

# US EPA Proposed PFAS MCLs

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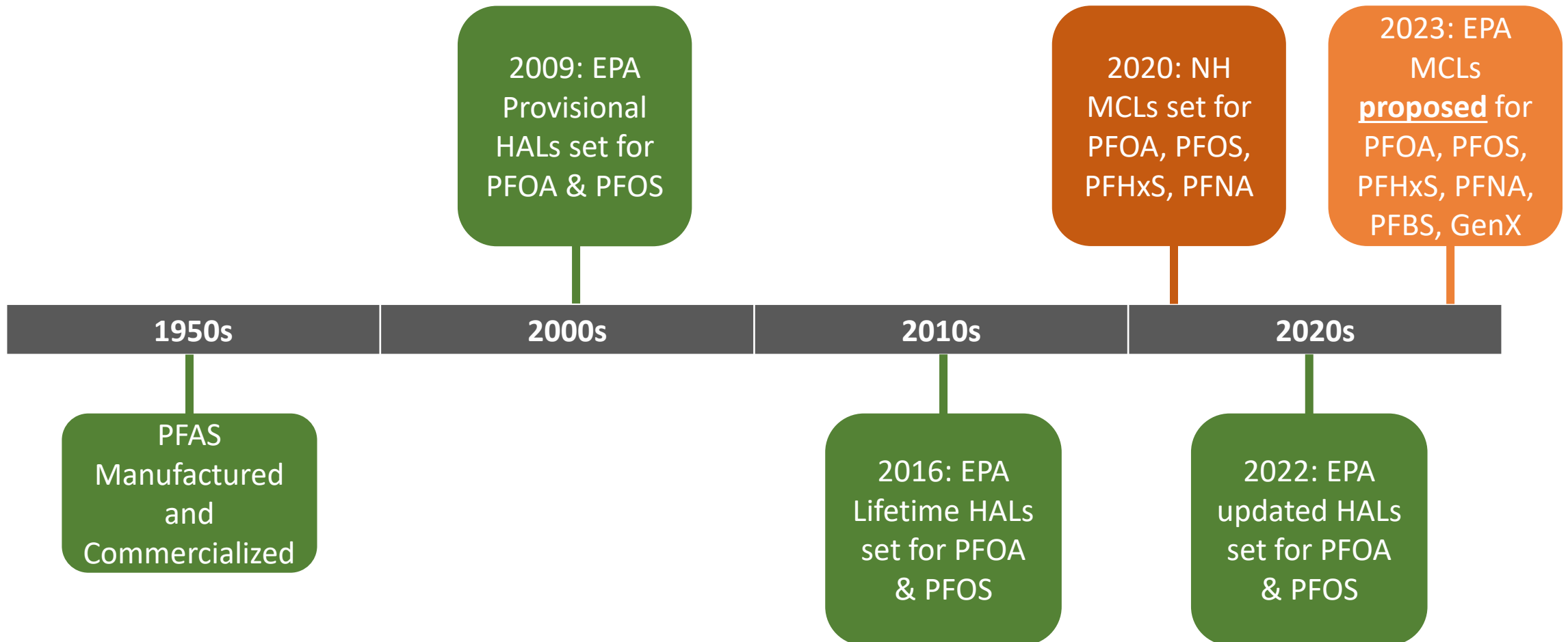


