

5/4/2020

«names_of_HHID»
«street_address»
«city», «state» «zip»

Dear «names_of_HHID»,

We hope that you are well during this difficult time.

Thank you for participating in the GenX Exposure Study. This research study is funded by the National Institute of Environmental Health Sciences. We are trying to understand human exposure to per- and polyfluoroalkyl substances (PFAS), including GenX, in the Cape Fear River Basin, North Carolina. The GenX Exposure Study is separate from other PFAS research activities you may have seen in your community, like those by the North Carolina PFAS Testing Network; the North Carolina Department of Health and Human Services; University of North Carolina, Chapel Hill; or other groups.

As early as 1980, GenX and other PFAS have been released from the Chemours Fayetteville Works plant to nearby areas. In response, the GenX Exposure Study began in November 2017 with residents in Wilmington, NC. In February 2019, we expanded the study to include people who live nearby the Fayetteville Works plant and who have private wells.

As part of this study, we collected water samples (from private wells and kitchen taps) from 85 homes of 153 residents in the Fayetteville area. This letter reports our initial results for these water samples.

What did we do?

In February 2019, we recruited 153 participants from 85 homes in Cumberland and Bladen County to participate in the GenX Exposure Study. We recruited people whose wells had already been tested for GenX and GenX values were reported to the North Carolina Department of

Environmental Quality (NC DEQ). We aimed to have half of the homes in our study to have wells with GenX levels above 140 ng/L, and half below. This means that while our water results provide some information about PFAS contamination in private wells around Fayetteville Works, our results do not represent the Fayetteville private well community as a whole.

During Feb 21-24, 2019, we sampled water from 85 homes.

At each home, we collected a water sample from the well. In 82 of the 85 homes, we also collected a water sample from the kitchen tap.

Tap samples were collected as is. That means that if there was any form of water treatment (for example, an under-the-sink filter), we collected treated tap water for that home's tap sample.

We tested for 31 different PFAS, including GenX and Nafion byproduct 2, in each water sample. Those PFAS were chosen based on our current knowledge of PFAS contamination in the area (PFAS originating from Fayetteville Works as well as other sources). Our analytical method can detect PFAS at nanogram-per-liter levels. "Nanogram-per-liter" or "ng/L" means the same thing as "part-per-trillion" or "ppt." While these are low levels, we are confident in our ability to test for the presence of PFAS in water even if they are there at very low levels. A complete list of the chemicals we tested for can be found on our website (genxstudy.ncsu.edu).

What did we find in the well samples?

Right now, we have PFAS results for 83 of the 85 wells we sampled. GenX was detected in 84% of the wells (see **Figure 1**). Our method reporting limit for GenX was 2.5 ng/L. This means that if GenX was present at 2.5 ng/L or greater, we would have been able to detect it and determine how much was in the sample.

