Division of Waste Management

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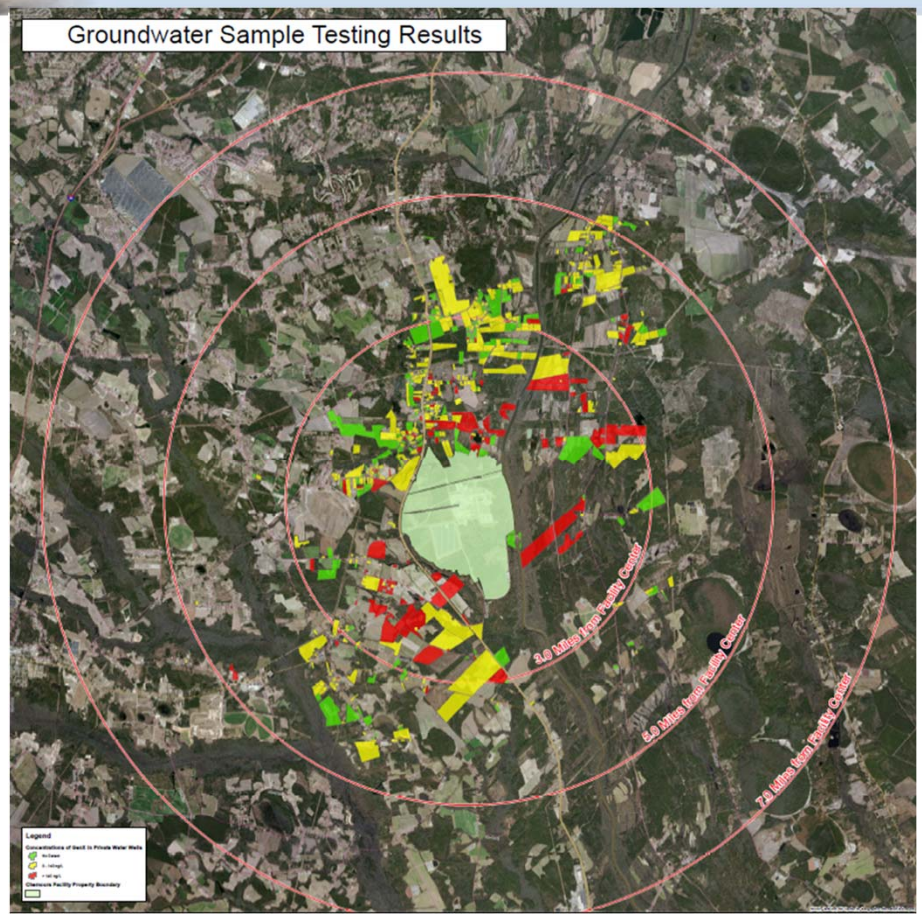
Department of Environmental Quality

Division of Waste Management
GenX Private Well Sampling



Well Sampling Results in the Chemours area,

Approximate distances from facility boundary:
Northeast – 5.5 miles
West – 1.8 miles
Southwest – 3.9 miles
East – 2.6 miles

GenX: NC health goal = 140 ng/l

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

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GenX Private Well Summary Data

Combined Phase I, II, III , IV (partial) Private Well PFAS Data, also Includes Robeson Co. and DEQ-collected Data

Private Well Water GenX Summary	Combined Well Data
Distance from Chemours' border	Up to 5.5 miles
Well Collection Dates	9/6/2017 – 6/13/18
Number of Wells tested	823
Number of Exceedances of the GenX Provisional Health Goal	164
Number of Not-Detected ("ND") GenX Analyses	220
Number of GenX Detections Less than the Health Goal [a]	439
Maximum Detected GenX Concentration	4000 ng/L

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

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Granular Activated Carbon (GAC) Point-of-Use Filtration Systems

- Chemours submitted a proposal to DEQ to install GAC filtration systems for residences with GenX in wells at or above 140 ng/L.
- Pilot study will determine system effectiveness, system maintenance schedule and compound breakthrough.
- All GAC systems were installed by April 20, 2018.
- Both DEQ and Chemours' third-party consultants are sampling the filter units.
- DEQ results to date are provided in this presentation and are posted on the DEQ website.

