



MassDEP Fact Sheet

Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water: Questions and Answers for Private Well Owners

Introduction

This fact sheet provides answers to questions frequently asked by private well owners about per- and polyfluoroalkyl substances (PFAS) in a private drinking water supply. A separate MassDEP fact sheet, “PFAS in Drinking Water: Questions and Answers for Consumers”, describes the sources of PFAS compounds, health effects, and MassDEP recommendations to reduce consumer exposure. This consumer factsheet is available at <https://www.mass.gov/doc/massdep-fact-sheet-pfas-in-drinking-water-questions-and-answers-for-consumers/download>.

1. What are PFAS?

PFAS are a group of man-made chemicals used in a variety of consumer products and industries throughout the world. Two PFAS chemicals, perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), were extensively produced and are the most studied and regulated of these chemicals. Many other PFAS 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 over the past 50 years, most people have been exposed to them.

2. What are the levels of concern for PFAS chemicals?

On October 2, 2020, MassDEP published its PFAS public drinking water standard of 20 nanograms per liter (ng/L) (or parts per trillion (ppt)) – individually or for the sum of the concentrations of six specific PFAS: 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. <https://www.mass.gov/regulations/310-CMR-22-the-massachusetts-drinking-water-regulations>. See MassDEP’s technical support document at: [Per- and Polyfluoroalkyl Substances \(PFAS\): An Updated Subgroup Approach to Groundwater and Drinking Water Values](#).

3. How do PFAS get into private well water supplies?

While consumer products and food can be sources of exposure to PFAS, private drinking water can be a significant source of exposure at locations where these chemicals have contaminated water supplies. Such contamination is often localized and associated with a specific facility; for example, an airfield where PFAS were used for firefighting or a facility where these chemicals were produced or used.

4. Should I test my private well for PFAS?

If your well is located within one to two miles of a known source of PFAS or of other water supplies where PFAS has been detected, you may wish to consider sampling your water source. Sources of PFAS may include airfields where certain firefighting foams were used in the past, firefighting training areas, certain manufacturing facilities, and some waste disposal sites. Your local health department may have information on historical or potential sources of PFAS, or other PFAS impacted water supplies, that may be in proximity to your private well. Because PFAS have been widely used in consumer products, it is possible that some septic systems and landfills may also be a source of PFAS in groundwater.

5. How can I test my well water for PFAS?

- Currently, there are three U.S. EPA testing methodologies for testing drinking water for PFAS. Laboratories will analyze drinking water for PFAS using either USEPA Method 537, 537.1, or 533¹. These methods test for multiple PFAS compounds, including the PFAS6 compounds that are part of the current MassDEP Drinking Water Guideline and proposed drinking water standard.
- MassDEP has started accepting applications to certify labs for PFAS analysis. Once labs receive Massachusetts certification they will appear in the Online Searchable Laboratory Certification Listing at <https://eeaonline.eea.state.ma.us/DEP/Labcert/Labcert.aspx>. (Search for Analyte = PFAS and Matrix = Potable (Drinking Water).) Until then, we recommend you use a laboratory from the list of [MassDEP DWP approved labs](#), or use a lab certified by another state or certification authority for the analysis of PFAS; see the [National Environmental Laboratory Accreditation Management System](#).
- We encourage you to ask the lab to use a reporting level of 2 ppt or lower for each of the PFAS6 compounds.
- When collecting the sample, to avoid contaminating it we encourage you to carefully follow the PFAS sample collection procedures located at <https://www.mass.gov/doc/field-sampling-guide-for-pfas> or provided by the laboratory that will be doing the analysis.

¹ Please note that Method 533 is not yet approved for public water supply testing in Massachusetts.

6. Can I use a Point of Use (POU) or a Point of Entry (POE) water treatment device to remove PFAS6?

Point of Use (POU) water treatment devices treat the water at one fixture in a home, such as a kitchen faucet. Point of Entry (POE) water treatment devices treat all of the water for the main water line serving a whole house.

- Yes. You may use a POU or POE treatment device to remove PFAS6. However, before installing any treatment device for drinking water, you should get your water tested, because the type of treatment device you select will depend on the level of specific PFAS in the water. You should also test your water after the treatment device is installed to verify that it is removing PFAS to levels less than 20 ppt for the sum of PFAS6.
- Ingestion of water with elevated PFAS is the main health concern, rather than other uses such as showering or use of the water for laundry. Therefore, installing a POU treatment device for drinking or food preparation in the kitchen, e.g., under a kitchen sink, may be a good option and location for a treatment device.

