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NC DEPARTMENT OF ENVIRONMENTAL QUALITY

GenX Update

03/22/2018

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Division of Water Resources

Current Sampling

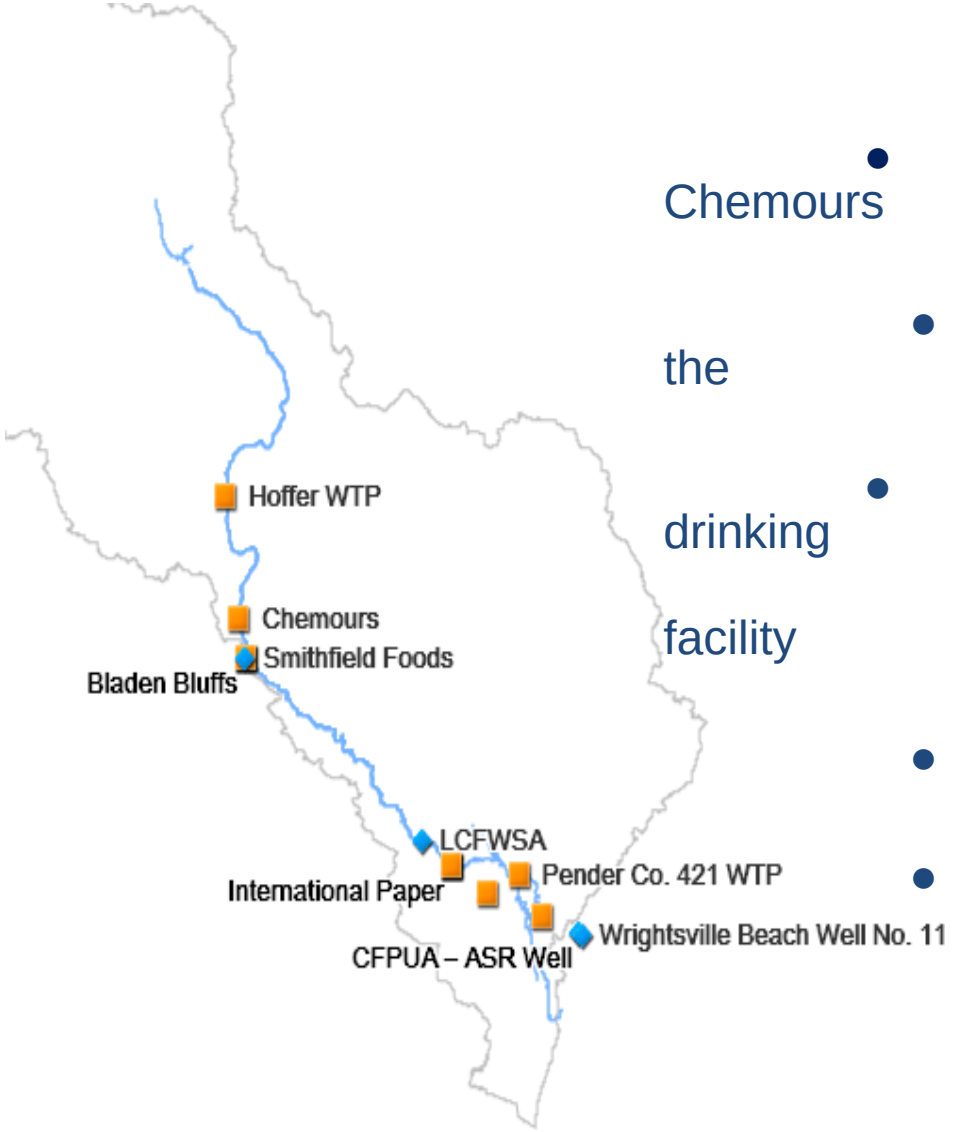
Division of Water Resources

- Two composite samples weekly at Chemours wastewater outfall into the Cape Fear River: Monday - Thursday and Friday - Sunday

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

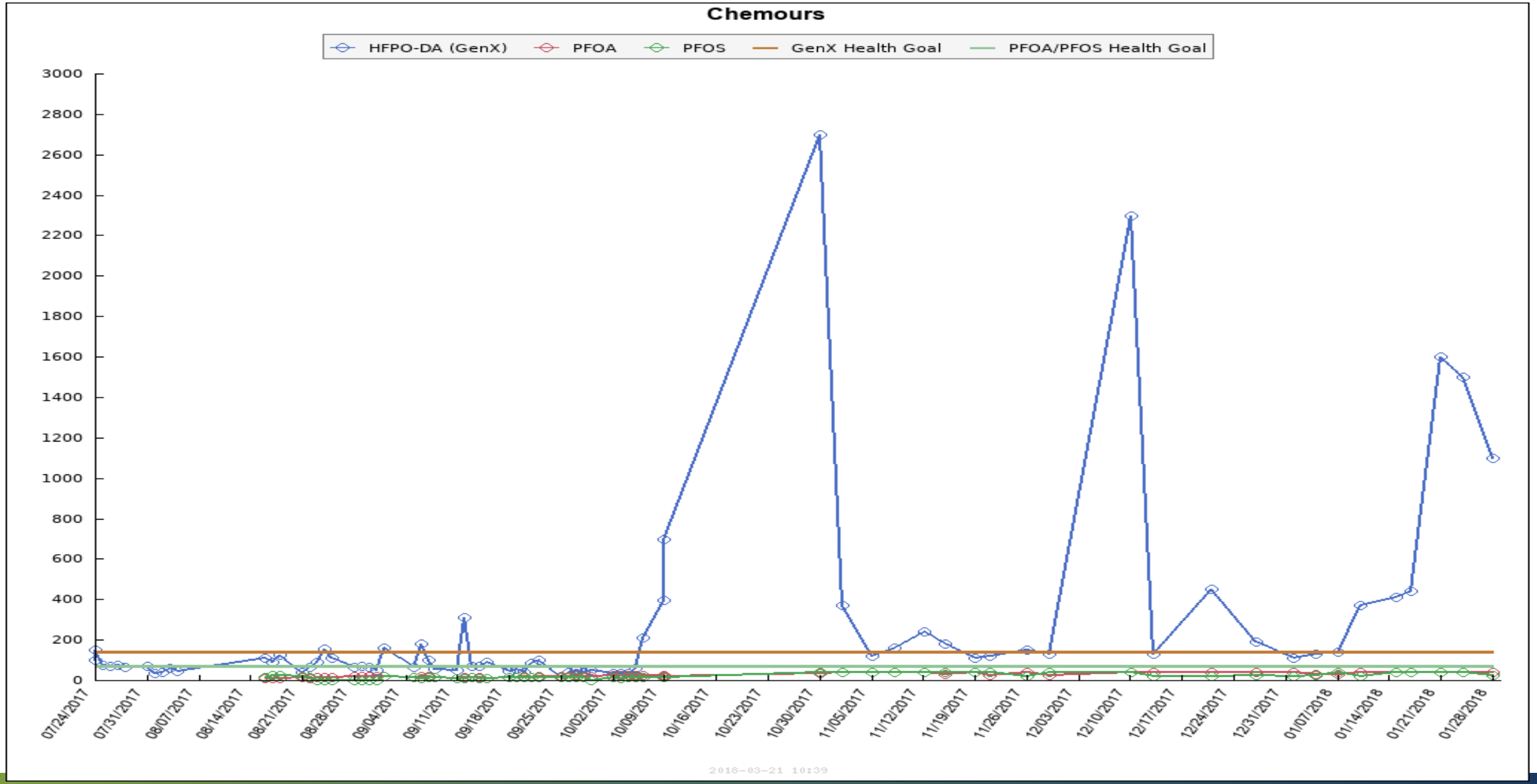
- Other watersheds across North Carolina
  - Began monthly monitoring in Jordan Lake watershed Jan. 2nd