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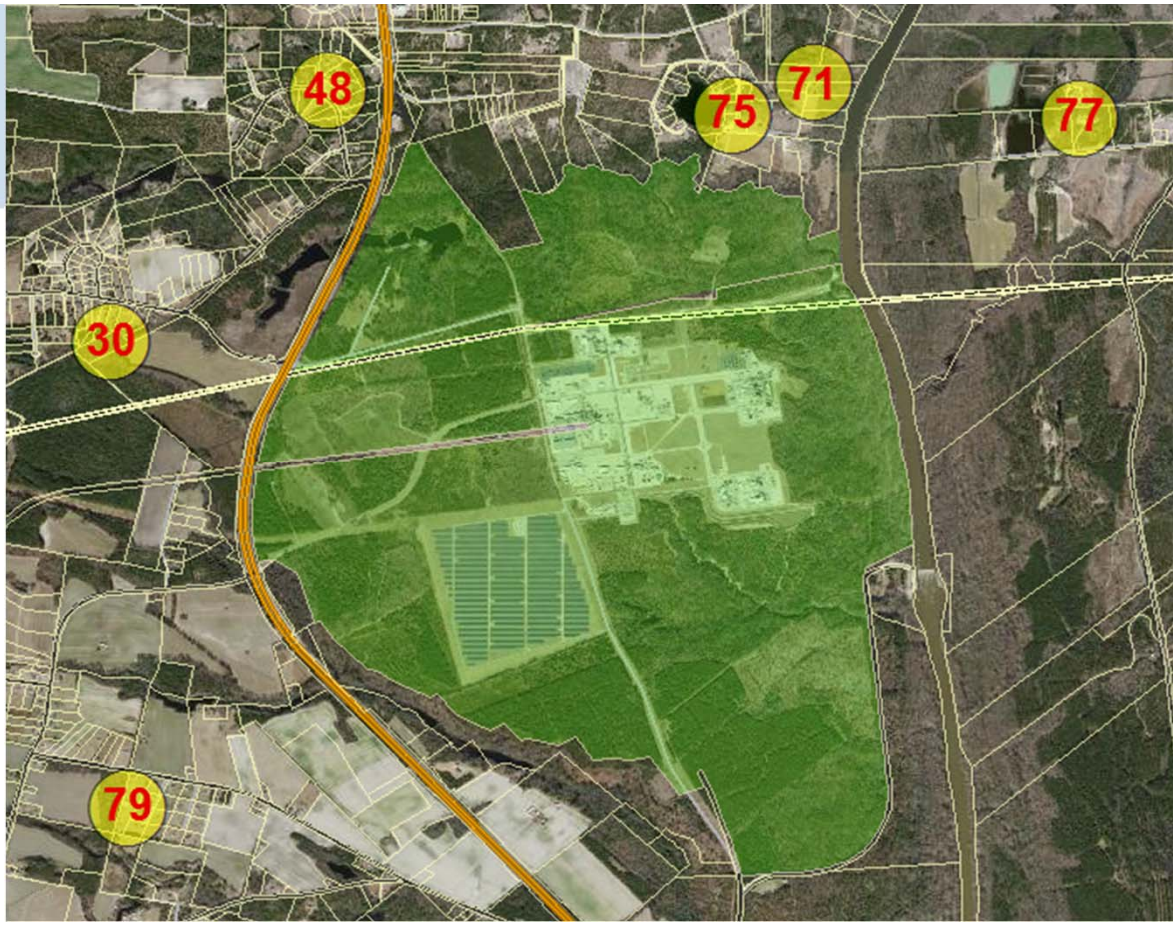
Basic study information

- 6 Locations
- GenX in untreated water = 159 - 1,910 ng/L
- Water usage = 450 to 2,500 gallons/week
- Analyzing for GenX and 32 other PFAS compounds



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GAC System for Pilot Study

- Specific type of GAC system installed – Other types may not perform the same.
  - Iron and sediment filters
  - Two GAC filters
- Samples are taken at 4 places:
  - Raw, Pre, Mid and Post
- Research questions:
  - Are they effective?
  - What maintenance and monitoring is required?

