

PFAS Exposure Assessment Community Summary

Orange County, New York, near Stewart Air National Guard Base

INFORMATION TO PROTECT OUR COMMUNITIES



The Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) conducted exposure assessments (EAs) in communities that were known to have PFAS in their drinking water and are near current or former military bases. The EAs provide information to communities about levels of PFAS in their bodies and can provide guidance to help people reduce or stop exposure. This document summarizes the exposure assessment results from Orange County, New York, near Stewart Air National Guard Base (the Base). The full exposure assessment report is available at <https://www.atsdr.cdc.gov/pfas/activities/assessments/sites/orange-county-ny.html>.

Why did we select the Orange County EA site?

When selecting EA sites, ATSDR considered the extent of PFOA and PFOS contamination in drinking water supplies, the duration over which exposure may have occurred, and the number of potentially affected residents. Orange County was one of several sites nationwide identified with PFAS drinking water contamination from use of products such as aqueous film forming foam (AFFF).

The Base previously used AFFF containing PFAS for its firefighter training. It is not known when the Base first used the foam, but it is believed to have started as early as the 1980s. Over time, the PFAS from the AFFF entered the ground, moved into the groundwater to offsite locations, and affected the City of Newburgh's surface water source, Washington Lake. To reduce levels of PFAS in drinking water, City of Newburgh authorities stopped using Washington Lake as its water source in May 2016, and New York City's Catskill Aqueduct has served as the primary water supply since that time.

Based on the information ATSDR has reviewed, the City of Newburgh drinking water supply currently meets or is below the U.S. Environmental Protection Agency's (EPA) 2016 health advisory (HA) and state public health standards for PFAS in drinking water.

What are PFAS?

PFAS (or "per- and polyfluoroalkyl substances") are a family of man-made chemicals that have been used in industry and consumer products since the 1950s.



The majority of PFAS do not occur naturally but are widespread in the environment. Most PFAS (including PFOA, PFOS, PFHxS, and PFNA) are either very resistant to breaking down themselves or degrade into other PFAS that do not degrade further. Certain PFAS will therefore remain in the environment indefinitely. Some studies have shown that PFAS exposure may harm human health.

How was the testing conducted?

ATSDR invited randomly selected households to participate in the EA. To be eligible to participate, household residents must have (1) lived within the sampling frame and received their drinking water from the City of Newburgh's public drinking water system for at least 1 year before May 2, 2016 (these residents have the greatest likelihood of past exposures to PFAS via the city's drinking water supply), (2) been greater than three years old

at the time of sample collection, and (3) not been anemic or have had a bleeding disorder that would prevent giving a blood sample. Households with private wells were not eligible for participation. Measuring PFAS in the blood of people from randomly selected households allows us to estimate exposure from consumption of public drinking water for the entire community in the affected area, even those who were not tested.

In October 2020,
ATSDR collected samples and other information from participants.

ATSDR analyzed data from

59 people,
(58 adults and 1 child)



from **48** households



Everyone completed a questionnaire



most people provided blood and urine samples

ATSDR collected samples of tap water and dust from some homes



ATSDR sent each participant their individual biological and environmental results in May and September 2021, respectively.

Key Takeaways

- Average age-adjusted levels of PFHxS in the blood of the Orange County EA site participants were three times national levels. Other PFAS were not higher than the national average or were detected too infrequently to compare to national averages.
- Elevated blood levels may be linked with past drinking water contamination.
- Some demographic and lifestyle characteristics were linked with higher PFAS blood levels.
- All tap water samples collected during the EA in 2021 met the EPA's HA and New York State public health standards for PFAS in drinking water.

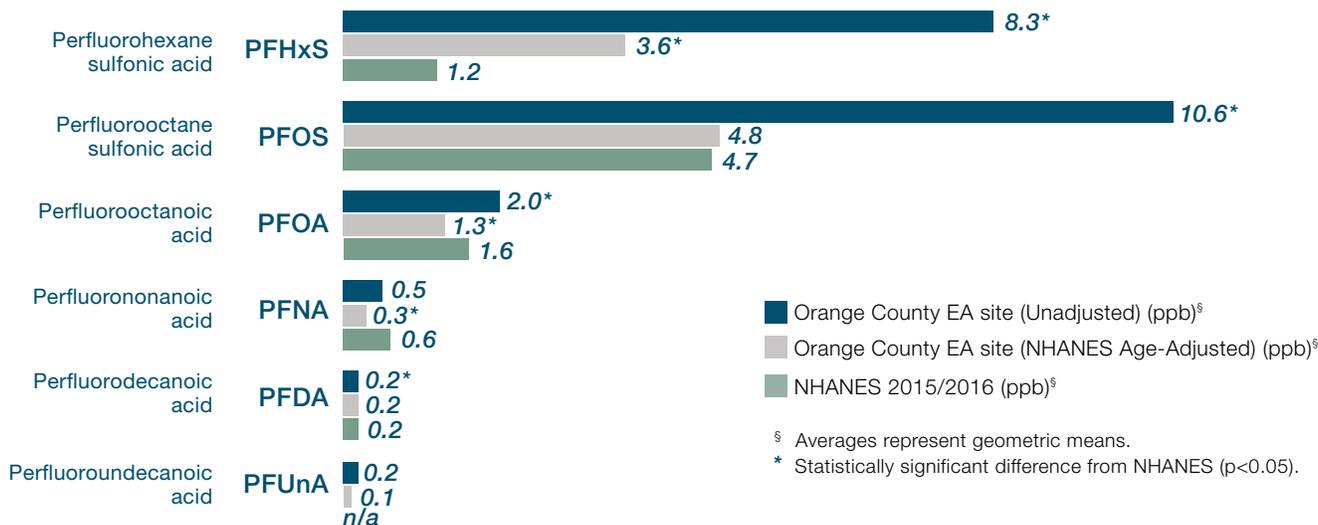
What did we learn about PFAS levels in blood?