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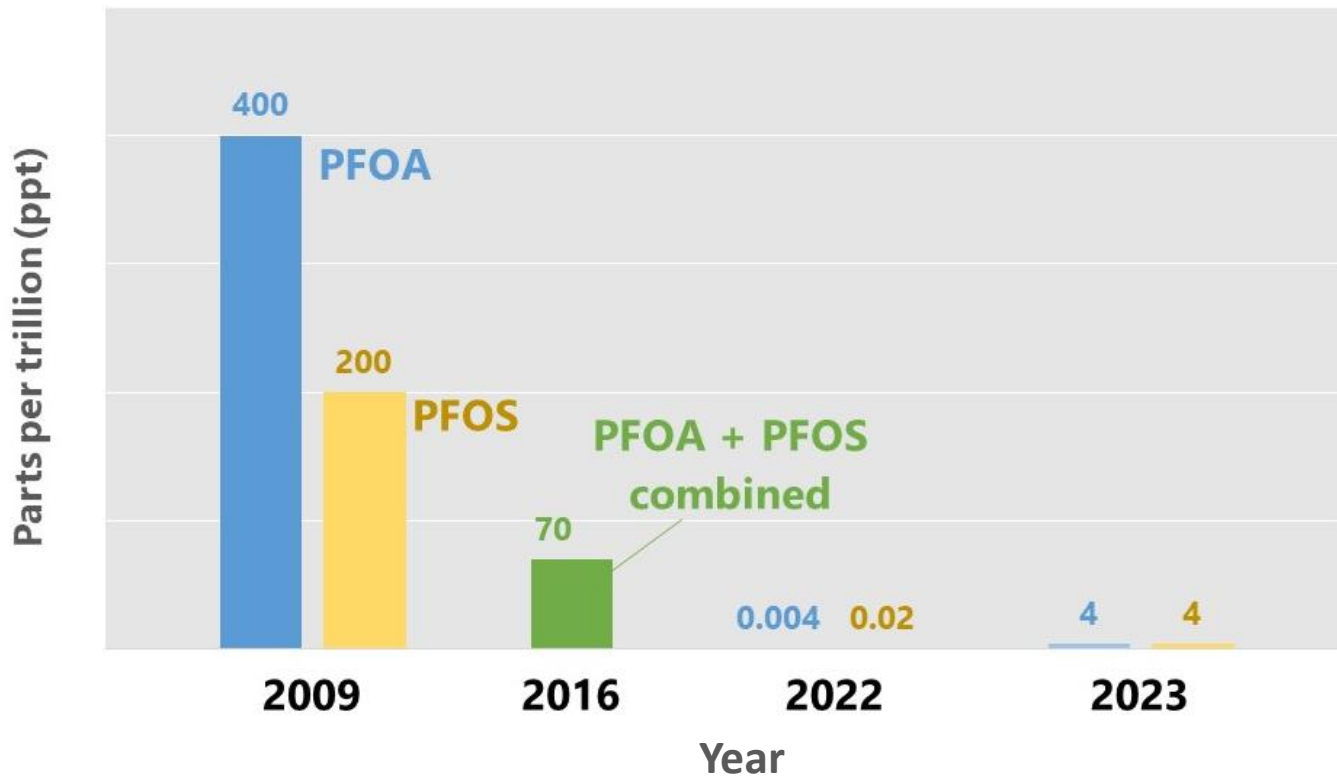


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# Timeline of PFAS guidelines and standards



# Changes in PFAS guidelines and standards over time



Year	PFOA	PFOS
2009	400 ng/L	200 ng/L
2016	70 ng/L (combined)	
2020*	12 ng/L*	15 ng/L*
2022	0.004 ng/L	0.02 ng/L
2023 (proposed)	4 ng/L	4 ng/L

\*NH maximum contaminant level (MCL)

Note: ng/L = parts per trillion (ppt)

# Proposed EPA MCLs compared to state levels

	PFOA	PFOS	PFNA	PFHxS	PFHpA	PFDA	Sum PFAS	PFBA	PFHxA	PFBS	GenX (HPFO-DA)
<b>EPA (proposed)</b>	4	4	10*	9*						2,000*	10*
<b>CA</b>	10	40									
<b>CT</b>	70	70	70	70	70		70 (5)				
<b>MA</b>	20	20	20	20	20	20	20 (6)			2,000	
<b>ME</b>	20	20	20	20	20	20	20 (6)				
<b>MI</b>	8	16	6	51					400,000	420	370
<b>MN</b>	35	15		47				7,000		2,000	
<b>NH</b>	12	15	11	18							
<b>NJ</b>	14	13	13								
<b>NY</b>	10	10									
<b>NC</b>											140
<b>OH</b>	70	70	21	140			70 (2)			140,000	700
<b>PA</b>	18	14									
<b>VT</b>	20	20	20	20	20		20 (5)				
<b>WA</b>	10	15	9	65						1,300	

# A note on guidelines versus standards

## Guidelines

- ✓ Examples:
  - ✓ Health advisory level (HAL)
  - ✓ Maximum contaminant level goals (MCLGs)
- ✓ Based only on health effects data
- ✓ Does not specify routine monitoring
- ✓ Not enforceable

