MassDEP Fact Sheet

Per- and Polyfluoroalkyl Substances (PFAS) in Public Drinking Water Supplies – Questions and Answers for PWS

Introduction

This Q&A provides answers to questions about Per- and Polyfluoroalkyl Substances (PFAS) and combines MassDEP PFAS Q&As and factsheets for Public Water Suppliers (PWS), including questions raised during PFAS training sessions. Other MassDEP fact sheets such as "PFAS in Drinking Water: Questions and Answers for Consumers" are available for consumers and describe 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.

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DRINKING WATER STANDARD AND REGULATION

Regulations Q1: What is the Massachusetts public drinking water standard for PFAS?

On October 2, 2020, MassDEP published its PFAS public drinking water standard or Massachusetts Maximum Contaminant Level (MMCL) of 20 nanograms per liter (ng/L), or parts per trillion (ppt) applicable to community (COM) and non-transient non-community (NTNC) systems for the sum of the concentrations of six specific 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.

TNCs are not required to meet the PFAS6 MCL, but are required to collect, analyze, and report the results of one PFAS sample from each sampling point by September 30, 2022, and may be subject to an individual health risk assessment if elevated PFAS6 levels are detected.

Regulations Q2: Which PFAS contaminants does MassDEP require testing for?

Currently, there are three U.S. EPA testing methodologies for testing drinking water for PFAS. The current MassDEP Drinking Water regulations, 310 CMR 22.00 approved the use of USEPA Methods 537 and 537.1 version 1 for the testing of drinking water for PFAS. MassDEP Policy 2024-01 also allows use of USEPA Methods 533 and 537.1 version 2 for testing drinking water for PFAS. These methods test for a different number of PFAS compounds, but all three methods include the PFAS6 compounds that are part of the MassDEP MMCL.

Regulations Q3: What are the current requirements and recommendations if PFAS is detected?

See Per- and Polyfluoroalkyl Substances (PFAS) Drinking Water Regulations Quick Reference Guide for a summary of requirements regarding confirmatory samples, Public Notices, and increased monitoring. MassDEP's regional offices will be working with PWSs that detect PFAS to ensure that appropriate corrective actions are taken.

Regulations Q4: How long will a PWS be required to continue monthly monitoring of a source with PFAS6 concentrations consistently between 10 and 20 ppt?

The regulations require COM and NTNC systems to continue monitoring monthly until the affected sampling location is determined in writing to be reliably and consistently below the MCL. A PWS may return to quarterly monitoring if PFAS treatment has been installed, and MassDEP has determined that location to be reliably and consistently below the MCL, as specified at 310 CMR 22.07G(8)(c). See 310 CMR 22.07G(8)(d) for criteria to be met for annual monitoring. See the PFAS Monitoring Flow Charts in the Resources Section below.

Regulations Q5: When is the PFAS6 standard exceeded?

A sampling location exceeds the MCL for COM and NTNC systems if the average of three months of PFAS6 concentrations is greater than 20 ng/L within the same quarter (for instance, Quarter 2 includes April, May and June) or any one sample would cause the quarterly average to exceed 20 ng/L. For example, if a first month sample has PFAS6 levels confirmed at greater than 60 ng/L, that would cause the quarterly average concentration to exceed 20 ng/L MCL.

Regulations Q6: A PWS first exceeded the PFAS6 MCL in Q4 2021 and has been using the results from the first month of the quarter for compliance since then; they mistakenly collected in September instead of October; can they use/substitute the September accepted result for Q4 compliance?

There's no provision in the PFAS regulation to use a sample collected outside of the quarter as a surrogate for the required first month's sample. The September sample should be averaged with the July sample to establish the Q3 compliance value.

Regulations Q7: Should a PWS invest in the construction of a treatment facility to remove PFAS given the large capital expense necessary and the political uncertainty in Washington; the PFAS level does not exceed the current state drinking water standard but does exceed the new federal PFAS standards.

MassDEP is committed to using the best scientific information available to establish standards that ensure our residents have safe drinking water.

In 2020, Massachusetts established a drinking water standard of 20 ng/L (or parts-per-trillion) for the sum of six PFAS. This standard will remain in effect until replaced by the federal PFAS standard or a new state PFAS standard.

In April 2024, the U.S. EPA established a federal drinking water standard for six PFAS that applies to all Community and Non-Transient Non-Community public water suppliers.

EPA's standards are:

- PFOA – 4.0 parts per trillion (ppt)

- PFOS – 4.0 ppt
- PFNA – 10 ppt
- PFHxS – 10 ppt
- HFPO-DA (commonly known as GenX Chemicals) – 10 ppt
- PFHxS, HFPO-DA, PFNA, and PFBS – Hazard Index (HI) = 1 (unitless)

On May 13, 2025, EPA announced changes to the National Primary Drinking Water Regulations (NPDWR) and the Maximum Contaminant Levels (MCLs) for PFAS. EPA announced it will keep the MCLs of 4 parts per trillion (ppt) for PFOA and PFOS that were established in April 2024; however, EPA intends to rescind the regulations for PFHxS, PFNA, HFPO-DA (commonly known as GenX), and the Hazard Index mixture of these three compounds plus PFBS. EPA plans to issue a proposed rule in Fall 2025 and finalize this rule in the Spring of 2026.
See the announcement: EPA Announces It Will Keep Maximum Contaminant Levels for PFOA, PFOS | US EPA

EPA's announcement included a 2-year extension of the 2029 deadline for compliance with the PFOS and PFOA MCLs until 2031. This will allow PWS more time to address PFAS and if necessary, obtain funding to construct treatment facilities or connect to alternative sources of water.

Within two years of the establishment of an NPDWR (by April 2026), states must establish standards that are no less stringent than the federal standards. EPA is encouraging states to apply for a 2-year extension to that deadline.

The vast majority of PFAS testing results in Massachusetts that have exceeded an EPA MCL did so because the level of PFOS and/or PFOA exceeded 4 ppt. MassDEP does not expect EPA's rule proposal to change the number of Public Water Suppliers that will need to address PFAS by taking action such as installing treatment or using an alternate source of drinking water.

It is still important for PWS to address elevated PFAS in their drinking water. 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.

Given that it can take more than three years to plan, design and construct a treatment facility, public water suppliers need to act now to be in compliance by that date and to provide safe drinking water.

SAMPLING

Sampling Q1: Are there special considerations for PFAS sampling and analysis?

Sampling for PFAS can be challenging because it is found in many consumer products, including certain clothing fabrics and food packaging, and the analytical detection limits are so low. MassDEP's Drinking Water Program has a Field Sampling Guide for PFAS available at https://www.mass.gov/doc/field-sampling-guide-for-pfas/download. The Association of State Drinking Water Administrators developed a Lab Testing Primer, available at https://www.mass.gov/doc/lab-testing-primer-for-pfas/download. Due to the low concentration of PFAS compounds that comprise the MMCL, sampling must be performed using precleaned sample containers that have been preserved at the laboratory.

Sampling Q2: If a PWS only has one well or source, is it necessary to collect a raw sample or can only a finished water sample be collected?

Sampling untreated source water is not required by 310 CMR 22.07G(7)(d) when there is only one source feeding the entry point to the distribution system. The treated water sample is used for MCL compliance purposes. However, there may be cases where an untreated source water sample is required by MassDEP, such as for investigatory purposes.

Sampling Q3: When a PWS has multiple sources that combine in one source before treatment and there is only one entry point to distribution, is only one sample required?

Yes, a PWS that draws water from more than one source, with sources combined before distribution, must collect samples that are representative of all combined sources after treatment. The entry point to the distribution system is the sample location. If all sources are not operated simultaneously under normal operating conditions, then additional samples shall be collected representing each source when operated.

