



MassDEP Fact Sheet

Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water: Questions and Answers for Consumers

1. What are PFAS and how are people exposed to them?

Per- and Polyfluoroalkyl Substances are a group of chemical compounds called PFAS. Two PFAS chemicals, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), were extensively produced and are the most studied and regulated of these chemicals. Several other PFAS that are similar to PFOS and PFOA exist. These PFAS are contained in some firefighting foams used to extinguish oil and gas fires. They have also been used in a number of industrial processes and to make carpets, clothing, fabrics for furniture, paper packaging for food and other materials (e.g., cookware) that are resistant to water, grease and stains. Because these chemicals have been used in many consumer products, most people have been exposed to them.

While consumer products and food are the largest source of exposure to these chemicals for most people, drinking water can be an additional source of exposure in communities where these chemicals have contaminated water supplies. Such contamination is typically localized and associated with a specific facility, for example, an airfield at which they were used for firefighting or a facility where these chemicals were produced or used.

2. What is the Massachusetts drinking water standard?

On October 2, 2020, MassDEP published its public drinking water standard or Massachusetts Maximum Contaminant Limit (MMCL) of 20 nanograms per liter (ng/L) or parts per trillion (ppt) – for the sum of the concentrations of six PFAS. The six PFAS are: perfluorooctane sulfonic acid (PFOS); perfluorooctanoic acid (PFOA); perfluorohexane sulfonic acid (PFHxS); perfluorononanoic acid (PFNA); perfluoroheptanoic acid (PFHpA); and perfluorodecanoic acid (PFDA). MassDEP abbreviates this set of six PFAS as “PFAS6.” This drinking water standard is set to be protective against adverse health effects for all people consuming the water. For information on the PFAS6 drinking water standard see: [310 CMR 22.00: The Massachusetts Drinking Water Regulations](#). For more information about the technical details behind the MMCL, see MassDEP’s technical support document at: [Per- and Polyfluoroalkyl Substances \(PFAS\): An Updated Subgroup Approach to Groundwater and Drinking Water Values](#).

3. What health effects are associated with exposure to PFAS6?

The MassDEP drinking water standard is based on studies of the six PFAS substances in laboratory animals and studies of exposed people. Overall, these studies indicate that exposure to sufficiently elevated levels of the six PFAS compounds may cause developmental effects in fetuses during pregnancy and in breastfed infants. Effects on the thyroid, the liver, kidneys, hormone levels and the immune system have also been reported. Some studies suggest a cancer risk may exist following long-term exposures to elevated levels of some of these compounds.

It is important to note that consuming water with PFAS6 above the drinking water standard does not mean that adverse effects will occur. The degree of risk depends on the level of the chemicals and the duration of exposure. The drinking water standard assumes that individuals drink only contaminated water, which typically overestimates exposure, and that they are also exposed to PFAS6 from sources beyond drinking water, such as food. To enhance safety, several uncertainty factors are additionally applied to account for differences between test animals and humans, and to account for differences between people. Scientists are still working to study and better understand the health risks posed by exposures to PFAS. If your water has been found to have PFAS6 and you have specific health concerns, you may wish to consult with your doctor.

4. How can I find out about contaminants in my drinking water?

If you get your water from a public water system, you should contact them for this information. For a contact list for all public water systems in the Commonwealth you may visit:

<https://www.mass.gov/lists/drinking-water-health-safety#contacts> then under “Contacts” click on “MA Public Water Supplier contacts sorted By Town.”

For private well owners see the [Per- and Polyfluoroalkyl Substances \(PFAS\) in Private Well Drinking Water Supplies FAQ](#) for more information.

5. What options should be considered when PFAS6 in drinking water is above MassDEP’s drinking water standard?

- ✓ Sensitive subgroups, including pregnant or nursing women, infants and people diagnosed by their health care provider to have a compromised immune system, should consider using bottled water that has been tested for PFAS6, for their drinking water, cooking of foods that absorb water (like pasta) and to make infant formula. Bottled water that has been tested for PFAS6, or formula that does not require adding water, are alternatives.
- ✓ For older children and adults, the MMCL is applicable to a lifetime of consuming the water. For these groups, shorter duration exposures present less risk. However, if you are concerned about your exposure while steps are taken to assess and lower the PFAS6 concentration in your drinking water, use of bottled water that has been tested for PFAS6 will reduce your exposure.
- ✓ Water contaminated with PFAS6 can be treated by some home water treatment systems that are certified to remove PFAS6 by an independent testing group such as NSF, UL, or Water Quality Association. These may include point of entry (POE) systems, which treat all the water entering a home, or point of use (POU) devices, which treat water where it is used, such as at a faucet.
- ✓ In most situations the water can be safely used for washing and rinsing foods and washing dishes.
- ✓ For washing items that might go directly into your mouth, like dentures and pacifiers, only a small amount of water might be swallowed and the risk of experiencing adverse health effects is very low. You can minimize any risk by not using water with PFAS6 greater than the MMCL to wash such items.
- ✓ The water can be safely used by adults and older children for brushing teeth. However, use of bottled water should be considered for young children as they may swallow more water than adults when they brush their teeth. If you are concerned about your exposure, even though the risk is very low, you could use bottled water for these activities.
- ✓ Because PFAS are not well absorbed through the skin, routine showering or bathing are not a significant concern unless PFAS6 levels are very high. Shorter showers or baths, especially for children

who may swallow water while playing in the bath, or for people with severe skin conditions (e.g. significant rashes) would limit any absorption from the water. Based on information from the Connecticut Department of Health, which is the only State to have issued guidance on this issue, water should not be used, long-term, for showering and bathing if the PFAS6 level exceeds 210 ppt.