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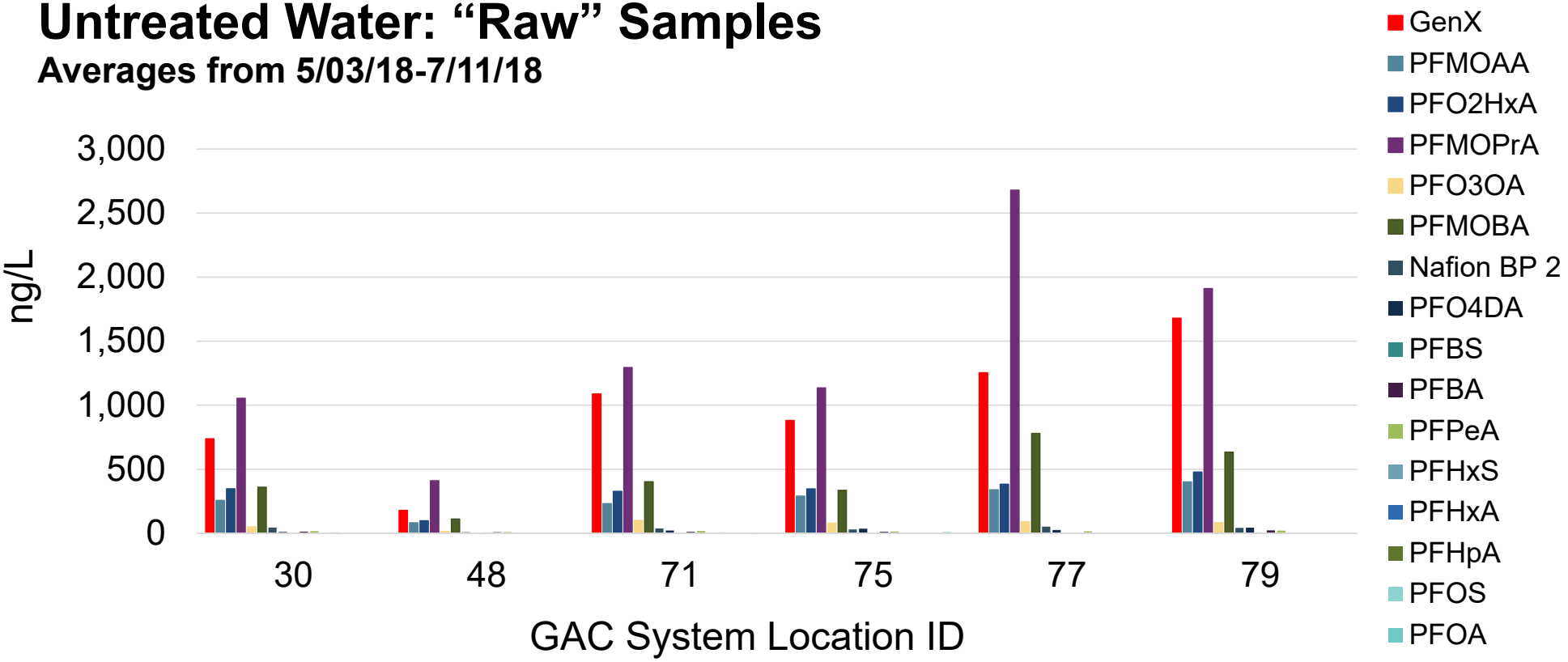
Untreated Water: “Raw” Samples