Sampling Q4: A system noted that their sample schedule contained initial monitoring for source water, why is DEP including source water sampling when the regulation calls for sampling at the entry point to the distribution system?

The PFAS regulation requires the collection of compliance samples at the entrance point of the distribution system. For systems with multiple sources feeding an entrance point under various operational practices, it is beneficial to analyze the level of PFAS6 in all sources that feed that entrance point to ascertain the levels of PFAS6 that may enter the distribution system under various operational practices.

Sampling Q5: Are confirmation samples required every time a sample is above the MRL, or just on the initial hit for that site?

A confirmation sample is required for COM and NTNC systems after the initial detection of any PFAS compound above the MRL in finished water. Confirmation samples are

also required when PFAS6 is detected > 10 ng/L for the first time during initial or routine PFAS monitoring. If a location is on an increased monitoring schedule due to concentrations > 10 ng/L, confirmation samples are no longer required unless required by MassDEP due to results outside the historic range. A PWS may choose to confirm the first results over 20 ng/L during monthly monitoring. TNC systems may be required to take a confirmation sample, depending on the level of PFAS6 and system uses.

Sampling Q6: If confirmation samples are required, when does the 14-day deadline start?

The confirmation samples must be collected within 14 days of the receipt of the analytical results from the lab or notification from MassDEP. The deadline for collecting confirmation samples can be extended if the PWS applies for and receives up to 14 additional days from MassDEP as allowed under the regulations.

Sampling Q7: What are the regulations when a raw water source is above the MCL but the finished water is below?

The PFAS6 MCL applies to finished water for COM and NTNC systems. If there is existing treatment or blending that is allowing a source that is high in PFAS6 to deliver finished drinking water that is below the MCL, MassDEP may require increased monitoring at the source, the finished water entry point, or both.

Sampling Q8: Are MWRA communities required to test at each entry point even though MWRA tests for PFAS at the source?

If the PWS is a fully consecutive system that purchases all of its water from the Massachusetts Water Resources Authority (MWRA) or another PWS, then that PWS is not required to sample for PFAS as long as the PWS that they purchase the water from has completed the required sampled for PFAS.

Sampling Q9: Will the PWS be specifically notified of what resampling is needed through eDEP?

The eDEP system is for submitting monitoring results, it does not notify a PWS what resampling is needed. Any correspondence related to required actions will come from the local MassDEP regional office. The regional PFAS coordinators follow up with PWS about any sampling issues. (see below for regional coordinator contact information).

Sampling Q10: Is there anything to be gained by removing (if possible) Teflon taped fittings from potential PFAS sample taps?

MassDEP does not prohibit the use of Teflon tape or equivalent dopes in drinking water facilities. Nor has MassDEP taken the position that PFAS treatment must be constructed without any Teflon tape, dope, components, etc. At this point,

although MassDEP is aware that the laboratory instrumentation that is used to test for PFAS requires a Teflon-free retrofit when it is put into service, MassDEP has not heard a convincing argument that this type of application of Teflon tape is contributing significant amounts of PFAS. This is not to say that we won't identify this practice as a contributing PFAS source. The outstanding question is the scale of any potential contribution.

Sampling Q11: When is eDEP electronic reporting going to be implemented for PFAS sample results? And will PWS still continue to get a full lab package or only the summary available through eDEP?

All labs are now required to report PFAS water quality data via eDEP. Reporting via eDEP requires the submittal of a full laboratory package as an attachment.

Sampling Q12: What will MassDEP require of the PWS if a homeowner does their own sample at their tap and there is a detection?

The compliance sampling location for PFAS6 is the entry point to the distribution system as specified at 310 CMR 22.07G(4). Consumer tap sampling for any SDWA contaminant with a similar entry point compliance location is not regulatory and does not necessarily trigger any regulatory response by MassDEP or the PWS. However, MassDEP Drinking Water Program (DWP) practice is to discuss with the customer, or ask the PWS to discuss with the customer, how the private results compare to standards and existing regulatory results. We encourage the PWS to provide educational information to the customer and to report any follow-up to MassDEP/DWP. In some cases, PWSs may elect to offer voluntary sampling at that home to confirm the private results but MassDEP does not require that they do so.

ANALYTICAL AND LABORATORY

Analytical Q1: What laboratory should I use? What detection limits should labs be using?

The PWS should ask for reporting limits of 2 ng/L (ppt) or lower for each of the PFAS6 chemicals. All other PFAS contaminants should be reported at this level as well or, if not achievable, at the lowest feasible Minimum Reporting Level (MRL). Laboratories will analyze drinking water for PFAS using either USEPA Method 537.1 or 533.

Analytical Q2: Can MassDEP provide a list of PFAS approved testing labs?

Laboratories certified by MassDEP for PFAS analysis can be found at: https://eeaonline.eea.state.ma.us/DEP/Labcert/Labcert.aspx.

Analytical Q3: Why do the laboratory testing results for PFAS vary?

Variation is to be expected; PFAS can be detected in drinking water down to very low concentrations. Check that appropriate quality assurance and quality control was completed on any laboratory results you receive. The best way to fully track PFAS levels in drinking water is to test multiple drinking water samples over time.

Analytical Q4: How do I interpret laboratory results: MRL, RL, J values, etc.?

Please see the following document:
https://www.mass.gov/doc/how-to-interpret-my-pfas-laboratory-report/download
You may also contact your MassDEP Regional Drinking Water Program for assistance with interpreting laboratory results.

Analytical Q5: What if a PFAS compound is detected but there is no established health guideline for it?

Please contact your MassDEP Regional Drinking Water Program. Depending on the level, an individual drinking water risk assessment may be warranted by the MassDEP Office of Research and Standards.

Analytical Q6: In DEP's "How to Interpret Lab Results" the document mentions nothing of understanding the importance of the QC, blank and/or sample MDL's, and surrogate's recoveries and whether the report is valid, can DEP add this information? Alternatively, could DEP share the guidance being used by UMass for PWS to evaluate their own data?

The guidance, "How to Interpret my PFAS Laboratory Report and Compare my Results to MassDEP's Maximum Contaminant Level (MCL) for PFAS6" available at https://www.mass.gov/doc/how-to-interpret-my-pfas-laboratory-report/download makes mention of all the relevant sections of a full lab report including the case narrative and the QA/QC sections. It includes a page covering qualifiers, the most common indication of a QC issue, and says that "these situations often require resampling." The field blank is described as well as the need to resample if the blank shows detections. The Department has shared our QC documents with stakeholders and can make them generally available. A good resource to understand the QC requirements is Table 13 in EPA Method 537.1 available at https://cfpub.epa.gov/si/si_public_record_Report.cfm?dirEntryId=343042&Lab=NERL .

Analytical Q7: Will MassDEP complete the QA/QC process for public water system samples?

Yes, MassDEP will continue QA/QC as it does for all other SDWA contaminants.

Analytical Q8: MassDEP indicated at the Safe Drinking Water Act Advisory Committee meeting on February 23rd 2021 that it intends to scale back on its level

of QC review for PFAS results; DEP should not do that until after the first year of implementation of the regulations.

MassDEP is not scaling back on all QA/QC review and, in fact, will maintain the same level of review that other SDWA contaminants receive but based on its experience to date will be implementing a more targeted approach for the most rigorous review where it is justified.

Analytical Q9: What percentage of samples have been identified as having QC issues?

Review as of March 2021 accepted 75% of all reports. Of the remaining reports 10% were partially accepted (i.e. PFAS6 results were acceptable) and 11% were rejected. 4% were on hold for acceptance pending responses from the labs.

Analytical Q10: What percentage of samples have subsequently been invalidated due to QC failure?

As of March 2021, 11% of reports have been rejected for QC failures affecting PFAS6 results.