Although POU and 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 (or parts per trillion, ppt) 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 PFAS below 20 ppt. In addition, to verify that the device achieves PFAS6 levels less than 20 ppt you may need to resample your water after the treatment device has been installed.

7. What types of POU and POE treatment systems are available to treat for PFAS6?

There are several treatment technologies that are capable of removing PFAS from drinking water, including granulated activated carbon (GAC), ion-exchange resin, and reverse-osmosis (RO). It is recommended that you evaluate the pros and cons for each type of treatment device to determine what is best for you.

- **GAC** treatment devices trap the PFAS inside the filter so that the PFAS is not discharged back into the environment. GAC has proven effective in removing PFAS contaminants, particularly the longer chain PFAS.
- **Ion-exchange** treatment devices also trap the PFAS inside the filter and are effective in removing PFAS.
- **Maintaining GAC or ion-exchange treatment devices.** These treatment devices must be maintained by replacing the filters periodically in accordance with the manufacturer's instructions. Some manufacturers will recycle spent filter cartridges. Check the website of the manufacturer for recycling locations and disposal options.
- **RO** treatment devices remove and then discharge the PFAS in a concentrated wastewater stream.
 - Discharge of the RO wastewater stream must comply with local and state requirements and may be costly; as such, cost may be a significant concern in determining which treatment device you choose.
 - Options for discharging a PFAS wastewater stream depend on where the private well is, and include municipal sewer system, an onsite Title 5 septic system, or an installed Underground Injection Control (UIC) dry well.
 - All wastewater disposal options will ultimately result in some treated wastewater reaching the ambient groundwater or surface water. Title 5 septic systems and soils do not effectively break down PFAS chemicals but may slow their transport to groundwater. **As such, MassDEP does not recommend RO treatment as your primary treatment option if your wastewater disposal method is to a Title 5 septic system or a UIC dry well.**

8. Can I discharge wastewater containing PFAS from my RO treatment system to my Title 5 septic system or a UIC dry well?

The answer depends upon the following factors: type of RO treatment system, whether you plan to install a POU or POE treatment device, the concentration of the PFAS in the water, and the use of the property.

- Prior to installing a RO treatment device, you may estimate the concentration of PFAS6 that will be in your RO wastewater and compare it with the PFAS6 drinking water standard:
 - You will need the following information: a) the total amount of PFAS6 chemicals in your untreated water from your laboratory results, and b) the percentage of water entering your RO device that will be discharged as wastewater.

- If specific PFAS6 removal efficiencies are not available from the manufacturer of the RO device, you should assume that all of the PFAS6 is being concentrated into the wastewater, to avoid underestimating the wastewater concentration.
- If specification sheets for the RO devices do not provide information on the percent of water entering the device that is discharged as wastewater, you may assume 80%.
- You may use the following equation for estimating the concentration of PFAS6 in the wastewater from the RO device:

[concentration of PFAS6 in your well water] X [100% / % of water entering the device that is discharged as wastewater].

Example: If the concentration of PFAS6 chemicals in your untreated well water equals 10 ppt and 80% of the water entering the RO filter is discharged as wastewater, then the above equation results in:

$$10 \text{ ppt PFAS6} \times [100\% / 80\%] = 12.5 \text{ ppt PFAS6.}$$

- If your RO device is more efficient than the example above and discharges less than 80% of the water entering it, then the calculation will show a higher concentration of PFAS6 in the wastewater.
- **If PFAS6 concentration in the wastewater stream from the RO device exceeds MassDEP PFAS6 drinking water standard, you may not discharge to a Title 5 septic system or UIC dry well.** *Note: If the water entering your RO for treatment has a PFAS6 concentration exceeding the drinking water standard, then the PFAS in your RO wastewater will also exceed the drinking water standard.*
 - **If PFAS6 concentration in the wastewater stream from the RO device is less than the drinking water standard and the estimated or tested PFAS concentrations in the wastewater are also below the drinking water standard, then on-site and other options for discharging the wastewater may be considered under the conditions mentioned in the following table.**