## Standards

- ✓ Example:
  - ✓ Maximum contaminant level (MCL)
- ✓ Also consider feasibility, costs vs benefits
- ✓ Requires routine monitoring by public water supplies
- ✓ Enforceable

# EPA 2023 proposed levels for PFOA & PFOS

Compound	Proposed MCLG	Proposed MCL (enforceable levels)
PFOA	Zero	4.0 parts per trillion (also expressed as ng/L)
PFOS	Zero	4.0 ppt

- Based on health alone, EPA's conclusion was that PFOA & PFOS standards should be zero (maximum contaminant level goal, or MCLG)
- Based on minimum reporting levels labs can achieve, EPA concluded PFOA & PFOS maximum contaminant levels (MCLs) couldn't be less than 4 ng/L
  - MCL (standard) considers health *and* feasibility

**But wait...**  
**there's more!**

# EPA 2023 proposed levels for 4 additional PFAS

Compound	Proposed MCLG	Proposed MCL (enforceable levels)
PFOA	Zero	4.0 parts per trillion (also expressed as ng/L)
PFOS	Zero	4.0 ppt
PFNA		
PFHxS	1.0 (unitless)	1.0 (unitless)
PFBS	Hazard Index	Hazard Index
HFPO-DA (commonly referred to as GenX Chemicals)		

**What's a Hazard Index?**



# What's a hazard index?

- Considers multiple contaminants at the same time
- Allows for combining across different potencies
- Previously used in risk assessment, but first time used for drinking water standards

**Equation**

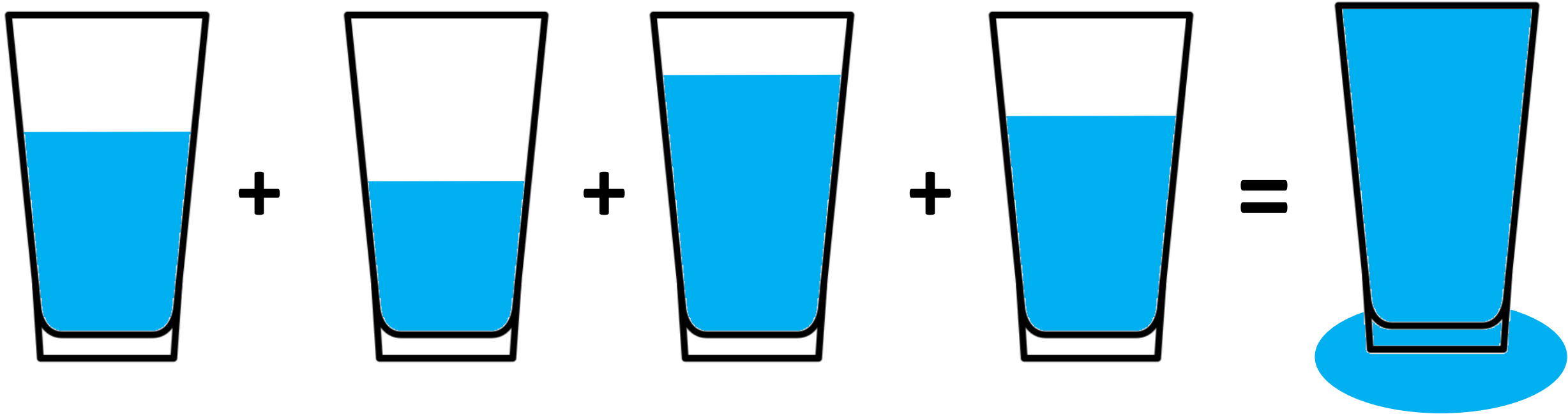
$$\text{Hazard Index} = \left( \frac{[\text{GenX}_{\text{water}}]}{[10 \text{ ppt}]} \right) + \left( \frac{[\text{PFBS}_{\text{water}}]}{[2000 \text{ ppt}]} \right) + \left( \frac{[\text{PFNA}_{\text{water}}]}{[10 \text{ ppt}]} \right) + \left( \frac{[\text{PFHxS}_{\text{water}}]}{[9.0 \text{ ppt}]} \right)$$



**FACT SHEET**

Understanding the PFAS National Primary Drinking Water Proposal  
Hazard Index

# A hazard index analogy



No individual PFAS exceeds its own standard...