Analytical Q11: Is there a correlation with QC failure and particular labs?

There is always some variability in drinking water testing results from one certified laboratory to another. This is true whether labs are analyzing drinking water for PFAS or for any other contaminant. Testing results will vary within a lab as well as across labs. In accordance with 310 CMR 42.00 each laboratory is certified to ensure that their results meet the accepted laboratory standards set by the MassDEP Laboratory Certification Program. The same is true if a lab has been reviewed by another certification authority. Labs must pass Quality Assurance/Quality Control criteria in order to receive certification and pass periodic performance tests and audits to retain certification. The certification is subject to revocation if MassDEP finds problems. A PWS can report a lab to MassDEP for review if they experience problems. As in all analytical monitoring programs, confidence in the PFAS testing results being reported by labs and the best indication of the levels of PFAS6 in the water will increase after looking at numerous testing results over time.

Analytical Q12: Can we put together a stakeholder group to discuss the PFAS QC matter going forward?

The existing and active MassDEP's Laboratory Advisory Committee is the appropriate forum to discuss these matters.

Analytical Q13: Has DEP seen seasonal variations in results?

It's too early to tell, but in some cases there does appear to be a seasonality. Whether this turns out to be the case will depend on the outcome of more sampling.

Analytical Q14: Water suppliers have expressed concern about sampling costs if labs data does not pass QC, is there a role for DEP to play in standardizing an approach to address this concern?

For samples where the PWS contracts with a laboratory, the contract should spell out the responsibility for the cost of any resampling. We encourage PWS when contracting for any analytical services to ensure that the laboratory is responsible for the cost of analysis related to QA/QC failure based on conditions under the laboratory's control. Note that QA/QC can fail based on contamination in a field blank (indicating a sample collection issue) or due to something else in the water (matrix interference). These problems can and do occur with the analysis of other SDWA contaminants and are beyond the control of the laboratory.

Analytical Q15: Can DEP provide guidance to PWS on the process that a PWS can use to initiate an investigation into a lab's ability to properly analyze samples?

The PWS must contact their regional Drinking Water Contact and provide a written request with documentation describing the complaint/issue.

Analytical Q16: Do invalidated results get reported on Public Education, Public Notice or in CCR or are they truly thrown out?

If MassDEP invalidates a result it is not required to be reported in PE, PN or CCR with one exception.

The exception is where PFAS6 is reported above the MCL but the surrogate recovery (a measure of the quality of the sample preparation and analysis) is lower than required. This means that the reported detections are lower than actually exist in the sample. If this is the only QC failure these results can and will be used to require PE as they indicate a level of concern even though the exact (higher) value isn't known. Your regional MassDEP Drinking Water Program contact will work with your system if this exception arises.

Analytical Q17: Labs are being challenged by standard turn-around times for PFAS, how will DEP handle reporting and compliance deadlines if data is delayed?

PWSs are encouraged to conduct all monitoring early enough in the monitoring period to accommodate potential delays in obtaining results and to be able to resample if, for example, a bottle is lost or broken. MassDEP is aware of the potential for delay as well as the challenges of any initial rule implementation issues and will evaluate each set of circumstance on a case-by-case basis. MassDEP may forbear from taking enforcement

action during the initial monitoring period for each system but will document all violations. Collecting samples late in the monitoring period may play a role in whether MassDEP chooses to issue enforcement.

Under new federal rules, DWP has always provided a forbearance from the enforcement period where we document the violation and offer new rule implementation compliance assistance.

Analytical Q18: Some PWS are getting lab analysis without getting the state reporting form at the same time. Is DEP going to mandate that the labs provide the state form at the same time? When does the regulatory clock start ticking and when does the PWS need to notify DEP of the results, when the lab analysis is received or upon receipt of the state form?

Prior to November 30, 2021, as part of MassDEP's regulation, laboratories must use the MassDEP PFAS form for paper reporting of PFAS results. Laboratories submitting via eDEP are required to attach the full report, including QC sections, to the electronic submission.

Analytical Q19: According to the regulation (310 CMR 22.00), the Minimum Reporting Level is the minimum concentration that can be reported as a quantitated value for a target analyte in a sample following analysis. Based on this, why is MassDEP having labs report quantities of PFAS down to the MDL?

Detections of PFAS below the MRL but at or above the MDL ("J" values) indicate that PFAS is present in the field sample and knowing the full scope of which PFAS are present may be used in site discovery activities to help identify the likely source of contamination.

Analytical Q20: In 22.07G(3)(b), it states that PFAS detection shall mean a concentration of any PFAS measured in accordance with 310 CMR 22.07G(12) which is greater than or equal to the analytical laboratory's applicable Minimum Reporting Level (or MRL). With these levels below the MRL but above the MDL being reported, what should not be a detection according to 22.07G(3)(b) means that the result will not be "Non-Detect" but instead be a quantity with "J" next to it. This is very confusing for our elected officials and water commissioners to understand, let alone the public. Can you explain why this is required?

Qualified detections of PFAS ("J" values) allow for a better understanding of the mix of PFAS at a sampling location and may help identify the source of contamination.

Analytical Q21: Can labs sub out the PFAS work?

Subcontracting may be allowed in certain circumstances to fulfill the requirement of reporting through eDEP. However, generally, labs that are not certified with MassDEP

cannot subcontract to labs that are certified by MassDEP. We understand that PWS have ongoing relationships with labs that may not be certified for PFAS analysis.

Analytical Q22: How much will each test cost the PWS?

Laboratories set their prices for PFAS analysis based on a variety of factors. The prices that PWS have reported range from approximately $200 per drinking water sample to $400 per sample for analysis using USEPA Method 537.1.

Analytical Q23: PFAS data variability can be 30 %, which seems like a lot, how can MassDEP accept that range?

There is always some variability in drinking water testing results from one certified laboratory to another. This is true whether labs are analyzing drinking water for PFAS or for any other contaminant. Testing results will vary within a lab as well as across labs. In accordance with 310 CMR 42.00 each laboratory is certified to ensure that their results meet the accepted laboratory standards set by the MassDEP Laboratory Certification Program. The same is true if a lab has been reviewed by another certification authority. Labs must pass Quality Assurance/Quality Control criteria in order to receive certification and pass periodic performance tests and audits to retain certification. The certification is subject to revocation if MassDEP finds problems. Also, a PWS can report a lab to MassDEP for review if they experience problems. In addition, MassDEP has temporarily contracted UMass Amherst to do the Quality Control review of all the PFAS lab reports we receive from PWS. As in all analytical monitoring programs, confidence in the PFAS testing results being reported by labs and the best indication of the levels of PFAS6 in the water, will increase after looking at numerous testing results over time.

Some PWS have chosen to split samples and send them to different labs for PFAS testing. If the PWS reports several sampling results taken from the same location within the same monitoring period, whether they are analyzed by the same lab or different labs, and the results meet quality control requirements, in accordance with 310 CMR 22.07G(10)(b)(1) MassDEP averages them for compliance purposes.

If a PWS wishes to take a split sample and send it to two different labs, the PWS must follow proper PFAS collection techniques, including sending Field Reagent Blanks to both labs. The PWS should contact their regional drinking water program contact or the Drinking Water Program at program.director-dwp@mass.gov prior to initiating split samples for PFAS to ensure that correct split sampling procedures are followed.

Analytical Q24: Does the lab calculate PFAS6 total and submit via eDEP or is that up to PWS?

Labs will calculate the PFAS6 value and submit it, along with the individual PFAS data, to MassDEP using eDEP.

Analytical Q25: Is there a mechanism that a user could see if their utility has

tested for PFAS as well as get the results?