Untreated Water: “Raw” Samples

Averages from 5/03/18-7/11/18

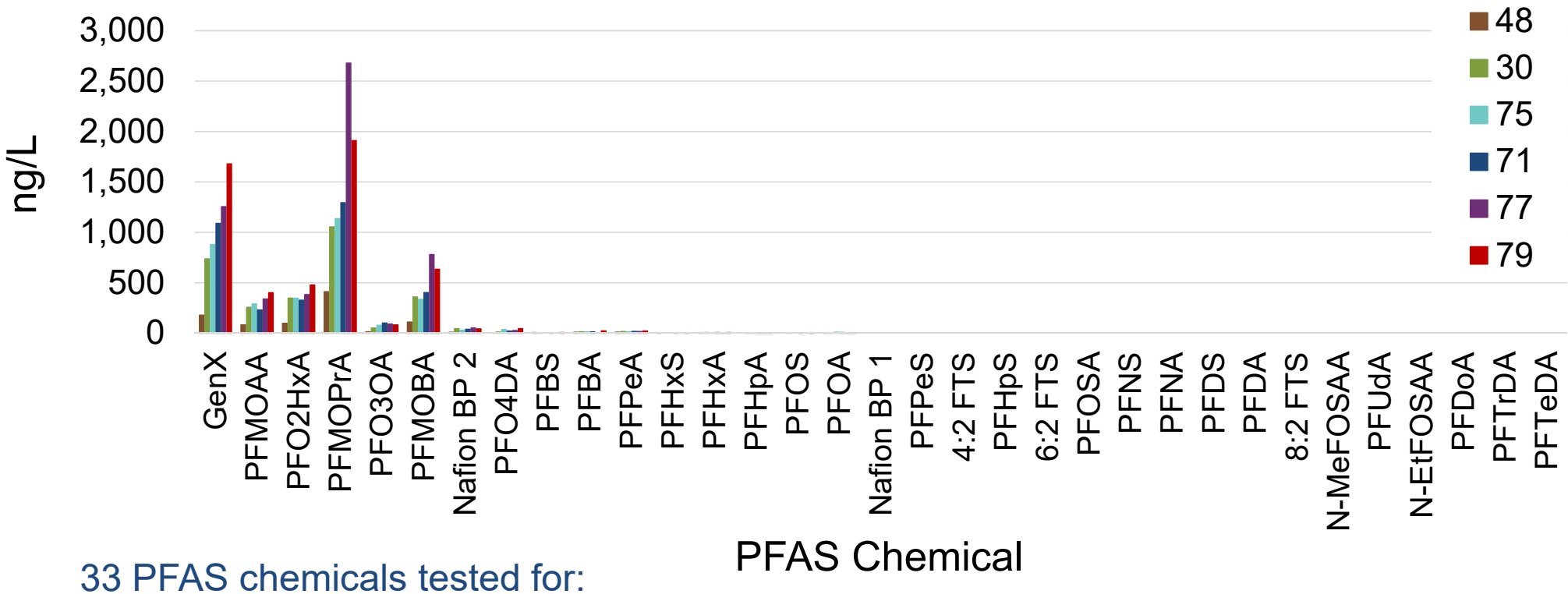


Each site has a similar pattern of PFAS chemicals.