...but together they exceed the upper limit

Developed by Dr. Laurel Schaider, Silent Spring Institute

# More about the 4 additional PFAS

	Type of PFAS	EPA Health Based Water Concentration (HBWC)	Risk assessment source
<b>PFHxS</b>	Long-chain	9 ng/L	ATSDR minimum risk level
<b>PFNA</b>	Long-chain	10 ng/L	
<b>GenX chemicals</b>	Perfluoroether	10 ng/L	EPA final health advisory (2022)
<b>PFBS</b>	Short-chain	2,000 ng/L	

# What happens next?

- 60-day comment period ended on May 30, 2023
  - >120,000 comments submitted to EPA
- Final decision expected by the end of 2023
- If enacted, there would be 3 years for water systems to come into compliance

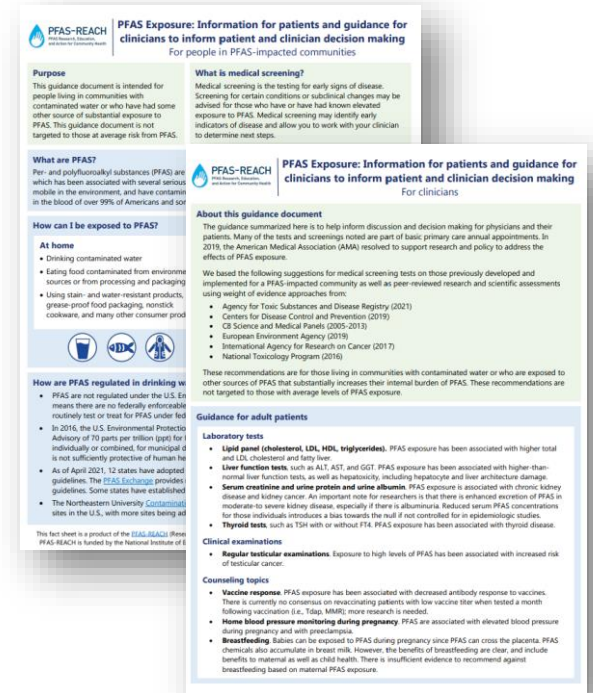
# PFAS Exchange online resources

[Fact sheets](#) on PFAS in drinking water, PFAS health effects, and reducing exposures

[Medical screening guidance documents](#) for people with high levels of exposure to PFAS

[Connecting Communities map](#) with information on PFAS contamination sites and community groups

[What's My Exposure tool](#) to help interpret your PFAS testing results for drinking water or blood and compare your results to others



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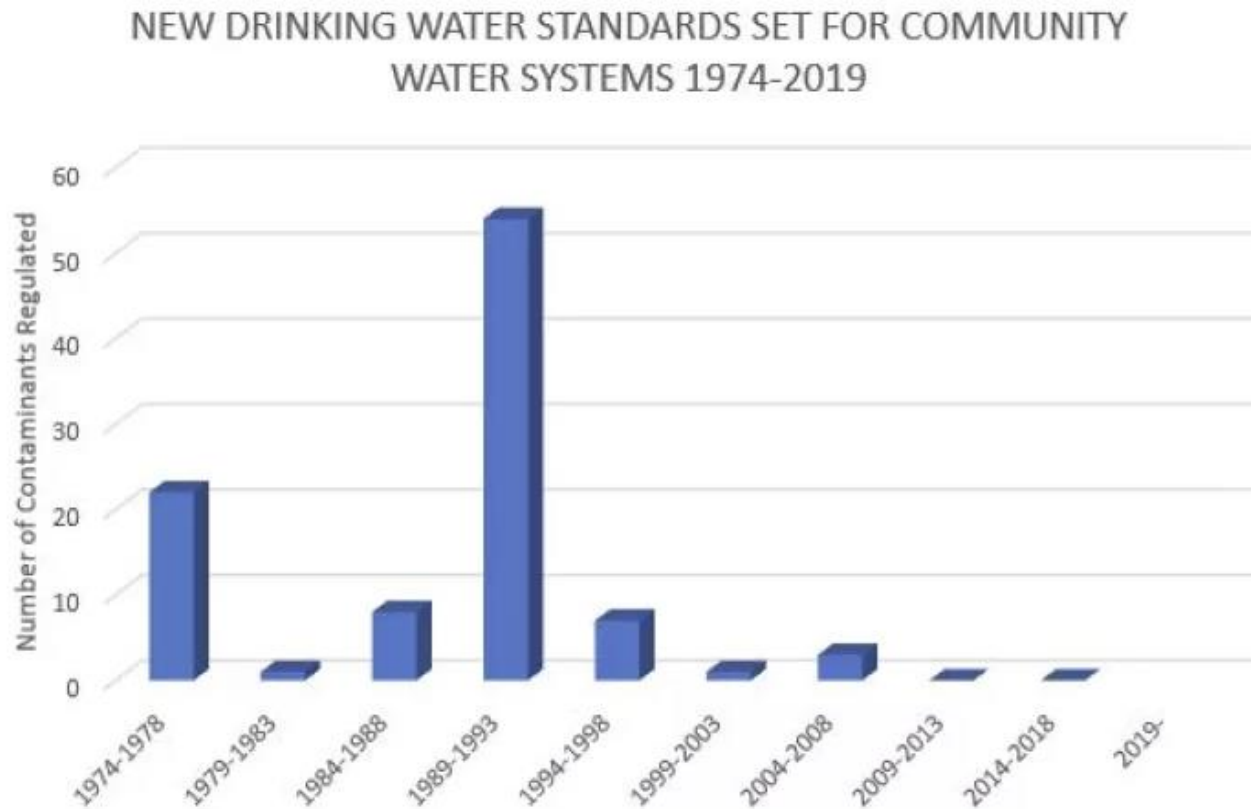


