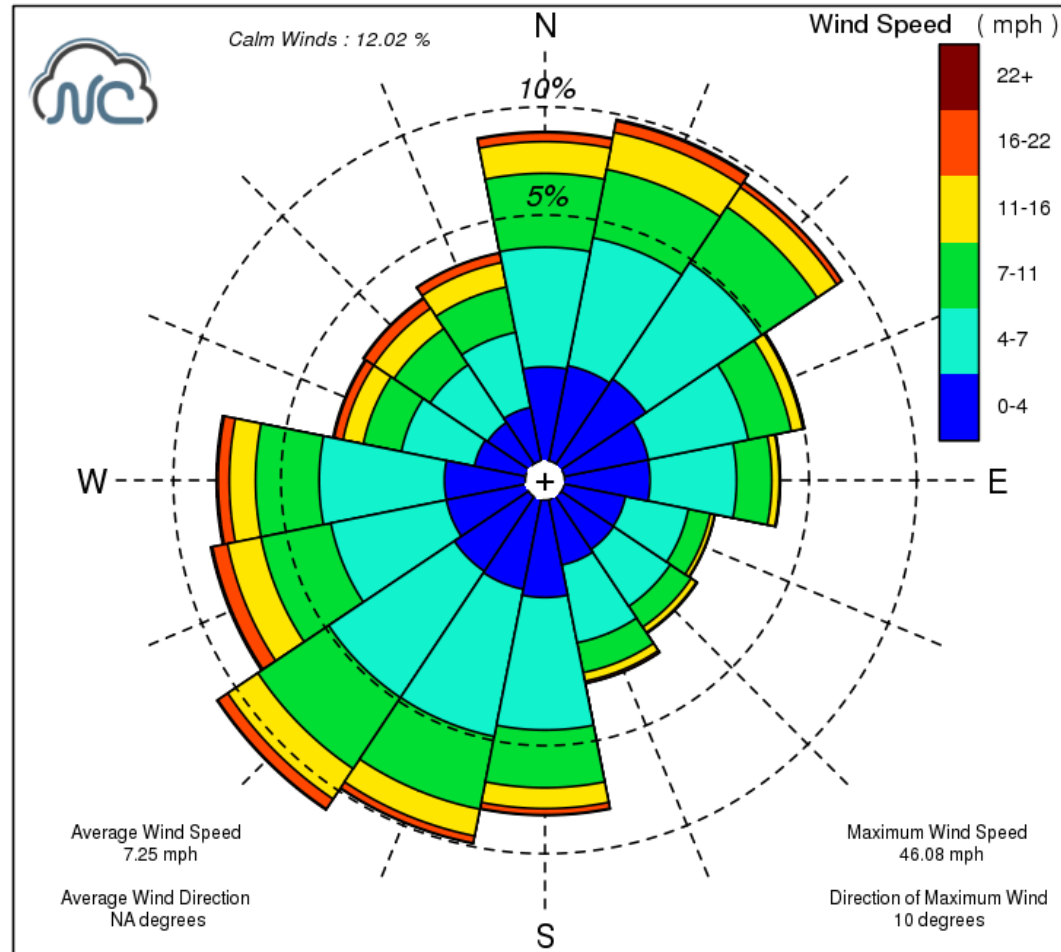




# Department of Environmental Quality

## 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

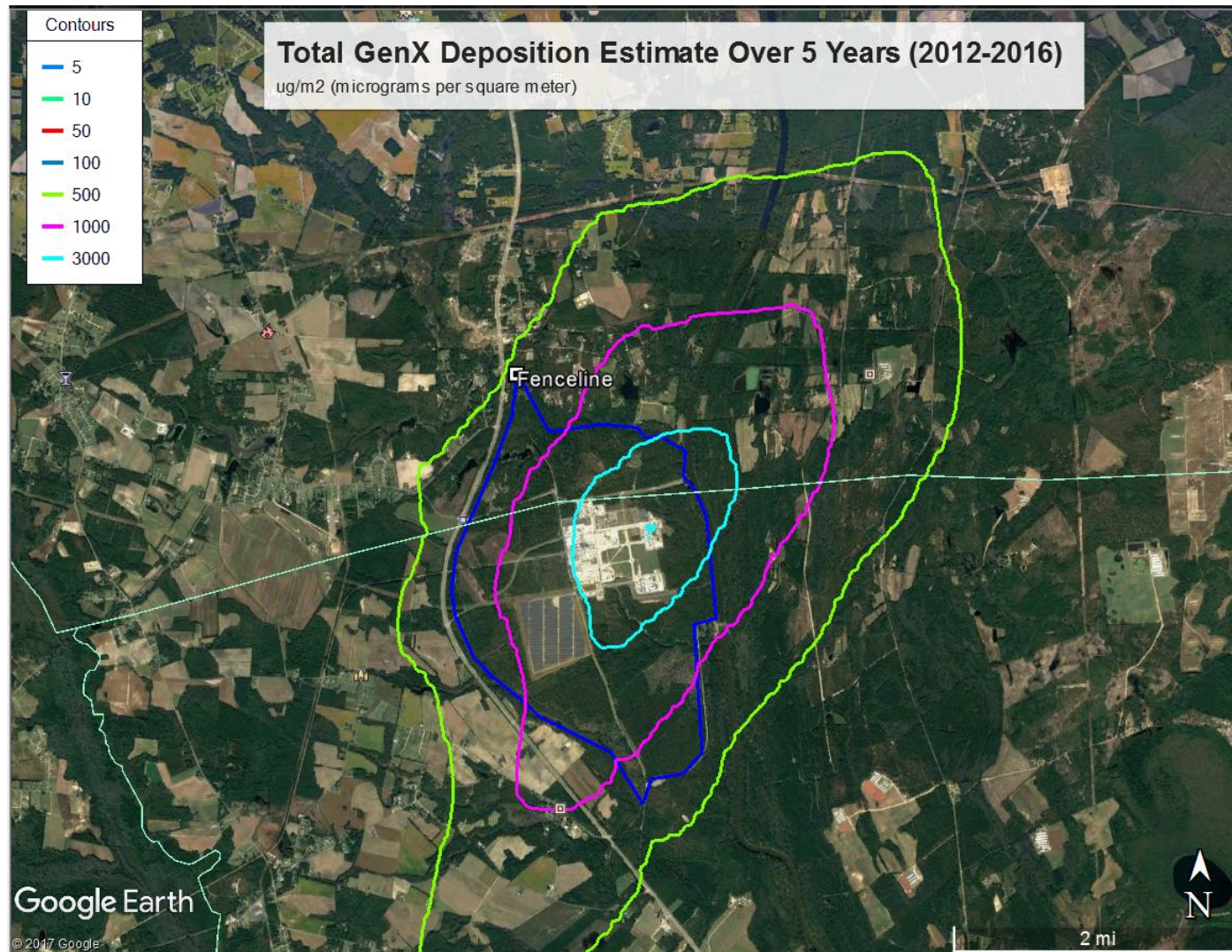
### Air Dispersion Modeling

- **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**

**Target contaminant - HFPO Dimer Acid (GenX)**

**Test method – EPA M0010 Modified Method 5 with XAD traps for the capture of volatile and semi-volatile organics**

**Three 180 minute test runs will be performed during normal process operations**

**Analysis –liquid chromatography with two mass spectrometry analyzers (LC/MS/MS)**





# Department of Environmental Quality

## Division of Air Quality

### Sources to be tested:

**Fluoromonomers, Nafion, and Polymer Processing Aid (PPA) Processes**

**Test Locations - Division, VE South Scrubber and PPA Stacks**

**Testing will be performed post – scrubber. The goal of the test is to quantify the emissions of GenX to the atmosphere during the test period.**

**The emissions testing will help verify emissions estimates previously submitted**



# Recap Activities

- **Monitoring the Facility for surface water and groundwater**
- **Air emissions evaluation and deposition 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 QC, 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**



## Next Steps – Emerging Compounds

- Secretaries' Science Advisory Board
- UCMR
- NPDES Permitting – Disclosure Requirements
- Lab Test Standards
- Health Risk Information
- General Public Education





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# Questions?

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December 4, 2017

*Secretaries' Science Advisory Board  
Public Forum*