Yes, data that are quality control approved by MassDEP and data entered are available through the EEA data portal. The data quality control review process may take several weeks. Data submitted via eDEP which has passed the quality control review will automatically move to the EEA data portal. Drinking water data is searchable at: https://eeaonline.eea.state.ma.us/Portal/#!/search/drinking-water.

Analytical Q26: Will EEA show all results or only results after they are averaged with confirmatory samples?

The EEA data portal displays all of the PFAS analysis results submitted and accepted; the data portal does not average confirmatory samples.

Analytical Q27: How do I calculate the level of PFAS6 to compare to the MCL? How many significant figures do I use?

Some labs may report concentrations to 3 significant figures and others to two. A lab will usually report all results to the same number of significant figures. The sum ultimately needs to be expressed with 2 significant figures. When rounding numbers to a significant digit, keep the number of significant digits wished to be kept, and replace the other numbers with insignificant zeroes. To aid in determining numbers of significant figures, use the following rule:

1. **All non-zero numbers ARE significant.** e.g., the number 33.2 has THREE significant figures because all of the digits present are non-zero.
2. **Zeros between two non-zero digits ARE significant.** e.g., 2051 has FOUR significant figures. The zero is between a 2 and a 5.
3. **Leading zeros are NOT significant.** They're nothing more than "place holders. e.g., The number 0.54 has only TWO significant figures. 0.0032 also has TWO significant figures. All of the zeros are leading.
4. **Trailing zeros to the right of the decimal ARE significant.** e.g., there are FOUR significant figures in 92.00.
5. **Trailing zeros in a whole number with the decimal shown ARE significant.**
6. **Trailing zeros in a whole number with no decimal shown are NOT significant.**

Round to 2 significant figures at the end of the calculation by applying the following rounding rules:

1. If the digit is smaller than 5, drop this digit and leave the remaining number unchanged, e.g., 1.684 becomes 1.68.
2. If the digit is 5 or larger, drop this digit and add 1 to the preceding digit. Thus, 23.948 becomes 24 (see following table).

This rounded sum with two significant figures can then be compared with the MMCL of 20 ng/L. Concentrations greater than or equal to 20 ng/L are above the MMCL whereas those less than 20 ng/L are less than the MMCL. For example, 20.49 rounds down to 20 which is not an MMCL violation; whereas 20.5 rounds up to 21 which would be an MMCL violation.

For example:

Compound	Concentration, ng/L		# Sig figs
PFH_pA	2.30		3
PFH_xS	3.06		3
PFOA	7.43		3
PFOS	10.2		3
PFNA	0.958		3
PFDA	NA		-
SUM	**23.948**		5
rounded to 2 sig. figs.	24		2

Conclusion: This sample would represent an MMCL violation.

Analytical Q28: How long does it take for PFAS results submitted to MassDEP to appear on the EEA data portal?

MassDEP performs in depth quality assurance and control reviews on all PFAS data to ensure accurate and verified PFAS results are presented to the public. The quality control reviews, data entry, and associated PWS notification and compliance actions may result in PFAS results taking up to 30 days from submittal to MassDEP before appearing on the EEA data portal. All PFAS water quality data now must be submitted through MassDEP's electronic reporting system, eDEP. PFAS data submitted through eDEP, which passes the quality control review, will automatically move to the EEA data portal. To ensure PFAS6 results above the MCL are processed and move to the EEA data portal more quickly, MassDEP prioritizes these results for quality control reviews.

TREATMENT AND PFAS RESPONSE

Treatment Q1. What treatment technologies are available to remove PFAS?

Granular activated carbon (GAC), ion-exchange resin, and reverse osmosis (RO) filters have been shown to be effective in removing PFAS. The type of treatment technology you will need depends on the specific PFAS compounds and their levels in the source

water. A pilot study may be required prior to installing treatment. Some resources to identify appropriate treatment technologies are:

- USEPA webpage: Reducing PFAS in Drinking Water with Treatment Technologies: https://www.epa.gov/sciencematters/reducing-pfas-drinking-water-treatment-technologies
- Interstate Technology & Regulatory Council (ITRC) fact sheets on PFAS: https://pfas-1.itrcweb.org/
- The Water Research Foundation's report and webcast on PFAS treatment. Go to their webpage www.waterrf.org and search for "Treatment Mitigation Strategies for Poly- and Perfluorinated Chemicals".

Treatment Q2. What does a PWS do with the waste stream from PFAS treatment?

If the PWS is using GAC or ion-exchange treatment, the GAC media and the ion-exchange resins can be incinerated. The PWS can also use high-pressure membranes such as nanofiltration or reverse osmosis to remove PFAS, but this will result in a concentrated waste stream. There is currently a lack of options for disposal of the concentrated PFAS waste stream. There are some destructive treatment technologies in development.

Treatment Q3. What should a PWS know about bottled water to address consumer questions?

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-

Treatment Q4: Will the addition of PFAS treatment require the PWS to return to semi-annual LCR monitoring?

Yes, the addition of any new treatment requires a PWS to return to semiannual monitoring under the LCR.

Treatment Q5: EPA, when setting Drinking Water Standards, proposes affordable small system compliance technology. Did DEP consider affordable technology for small systems? We operate many small community and NTNC systems; they can barely afford to comply with the regulations as they were before an MCL was set for PFAS in Massachusetts. Small systems have been hit very hard by the pandemic; condo associations may be experiencing lag time in collecting HOA fees, NTNC's (many of which are businesses) were directly impacted by the pandemic, either due to closures mandated by the Commonwealth or decrease in revenue.

No, MassDEP did not propose a small system compliance technology for PFAS6. EPA has listed GAC, Ion Exchange, Nanofiltration, and Reverse Osmosis as small system compliance technologies for PFAS under the SDWA.

Treatment Q6: Will DEP consider wellhead treatment for single sources that are more significantly impaired than other sources which all go into one treatment plant (rather than treating all the wells within the plant)?

MassDEP will review all treatment proposals on a case-by-case basis.
These may include one that only treats a subset of sources prior to a manifold point and downstream treatment.

Treatment Q7: Can a Public Water Supplier (PWS) offer home treatment systems or devices or incentives for homeowner treatment systems to remove PFAS?

Yes. A PWS may offer home treatment systems or devices or incentives for homeowner treatment systems to remove PFAS under the following conditions:

A PWS must be aware and inform consumers that home treatment systems and devices are not specifically designed to meet Massachusetts' drinking water standard for PFAS6. Currently available home treatment systems or devices have been designed to meet USEPA's former Health Advisory of 70 ng/L for the sum of PFOS and PFOA. At a minimum, any such treatment system or device 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 70 ng/L. Please be aware that 70 ng/L is significantly greater than the MassDEP's drinking water standard of 20 ng/L for the PFAS6 compounds. Many of these treatment systems and devices certified to meet NSF standard P473 will likely be able to reduce PFAS6 levels below 70 ng/L, but there are no federal or state processes to confirm this possibility.

A PWS offering home treatment systems or devices or offering incentives for homeowner treatment systems must inform the homeowners of the above information and whether or not the PWS has evaluated the efficacy of specific devices to remove and maintain PFAS6 below the MassDEP MCL.

MassDEP is aware that some homeowners will decide to install a home treatment unit despite the current lack of certification by a national organization to treat water to levels below the MassDEP PFAS6 MCL. Therefore, if a PWS mentions home treatment as an option to reduce PFAS6 levels in a PFAS public notices or educational information the PWS should also inform all consumers who choose to install a home treatment system or device, that they should check to see if the manufacturer has independently verifiable monitoring results demonstrating that the device can reduce PFAS6 below 20 ng/L. For more detailed information on home treatment systems
see https://www.mass.gov/service-details/home-water-treatment-devices-point-of-entry-

and-point-of-use-drinking-water and https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas-in-private-well-drinking-water-supplies-faq.