Untreated Water: “Raw” Samples

Averages from 5/03/18-7/11/18

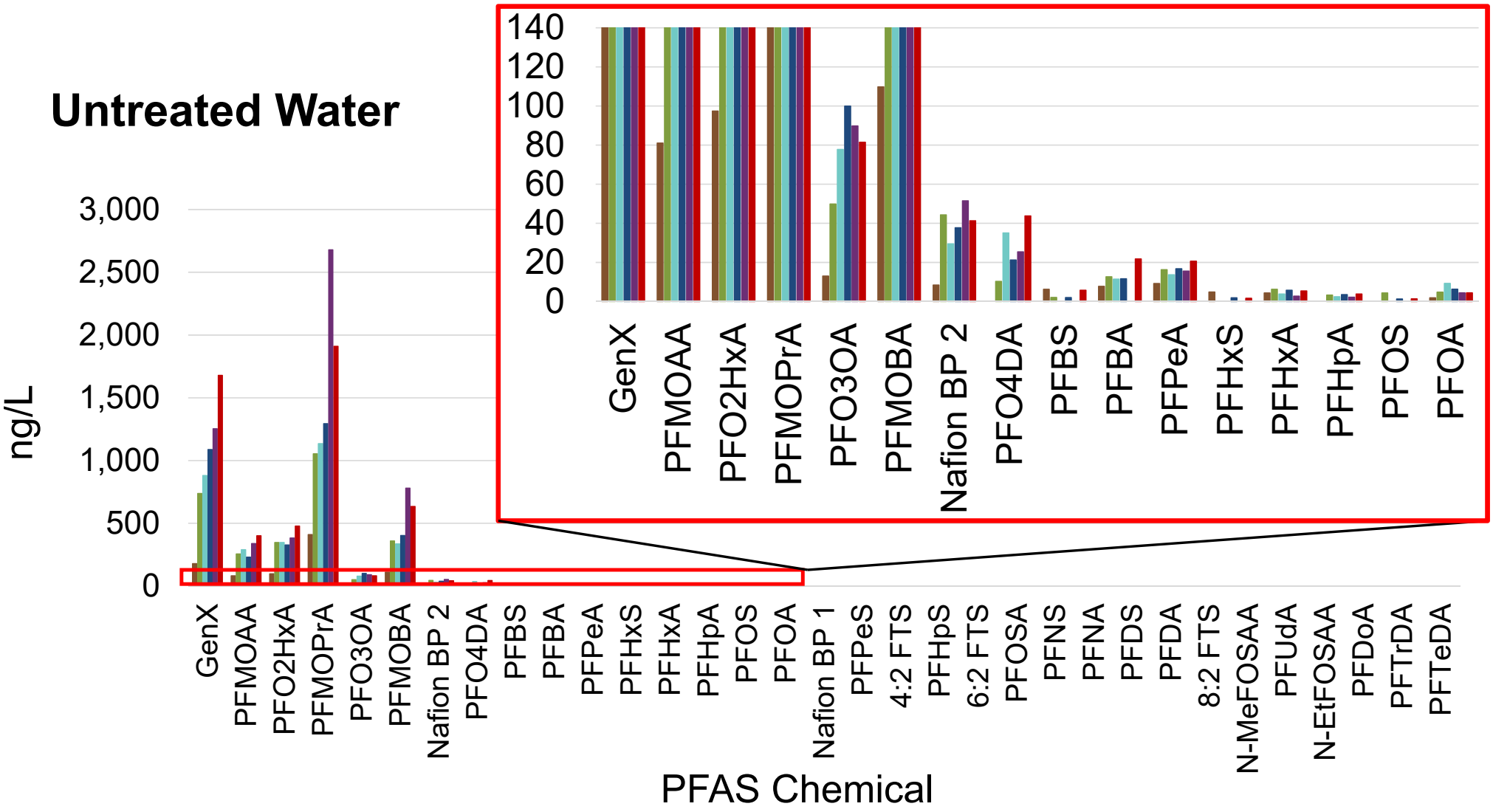
Same data but viewed by chemical



33 PFAS chemicals tested for:

- 17 detected in at least one well.
- 6 of these found at higher levels and in all wells.