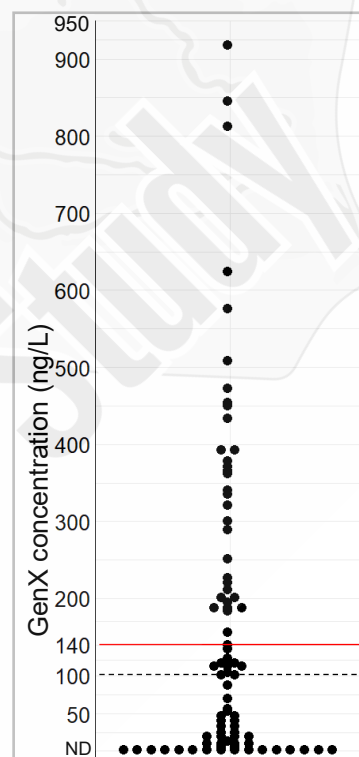
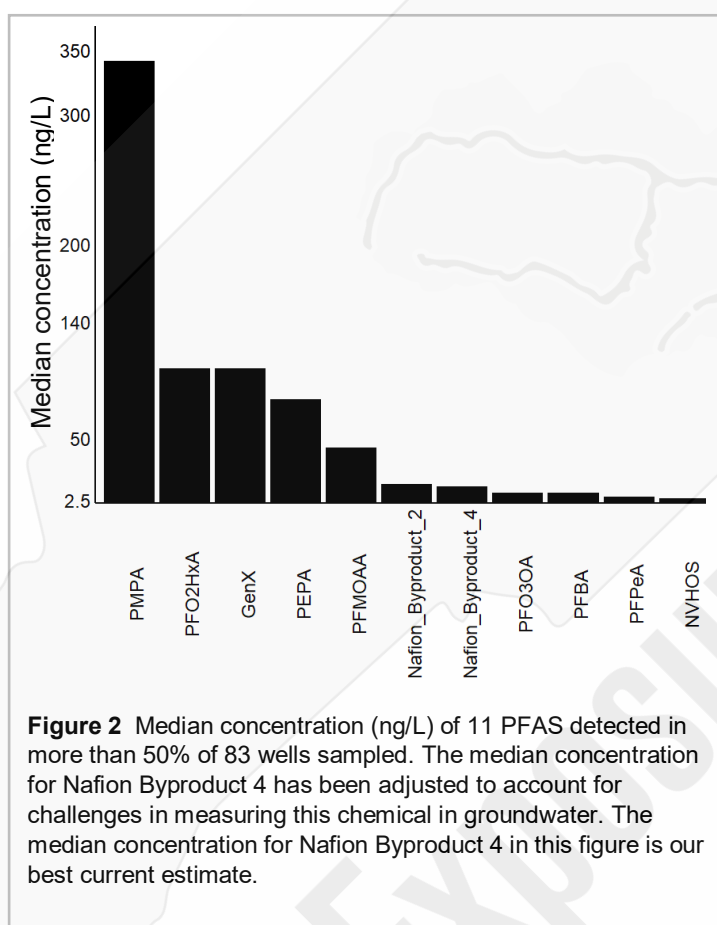


Figure 1 GenX in ng/L in well water samples (each dot represents one sample). The black dotted line is the median (103 ng/L) and the red line is the GenX health advisory level (140 ng/L). ND stands for non-detect.

The median GenX concentration across the well samples was 103 ng/L (see **Figure 1**, dotted line). This means that 50% of wells had GenX levels above 103 ng/L. A total of 33 wells (40%) had GenX above the North Carolina health advisory level of 140 ng/L. Six wells (or 7%) had GenX levels greater than 500 ng/L.

We detected 10 other PFAS besides GenX in more than 50% of the wells (see **Figure 2**). Of all PFAS, PMPA was present at the highest concentration. Samples with higher GenX levels were more likely to have higher levels of the other PFAS too.



The term “legacy PFAS” refers to those PFAS with a history of use throughout the US. They tend to be longer chain such as PFOA and PFOS. For the legacy PFAS, we detected PFOA in 37% of the wells. We detected PFOS in 24% of the wells. In two wells, the summed concentration of PFOA and PFOS was greater than 70 ng/L, the US Environmental Protection Agency’s health advisory standard for PFOA/PFOS. PFPeA and PFBA were frequently detected in wells at concentrations less than 10 ng/L.

We detected PFHxS, PFNA, PFDA, and PFO5DoA in fewer than 10% of wells. We did not detect 4:2 FTS, 6:2 FTS, 8:2 FTS, FBSA, FHxSA, FOSA, Nafion byproduct 1, PFHpS, and PFPeS in any wells.