A PWS delivering water with PFAS6 concentrations over 20 ng/L (as measured at any entry point to the system) must obtain MassDEP Drinking Water Program written approval before offering any home treatment systems or devices or incentives for homeowner treatment systems for PFAS6 removal, such as rebates.

A PWS delivering water with PFAS6 concentrations below 20 ng/L and following MassDEP guidance (see question 14) at https://www.mass.gov/doc/per-and-polyfluoroalkyl-substances-pfas-in-public-drinking-water-supplies-questions-and-answers/download and https://www.mass.gov/service-details/home-water-treatment-devices-point-of-entry-and-point-of-use-drinking-water may offer rebates and other assistance with home treatment systems or devices without obtaining prior MassDEP Drinking Water Program approval for such programs.

A PWS in violation of the PFAS6 MCL must comply with 310 CMR 22.23 if seeking to use home treatment devices to comply with the PFAS6 MCL. For more information see https://www.mass.gov/doc/self-guide-for-point-of-use-and-point-of-entry-treatment-devices/download.

For more information contact your MassDEP regional PFAS contact or the Drinking Water Program at program.director-dwp@mass.gov.

Treatment Q8: What are the anticipated monitoring and treatment costs that will be required of public water suppliers who detect elevated levels of PFAS in their drinking water?

Costs associated with treatment will vary based on multiple criteria, including monitoring results, source water characteristics, and size of the system. The following table provided by the Association of State Drinking Water Administrators (ASDWA) details estimated annualized monitoring and treatment costs for various sized systems and treatment technologies, based on the proposed PFAS National Primary Drinking Water Regulation (NPDWR) for PFOS and PFOA.

Annualized Cost per System of Proposed PFAS NPDWR by System Size (2020$, 3% discounting, numbers round to the closest hundred)

	Population Served ≤500	Population Served 501 to 3,300	Population Served 3,301 to 10,000	Population Served 10,001 to 50,000	Population Served 50,001 to 100,000	Population Served 100,001 to 500,000
Monitoring Costs[a]	$900 ($300 to $1,500)	$1,800 ($600 to $2,900)	$2,100 ($1,300 to $3,000)	$3,200 ($1,900 to $4,500)	$5,400 ($3,200 to $7,500)	$5,400 ($3,200 to $7,500)
Treatment Costs: GAC[b]	$25,000 ($19,800 to $30,300)	$110,900 ($87,700 to $134,000)	$412,200 ($335,000 to $489,500)	$1,246,400 ($1,016,000 to $1,476,900)	$2,799,400 ($2,281,900 to $3,316,800)	$8,947,800 ($7,255,600 to $10,640,000)
Treatment Costs: IX[b]	$19,500 ($15,000 to $24,000)	$74,000 ($59,100 to $88,900)	$262,400 ($212,400 to $312,300)	$869,700 ($692,700 to $1,046,600)	$2,036,400 ($1,623,400 to $2,449,300)	$7,339,100 ($5,777,400 to $8,900,800)
Treatment Costs: POU RO[c]	$17,800 ($1,700 to $33,800)	$128,500 ($33,800 to $223,100)	$449,600 ($223,100 to $676,000)	Not applicable	Not applicable	Not applicable

Data shown are the midpoint of estimated annualized costs per system, with the estimated range in parenthesis.

a) The ranges shown reflect differences in annualized monitoring cost between analytical methods that might be required (low cost of $302 for EPA Method 537.1 or high cost of $376 for EPA Method 533), differing numbers of samples per year per entry point as noted in the text, and the number entry points per system (an average of 1 entry point for systems serving less than or equal to 500 people and 2 entry points for systems serving more than 500). They do not consider potential cost savings that may be realized by utilizing existing monitoring data.

b) The range shown reflect differences in cost among treatment technologies (granular activated carbon or ion exchange), example PFAS contaminants (PFOA or PFOS), and variations in treatment system design (high, mid, or low cost). Estimates assume 90 percent removal for GAC and IX. Treatment process designs assume the specified percent removal of PFOA or PFOS at all entry points. Systems requiring lower removal percentages or with fewer-than-average entry points requiring treatment could have costs lower than the ranges shown. Systems requiring higher removal percentages could have costs greater than the ranges shown.

c) The values shown reflect minimum, midpoint, and maximum population served within each size range divided by an average household size of 2.58 people to approximate the number of residential connections that would need a POU RO device. Annualized cost includes POU RO device purchase ($312/unit) and installation (0.6 hours per unit for administrative time and 2 hours per unit for installation), which are annualized over a 10-year device useful life at 3%, plus annual filter maintenance costs ($93 for filters and 0.6 hours/unit). The values are based on the plumbed-in RO costs and assumptions developed for the Lead and Copper Rule Revisions. RO devices are certified by third parties for contaminant removal effectiveness and currently the removal standard is 70 parts per trillion (ppt). EPA notes that the standard for the final regulation may differ from 70 ppt.

PUBLIC EDUCATION/PUBLIC NOTICE/COMMUNICATION

Communication Q1: Where are the templates for public notice and public education?

MassDEP has developed PFAS specific PN and PE templates. These templates are available here: https://www.mass.gov/lists/public-notification-forms-and-templates.

Communication Q2: Why did DEP add immune-compromised to the sensitive subgroup? What support has DEP given to water systems who put out notices that did not include this as a sensitive subgroup to explain why this group was added?

Recent developments have further heightened concerns regarding potential PFAS effects on the immune system. In July 2020, the European Food Safety Authority (EFSA) published an updated PFAS assessment and concluded that "Based on available studies in animals and humans, effects on the immune system were considered the most critical for risk assessment." Based on this finding, EFSA proposed a PFAS food intake limit based on potential immune effects for the sum of PFOA, PFNA, PFHxS and PFOS.

The COVID-19 pandemic has also heightened concerns over potential PFAS effects on the immune system as these could potentially enhance susceptibility or reduce vaccine effectiveness. These possibilities have been raised by several academic researchers.

Based on the above and the potential that individuals with compromised immune systems may be more sensitive to PFAS immune effects, MassDEP has decided it is prudent to

update the sensitive subgroup for PFAS exposures attributable to drinking water to include individuals diagnosed by their health care provider to have a compromised immune system.

MassDEP have developed a document outlining this justification, and it is available at https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas.

Communication Q3: Would you please define exactly what immune-sensitive or immune-compromised means?

The definition of immune-compromised used for the purposes of defining the sensitive subgroup is people diagnosed by their health care provider to have a compromised immune system.

Communication Q4: What is DEP and DPH doing for broader education to Commonwealth's residents and health care providers about PFAS?

MassDEP and DPH are coordinating on PFAS and will be sharing information on this aspect of the program in the near future.

Communication Q5: Do I have to mail out my CCR to each customer or can I post it on my town's web page?

Yes, you can post your CCR on your town's web page provided you adhere to these requirements:

1. A **direct** link to the CCR can be put on the water bills (or on an insert sent with bills or a mailed postcard) telling the customers they can get their CCR by going to that website. It must be a direct link and open-up right to the CCR with no other clicks allowed.
2. The notice on the bills must be readable - no tiny fonts buried in the body of the text.
3. The bills to the customers must be delivered to **all** customers by July 1.
4. Three Good Faith Efforts still must be made and cannot include the web posting if that is the primary distribution method. Examples can include posting in apartment buildings, town hall, library, community groups; print in local paper; radio announcements; outside sign boards; Twitter; etc.
5. The CCR must stay posted all year until a new one is posted the following year.
6. The insert or a copy of bill must be delivered to MassDEP along with the CCR, Certification Form, and any other needed documents by July 1. Emailing a PDF is the preferred and safest method.

Communication Q6: How do I report PFAS detections in my CCR?