- ✓ For pets or companion animals, the health effects and levels of concern to mammalian species, like dogs, cats and farm animals, are likely to be similar to those for people. However, because these animals are different sizes, have different lifespans, and drink different amounts of water than people it's not possible to predict what health effects an animal may experience from drinking water long-term with PFAS6 concentrations greater than the MMCL. There is some evidence that birds may be more sensitive to PFAS6. There is little data on PFAS6 effects on other species like turtles, lizards, snakes and fish. As a precaution, if you have elevated levels of PFAS6 in your water, you may wish to consider using alternative water for your pets. If you have concerns, you may also want to consult with your veterinarian.
- ✓ For gardening or farming, certain plants may take up some PFAS6 from irrigation water and soil. Unfortunately, there is not enough scientific data to predict how much will end up in a specific crop. Since people eat a variety of foods, the risk from the occasional consumption of produce grown in soil or irrigated with water contaminated with PFAS6 is likely to be low. Families who grow a large fraction of their produce would experience higher potential exposures and should consider the following steps, which should help reduce PFAS6 exposures from gardening:
 - Maximize use of rainwater or water from another safe source for your garden.
 - Wash your produce in clean water after you harvest it.
 - Enhance your soil with clean compost rich in organic matter, which has been reported to reduce PFAS uptake into plants.
 - Use raised beds with clean soil.
- **NOTE ON BOILING WATER:** Boiling water will not destroy these chemicals and will increase their levels somewhat due to water evaporation.
- **NOTE ON BOTTLED WATER:** Bottled water should only be used if it has been tested. The Massachusetts Department of Public Health requires companies licensed to sell or distribute bottled water or carbonated non-alcoholic beverages to test for PFAS. See <https://www.mass.gov/info-details/water-quality-standards-for-bottled-water-in-massachusetts#list-of-bottlers>
- **NOTE ON POU and POE TREATMENT DEVICES:** Point of Use (POU) and Point of Entry (POE) treatment devices are not specifically designed to meet Massachusetts' drinking water standard for PFAS6, there are systems that have been designed to meet the USEPA's Health Advisory of 70 ng/L for the sum of PFOS and PFOA. Any treatment device you use should be certified to meet the [National Sanitation Foundation \(NSF\)](#) standard P473 to remove PFOS and PFOA compounds so that the sum of their concentrations is below the USEPA Health Advisory of 70 ng/L. **Please be aware that 70 ng/L is significantly greater than the MassDEP's drinking water standard of 20 ppt for the PFAS6 compounds.** Many of these treatment devices certified to meet NSF standard P473 will likely be able to reduce PFAS6 levels to well below 70 ppt, but there are no federal or state testing requirements for these treatment devices. If you chose to install a treatment device, you should check to see if the manufacturer has independently verifiable PFAS6 monitoring results demonstrating that the device can reduce PFAS6 below 20 ppt. See more detailed information on POU/POE treatment systems in the Private Well Factsheet at <https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas-in-private-well-drinking-water-supplies-faq>.

6. Where can I get more information on PFAS?

MassDEP PFAS Information. <https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas>

[Per- and Polyfluoroalkyl Substances \(PFAS\) in Private Well Drinking Water Supplies FAQ](#)

Massachusetts Department of Public Health PFAS webpage: <https://www.mass.gov/service-details/per-and-polyfluoroalkyl-substances-pfas-in-drinking-water>

Interstate Technology and Regulatory Council (ITRC) PFAS resources. <https://www.itrcweb.org/Team/Public?teamID=78>

Association of State Drinking Water Administrators PFAS webpage <https://www.asdwa.org/pfas/>

EPA's Drinking Water Health Advisories for PFOA and PFOS can be found at: <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>

The Centers for Disease Control and Prevention's Public Health Statement for PFOS and PFOA can be found at: <https://www.atsdr.cdc.gov/pfas/index.html>

7. Where can I find more information about Treatment Devices for PFAS?

MassDEP information on drinking water treatment devices: <https://www.mass.gov/service-details/home-water-treatment-devices-point-of-entry-and-point-of-use-drinking-water>

NSF PFAS information: <https://www.nsf.org/knowledge-library/perfluorooctanoic-acid-and-perfluorooctanesulfonic-acid-in-drinking-water>

USEPA information on PFAS and treatment devices: <https://www.epa.gov/sciencematters/reducing-pfas-drinking-water-treatment-technologies>

UL information on PFAS and treatment devices: <https://www.ul.com/offerings/testing-and-certification-water-filtration-products>

The Water Quality Association information on PFAS, including treatment: <https://www.wqa.org/Portals/0/WQ&A%20sheets/WaterQA%20PFAS.pdf>

For further information on PFAS in drinking water, including possible health effects, you may contact the Massachusetts Department Environmental Protection, Drinking Water Program at program.director-dwp@state.ma.us or 617-292-5770.