[www.pfas-exchange.org](http://www.pfas-exchange.org)



# **Additional slides**

# New federal drinking water standards



Erik Olson, NRDC

<https://www.nrdc.org/bio/erik-d-olson/broken-safe-drinking-water-act-wont-fix-pfas-crisis>

- After 1996 amendments to Safe Drinking Water Act, only a handful of new standards adopted
  - Updated standards for disinfection byproducts, radionuclides, and microbial contaminants
  - No new standards for unregulated contaminants

# Estimated implementation cost/benefit estimates

TABLE 66—ANNUALIZED QUANTIFIED NATIONAL COSTS AND BENEFITS, PROPOSED OPTION  
 [PFOA and PFOS MCLs of 4.0 ppt and HI of 1.0; Million \$2021]

	3% Discount rate			7% Discount rate		
	5th Percentile <sup>1</sup>	Expected value	95th Percentile <sup>1</sup>	5th Percentile <sup>1</sup>	Expected value	95th Percentile <sup>1</sup>
Total Annualized Rule Costs <sup>2 3 4</sup> .....	\$704.53	\$771.77	\$850.40	\$1,106.01	\$1,204.61	\$1,321.01
Total Annualized Rule Benefits <sup>4</sup> .....	659.91	1,232.98	1,991.51	477.69	908.11	1,462.43
Total Net Benefits .....	- 44.62	461.21	1,141.11	- 628.31	- 296.50	141.42



# Estimated implementation cost/benefit estimates

TABLE 71—SUMMARY OF QUANTIFIED AND NONQUANTIFIED BENEFITS AND COSTS

Category	Quantified	Non-quantified	Methods (economic analysis report section where analysis is detailed)
<b>Costs:</b>			
PWS treatment costs <sup>1</sup> .....	X		Section 5.3.1.
PWS sampling costs .....	X		Section 5.3.2.2.
PWS implementation and administration costs .....	X		Section 5.3.2.1.
Primacy agency rule implementation and administration costs .....	X		Section 5.3.2.
Hazardous waste disposal for treatment media .....		X	Section 5.6.
POU not in compliance forecast .....		X	Section 5.6.
<b>Benefits:</b>			
PFOA and PFOS birth weight effects .....	X		Section 6.4.
PFOA and PFOS cardiovascular effects .....	X		Section 6.5.
PFOA and PFOS RCC .....	X		Section 6.6.
Health effects associated with disinfection byproducts .....	X		Section 6.7.
Other PFOA and PFOS health effects .....		X	Section 6.2.2.2.
Health effects associated with HI compounds (HFPO–DA, PFNA, PFBS, PFHxS).		X	Section 6.2.
Health effects associated with other PFAS .....		X	Section 6.2.