Please see the document detailing the process at: https://www.mass.gov/doc/preparing-your-massachusetts-drinking-water-consumer-confidence-report-0/download to download a copy of Appendix M Preparing your CCR and go to page 55.

Here are a few additional things to remember:

1. Finished water detects must be reported.
2. PFAS6 is treated as one contaminant even though it encompasses six. If you detect say three out of the six you still report it as PFAS6.
3. PFAS6 detections are reported in the regulated table.
4. When you average the detects it is site-specific; you do not average between sample sites. After you average each site you report the highest site in the CCR.
5. If, for this first year, you only had two, not three results to average for the quarter, just average the two.

Reporting unregulated PFAS:

6. Unregulated PFAS are reported by contaminant - not source as PFAS6 are.
7. If you detected PFAS6 before the regulation came out in October 2020 you report those previous detects in the unregulated table as single contaminants. Add a remark to the table noting when PFAS6 became regulated.
8. If you detect any other individual unregulated PFAS you report those in the unregulated table as well.
9. If you have multiple detects for one individual PFAS from any/all location sites, you report the highest detect, the lowest detect, and the average of all detects for that single PFAS in the unregulated table.

Review *Appendix M - Guide to Preparing your CCR* for table examples and charts in the back on how to report the contaminants.

Communication Q7: Do raw water results for PFAS need to be reported in the Consumer Confidence Report?

The requirements for the Consumer Confidence Report include any PFAS detected in finished water, and health effects language must be included if the MCL is exceeded. A PWS may choose to report raw water results for PFAS in the Consumer Confidence Report to provide information to consumers. Reporting raw water results for PFAS in the Consumer Confidence Report is not a MassDEP requirement.

Communication Q8: Can a PWS limit the distribution of PFAS Public Education materials if the affected source(s) provide water to a portion of the distribution system?

The PFAS regulations require that Public Education (PE) materials “be provided to all persons served by the affected Public Water System” (310 CMR 22.07G(7)(e)2.). However, if the PWS can document to MassDEP’s satisfaction based, for example, on a hydraulic model or due to physical isolation, that elevated levels of PFAS were only delivered to a distinct portion of the distribution system, then MassDEP may limit the PE mailing to consumers within the affected portion of the distribution system and may approve the use of alternative delivery methods (as per 310 CMR 22.07G(7)(e)5.) for consumers outside the affected portion of the distribution system. These alternative delivery methods may include a combination of: telephonic messages (e.g. Reverse 911), web and social media posts, print and broadcast media announcements, physical

postings, electronic sign boards, hand delivery and/or other methods approved by MassDEP.

MCL COMPLIANCE

Compliance Q1: What will be the process to turn a well back online if it was taken offline for a result above 20 ppt?

MassDEP will evaluate any such request on a case-by-case basis taking into consideration: the level of PFAS6 in the offline well, the length of time the well has been offline, the need to put the well back online and any other relevant actions the PWS has taken to mitigate the risk to public health. The PWS may be required to monitor the well prior to it going back online and may be required to issue PE/PN depending on the level of PFAS6 that will be delivered to the public.

PWS should contact their MassDEP Drinking Water Program regional contact with any questions. See PFAS contacts in the Resources section below.

Compliance Q2: What are the sampling protocols required for PWS with existing treatment systems that are removing PFAS, but were not specifically designed to do so?

Where MassDEP is made aware of PFAS6 contamination in the untreated water at levels above the PFAS6 MCL the existing treatment will be considered necessary for compliance and the PWS will be required to monitor quarterly.

Compliance Q3: With recent sample results fluctuating as much as 20% in certain cases, month to month, not to mention a wider fluctuation from summer to winter months, will MassDEP handle regulation enforcement differently, especially when the fluctuation occurs around the 20 ppt?

MassDEP shall enforce the MCL requirement for COM and NTNC systems to ensure that consumers are not receiving water that is over the MCL without the public water supplier issuing an approved public notification and implementing an approved plan for the provision of an alternate source of water for the sensitive subpopulation while the public water supplier is working toward addressing the MCL exceedance.

Compliance Q4: Why does a COM or NTNC system that gets a 2.5 parts per trillion result at one site required to do confirmatory sampling if the MCL is 20 for combination of all 6, why does one compound matter at concentration of 2.5 ppt? What are we confirming that we did not exceed the 20 parts per trillion MCL?

This is not unlike other SDWA contaminants that require increased monitoring for detections at or just above the detection limit (e.g. SOC, VOC) even though in some cases these detections can be orders or magnitude below their corresponding MCLs. It is important to confirm the initial result. Anything above the laboratory's minimum reporting level (MRL) is considered a detection, requiring confirmation sampling. If the initial sample and confirmation sample average over 10 ppt, then monthly monitoring would be required to determine compliance with the MCL.

Compliance Q5: Can MassDEP expand on the regulation requirements for minimizing PFAS entering water systems? Is there a MassDEP required, or recommended, timeline for a PWS to minimize PFAS entering their water system, when they test over 20 ppt, or is that up to the PWS? Does the level of PFAS entering the system play a part in the requirement or timing to minimize PFAs, i.e., 21 ppt compared to 55 ppt?

The drinking water regulations do not specify a universal timeline for coming into compliance with any MCLs. PFAS6 is no different in this regard. If a PWS is unable to implement an immediate corrective action, such as taking a contaminated source off-line or altering operational practices to lower the PFAS6 level being delivered to the public, "the Department may establish a schedule for compliance within an administrative consent order or other enforceable document that may include interim measures that the Supplier of Water must take." (see 310 CMR 22.03(1)). The level of PFAS6 being delivered could affect this schedule depending on the actions that are being taken at the PWS to, for example, provide an alternate source of water to the sensitive subpopulation or if the levels are high enough to put more of the population at risk.

Compliance Q6: Has DEP given consideration to the devastating economic impact the average water rate payer has experienced during the Commonwealth's shutdowns? Will DEP consider suspending implementation of the PFAS regulation given these circumstances? The US Department of Commerce surveyed over 200,000 small businesses per week for 27 weeks beginning in April 2020; 24 of those 27 weeks Massachusetts small business owners reported a "Large, negative impact" to their businesses each week, and at rates well over the national average. Small businesses, and their employees have been hit hard by mandatory shutdowns. That leads to a decrease in income (thus a decrease in ability to pay water rates, HOA fees which would otherwise fund water system improvements).

MassDEP is not considering the suspension of its public health-based standard for PFAS6. However, MassDEP continues to advocate for relief for public water suppliers. We continue to engage with the Clean Water Trust to ensure funding is available for PFAS treatment and corrective actions.

Compliance Q7: Regarding TNC's (Transient Non-Community) Public Water Systems, how has DEP scaled up to meet the "Site Specific health assessments" prescribed in the regulation?

a. What is the expected turnaround time for those assessments?
b. What guidance is available for local boards of health who may permit these establishments also?
c. Will results have to be public and/or posted in the establishment?

a. Depending on the volume of assessments, in general, MassDEP expects to be able to complete these assessments within a week or two of confirmatory sampling results. MassDEP will prioritize establishments based on the nature of the potentially exposed populations and the PFAS concentration, with expedited turnarounds in situations with higher exposure potential to sensitive populations and higher PFAS6 concentrations.
b. MassDEP will continue to share its private well information and guidance with local Boards of Health. See https://www.mass.gov/service-details/home-water-treatment-devices-point-of-entry-and-point-of-use-drinking-water
c. Whether results will have to be posted will be determined on a case-by-case basis depending on concentrations, populations exposed, and response measures taken to address the risk. If the results are determined to be over a level of concern for that specific transient use establishment MassDEP will require the results to be posted by the TNCs on its' premises, as specified. The results will also be provided by MassDEP to the TNC in its annual consumer confidence report. The information for that report will be located at https://www.mass.gov/service-details/public-water-supplier-document-search .