DEQ Sampling - Cape Fear River

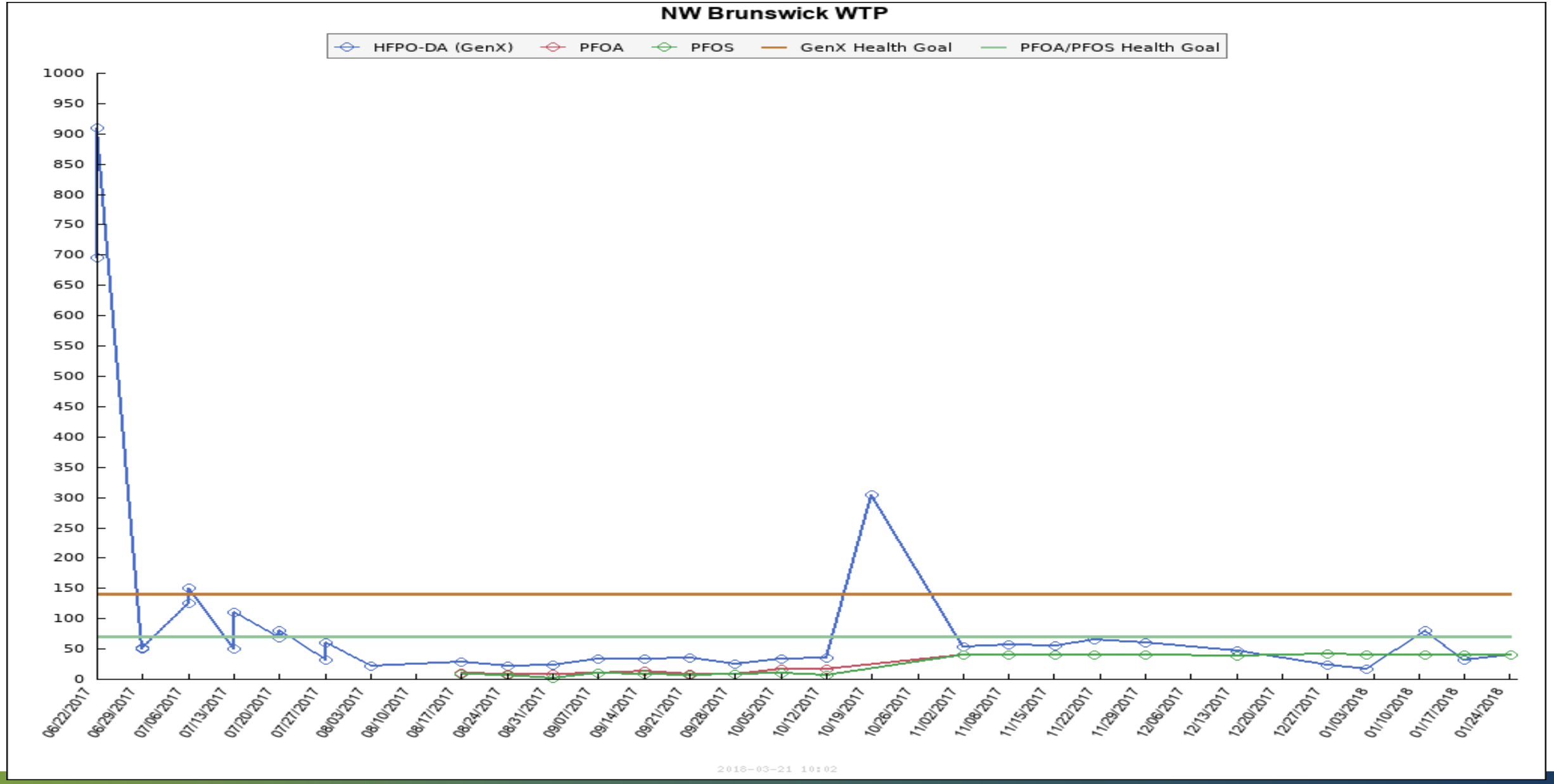


- Process area sampling at Chemours
- Weekly composite sampling at Chemours wastewater outfall 002
- Weekly sampling of finished drinking water downstream of the Chemours facility
- Aquifer Storage Recovery Well
- Nearby Public Water Supply Wells