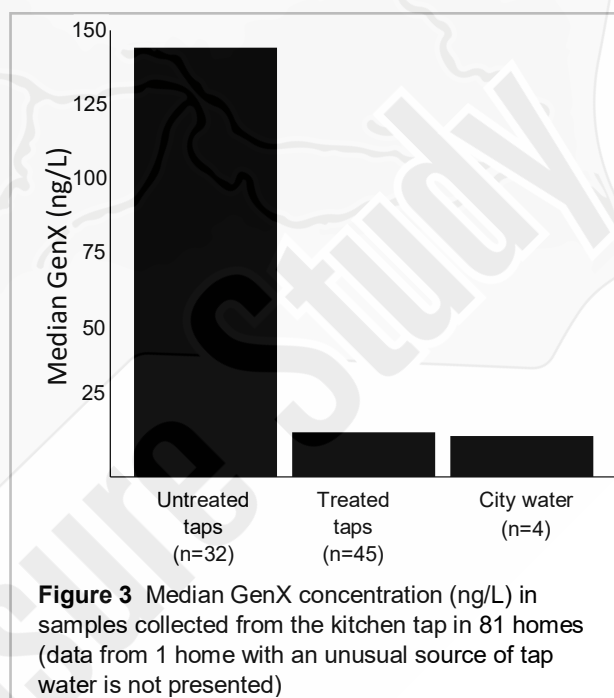
What did we find in the tap samples?

We sampled taps at 82 homes in February 2019. At that time, some residents had installed their own water treatment systems. Some homes had whole-house water treatment (for example, whole-house activated carbon, reverse osmosis, or water softening), whereas other homes had under-the-sink water treatment. In 55% of homes, there was at least one type of water treatment installed. In 23%, there were multiple types of water treatment installed.

In the 32 homes that did not have any water treatment, GenX concentrations at taps were similar to GenX concentrations in wells, as we would expect.

In the 45 homes with water treatment, GenX concentrations at taps were different from GenX concentrations in wells. The GenX levels at taps were generally lower than at wells (see **Figure 3**). We are still working on understanding the impact of specific water treatments on PFAS removal.

There were four homes in our study that, when we visited to collect their water samples, we learned had been connected to city water. We still sampled those homes' wells and collected samples from their kitchen taps. In those four homes, the GenX levels were lower (median of 14 ng/L GenX, **Figure 3**) than the GenX levels in their wells.



What are the limitations of these findings?

Our study was not intended to describe the range of PFAS contamination in the entire Fayetteville private well community. We purposefully enrolled participants with wells above and below 140 ng/L GenX so that we would have a sharp contrast for studying PFAS exposure and potential health effects. Because our participants were not a random sampling of the

people living in Cumberland and Bladen Counties, we cannot make broad statements about PFAS contamination for those areas. Therefore, our data are specific for our study participants. We did not sample in Robeson County.

All of the water samples were collected during the week of Feb 21-24, 2019, because we wanted to limit changes over time. PFAS concentrations in your well may change over time, but we don't know by how much or how quickly.

In this research study, we are reporting concentrations for many PFAS that have not been measured by other researchers before. While we are confident that what we found is actually present, the exact concentration may be somewhat different due to limitations of the analytical method. Because there were some challenges in measuring for Nafion Byproduct 4 in groundwater, we are not reporting individual sample concentrations for this chemical. The limitations that we have in our method are likely to be the same limitations that other labs are facing.

Our sampling was not conducted under the Chemours consent order. This means that our results for your well sample do not qualify you for a water treatment system provided by Chemours. Due to the coronavirus outbreak, Chemours and NC DEQ have temporarily stopped testing private wells for GenX. If you would like to request additional testing of your well when testing is available again, please visit <https://deq.nc.gov/news/key-issues/genx-investigation/genx-information-residents> (look for "Well testing") or call NCDEQ at 919-707-8200.

Your home's water results

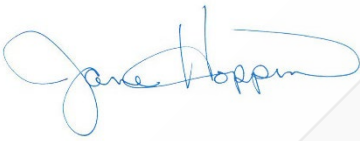
Your home's water results are presented on the following pages.

Given the difficulty of holding in-person community meetings at this time, we are considering hosting a virtual presentation with Q&A about the water results. Please check our study website genxstudy.ncsu.edu for updates. In the meantime, we will post videos explaining these results for you and your community members. Feel free to share any of the information that we post on our website.

If you have any questions, please feel free to contact our study office by phone (855-854-2641) or email (genx-exposure-study@ncsu.edu).





