POLICY BRIEF

Two Steps Forward, One Step Back

Changes to Federal PFAS Drinking Water Standards

Isabel Yannatos

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Rockefeller SUNY Institute of Government

ABOUT THE AUTHOR

Isabel Yannatos is a New York State Science Policy Fellow at the Rockefeller Institute of Government

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Perfluoroalkyl and polyfluoroalkyl substances (PFAS), also known as forever chemicals, are a large class of thousands of chemical compounds that are used in a variety of industrial and consumer products. As evidence has grown concerning the negative health effects of exposures to PFAS, federal and state governments have in recent years begun to monitor and regulate some PFAS in drinking water. The federal government finalized regulations for certain PFAS in drinking water in 2024. Since then, the finalized rule has been challenged in court, and the Trump administration has communicated that it intends to delay enforcement and rescind parts of the rule.

This piece follows up on the Rockefeller Institute's earlier work when the draft version of the federal rule was first proposed and outlines the final rule.[1] It further discusses legal challenges and potential changes to the rule, and how those potential changes relate to current state standards. And finally, it considers more recent data on the prevalence of PFAS in drinking water systems across the country, and what impact the potential changes to federal standards may have with respect to human health.

The PFAS Federal Drinking Water Rule and its Uncertain Future

The 2024 Final Rule

As the Rockefeller Institute previously covered, the Environmental Protection Agency (EPA) proposed new drinking water standards for six PFAS chemicals in 2023, marking the first new federal drinking water standards since 1996.[2] The EPA under President Biden finalized the rule in April 2024.[3] The final rule set Maximum Contaminant Levels (MCLs), which are enforceable drinking water standards, for five individual PFAS and a hazard index for mixtures of four PFAS.

For the five individual PFAS (PFOA, PFOS, PFHxS, PFNA, and HFPO-DA), the EPA established both Maximum Contaminant Level Goals (MCLGs)—nonenforceable health-based goals—and enforceable MCLs. The EPA set MCLGs for PFOA and PFOS at zero, recognizing that any exposure may be harmful. The enforceable MCL was set at 4 ppt (parts per trillion) each for PFOA and PFOS based on the practical quantitation level—the lowest level which can be reliably measured using approved analytical methods and technologies that are available at scale. Both the MCLGs and the MCLs were set at 10 ppt for the other three PFAS.

The final rule also established a hazard index for a mixture of four PFAS (PFHxS, PFNA, HFPO-DA, and PFBS).[4] The hazard index is intended to protect against cumulative risks of the combined effects of exposure to multiple contaminants. It is the sum of the ratios of each of these PFAS concentrations to their respective standard or MCL. It is unitless, since it represents a ratio, and the maximum compliance value was set at one. All of these standards were set to be enforced beginning in 2029.

FIGURE 1 | Hazard Index Calculation

$$\text{Hazard Index (1 unitless)} = \left(\frac{[\text{HFPO} - \text{DA}_{ppt}]}{[10\ ppt]}\right) + \left(\frac{[\text{PFBS}_{ppt}]}{[2000\ ppt]}\right) + \left(\frac{[\text{PFNA}_{ppt}]}{[10\ ppt]}\right) + \left(\frac{[\text{PFHxS}_{ppt}]}{[10\ ppt]}\right)$$

SOURCE: "Understanding the Final PFAS National Primary Drinking Water Regulation Hazard Index Maximum Contaminant Level," US Environmental Protection Agency, April 2024, https://www.epa.gov/system/files/documents/2024-04/pfas-npdwr_fact-sheet_hazard-index_4.8.24.pdf.