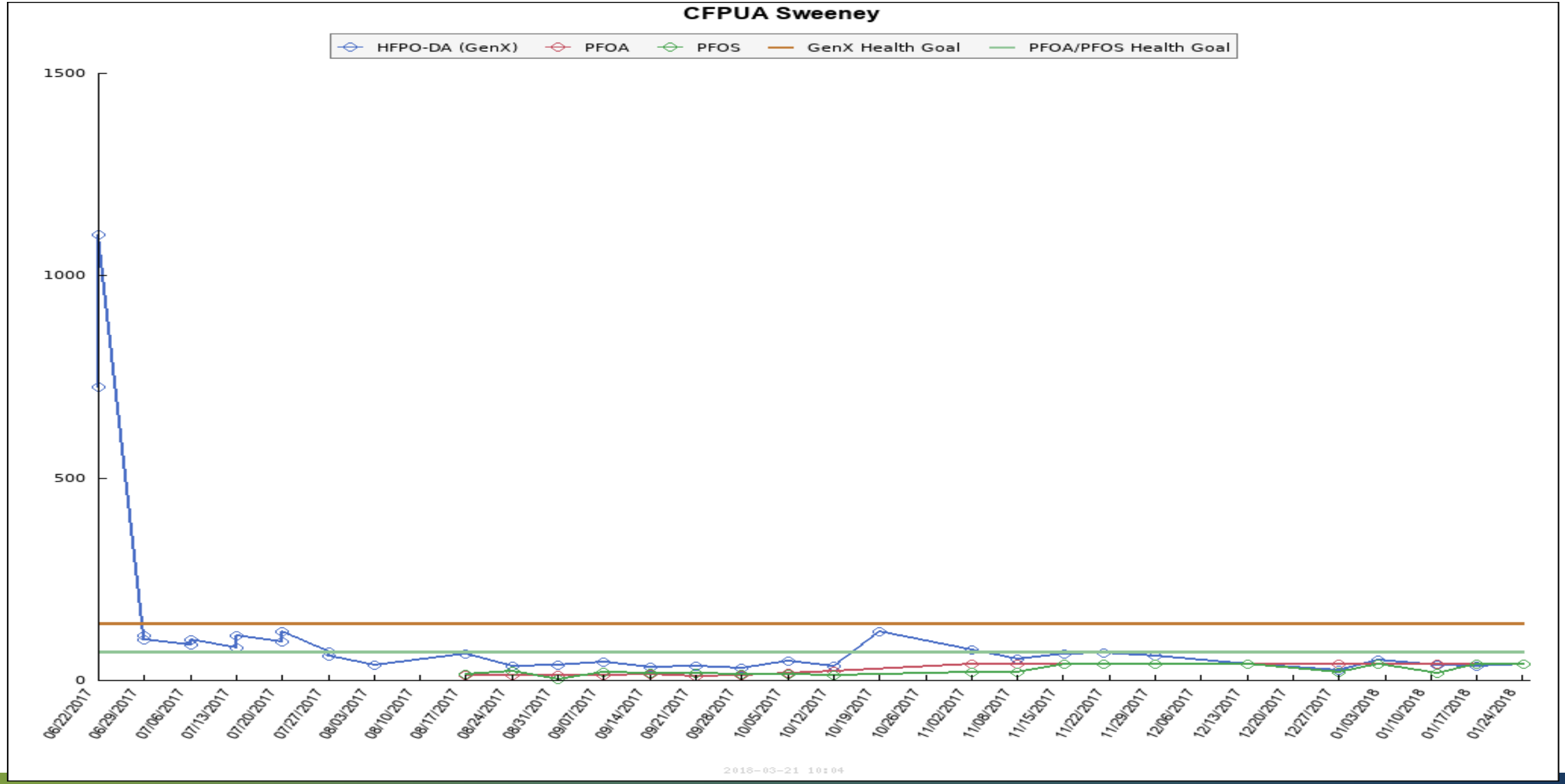
Data at Chemours Outfall 002 GenX (parts per trillion)



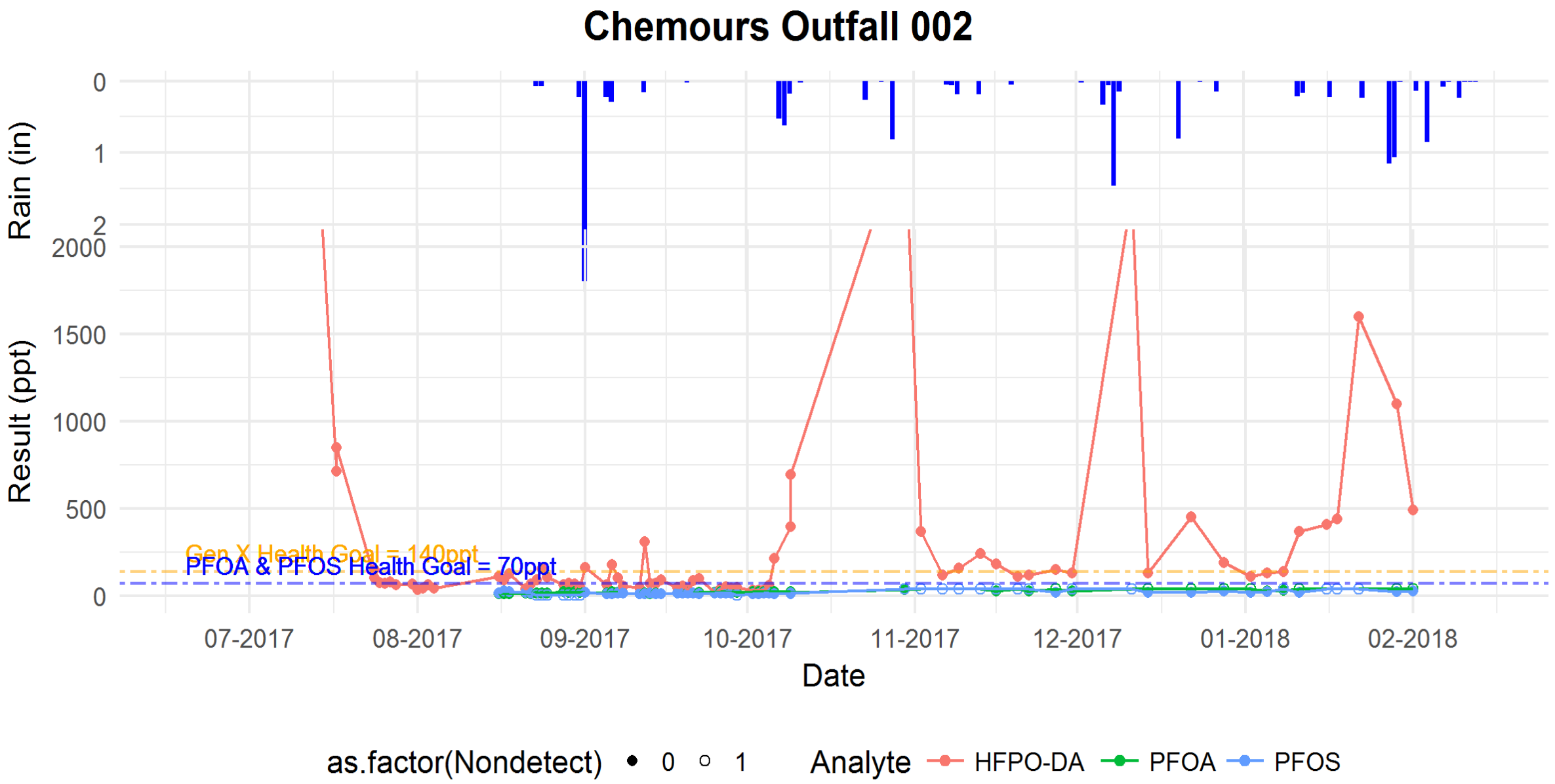
Data at Drinking Water Facilities -GenX (parts per trillion)