Compliance Q8: What happens if a PWS has detected PFAS6 over 20 ppt in its only water supply and cannot meet any of the short-term solutions?

PWS should review the resource information below, consider what they should do and in accordance with 310 CMR 22.04 (13) update their emergency response plan with a plan of action for when/if they detect PFAS over the MCL. PWS may have opportunities for interconnections to purchase water that is below the MCL. PWS may also consider providing bottled water that has been tested for PFAS for their consumers in sensitive sub-groups. Public education materials and the Public Notification requirements can help to inform the consumers about their drinking water and options for reducing their exposures, such as using bottled water that has been tested for PFAS for drinking and cooking of foods that absorb water (like pasta).

Compliance Q9: Why are the laboratory's Minimum Reporting Levels (MRLs) important for all PFAS compounds tested; even the compounds that aren't regulated?

The MRLs demonstrate how low a concentration the laboratory is able to quantify. Results below the MRL, but at or above the laboratory's Method Detection Limit (MDL),

are qualified as “estimated results”. This means the compound appears to be present in the water at a low concentration. As EPA and MassDEP consider whether additional PFAS compounds need to be regulated, this gives the PWS an indication of where they stand.

SOURCE IDENTIFICATION/WASTE SITE ISSUES

Sources Q1: If PFAS contamination is from a Federal site (such as a military base) or a site being managed by the Superfund Program, and there is no federal standard, will water suppliers be able to recoup their costs of treatment from these Federal sites?

The promulgation of a Massachusetts MCL for PFAS6 makes the prospect for contribution for treatment of PFAS6 contamination more likely at sites managed under the federal Superfund Program, although the timing may not meet a water supplier’s immediate need to address the problem. State standards that are more stringent than the equivalent federal criteria are identified as “applicable or relevant and appropriate requirements”, or “ARARs”. Selected remedies at Superfund sites must comply with identified ARARs (unless a waiver is justified), although the timing will follow the often lengthy federal process. At state sites undergoing assessment and cleanup through the Massachusetts Contingency Plan, regulations often require more timely action by the parties conducting the cleanup, including – where appropriate – contribution to treatment costs.

Sources Q2: DEP’s recent analysis that Anvil 10+10 containers were leaching PFAS into the product has us wondering if DEP has done any analysis on the containers used to transport and store water treatment chemicals?

The PFAS detected in Anvil 10+10 has been associated with a fluoridation process used to enhance container stability. MassDEP and MDAR worked with USEPA to evaluate PFAS in such containers, test other pesticide types and to assess what other products, including water treatment chemicals, may use fluorinated containers. https://content.govdelivery.com/accounts/USAEPAOPPT/bulletins/2b8444f

Sources Q3: Is MassDEP aware of instances of common equipment or materials used in production facilities that may contribute PFAS? This would be beyond the concerns of Teflon tape and pipe sealant. Can research be done to better understand this potential similar to the work done to understand PFAS in Anvil 10 + 10? Are NSF certifications able to establish that PFAS levels at the part per trillion level are not able to leach from drinking water equipment?

MassDEP is not aware of any at this time. MassDEP will investigate whether any fluorinated plastics are used in common equipment or materials in this sector.

Sources Q4: Will DEP be doing audits on previously closed BWSC sites that may pose a risk?

A previously closed BWSC site may still have assessment and cleanup obligations if new PFAS-related contamination is discovered. This may come about in a number of different ways, including through the Waste Site Cleanup audit program. In cases where PFAS contamination has been found in specific public or private drinking water supplies, MassDEP uses a number of tools available to identify potential sources of the contamination and require potentially responsible parties to initiate response actions. This is known as Source (or Site) Discovery. More broadly, MassDEP is working across its programs to identify common sources of PFAS to the environment – Source Discovery is just one aspect of this work. As the Department understands these sources better, actions directed towards these potential sources (such as targeted sampling, Requests for Information, and possibly BWSC audits) may be initiated even *before* contaminated downgradient wells are reported.

Sources Q5: Will DEP be providing better guidance to LSPs on identification of sites that had a process or product applied (current guidance seems limited based on knowledge of PFAS containing material)?

As noted above in #33, as the Department learns more about sources of PFAS contamination to the environment, there will be a number of likely follow-up actions. This would include updating guidance to Licensed Site Professionals (LSPs) on where/when sampling for PFAS should be included in the site assessment.

Sources Q6: Does DEP have a process for undertaking an investigation after the PWS identifies PFAS in their source, if so, what is that process and will you proactively share that with impacted water systems?

MassDEP's Source Discovery activities implemented after a PWS identifies PFAS in their source will be case specific – there is no single process. Regional staff in the Waste Site Cleanup and Drinking Water Programs coordinate closely on case specifics and information can/will be shared with affected water systems as appropriate.

Sources Q7: If EPA regulates PFAS as a hazardous waste, what is the potential liability to a PWS and is there any legal exemption under state law for PWS for federal standards under CERCLA if EPA regulates it?

Under CERCLA (the federal Superfund law), EPA may soon designate PFAS as a "hazardous substance" (not "hazardous waste"). This would make EPA's regulation of PFAS similar to how they regulate other hazardous substances we are more familiar with, such as chlorinated solvents (e.g., trichloroethylene). The "hazardous substance" designation would provide EPA with the authority to require parties responsible for the contamination to include PFAS in the Superfund assessment process and, where necessary, address risks posed by these contaminants. For what this means to a PWS

affected by PFAS at/from a Superfund site, the Public Water Supplies currently affected by *non-PFAS* contamination at/from a Superfund would provide examples. MassDEP would also note that state law cannot provide legal exemptions for ***federal*** liability.

Sources Q8: Has DEP investigated any association between septic-system effluent (i.e., nitrate) and PFAS?

The Silent Spring Institute (SSI) and recent Harvard University studies of PFAS in waters of Cape Cod suggest that septic systems may be a source of various PFAS. However, MassDEP is not aware of evidence that indicates a strong overall association of septic system inputs and PFAS6 above the MCL and has not begun an investigation of the association between PFAS contamination and septic systems.

Sources Q9: How has waste site cleanup bureau scaled up to address the extra work of discovering the sources of PFAS contamination that ultimately will be discovered from testing PWS's and Private wells?

Consistent with MassDEP's overall approach to the resource demands created by the discovery of PFAS contamination, the waste site cleanup program has implemented a combination of measures, including the hiring additional staff, re-organizing existing staff, prioritizing the PFAS work, and the use of contractors.

OUTREACH

Outreach Q1: Has DEP had a discussion with the Attorney General to file a lawsuit on behalf of the citizens of the Commonwealth and the public water suppliers?

On May 25, 2022, the Massachusetts Attorney General filed a lawsuit against 13 manufacturers of PFAS https://www.mass.gov/news/ag-healey-sues-manufacturers-of-toxic-forever-chemicals-for-contaminating-massachusetts-drinking-water-and-damaging-natural-resources

Outreach Q2: Has DEP been in contact with the legislature about the convening of the PFAS Task Force that was passed at the end of 2020?

The Final Legislative PFAS Task Force Report has been issued https://malegislature.gov/Commissions/Detail/556/Documents

Outreach Q3: What conversations has DEP had with the legislature to let them know about the financial impact to water suppliers to meet the MCL and to get additional funding to support compliance beyond the $8.4 million already appropriated?

MassDEP has met with members of both the House and Senate, to discuss PFAS and highlight the contaminant's potential impact on water suppliers. We have also been in communication with legislators who represent individual communities impacted by PFAS contamination, to assist with the specific issues they are facing. Further, we continue to provide the legislature with updates on the evolving work of the Department's mitigation efforts and funding opportunities such as the availability of free testing through 2021, the Treatment Design Grants, and the private wells PFAS sampling program.