Of the seven PFAS tested at the Orange County EA site, six PFAS were detected in more than 84% of the blood samples collected: PFHxS, PFOS, PFOA, PFNA, PFDA, and PFUnA.

The average blood levels of PFHxS in Orange County EA site participants were higher than average levels nationwide.

Since 1999, the National Health and Nutrition Examination Survey (NHANES) has measured PFAS levels in blood in the U.S. population. PFAS levels are shown to be age dependent and tend to increase with age in part due to longer periods of exposure. ATSDR adjusted blood levels of study participants in the Orange County EA site community for age to enable meaningful comparison to the NHANES dataset. After adjustment, PFHxS levels remained higher than levels nationwide. Age-adjusted averages are more representative of the Orange County EA site community.

Orange County EA site average PFAS blood levels compared to national averages[§]





Elevated blood levels of PFHxS in Orange County EA site participants may be linked with past drinking water contamination.

PFHxS, PFOS, and PFOA were detected in the City of Newburgh water supply as early as 2013. Because no data are available prior to 2013, we do not know if contamination began earlier. In 2016, the City of Newburgh reduced concentrations of PFAS below U.S. EPA health advisory levels by switching its water source. There were four years and five months between the reduction of exposure via contaminated drinking water and the collection of the EA blood samples. Because of the long half-lives of PFHxS, PFOS, and PFOA in the human body, past drinking water

exposures may have contributed to the EA participants' blood levels. PFHxS has the longest estimated half-life of the three compounds, which may contribute to why it exceeded the national average by the largest margin.



Long-time residents had higher PFHxS levels.



Taken together, the data suggest that past drinking water exposure contributed to the elevated blood levels of PFHxS

observed in the Orange County EA participants.

ATSDR used statistical models to study relationships between various demographic and lifestyle characteristics of the tested residents. The models showed that, in general:



Blood levels of PFHxS, PFOS, and PFOA changed with participant age.

In females, blood levels for these compounds **increased by 2.4% to 5.4%** for every year of participant age.

In males, blood levels for these compounds **decreased by 0.58% to 1.3%** for every year of participant age.



Males had higher blood levels of PFHxS, PFOS, and PFOA than females.

The difference between males and females was larger in younger people.



Residents who reported consuming locally grow fruits and vegetables had 44% higher PFUnA blood levels than those who did not.

What did we learn about exposure in children?



We were not able to report findings on PFAS in children due to the small number of child participants.

ATSDR will gather the data from children across all exposure assessment sites and provide a detailed analysis. A report will be available to all communities.

What did other testing find at the Orange County EA site?



No PFAS were detected in urine.



All tap water samples collected during the EA in 2021 met the EPA's HA and New York State public health standards for PFAS in drinking water.



PFAS contamination in house dust was similar to that reported in other studies (with and without PFAS contamination) and likely contributed to PFAS levels in the blood.



PFAS concentrations in blood are declining over time in Orange County EA participants

A total of 23 participants shared previous (2016 or 2017) PFAS blood results.

A comparison with the EA results showed PFAS blood levels decreased in all participants.

PFHxS decreased - 17%-80%
PFOS decreased - 34%-86%
PFOA decreased - 17%-80%

What do these results mean for community members?



This PFAS EA provides evidence that past exposures to PFAS in drinking water have impacted the levels of some PFAS in people's bodies.

These PFAS are eliminated from the body over a long period of time. This allowed ATSDR to measure PFAS even though exposures through drinking water were mitigated, or lowered, years ago.

Although the exposure contribution from PFAS in City of Newburgh drinking water in Orange County has been mitigated (reduced), there are actions community members and city officials can take to further reduce exposures to PFAS and protect public health.