Data at Drinking Water Facilities-GenX (parts per trillion)



Rain Results



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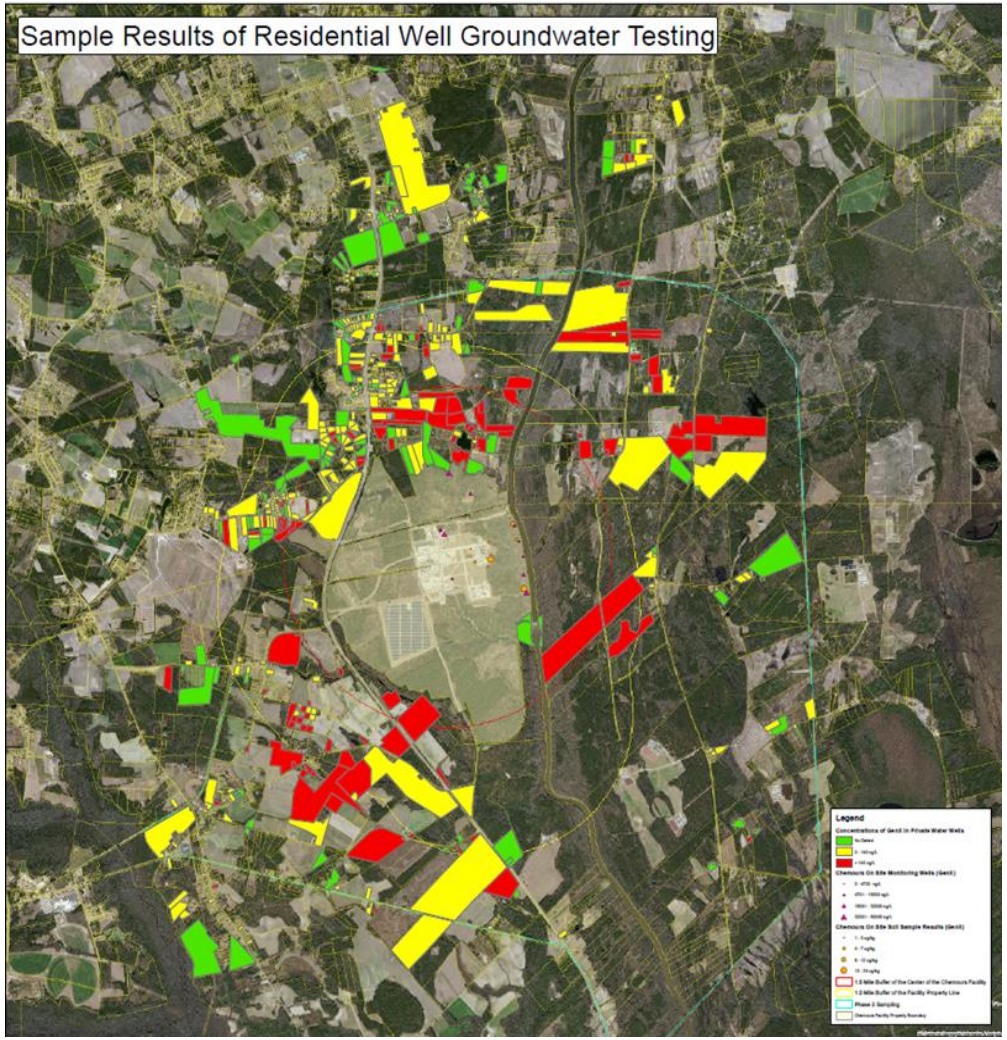
Division of Waste Management