On behalf of the GenX Exposure Study team, we hope that you and your family are safe and healthy during these challenging times. We appreciate your participation in the study, and look forward to talking to you in person soon.

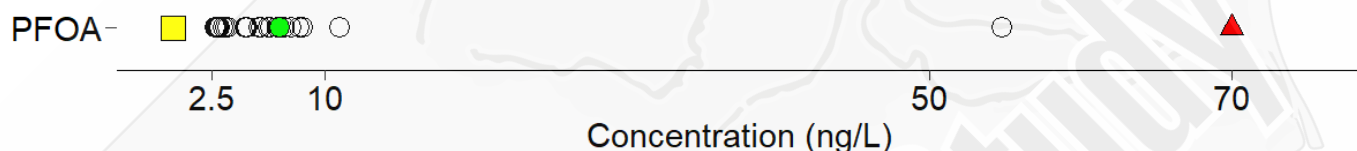
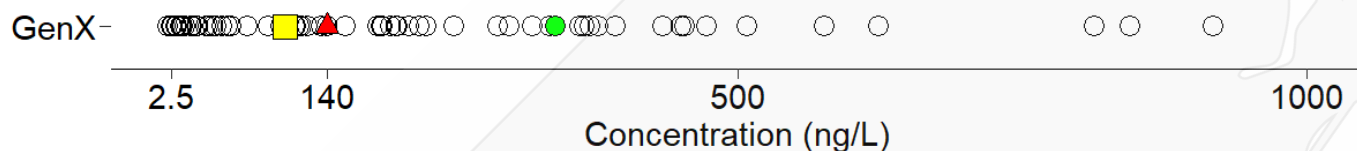
Sincerely,

A handwritten signature in blue ink, reading "Jane Hoppin".




Jane Hoppin, ScD
GenX Exposure Study, Principal Investigator

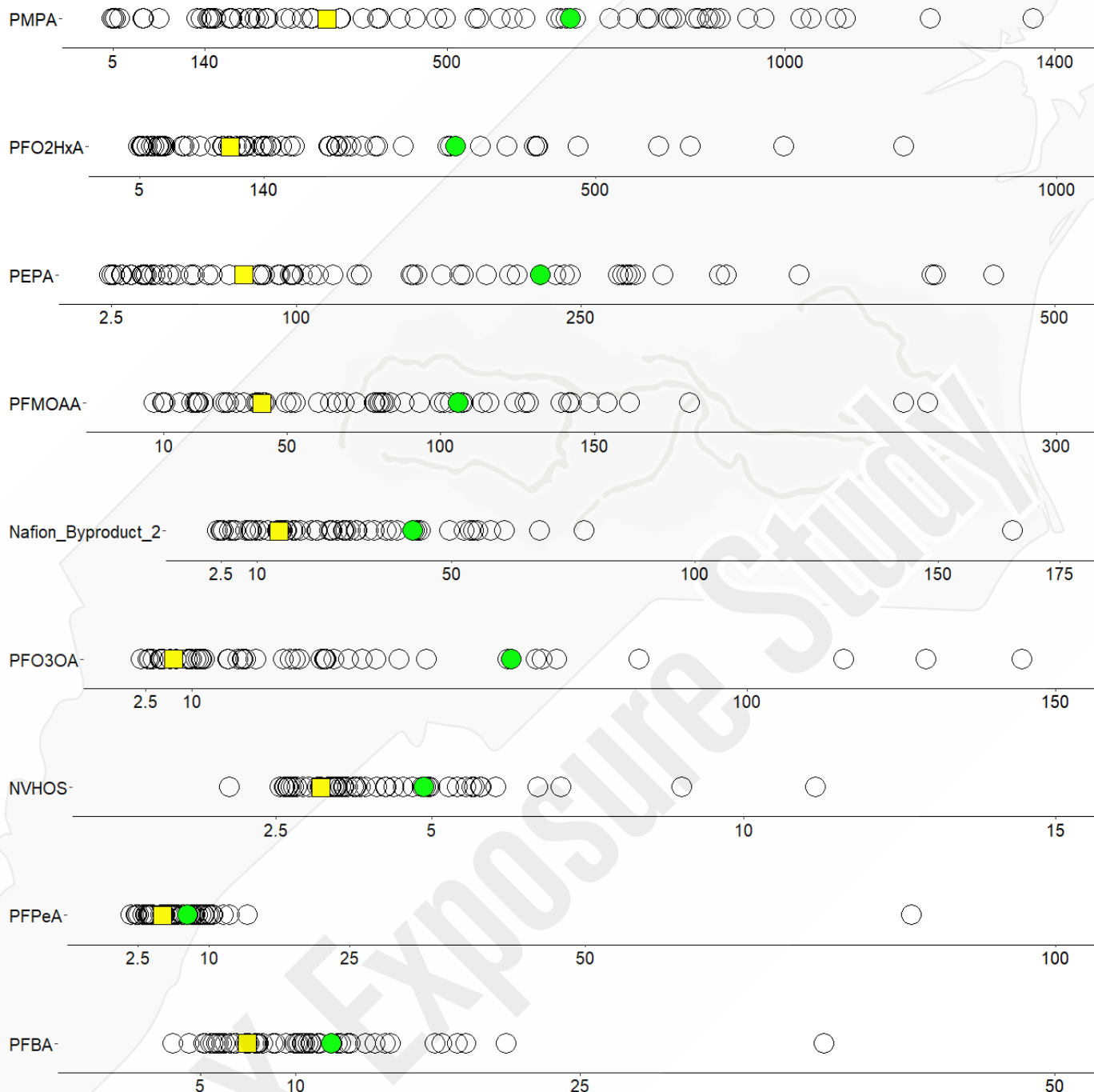
Below are your **well water results** (household ID #HHID) for GenX, PFOA and PFOS. These three PFAS have health advisory levels. Each plot has data from 83 wells. As you are looking across each plot, please be aware that the concentration range changes.