Type of RO Treatment System and Type of Facility	Municipal Waste water System Allowed?	UIC/Dry Well Allowed?	Title 5 Septic System Allowed?
POU treatment (e.g., treating only the water that flows to the kitchen sink)	Yes, but be advised that discharges other than sanitary waste to municipal sewer systems may require sewer authority approval. Check with your local sewer authority. If you are serviced by a private sewer	Yes, but only if the PFAS concentrations in the wastewater also remain below the drinking water standard. In accordance with 310 CMR 27.00, discharge to a dry well may be considered. The discharge to a dry well requires the submittal of a MassDEP Underground	The following answers depend upon whether the parcel of land is only used for residences and, if so, the number of residential units on that parcel: No for greater than 4-unit residential parcels and for all other land uses. In accordance with 310 CMR 15.00, discharge to a Title 5 system is not allowed.

	system, check with your treatment plant operator about discharging RO wastewater.	Injection Control (UIC) registration application with the exception of properties that are only used for a one unit residence. UIC application information is located at https://www.mass.gov/underground-injection-control-uic For questions on UIC, contact program.director-dwp@mass.gov : Subject UIC	Yes for 1- to 4-unit residential parcels with no additional non-residential uses. In accordance with Wastewater Management and Drinking Water Programs' policies, discharge to a Title 5 septic system may be considered.
POE treatment (i.e.. treating all of the water that enters the house)	See above answer in this column.	See above answer in this column.	No. In accordance with 310 CMR 15.00, discharge to a Title 5 system is not allowed.

9. Can I use bottled water if I have concerns about PFAS in my private well water?

If PFAS has been detected in your private well and you are a consumer in one of the groups considered most sensitive to PFAS (pregnant women, nursing mothers, and infants) you can minimize your exposure by using bottled water that has been tested for PFAS for drinking, making infant formula, and cooking of foods that absorb water.

Consumers can contact bottled water companies to see if their water is tested for PFAS. In addition, MassDEP surveyed all Massachusetts-permitted bottled water companies to determine if they sampled their water sources for PFAS and to request that they voluntarily share the results of such testing with MassDEP for posting to the Commonwealth's website. See the current list of Massachusetts permitted bottled water companies that have voluntarily provided MassDEP with their results at <https://www.mass.gov/doc/bottled-water-tested-for-pfas>.

10. Who can I contact for more information on PFAS in drinking water?

Private well owners or users should contact their local board of health or town government for information regarding groundwater quality issues in the area. For any additional PFAS drinking water inquires, contact the MassDEP Drinking Water Program at: Program.director-dwp@mass.gov, Subject: PFAS.

11. Where can I get more information on PFAS?

For health-related questions/contact:

Environmental Toxicology Program
Bureau of Environmental Health, MDPH
250 Washington Street
7th Floor
Boston, MA 02108
Phone: 617-624-5757
Fax: 617-624-5777
TTY: 617-624-5286

[The Centers for Disease Control and Prevention's webpage on PFAS](#)

Additional Resources

MassDEP

- [MassDEP PFAS Information](#)
- [MassDEP Fact Sheet - Questions and Answers for Consumers](#)
- [MassDEP Fact Sheet - Home Water Treatment Devices - Point of Entry and Point of Use Drinking Water Treatment](#)
- [Per- and Polyfluoroalkyl Substances \(PFAS\) in Private Well Drinking Water Supplies FAQ](#) (DOCX 42.56 KB)
- Massachusetts Drinking Water regulations <https://www.mass.gov/regulations/310-CMR-22-the-massachusetts-drinking-water-regulations>.
- MassDEP PFAS Technical Support Document at: [Per- and Polyfluoroalkyl Substances \(PFAS\): An Updated Subgroup Approach to Groundwater and Drinking Water Values](#).

Massachusetts Department of Public Health

- [Massachusetts Department of Public Health information about PFAS in Drinking Water](#)

USEPA

- [U.S. Environmental Protection Agency webpage on PFAS](#)
- [EPA's Drinking Water Health Advisories for PFOA and PFOS](#)

The Interstate Technology and Regulatory Council (ITRC)

- [Interstate Technology and Regulatory Council \(ITRC\) PFAS webpage](#)

Association of State Drinking Water Administrators

- [Association of State Drinking Water Administrators PFAS webpage](#)

CONTACT

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Directions [\[note: this links to our Google Maps location\]](#)