Division of Waste Management

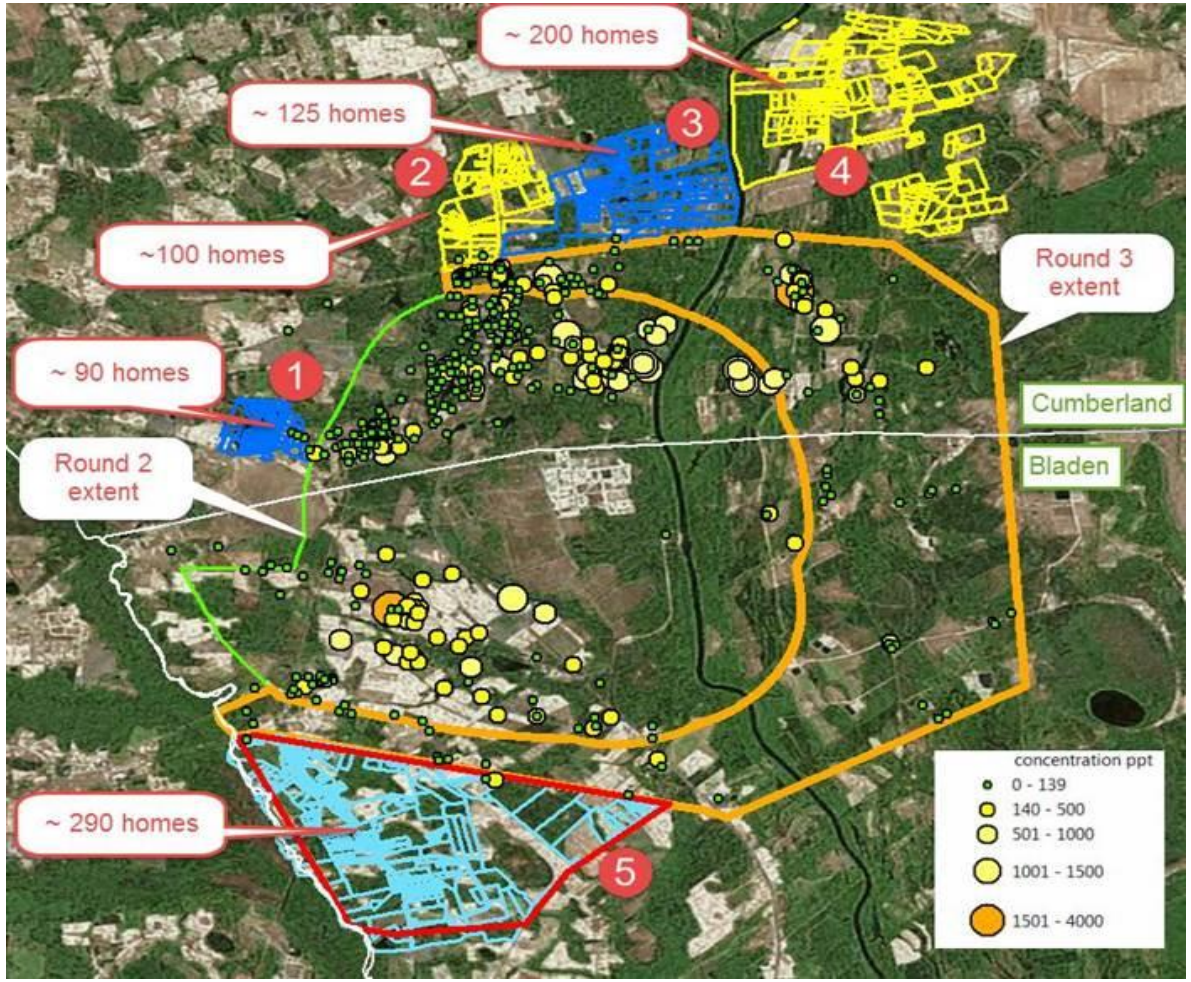


Well Sampling Results
in the Chemours area,
Phases 1-4
(up to ~ 4 mi. from facility border)

GenX: NC health goal = 140 ng/l

Red = > 140 ng/l
Yellow= 0-140 ng/l
Green = Non detect

Division of Waste Management



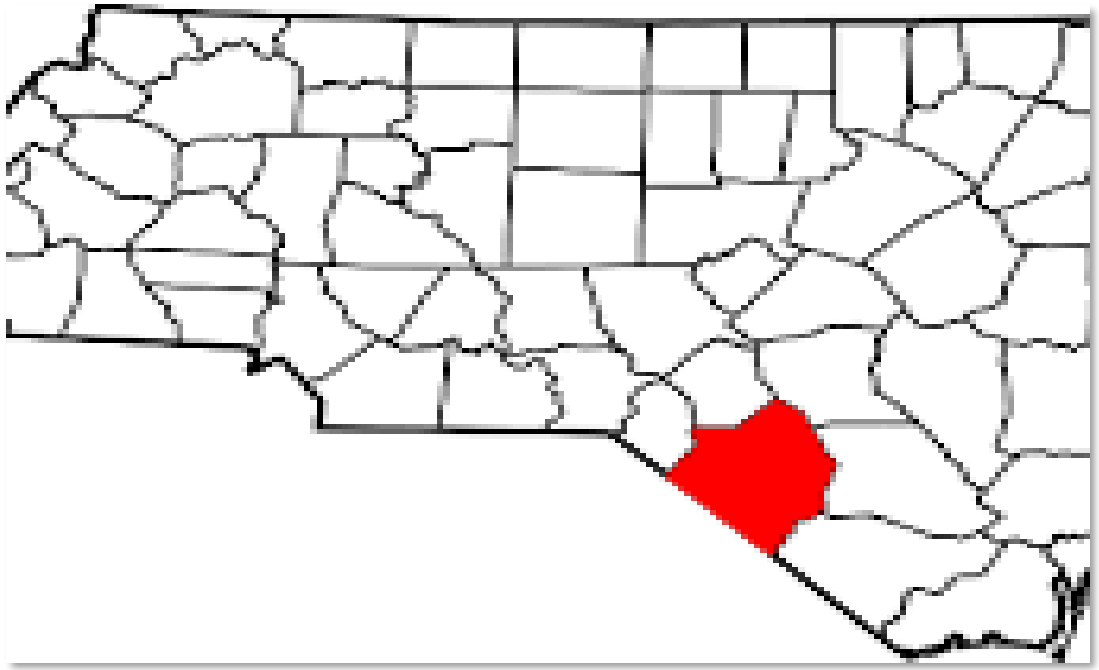
Chemours “Phase 4” sampling plan

Starts with areas in red and yellow (2, 4 and 5)

287 residences have been sampled thus far in phase 4

Data is showing a lower percentage of wells above the health goal

Robeson County Private Well Testing



- Robeson County tested 27 drinking water wells at residences.
- Sample dates: 1/29/18 and 2/13/18
- Results:
  - 25 wells had GenX detections and two were ND; highest was just under 42 ng/l
  - 25 wells had PFOS+PFOA detections and two were ND; highest was just under 25 ng/l combined
  - 0 wells exceeded the health goal for GenX (140 ng/l)
  - 0 wells exceeded the health goal for PFOS + PFOA (70 ng/l)
  - 1 well was ND for all three compounds