As part of the regular rulemaking process, the EPA is required to conduct cost benefit analyses. The EPA estimated the cost of implementing the rule (related to monitoring water systems and implementing technologies or infrastructure as necessary to treat drinking water when standards are exceeded) at $1.548 billion to $1.631 billion annually.[5] Benefits of the rule stem from improvements to public health as exposures to PFAS are reduced. EPA modeled the health benefits of the rule as resulting in an estimated 1,302 fewer infant deaths (related to low birth weight), 9,645 fewer total deaths, and 29,872 fewer nonfatal cases of disease (including heart attack, stroke, cardiovascular disease, and cancer) over 80 years. Based on those projections, the EPA estimated the total quantifiable savings from these health benefits would be $1.549 billion annually.

The EPA also noted that the true benefit of the rule could, however, be larger for a couple of reasons. First, the quantifiable benefits may be higher depending on how they are calculated. For example, using a different model for the benefits related to cancer, the EPA estimated the benefit as $83 million higher. And, second, in addition to these quantifiable benefits, there are many other health benefits of reduced exposure to PFAS and co-contaminants that the EPA was not able to quantify given currently available data. Lack of research on the health effects of each of the thousands of PFAS chemicals does not imply that they have no effect, but makes it difficult to quantify the benefit. The six PFAS in the rule could have additional health effects that were not quantified, and treatment for these PFAS would remove additional PFAS and co-contaminants that have additional health effects.

Legal Challenges

As was generally anticipated, the EPA's final rule received legal challenges, which were combined in a consolidated case—*American Water Works Association, et al. v. U.S. Environmental Protection Agency, et. al.*[6] The American Water Works Association (AWWA) and Association of Metropolitan Water Agencies (AMWA) jointly filed a petition in June 2024.[7] Two other lawsuits from chemical manufacturers (the National Association of Manufacturers/American Chemistry Council and The Chemours Company) were consolidated with the AWWA/AMWA suit.[8] Briefings in the case began in late 2024 but were paused upon the transition to a new administration.

The petitioners have several main points of contention.[9] First, they argue that the EPA did not follow the correct administrative procedure because it proposed specific standards for the non-PFOA/PFOS PFAS at the same time as it made a determination on whether or not to regulate them at all. The EPA under the Biden administration interpreted the Safe Drinking Water Act as allowing these actions to occur concurrently, but the Trump administration has since agreed with the petitioners that this violated the law and deprived a required opportunity for public comment. The Government Accountability Office noted in July 2025 that the EPA had sought public comment as required on the proposed rule and revised its cost estimates based on comments received.[10]

Second, the petitioners argue that a hazard index is not an appropriate enforceable regulatory standard. The EPA has used hazard indices in other contexts, however, such as the Superfund program and assessment of air toxins.[11] Third, they argue that the EPA used insufficient data. They claim that data from the Fifth Unregulated Contaminants Monitoring Rule or UCMR5 (discussed further below) shows that the four PFAS other than PFOA and PFOS do not occur at levels or frequency that justify regulation. And lastly, the suit argues that the EPA underestimated the cost of implementing the rule. The AWWA commissioned its own cost estimate based on UCMR5 data and what the petitioners claim are more accurate projections of capital costs.[12] The estimated result was $2.6 to $3 billion annually, compared to the EPA's lower estimate of $1.5 to $1.6 billion.

Federal Administrative Actions

The EPA under the Trump administration then announced in May 2025 that it would delay enforcement of the PFOA and PFOS MCLs until 2031 and rescind regulations on the other PFAS chemicals in the rule.[13] Consistent with this intent, the EPA filed a motion in September 2025 to vacate parts of the PFAS drinking water rule and no longer defend them in the case discussed above. Specifically, the motion seeks to vacate the MCLs set for PFHxS, PFNA, and HFPO-DA as well as the hazard index. The petitioners, as might be anticipated, are supporting this position. Organizations such as Natural Resources Defense Council and Earthjustice have intervened in the case, opposing the motion to vacate parts of the rule.[14]