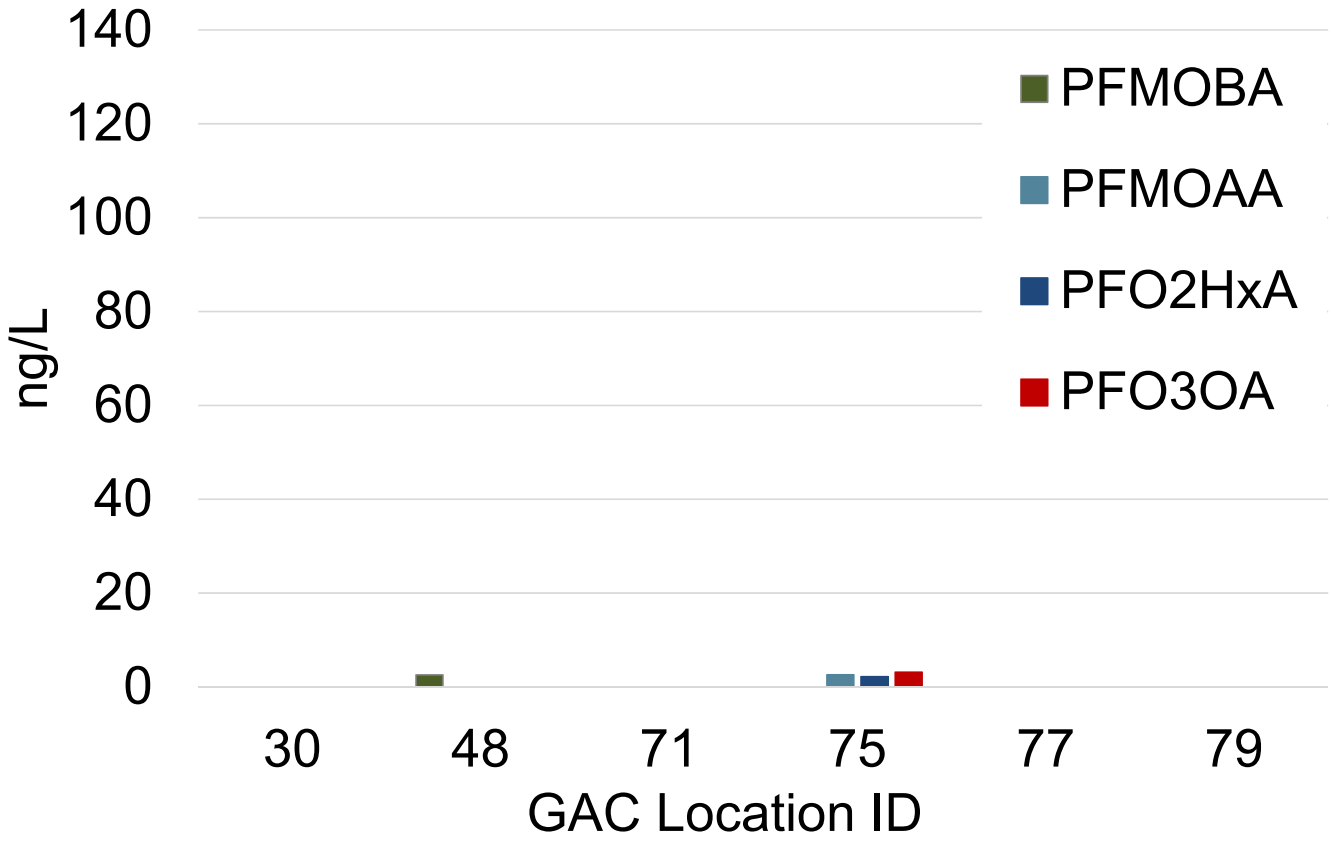
Untreated Water



Treated Water: “Post” Samples

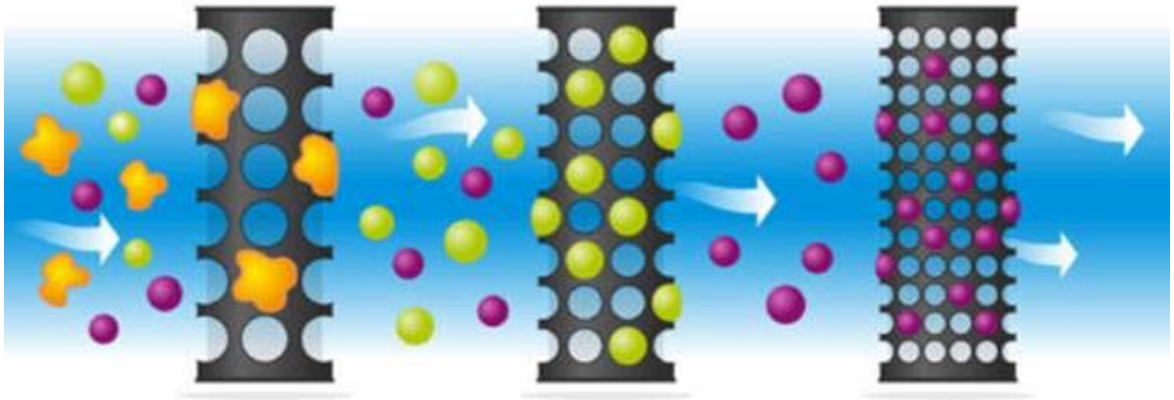
Treated Water: “Post” Samples

Averages from 5/03/18-7/11/18



- 4 chemicals detected in “Post” samples:
  - Low concentrations near the reporting level (<10 ng/L).
- All detections of PFAS are far below the state’s provisional health goal of 140 ng/L for GenX.