- Robeson County is planning to test a few additional wells and surface water features

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Combined Phase I, II, III , IV (partial) Private Well PFAS Data

Includes Robeson Co Data

Private Well Water GenX Summary	Phase I, II, III, IV partial Combined (%)
Distance from Chemours' border	Up to 4 miles
Well Collection Dates	9/6/2017 – 2/18
Number of Wells tested	748
Number of Exceedances of the GenX Provisional Health Goal	190
Number of Not-Detected ("ND") GenX Analyses	198
Number of GenX Detections Less than the Health Goal [a]	360
Maximum Detected GenX Concentration	4000 ng/L

a. The NC DHHS Provisional Drinking Water Health Goal for GenX is 140 ng/L (July 2017)

Granular Activated Carbon Point of Use Filtration Systems

- Chemours has submitted to DEQ a proposal to install granular activated carbon filtration systems for residences with Gen X present in the well at or above 140 ppt
- DEQ has provided initial feedback to Chemours to include the requirement to install 5 additional filter systems for sampling
- Installation of the systems should start this week
- Sampling data regarding the effectiveness of the systems will be shared online

Fish Tissue Testing

Marshwood Lake Testing by DEQ

- DEQ sampled Marshwood Lake on March 14:
  - Five surface water samples
  - Two composite sediment samples
  - Two fish species composite samples (Largemouth Bass and Redear Sunfish, composites from multiple fish)

- A drinking water well onsite at the lake was sampled
- A composite sediment sample was taken from Lock & Dam 3 in the Cape Fear River

- All samples collected will be analyzed using USEPA M537-modified for Full PFAS Suite at GEL Labs.
- Surface water will also be tested for Total Organic Carbon, Dissolved Organic Carbon, pH and Total Particulates

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Division of Air Quality

Division of Air Quality

Air Emissions Testing or “Stack Testing”

Target contaminant – C_3 Dimer Acid (GenX)

Purpose of testing is to quantify the emission rate of GenX during specific chemical campaigns at various processes

DAQ staff are on-site for every day of testing

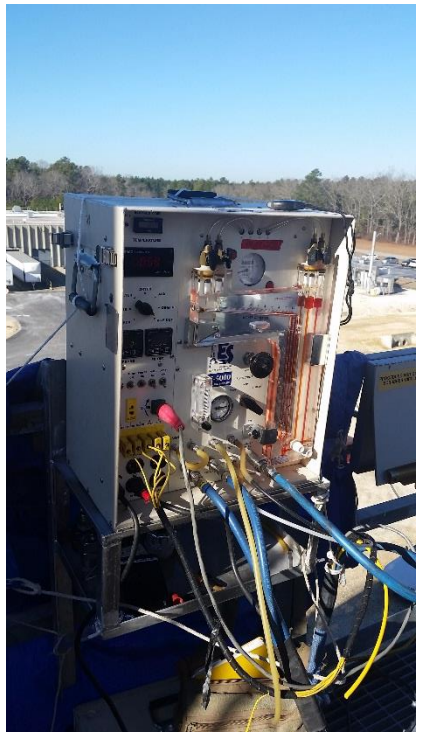
Division of Air Quality

Air Emissions Testing

Preliminary Testing – January 9, 2018 Polymer Processing Aid (PPA) process

Testing – January 22-26, 2018
- PPA process
- Vinyl Ethers North - Division Scrubber Stack

February 26 – March 2, 2018
- PPA process
- Vinyl Ethers South



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Air Emissions Testing

DAQ required Chemours to provide split samples for independent assessment by EPA lab

Results of January testing have been submitted and are being analyzed by DAQ staff

Testing ongoing this week: March 19-23

- Vinyl Ethers North – Division Scrubber Stack
- IXM Polymers Stack
- Semi-works Stack

Division of Air Quality

Air Emissions Testing

Future testing:

DAQ has required Chemours to develop test methods and quantify emissions for other chemicals beginning with:

- HFPO Monomer –
  - testing targeted for April
- E-1 –
  - testing targeted for May
- Nafion byproducts 1&2 –
  - targeted for May

Division of Air Quality

Ambient Air Quality Monitoring

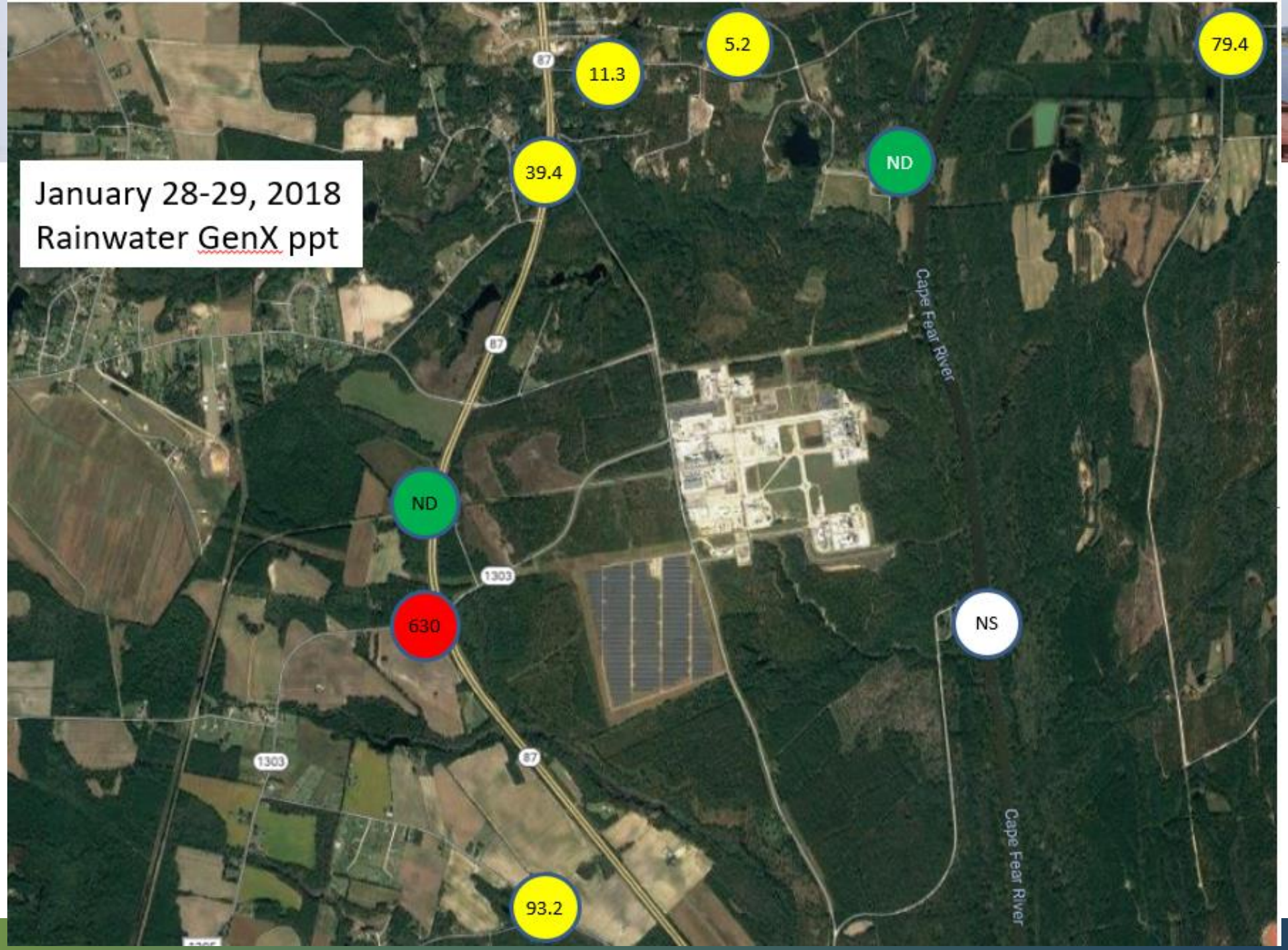
- Network of wet deposition monitors planned