Litigation was again paused during the federal government shutdown in October 2025 and resumed in late November.[15] The court will eventually decide whether the rule violates the law, as both parties now contend. It may uphold the rule, vacate or remand part of the rule (annulling it or sending it back to the lower courts), or put the rule's implementation on hold while the EPA conducts a new rulemaking process.[16] Although the EPA is pursuing a reversal of parts of the rule, observers have noted that rolling it back may violate the anti-backsliding provisions of the Safe Drinking Water Act. These provisions were established in an amendment to the Act in 1996, which states that any revision of a drinking water standard "shall maintain, or provide for greater, protection of the health of persons." This means the EPA generally cannot weaken standards—instead the agency must strengthen or maintain a standard unless new scientific evidence proves it is unnecessarily strict to maintain public health.[17]

It appears that the EPA is, however, maintaining or continuing several other PFAS regulations that were initiated or established during the Biden administration at this time. EPA Administrator Lee Zeldin has repeated that the agency is committed to addressing PFAS contamination in drinking water and has announced a number of actions it intends to pursue to reduce PFAS release into the environment.[18] For example, Zeldin announced that the EPA would develop effluent limitations guidelines for PFAS and add PFAS to the Toxic Release Inventory to reduce and track industrial discharges, initiatives that began during the Biden administration.[19] In September 2025, the EPA announced that it would maintain the designation of PFOA and PFOS as hazardous substances under the Superfund law, initially designated as such in April 2024.[20] However, the EPA is also proposing to delay and create exemptions to PFAS reporting requirements under the Toxic Substances Control Act.[21] There is additional recent reporting that the EPA has delayed releasing a report on the health toxicity of PFNA, one of the PFAS included in the final rule.[22]

The Status of State Standards

Ten states already have enforceable standards in place for PFAS in drinking water.[23] Several other states have proposed regulations or have guidance or notification levels, but not enforceable standards. The federal MCLs would supersede less stringent, or higher, state standards. New York, for example, currently has MCLs for PFOA and PFOS of 10 ppt each, which would be preempted by the new federal MCLs of 4 ppt.[24]

States can, however, retain or create standards that are at least as strong or stronger than federal regulations. Michigan, for example, has a standard for PFNA at 6 ppt that is lower than the final federal rule's, and four states have combined standards—a total limit for the sum of multiple PFAS concentrations—that can remain in place in addition to the federal rule. Likewise states that have standards for the PFAS which the Trump administration is looking to remove from the final rule—PFHxS, PFNA, and HFPO-DA—can maintain those if removed federally. States may also choose to codify the final rule in state statute or regulations even as the EPA looks to walk it back. Illinois adopted a law in March 2025 directing its Pollution Control Board to adopt MCLs identical to the final rule MCLs.[25]

New York State's standards of 10 ppt each for PFOA and PFOS were finalized in 2020. While state standards of 10 ppt each for four additional PFAS (PFHxS, PFNA, PFHpA, and PFDA) along with a combined standard of 30 ppt total for six PFAS (PFOA, PFOS, PFHxS, PFNA, PFHpA, PFDA) were proposed in 2022, they have not been finalized. If they were finalized, those standards would remain in place to protect public health even if federal standards were raised, delayed, or removed.

Compound	Federal MCGL (Health Guidance Level)	Federal MCL (Enforceable Level)	New York State MCL	Other States (Enforceable Standards)
PFOA	0	4.0ppt	10ppt (enforceable)	MI (8ppt), NH (12ppt), NJ (14ppt), PA (14ppt)
PFOS	0	4.0ppt	10ppt (enforceable)	MI (16), NH (15), NJ (13), PA (18)
PFHxS	10ppt	10ppt	10ppt (proposed)	MI (51), NH (18)
PFNA	10ppt	10ppt	10ppt (proposed)	MI (6), NH (11), NJ (13)
HFPO-DA	10ppt	10ppt		MI (370)
Mixtures of PFHxS, PFNA, HFPO-DA, and PFBS	1 Hazard Index	1 Hazard Index		
PFHpA			10ppt (proposed)	
PFDA			10ppt (proposed)	
PFHxA				MI (400,000)
PFBS				MI (420)
PFOA and PFOS				WI (70ppt total)
Mixtures of PFOA, PFOS, PFHxS, PFNA, PFHpA, PFDA			30ppt total (proposed)	MA (20ppt total), ME (20), RI (20), VT (20, does not include PFDA)