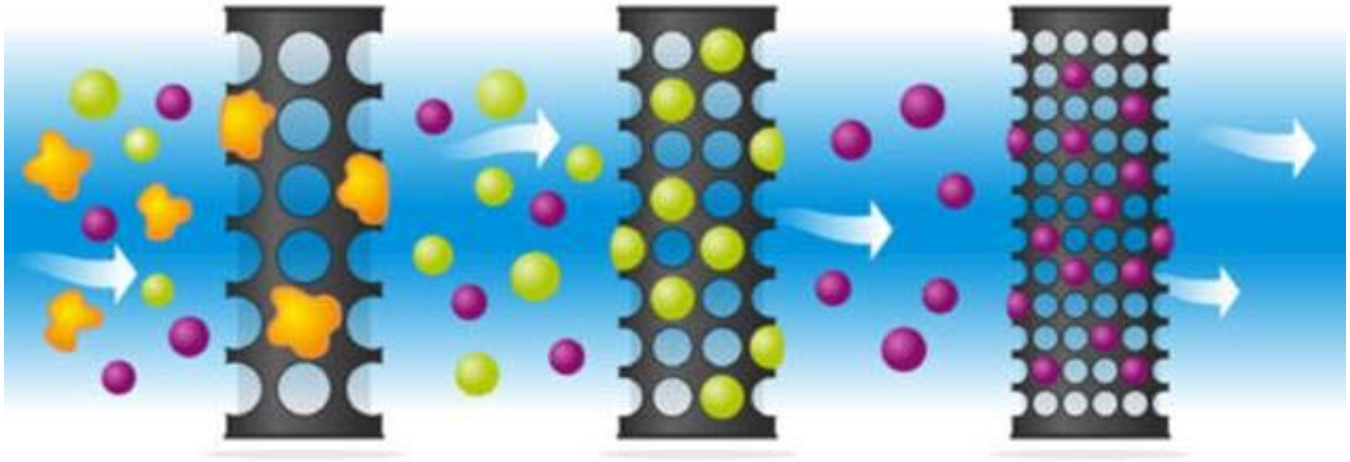
What is Breakthrough?



Research predicts that smaller chemicals will breakthrough first.

- Breakthrough is when GAC filters begin to reach capacity and they are no longer able to capture the PFAS.
- Identified by measuring PFAS in the “Mid” sample - the sample we collect after the 1st GAC filter but before the 2nd GAC filter.
- Steadily increasing concentrations in the Mid sample would indicate breakthrough is occurring.

More about Breakthrough



- The 2nd GAC filter will continue to treat the water after the 1st GAC filter's capacity is exhausted.
- Information about the timing of breakthrough will help determine filter replacement and monitoring schedules.