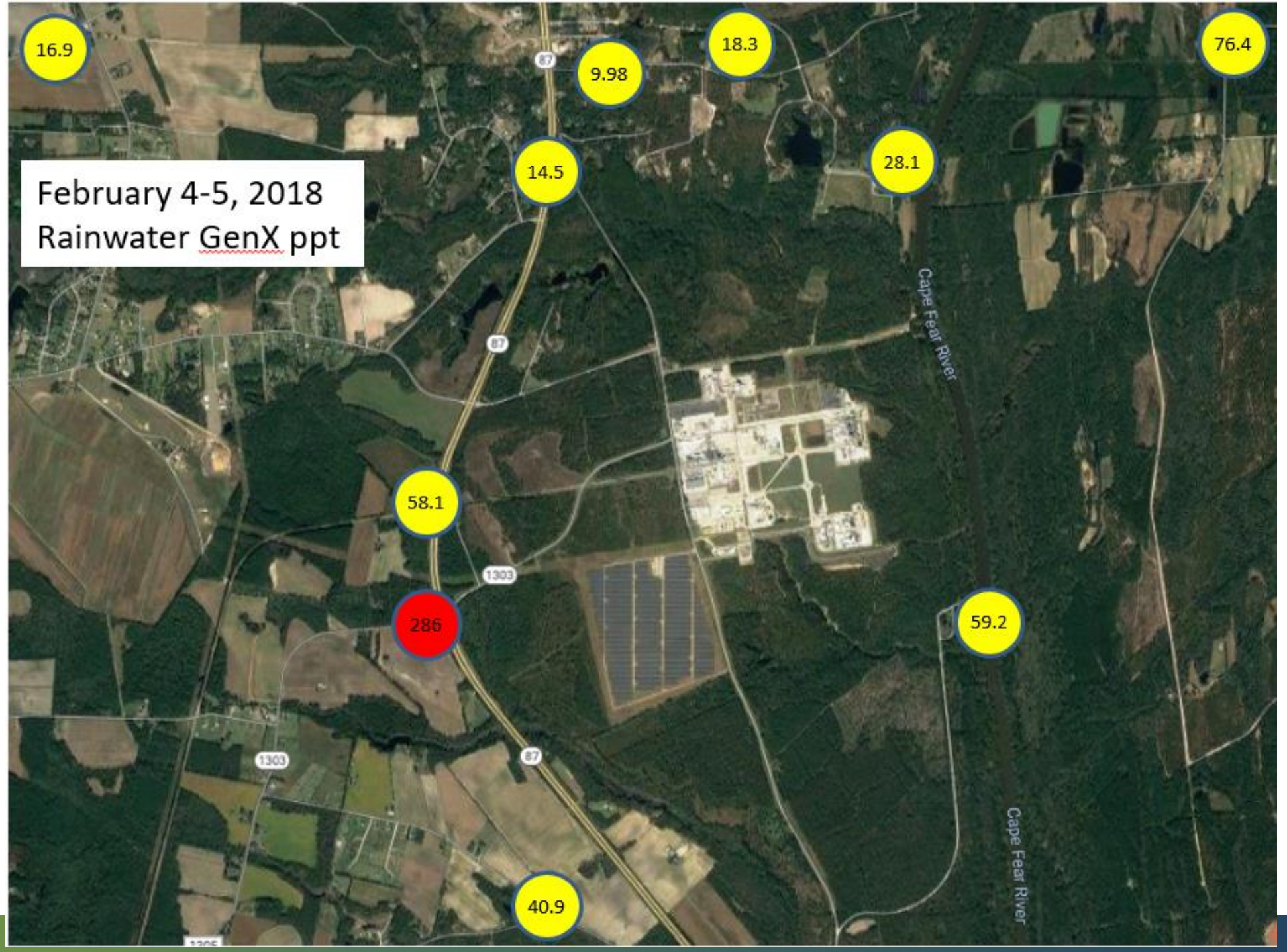
- Goal: Quantify near-field deposition rates and confirm cause/effect relationships. Quantify “background” amounts of PFAS in rainwater.
- Preliminary wet deposition samples under analysis
    - Source-oriented sites near Chemours
        - 2 northeast of facility
        - 2 southwest of facility
    - Background sites
        - Asheville
        - Raleigh
        - Candor
        - Wilmington