PFAS Prevalence in Drinking Water

PFAS are widespread in the environment, including in drinking water, and have a number of negative human health effects. Our previous work has outlined the history of PFAS contamination and awareness of their toxicity, and the EPA's monitoring and regulatory processes, including under the Unregulated Contaminants Monitoring Rule (UCMR).[26] While the EPA reviewed data and literature available at the time to develop the PFAS drinking water rule, new data from the latest UCMR is continuing to shed light on the extent and distribution of PFAS in drinking water.[27]

Under the UCMR, national testing is conducted periodically to monitor contaminants in drinking water. The third round of testing under the UCMR (UCMR3), conducted between 2013 and 2015, included six PFAS chemicals for the first time. The fifth round, (UCMR5) is being conducted from 2023–25, and includes 29 PFAS chemicals. These again include the six PFAS previously monitored in UCMR3, but water systems must report lower levels than before. For example, a public water system (PWS) that detects levels of PFOA or PFOS equal to or greater than 4 ppt must report that result, while previously it would only be required to report levels greater than 20 ppt for PFOA and 40 ppt for PFOS.[28]

UCMR5 also includes over 5,000 additional small and medium PWSs. All systems serving at least 3,300 customers now must conduct monitoring under UCMR5, and a nationally representative sample of 800 systems with fewer than 3,300 customers was selected for monitoring as well. UCMR3, on the other hand, selected 800 systems serving fewer than 10,000 customers for monitoring.[29] All large systems serving more than 10,000 customers were required to monitor for PFAS under both. UCMR5 data will thus depict a broader, more precise, and more inclusive landscape of PFAS contamination and represents a step towards science that is more commensurate with the scale of the problem it is studying.[30] It is important to note, though, that private wells are not included in UCMR testing as they are not regulated under the Safe Drinking Water Act.

Number and Size of PWSs Tested in UCMR3 vs. UCMR5

		Public Water System Size (number of customers served)			
		Small (<3,300)	Medium (3,300–10,000)	Large (>10,000)	Total
Number of Systems included	UCMR3	800		4,122	4,922
	UCMR5	800	5,147	4,364	10,311

Approximately 89 percent of the data collected through UCMR5 has been released as of October 7, 2025.[31] These data were not available at the time the EPA developed the final rule, and they are not used to determine whether a system is in compliance with the rule. Over 2,300 systems detected PFAS above the minimum reporting levels, with 60 such systems in New York. Of the approximate 8,000 systems that have reported a full set of results, 8 percent of systems serving 10,000 customers or fewer, and 15

percent of larger systems serving over 10,000 customers have exceeded at least one of the final rule's MCLs or the hazard index for PFAS. The EPA estimates, based on a weighted average, that 8.4 percent of all PWSs will exceed at least one of the final rule's PFAS standards. The testing so far shows that 950 PWSs, across every state except Arkansas, Hawaii, and North Dakota, have PFAS levels exceeding the rule's standards, including 27 in New York serving approximately 1.8 million people.[32] The Natural Resources Defense Council estimated that has resulted in over 73 million people nationally being exposed to PFAS levels above the standards in drinking water.[33] Likewise, using these data, the Environmental Working Group estimated that 172 million Americans are exposed to drinking water with detectable levels of PFAS, including levels that do not exceed the final rule's standards.[34]

Exceedance of the PFOS or PFOA MCLs is much more common than exceedance of the other MCLs or the hazard index, both because they are more stringent and because PFOA and PFOS are the most prevalent PFAS. A total of 738 systems reported levels above the PFOS MCL, and 645 systems reported levels above the PFOA MCL, while 60 systems reported levels above the PFHxS MCL. Only six systems reported levels above the PFNA MCL, and three had HFPO-DA levels above the MCL. Sixty-eight systems reported the hazard index above one. Co-occurrence of different PFAS at the same locations is, however, very common; the majority of systems that reported levels which exceeded one PFAS MCL reported multiple PFAS levels above their MCLs.