Based on the PFAS drinking water test results from the City of Newburgh's public drinking water system, ATSDR does not recommend an alternate source of drinking water at this time.

What can community members do?



Become familiar with Consumer Confidence Reports (<https://www.cityofnewburgh-ny.gov/196/Water-Quality-Reports>) for information on the City of Newburgh's water quality.



Private well owners living in the area affected by PFAS should consider having their wells tested for PFAS if testing has not been conducted before. To learn more about testing wells for PFAS visit https://www.health.ny.gov/environmental/water/drinking/private_wells.htm. To learn more about previous testing for PFAS in private wells in the Newburgh area visit <https://www.health.ny.gov/environmental/investigations/newburgh/index.htm>.

Global public health organization NSF International has developed a test method to verify a water filter's ability to reduce PFOA and PFOS to below the health advisory levels set by the EPA. NSF International-approved devices can be found at: <https://info.nsf.org/Certified/DWTU/> Click on "reduction devices" at the bottom of the page for PFOA and PFOS.



Nursing mothers should continue breastfeeding. Based on current science, the benefits of breastfeeding outweigh the potential risks for infants exposed to PFAS in breast milk.



When possible, eliminate or decrease potential exposure to PFAS in consumer products such as stain-resistant products and food packaging materials. To learn more visit <https://www.fda.gov/food/chemical-contaminants-food/questions-and-answers-pfas-food>.



Pay attention to advisories about food consumption, such as local fish advisories.



Discuss any health concerns or symptoms with your health care provider. Share results of PFAS blood testing with your health care provider and make them aware of ATSDR resources for clinicians <https://www.atsdr.cdc.gov/pfas/resources/info-for-health-professionals.html>. Follow the advice of your health care provider and the recommendations for checkups, vaccinations, prenatal care, and health screening tests.



Consider joining the ATSDR funded multi-site health study which includes the Orange County area (Hoosick Falls and Newburgh). The study is being conducted by the New York State Department of Health and the University of Albany's School of Public Health. If you are interested in participating, or want further information, please visit [Multi-Site PFAS Health Study | University at Albany](#).



At this time, ATSDR does not have plans to conduct additional blood testing for PFAS and does not recommend PFAS EA participants get individually retested for PFAS in blood. The biological half-lives of many of the PFAS measured in people's blood are long. PFHxS has one of the longest half-lives. This means that PFAS blood levels are not expected to change significantly in the near-term, even if exposure stops. Additionally, it is unclear what an individual's PFAS test results mean in terms of possible health effects.

For the general population, blood tests for PFAS are most useful when they are part of a scientific investigation like this EA. Test results will tell you how much of each PFAS is in your blood, but it is unclear what the results mean in terms of possible health effects. In addition, blood testing for PFAS is not a routine test offered by most doctors or health

departments. If you are concerned about the effect of PFAS on your health, talk to your health care provider and make them aware of ATSDR resources for clinicians. (<https://www.atsdr.cdc.gov/pfas/resources/info-for-health-professionals.html>).



Follow the advice of your child's health care provider and the recommendations for well child checkups, vaccinations, and health screening tests. Consult <https://health.gov/myhealthfinder> to help identify those vaccinations and tests.



For additional information about environmental exposures and children's health, contact the Pediatric Environmental Health Specialty Units, a nationwide network of experts in reproductive and children's environmental health, <https://www.pehsu.net/>.

What can the City of Newburgh do?



Operators of the public drinking water system should continue to monitor concentrations of PFAS in drinking water delivered to the Newburgh community to ensure that concentrations of PFAS remain below the EPA's HA or other applicable guidelines and New York State standards for specific PFAS in drinking water.



Any treatment systems to remove PFAS from the City of Newburgh drinking water should be maintained appropriately to ensure that PFAS concentrations remain below the EPA's HA or other applicable guidelines and New York State standards for specific PFAS in drinking water.



Results of PFAS monitoring should be shared with community members through appropriate communication channels (Consumer Confidence Reports, <https://www.cityofnewburgh-ny.gov/196/Water-Quality-Reports>).

What will we do next?



ATSDR will hold a meeting to discuss the results and is available to answer questions from the community at any time.



When all of the exposure assessments are complete, we will prepare a report describing the data across all sites.



We are also reaching out to doctors, nurses, and other health care providers in your area to provide PFAS information. PFAS clinician guidance and continuing medical education can be found at <https://www.atsdr.cdc.gov/pfas/resources/clinical-guidance.html>.

About ATSDR

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency of the U.S. Department of Health and Human Services. <https://www.atsdr.cdc.gov/>

For More Information

visit: <https://www.atsdr.cdc.gov/>

email: pfas@cdc.gov

call: 800-CDC-INFO (800-232-4636)



**National Center
for Environmental Health
Agency for Toxic Substances
and Disease Registry**