

PFAS Exposure Assessment Community Summary

Westfield, Hampden County, Massachusetts

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 the City of Westfield in Hampden County, Massachusetts, near Barnes Air National Guard Base. The full exposure assessment report is available at <https://www.atsdr.cdc.gov/pfas/activities/assessments/sites/hampden-county-ma.html>.

Why did we select Westfield?

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. Westfield was one of several sites nationwide identified with PFAS drinking water contamination from use of products such as aqueous film forming foam (AFFF). As early as the 1980s, the Barnes Air National Guard Base used AFFF containing PFAS for its firefighter training. Over time, the PFAS from the AFFF entered the ground, moved into the groundwater to offsite locations, and affected nearby municipal wells. PFAS were first detected in the Westfield water system in 2013. Over the next several years, the City of Westfield took actions to reduce PFAS levels in water supplies. These actions included removal of drinking water supply wells from service and temporary water restrictions on all non-essential water use. Municipal drinking water testing in 2016 for a set of PFAS showed that levels of these PFAS met the U.S. Environmental Protection Agency's (EPA) 2016 Health Advisory (HA). Based on the information we reviewed as part of the EA, the public drinking water supply in Westfield continues to meet this health advisory.

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.



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 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 PFAS exposure assessment. Household members were eligible if they (1) received their drinking water from the Westfield Water Department, (2) lived north of the Westfield River for at least one year before January 20, 2016 (the date when water treatment for PFAS began), (3) were older than three years old at the time of sample collection (these residents have the greatest likelihood of past exposures

to PFAS via the city's drinking water supply), and (4) were not anemic or have 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 September 2019, ATSDR collected samples and other information from participants.

ATSDR analyzed data from

459 people, including children

from **247** 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 results in May 2020.

Key Takeaways

- Levels of some PFAS in the blood of Westfield residents were up to four times higher than national levels.
- 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 2019 met the EPA's HA and Massachusetts Department of Environmental Protection's (MassDEP) public health guidelines for PFAS in drinking water.



What did we learn about PFAS levels in blood?

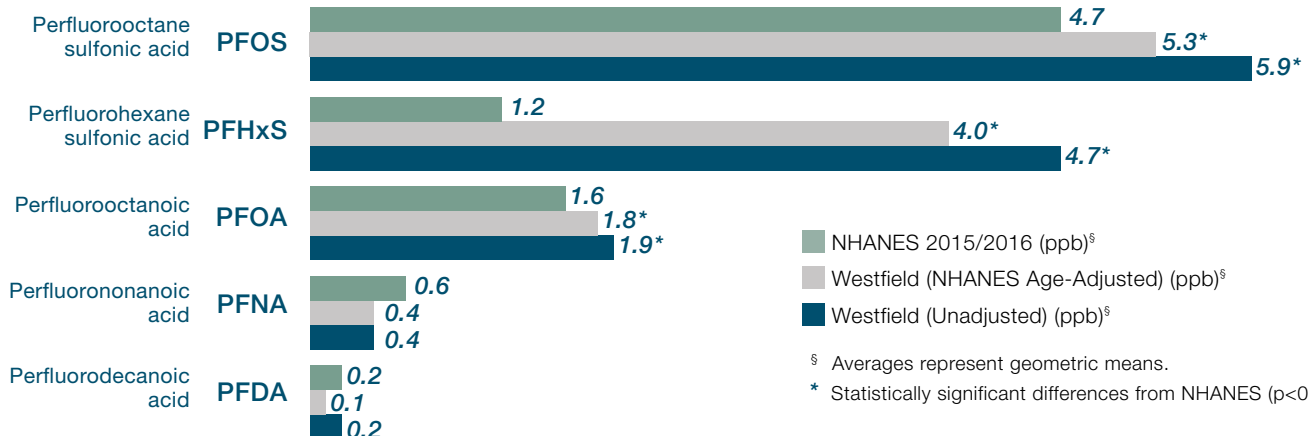
Of the seven PFAS tested in Westfield, five PFAS were detected in more than 85% of the blood samples collected: PFHxS, PFOS, PFOA, PFNA, and PFDA.