 Your well's chemical level  Other well's chemical level  Median  Health advisory



Below are your **well water results** (household ID #HHID) for 10 PFAS frequently detected across wells. These PFAS do not currently have health advisory levels. Each plot has data from 83 wells. As you are looking across each plot, please be aware that the concentration range may change. All concentrations are in ng/L units.

 Your well's chemical level
  Other well's chemical level
  Median



On the strip chart below, we are not providing specific concentrations for Nafion Byproduct 4. We only show where your well sample is compared with other wells, and the median.



When we collected water samples from your home (household ID # HHID) in February 2019, we recorded that you had **(insert type of filter recorded on water form)**. We analyzed for 31 PFAS in water. Below are the results for 30 PFAS (Nafion byproduct 4 concentrations not provided) in your well and tap samples.

	PFAS	Method reporting limit (MRL) (ng/L)	Well concentration (ng/L)	Tap concentration (ng/L)
1	GenX	2.5		
2	PFOA	2.5		
3	PFOS	2.5		
4	PMPA	5.0		
5	PFO2HxA	5.0		
6	PEPA	2.5		
7	PFMOAA	10.0		
8	Nafion_Byproduct_2	2.5		
9	PFO3OA	2.5		
10	NVHOS	2.5		
11	PFPeA	2.5		
12	PFBA	5.0		
13	PFNA	2.5		
14	PFDA	2.5		
15	PFO5DoA	2.5		
16	Hydro-EVE	2.5		
17	PFBS	2.5		
18	PFHpA	2.5		
19	PFHXA	2.5		
20	PFHXS	2.5		
21	PFO4DA	2.5		
22	4:2 FTS	2.5		
23	6:2 FTS	5.0		
24	8:2 FTS	5.0		
25	FBSA	2.5		
26	FHxSA	2.5		
27	FOSA	2.5		
28	Nafion_Byproduct_1	2.5		
29	PFHpS	2.5		
30	PFPeS	2.5		