**Notes:**

<sup>1</sup> Due to occurrence data limitations, EPA quantified the national treatment and monitoring costs associated with the HI for PFHxS only and has not quantified the national cost impacts associated with HI exceedances resulting from PFNA, PFBS, and HFPO–DA.

# Estimated implementation household cost estimates

TABLE 22—TOTAL ANNUAL COST PER HOUSEHOLD FOR CANDIDATE TECHNOLOGIES

System size (population served)	GAC	IX	RO/NF	POU RO/NF <sup>1</sup>
25–500 .....	\$395 to \$727 .....	\$376 to \$645 .....	\$3,711 to \$4,676 .....	\$317 to \$326.
501–3,300 .....	\$139 to \$332 .....	\$133 to \$235 .....	\$608 to \$1,169 .....	\$299 to \$300.
3,301–10,000 .....	\$136 to \$329 .....	\$121 to \$218 .....	\$326 to \$462 .....	not applicable. <sup>2</sup>

**Notes:**

<sup>1</sup> POU RO is not currently a compliance option because the regulatory options under consideration require treatment to concentrations below the current NSF/ANSI certification standard for POU device removal of PFAS. However, POU treatment is reasonably anticipated to become a compliance option for small systems in the future if NSF/ANSI or other independent third-party certification organizations develop a new certification standard that mirrors EPA’s proposed regulatory standard. Costs presented here reflect the costs of devices certified under the current testing standard, not a future standard, which may change dependent on future device design.

<sup>2</sup> EPA’s WBS model for POU treatment does not cover systems larger than 3,300 people (greater than 1 MGD design flow), because implementing and maintaining a large-scale POU program is likely to be impractical.

# Estimated implementation national cost estimates

TABLE 37—NATIONAL ANNUALIZED COSTS, PROPOSED OPTION  
[PFOA and PFOS MCLs of 4.0 ppt and HI of 1.0; million \$2021]

	3% Discount rate			7% Discount rate		
	5th Percentile <sup>1</sup>	Expected value	95th Percentile <sup>1</sup>	5th Percentile <sup>1</sup>	Expected value	95th Percentile <sup>1</sup>
Annualized PWS Sampling Costs .....	\$76.12	\$90.32	\$106.95	\$78.54	\$92.97	\$109.19
Annualized PWS Implementation and Administration Costs .....	1.71	1.71	1.71	3.52	3.52	3.52
Annualized PWS Treatment Costs .....	617.05	676.56	762.05	1,008.88	1,105.66	1,232.92
Total Annualized PWS Costs <sup>2 3 4</sup> .....	698.90	768.57	861.78	1,096.29	1,202.09	1,341.19
Primacy Agency Rule Implementation and Administration Cost .....	6.86	7.96	9.18	7.67	8.76	10.04
Total Annualized Rule Costs <sup>2 3 4</sup> .....	705.85	776.54	871.50	1,102.71	1,210.91	1,352.71

**Notes:**

Detail may not add exactly to total due to independent rounding. Percentiles cannot be summed because cost components are not perfectly correlated.

<sup>1</sup> The 5th and 95th percentile range is based on modeled variability and uncertainty described in section XIII.I of this preamble and Table 71. This range does not include the uncertainty described in Table 41.

<sup>2</sup> Total quantified national cost values do not include the incremental treatment costs associated with the co-occurrence of HFPO-DA, PFBS, and PFNA at systems required to treat for PFOA, PFOS, and PFHxS. The total quantified national cost values do not include treatment costs for systems that would be required to treat based on HI exceedances apart from systems required to treat because of PFHxS occurrence alone. See Appendix N, Section 3 of the Economic Analysis (USEPA, 2023i) for additional detail on co-occurrence incremental treatment costs and additional treatment costs at systems with HI exceedances.

<sup>3</sup> PFAS-contaminated wastes are not considered hazardous wastes at this time and therefore total costs reported in this table do not include costs associated with hazardous waste disposal of spent filtration materials. To address stakeholder concerns about potential costs for disposing PFAS-contaminated wastes as hazardous should they be regulated as such in the future, EPA conducted a sensitivity analysis with an assumption of hazardous waste disposal for illustrative purposes only. See Appendix N, Section 2 of the Economic Analysis (USEPA, 2023i) for additional detail.