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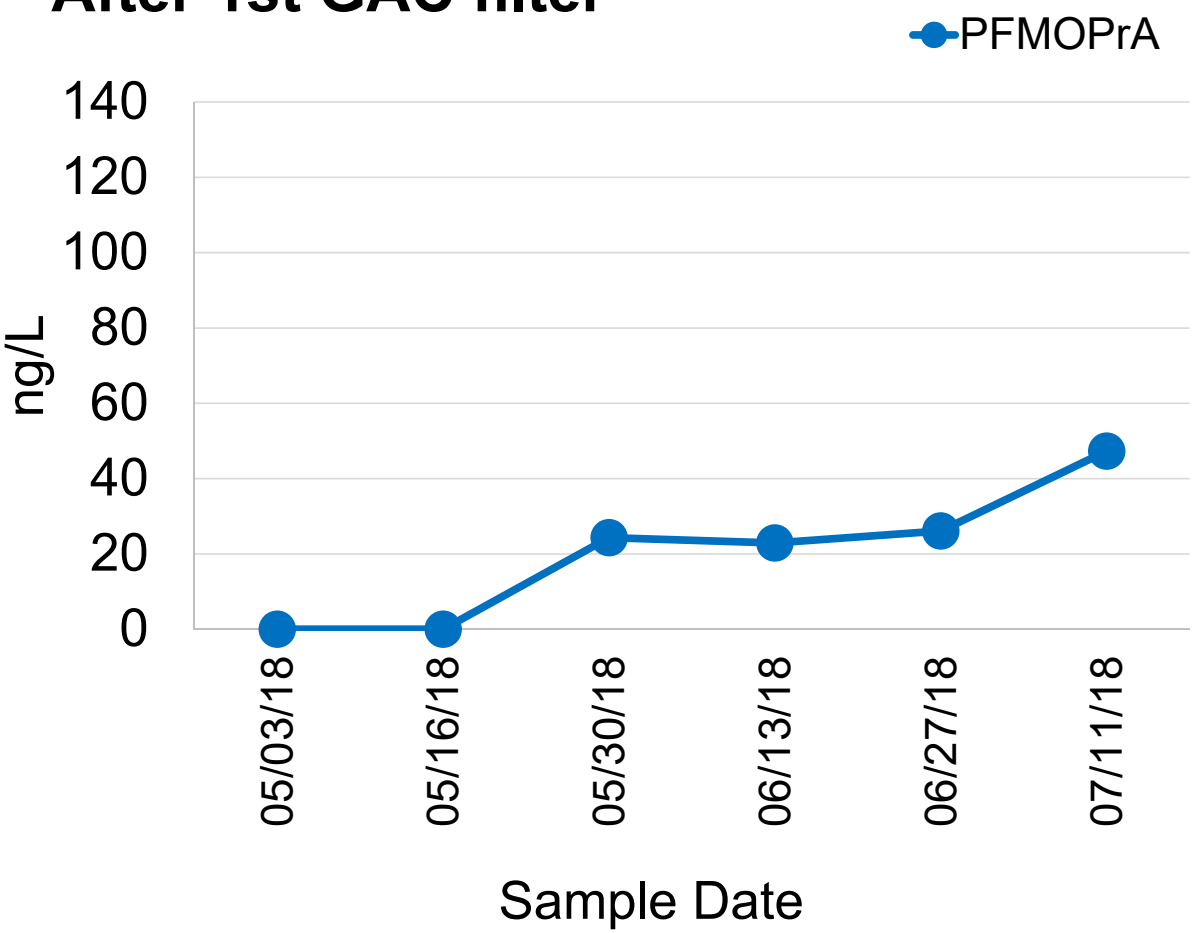
Partially Treated: "Mid" Samples

"Mid" Samples
After 1st GAC filter



- Location 79.
- Chemical detected is PFMOPrA. It is a smaller molecule (C4).
- PFAS chemicals not yet detected in “Post” or treated water.

PFAS	# Carbons	Location 79 Raw Water Avg.(ng/L)
PFMOAA	3	401
PFO2HxA	4	478
PFMOPrA	**4**	**1,910**
PFBS	4	5.70
PFBA	4	21.3
PFO3OA	5	80.4
PFMOBA	5	633
PFPeA	5	19.6
GenX	6	1,678
PFHxS	6	2.04
PFHxA	6	5.38
Nafion BP2	7	46.3
PFHpA	7	3.79
PFOS	8	3.64
PFOA	8	4.36
PFO4DA	10	46.0

- PFMOPrA is shorter chain 4-carbon PFAS (C4).
- PFMOPrA was at a high concentration in untreated water (1,910 ng/L).

What comes next for GAC?

- Based on first 2.5 months of data, filters appear to be removing GenX and other PFAS.
  - Maintenance will be needed to ensure continued chemical removal.
  - Maintenance and monitoring requirements will be reviewed.

- Iron is high in some wells. This may impact system performance and maintenance schedules. This needs further evaluation.

- DEQ will continue GAC system testing until we can estimate the timeframe of PFAS breakthrough.

- DEQ will continue to sample the pilot study GAC systems to determine maintenance, monitoring schedules and breakthrough.

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Alternate Water Sources

- Chemours submitted a proposal this summer which is under review by DEQ.

- May use different solutions for different areas:
  - Whole-house filter systems, such as GAC filters.
  - Connection to public water supply lines.
  - Deeper private wells.

- DEQ and local governments are reviewing current capacity and how capacity could be increased.

On-site Clean-up

- As part of existing permit Chemours is:
  - Pumping 3 wells to address high concentrations in the shallow aquifers.
  - Removing contaminated soil.
- Investigations are ongoing.
- Future clean-up efforts will focus on groundwater and soil.

Questions?

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