Division of Air Quality

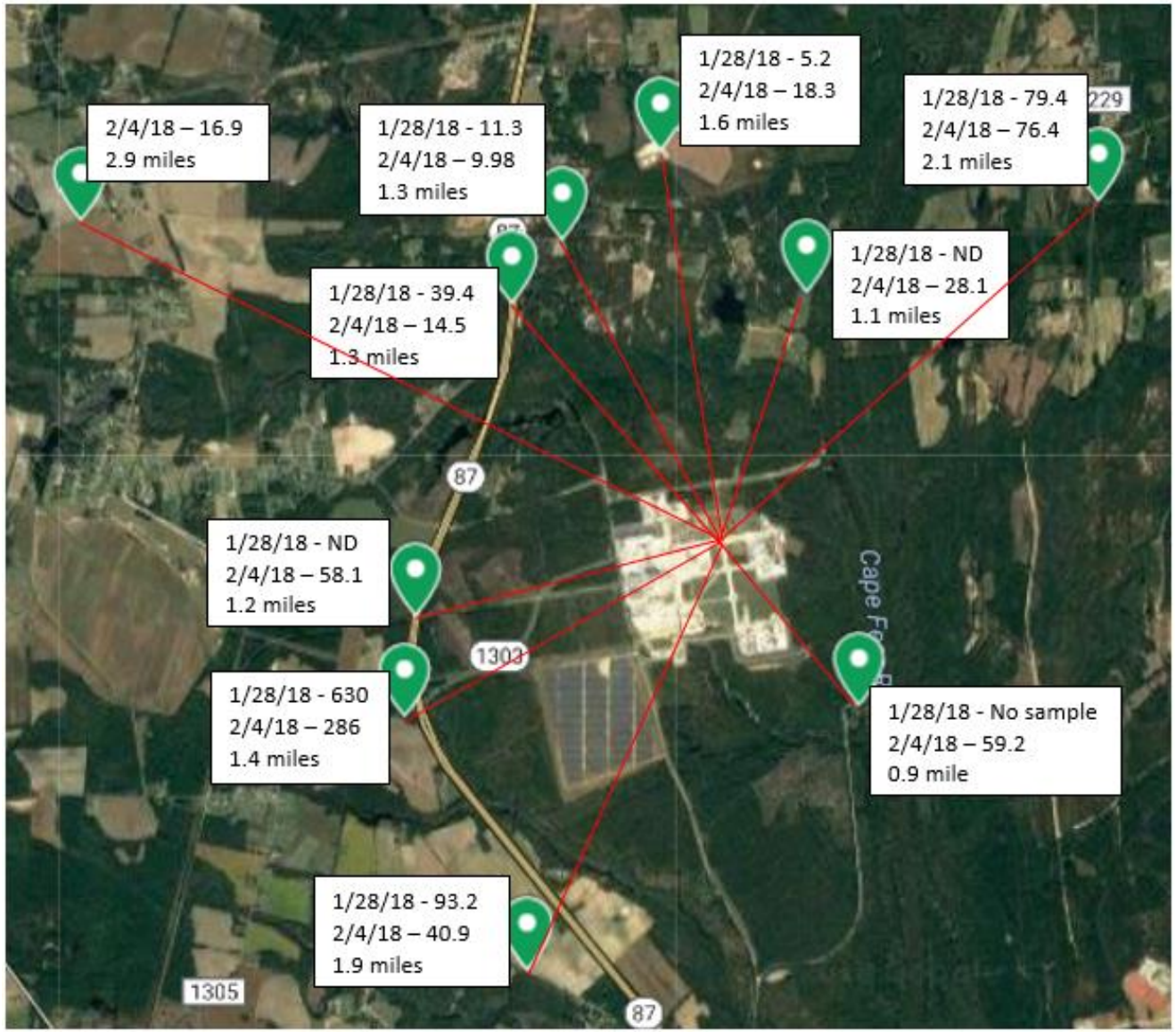
Ambient Air Quality Monitoring

- In the interim, DAQ has been performing a series of temporary site rainwater sampling:
  - January 28-29
  - February 4-5
  - February 28-March 1
  - March 6-7
  - March 9-12
  - March 19-21


January 28-29, 2018
Rainwater GenX ppt
11.3
5.2
79.4
39.4
ND
ND
630
NS
93.2
Cape Fear River
Cape Fear River
87
1303


February 4-5, 2018
Rainwater GenX ppt
16.9
9.98
18.3
76.4
14.5
28.1
58.1
286
59.2
40.9
87
1303
Cape Fear River
Cape Fear River

Composite analysis Jan 28 and Feb 4 rain events



Division of Air Quality

Ambient Air Quality Monitoring

- DAQ has received permission from property owners to site 3 fixed rain samplers. Temporary sampling will be performed at those locations until permanent equipment is delivered.

- DAQ is analyzing the rainwater data, meteorological data and process data to generate a baseline of rainwater impact during early 2018.

Division of Air Quality

What control techniques will eliminate or significantly reduce the air emissions of interest?

- Exploring all options.
- Studying technologies, gathering available test data.

- Understanding secondary impacts of adding air pollution controls to reduce PFAS.
    - Solid waste generated?
    - Waste water generated?
    - Secondary air pollutants generated
- Approved trial carbon adsorption technology for 2 processes on February 9, 2018
    - Portion of emissions profile.

Emissions Controls:

- Chemours has taken steps to address equipment leaks, including:
  - Enhanced leak detection and repair program
  - Adjusting process parameters and upgrading equipment

- Chemours has committed to installing and operating carbon bed adsorbers by May 25, 2018 on:
  - PPA process and room air
  - Vinyl Ethers North room air

- Chemours is also evaluating additional carbon bed adsorber applications and scrubber efficiency upgrades as interim measures

Emissions Controls:

- Chemours stated in their 2/26 response to DWM's 2/12 NOV that they are:
  - "implementing a comprehensive program to identify, evaluate and abate PFAS air emissions at Fayetteville Works. The centerpiece of this program is a longer term effort to install a state of the art thermal oxidizer unit for air emissions from the facility, which is expected to be at least 99.99% effective for HFPO Dimer Acid and other PFAS compounds."