Outreach Q4: Is DEP advising Planning Boards on the possible impact of proposed housing developments (with septic systems) on groundwater quality, specifically PFAS?

MassDEP has notified Planning Boards and other local officials about PFAS and will continue to do so.

Outreach Q5: Can DEP work with DCR to encourage the siting of new wells in State Forest where the groundwater-quality is likely to be the highest in the Commonwealth? We are concerned about the possible demise of municipal water supply in Massachusetts, which over the last four decades has been regularly subjected to one upheaval after the next, PFAS being only the latest.

MassDEP can make sure DCR is aware of this issue, however, would note that Article 97 of the state constitution establishes perpetual protection of state park and forest lands and limits the purposes for which they may be used.

GENERAL

General Q1: What is the Commonwealth doing to prevent further contamination from PFAS / PFOA compounds?

MassDEP has collected 200,000 pounds of aqueous film forming foam used in firefighting in a take-back program. MassDEP has also been coordinating with the US Environmental Protection Agency and the not-for-profit-organization PEER in evaluating the presence and origination of PFAS in Anvil 10+10, the pesticide used in Massachusetts to control mosquitos affected by EEE (eastern equine encephalitis). MassDEP is also working with the Executive Office of Energy & Environmental Affairs' Office of Technical Assistance to provide technical assistance on the reduction of PFAS to industrial dischargers and industries that discharge to municipal systems.

General Q2: Will MassDEP be reviewing the current PFAS MCL to include other fluorinated compounds as more data is collected?

Yes. The Department will review its PFAS rules as required by the PFAS regulations at 22.07G(3)(e), which say that MassDEP "shall perform a review of relevant developments in the science, assessment and regulation of PFAS in drinking water." That review is required by December 31, 2023, at the latest.

General Q3: Does MassDEP have a plan to work with other states or NEIWPCC to mitigate the sources of PFAS from the Merrimack River?

MassDEP is coordinating with the U.S. Environmental Protection Agency, NEIWPCC, and NHDES on issues related to water quality in the Merrimack River including combined sewer overflows, nutrients, and PFAS.

General Q4: Can public water supplies be contaminated by per- and polyfluoroalkyl substances (PFAS) washing off solar panels and solar sheets installed at public water systems?

PFAS may be generated as a waste during the manufacture of the panels. We have not identified any water sampling results that have detected PFAS coming off solar panels or that PFAS is present on panels.

MassDEP's solar guidance, policy, model certification, template approval letter and SOP for staff state that PWS shall use solar panels and solar sheets that do not contain PFAS. It is a PWS's responsibility to ask the manufacturer about PFAS from the solar panels being considered.

We have also been approached by a company that is marketing thin, flexible solar sheets that they adhere to infrastructure and they were specifically asking about adhering solar sheets to PWS drinking water storage tanks. After reviewing data, talking with the company and the manufacturer, we decided to allow such an installation under our Policy #98-01 which is titled Antennas & Other Appurtenances Attached to Public Drinking Water Storage Tanks with one condition: that if the drinking water storage tank is located within the Zone I, the project proponent clearly demonstrates, possibly through testing, that there is no PFAS in the solar sheets, adhesives, other components of the solar installation or maintenance practices. A copy of the written documentation must be maintained in the PWS's files for MassDEP review when requested. Additionally, the PWS have been made aware through the updated policy that solar sheeting on drinking water storage tanks may increase the temperature of the water in the tank. Care should be taken in selecting the type of solar sheeting to be used, managing the water in the tank and preventing detrimental impacts to the structural integrity of the tank.

The most up-to-date DWP solar guidance, solar Zone I policy and Antenna & Other Appurtenances on Drinking Water Storage Tanks solar policy for PWS posted at https://www.mass.gov/service-details/drinking-water-policies-and-guidance. As new

information becomes available, MassDEP will update this and other relevant documents.

TECHNICAL ASSISTANCE

Assistance Q1: Does MassDEP provide funding for PFAS testing or other services for Public Water Suppliers?

MassDEP is offering grants and technical assistance to PWS through the Emerging Contaminants in Small or Disadvantaged Communities Grant Program https://www.mass.gov/info-details/emerging-contaminants-in-small-or-disadvantaged-communities-grant

Zero percent interest loans for PWS to install treatment for PFAS are available through the Drinking Water State Revolving Loan Fund contingent on the availability of funds. https://www.mass.gov/info-details/zero-interest-pfas-mitigation-loans# https://www.mass.gov/service-details/srf-drinking-water-program

Assistance Q2: Is technical and financial assistance available to PWS to evaluate their drinking water sources for PFAS and implement treatment?

Technical assistance is available from MassDEP and our technical assistance providers. Please contact your MassDEP Regional Office Drinking Water Program or Program.director-dwp@mass.gov: Subject PFAS Technical Assistance.

The Massachusetts Drinking Water State Revolving Fund loan program (DWSRF) provides low interest loans for drinking water infrastructure projects. MassDEP has established High Priority status for project proposals that will provide treatment of drinking water affected by concentrations of PFAS compounds above the MCL of 20 ppt. Contingent on the availability of funds, PFAS mitigation projects may be eligible to receive additional subsidy in the form of 0% interest rate loans in addition to some principal forgiveness on the loans for lower-income communities.

MassDEP is encouraging communities that have tested and identified PFAS at concentrations at or above the MCL in their water systems to apply for emergency funding through the DWSRF. Requests for emergency PFAS mitigation project financing are subject to review and approval by MassDEP and the Clean Water Trust. For more information on DWSRF please contact Ms. Maria Pinaud, Director of Municipal Services, by email at Maria.Pinaud@mass.gov.

MassDEP is also offering technical assistance to PWS through the Emerging Contaminants in Small or Disadvantaged Communities Grant Program

https://www.mass.gov/info-details/emerging-contaminants-in-small-or-disadvantaged-communities-grant

Technical assistance on a wide range of financial, managerial and technical issues is available for communities serving < 10,000 people. Contact jstarbard@rcapsolutions.org at RCAP Solutions or dkaczenski@massrwa.org at Mass Rural Water Association for a "no cost" consultation or site visit.

My questions were not answered here. Who should I contact?

Contact the MassDEP Drinking Water Program at **program.director-dwp@mass.gov,** Subject: PFAS or one of the regional contacts below.

RESOURCES

For all questions:
MassDEP Drinking Water Program Program.director-dwp@mass.gov

MassDEP PFAS Contacts:
Western: Christine Simard christine.simard@mass.gov
Central: Paula Caron Paula.Caron@mass.gov
Northeast: Amy LaPusata and Sofia Savoca amy.lapusata@mass.gov;
Southeast: William Schwartz William.Schwartz@mass.gov
Boston: Margaret Finn Margaret.Finn@mass.gov

Links to PFAS information:

More information on PFAS can be found at:
https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas

PFAS Regulations Quick Reference Guide:
https://www.mass.gov/doc/per-and-polyfluoroalkyl-substances-pfas-drinking-water-regulations-quick-reference-guide/download

PFAS in Drinking Water FAQ for Consumers:
https://www.mass.gov/doc/massdep-fact-sheet-pfas-in-drinking-water-questions-and-answers-for-consumers/download

PFAS Monitoring Flowchart for Small COM and NTNC PWS:
https://www.mass.gov/doc/pfas-monitoring-flowchart-for-small-public-water-suppliers-com-and-ntnc/download

PFAS Monitoring Flowchart for COM and NTNC PWS:
https://www.mass.gov/doc/pfas-monitoring-flowchart-for-public-water-suppliers-com-and-ntnc/download