Impacts of the Proposed Changes to the Rule

As referenced above, if the court allows, the EPA has signaled it will move forward with rescinding regulations on PFHxS, PFNA, HFPO-DA, and PFBS and delaying enforcement of regulations on PFOA and PFOS by two years. These changes could give PWSs more time to plan and implement work needed to comply with the rule, such as installing water treatment technology, and greater flexibility to budget for the capital costs and financing required. Also, fewer systems would be required to take action to comply, resulting in monetary savings. These benefits would, however, be offset by decreased health benefits, as millions of Americans would continue to be exposed to PFAS in drinking water.

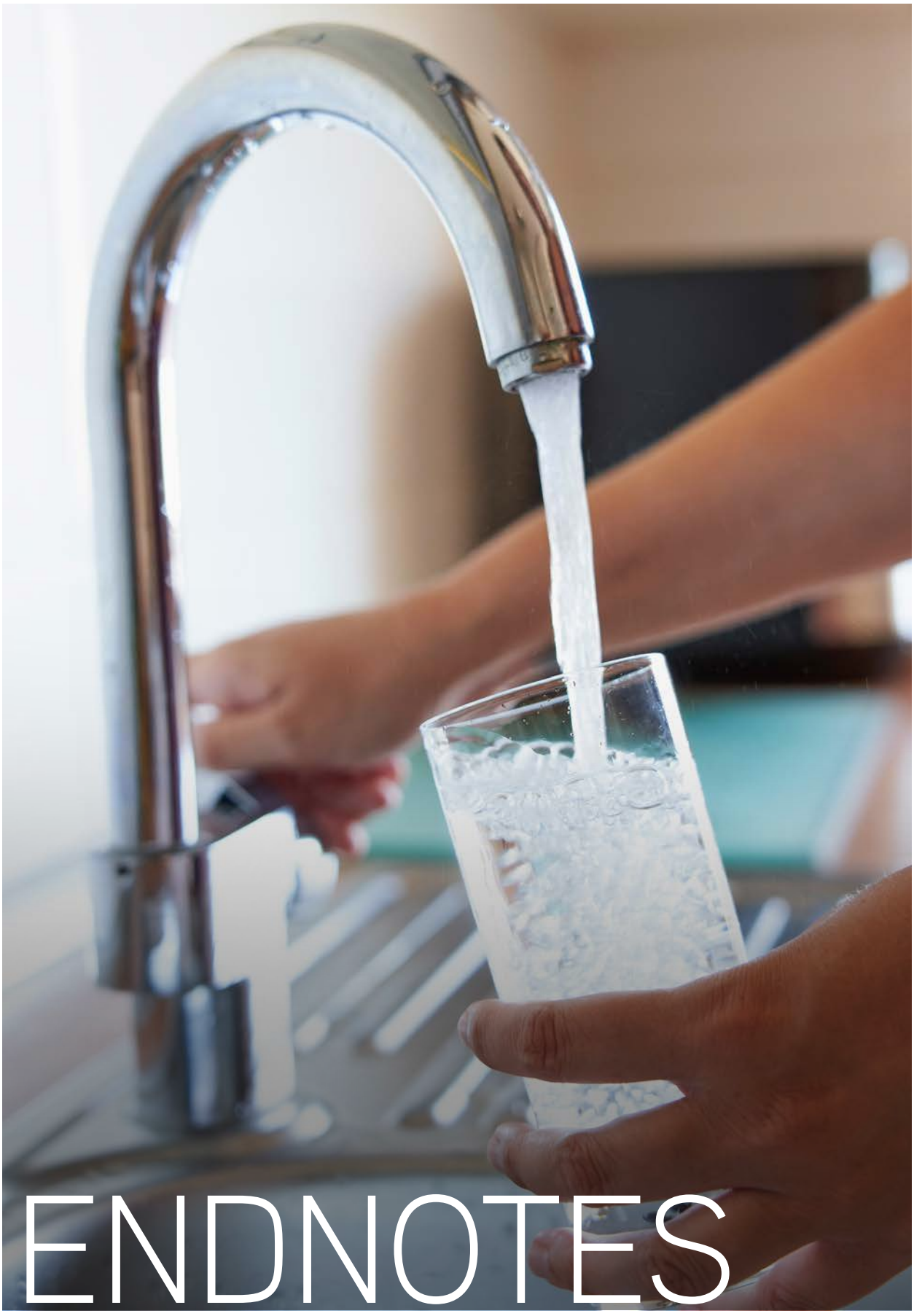
In its economic cost-benefit analysis, the EPA also modeled a version of the rule with only PFOA and PFOS MCLs, as the Trump EPA now proposes.[35] It estimated this version of the rule to cost $1.537 billion, compared to $1.549 billion for the final rule, resulting in national savings of only approximately $11.57 million annually. The EPA noted uncertainty in these estimates resulting from lack of data available at the time on the occurence of PFNA, PFBS and HFPO-DA and that the savings could be as much as $94 million, about 6 percent of the overall costs. The majority of these savings result from a small number of PWSs no longer being required to treat water for PFAS. The EPA estimated that only three PWSs would exceed one of the non-PFOA/PFOS MCLs or the hazard index but not exceed the PFOA or PFOS MCLs, since there is a high frequency of PFAS co-occurrence. UCMR5 data released so far show six systems meet these criteria, though these data are not complete and are not used