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 Westfield for age to enable meaningful comparison to the NHANES dataset. After adjustment, the same three PFAS were still higher than levels nationwide, but slightly less so. Age-adjusted averages may be more representative of the Westfield community.



Average blood levels of three PFAS (PFOS, PFHxS, and PFOA) in Westfield were higher than average levels nationwide.

Westfield PFAS blood levels compared to national averages[§]



[§] Averages represent geometric means.

* Statistically significant differences from NHANES (p<0.05).

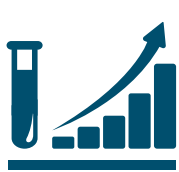


Blood levels of the three PFAS in the Westfield community may be linked with past contamination of the city's drinking water.

These same three PFAS (PFHxS, PFOS, and PFOA) were all detected in Westfield's water supply as early as 2013. It is likely that contamination began earlier, but no data are available before 2013. By 2016, Westfield's municipal drinking water met the EPA's HA for PFOA and PFOS. There were over 3 years and 8 months between the end

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. Typically, participants who had elevated blood levels of one of the three PFAS also had elevated levels of the other two PFAS. This suggests a common source of exposure, such as the Westfield public water supply. Other sources of exposure were not measured but could have contributed to PFAS concentrations measured in blood of the 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 were higher in older participants.



In males, blood levels for these compounds increased by **0.5% to 1.2%** for every year of participant age.



In females, blood levels for these compounds increased by **1.8% to 3.5%** for every year of participant age.



Males had higher blood levels than females did.

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



Residents who reported **ever using stain-resistant products had higher blood levels of PFHxS** than residents who reported never using these products.



Women who breastfed had lower blood levels than women who did not.



Residents who reported **donating blood at least once a year had lower blood levels of PFHxS and PFOS** than residents who reported never donating blood.



What did we learn about exposure in children?



Blood levels of PFOA tended to be lower in older children.



Infants born to mothers exposed to PFAS can be exposed in utero and while breastfeeding.



Children who were breastfed had higher blood levels of PFHxS and PFOA.



However, based on current science, **the benefits of breastfeeding outweigh the risks for infants exposed to PFAS in breast milk.**

Because of the small sample size, results should be interpreted with caution. The final aggregate report on all exposure assessment sites will include a more detailed analysis.

What did other testing find in Westfield?



Only one PFAS (PFBA) was detected in urine; it was detected at low concentrations.



All tap water samples collected during the EA in 2019 met the EPA's HA and MassDEP public health guidelines for PFAS in drinking water.



PFAS contamination in house dust was similar to that reported in other studies.

What do these results mean for Westfield community members?



This PFAS EA has demonstrated that past exposures to PFAS in drinking water have impacted the levels of PFAS in people's bodies. 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 drinking water in Westfield has been mitigated, there are actions community members and city officials can take to further reduce exposures to PFAS and protect public health.

Based on the recent PFAS drinking water test results from the City of Westfield's municipal water system, ATSDR does not recommend community members who get drinking water from the City of Westfield's public water system use an alternate source of drinking water at this time.

What can community members do?



Become familiar with Consumer Confidence Reports for information on the City of Westfield's water quality: <https://www.cityofwestfield.org/236/Water-Quality-Reports>.



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.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas-in-private-well-drinking-water-supplies-faq>. To learn more about previous testing for PFAS in private wells in Westfield visit <http://eeaaonline.eea.state.ma.us/EEA/fileviewer/Rtn.aspx?rtn=1-0020093>.



Nursing mothers should continue breastfeeding. Based on current science, the benefits of breastfeeding outweigh the 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>.

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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, and health screening tests.



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 Westfield do?



Operators of the municipal water system should continue to monitor concentrations of PFAS in drinking water delivered to the Westfield community to ensure concentrations of PFAS remain below the EPA's HA and MassDEP's guidelines for specific PFAS in drinking water.



Results of PFAS monitoring should continue to be shared with community members (Consumer Confidence Reports, <https://www.cityofwestfield.org/236/Water-Quality-Reports>).



All treatment systems to remove PFAS from the municipal drinking water in Westfield should be maintained appropriately to ensure PFAS concentrations remain below the EPA's HA and MassDEP's guidelines for specific PFAS in drinking water.

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 analyzing 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

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