to determine compliance with the rule.[36] The EPA did not model the effects of delaying the PFOA and PFOS MCLs.

Consumers served by the systems that have elevated PFHxS, PFNA, HFPO-DA, or PFBS levels, but are no longer required to treat drinking water, would continue to be exposed to those PFAS. Systems that have co-occurrence of these PFAS and PFOA or PFOS would still be required to treat their water in order to comply with the PFOA and PFOS MCLs. Existing treatment technologies are not specific to PFOA/PFOS and are over 90 percent efficient at removing all the PFAS in the final rule.[37] However, systems would not be required to regularly monitor other PFAS and therefore would not know if there are elevated levels of those compounds. This reduces the ability of regulators and water systems to identify the contaminants and respond quickly. It also reduces the ability of consumers to be informed about potential contaminants in their water and to take steps to protect themselves.

If the rule changes, the health of consumers of the water systems no longer required to treat for certain PFAS, and of the systems which may delay treatment for a PFOA or PFOS exceedance, would be impacted. Modeling the version of the rule with PFOA and PFOS MCLs only, the EPA found that the quantifiable benefits reduce slightly, with 132 fewer disease cases avoided and 40 fewer deaths avoided. However, the full health impact of rescinding part of the rule and delaying enforcement is unclear. The EPA has released health toxicity assessments of PFHxS,[38] HFPO-DA,[39] PFNA (the final version of which has not been published),[40] and PFBS.[41] These assessments found that evidence supports likely human health effects on development, thyroid, immune, reproductive, kidney, and liver function. The EPA did not quantify the health benefits associated with regulating these PFAS though, due to insufficient data. Since these PFAS are generally very persistent and accumulate in the body, any intake of PFAS may have long-term effects.

As the legal and political future of federal PFAS drinking water regulation remains in flux, states may step in to further protect their residents and provide greater certainty. The Rockefeller Institute is analyzing not only federal PFAS policy changes, but tracking state level legislation across the country and will continue to provide updates and analyses.[42]



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