<sup>4</sup> See Table 70 for a list of the nonquantifiable costs, and the potential direction of impact these costs would have on the estimated monetized total annualized costs in this table.

# Estimated implementation national cost estimates

TABLE 27—COST ELEMENTS INCLUDED IN ALL WBS MODELS

Cost category	Components included
Direct Capital Costs .....	<ul style="list-style-type: none"> <li>• Technology-specific equipment (<i>e.g.</i>, vessels, basins, pumps, treatment media, piping, valves).</li> <li>• Instrumentation and system controls.</li> </ul>
Add-on Costs .....	<ul style="list-style-type: none"> <li>• Buildings.</li> <li>• Residuals management equipment.</li> <li>• Land.</li> <li>• Permits.</li> <li>• Pilot testing.</li> </ul>
Indirect Capital Costs .....	<ul style="list-style-type: none"> <li>• Mobilization and demobilization.</li> <li>• Architectural fees for treatment building.</li> <li>• Equipment delivery, installation, and contractor's overhead and profit.</li> <li>• Sitework.</li> <li>• Yard piping.</li> <li>• Geotechnical.</li> <li>• Standby power.</li> <li>• Electrical infrastructure.</li> <li>• Process engineering.</li> <li>• Contingency.</li> <li>• Miscellaneous allowance.</li> <li>• Legal, fiscal, and administrative.</li> <li>• Sales tax.</li> <li>• Financing during construction.</li> <li>• Construction management.</li> </ul>
O&M Costs: Technology-specific.	<ul style="list-style-type: none"> <li>• Operator labor for technology-specific tasks (<i>e.g.</i>, managing backwash and media replacement).</li> <li>• Materials for O&amp;M of technology-specific equipment.</li> <li>• Technology-specific chemical usage.</li> <li>• Replacement of technology-specific equipment that occurs on an annual basis (<i>e.g.</i>, treatment media).</li> <li>• Energy for operation of technology-specific equipment (<i>e.g.</i>, mixers).</li> </ul>
O&M Costs: Labor .....	<ul style="list-style-type: none"> <li>• Operator labor for O&amp;M of process equipment.</li> <li>• Operator labor for building maintenance.</li> <li>• Managerial and clerical labor.</li> </ul>
O&M Costs: Materials .....	<ul style="list-style-type: none"> <li>• Materials for maintenance of booster or influent pumps.</li> <li>• Materials for building maintenance.</li> </ul>
O&M Costs: Energy .....	<ul style="list-style-type: none"> <li>• Energy for operation of booster or influent pumps.</li> <li>• Energy for lighting, ventilation, cooling, and heating.</li> </ul>
O&M Costs: Residuals ...	<ul style="list-style-type: none"> <li>• Residuals management operator labor, materials, and energy.</li> <li>• Residuals disposal and discharge costs.</li> </ul>

# Estimated implementation national benefit estimates

TABLE 46—NATIONAL BIRTH WEIGHT BENEFITS, PROPOSED OPTION  
[PFOA and PFOS MCLs of 4.0 ppt and HI of 1.0]  
[Million \$2021]

Benefits category	3% Discount rate			7% Discount rate		
	5th Percentile <sup>1</sup>	Expected benefits	95th Percentile <sup>1</sup>	5th Percentile <sup>1</sup>	Expected benefits	95th Percentile <sup>1</sup>
Increase in Birth Weight (millions of grams) .....	114.2	209.3	329.7	114.2	209.3	329.7
Number of Birth Weight-Related Deaths Avoided .....	676.8	1,232.7	1,941.0	676.8	1,232.7	1,941.0
Total Annualized Birth Weight Benefits (Million \$2021) <sup>2</sup> .....	\$97.36	\$177.66	\$279.49	\$74.62	\$139.01	\$219.43

TABLE 51—NATIONAL CVD BENEFITS, PROPOSED OPTION  
[PFOA and PFOS MCLs of 4.0 ppt and HI of 1.0]  
[Million \$2021]

Benefits category	3% Discount rate			7% Discount rate		
	5th Percentile <sup>1</sup>	Expected benefits	95th Percentile <sup>1</sup>	5th Percentile <sup>1</sup>	Expected benefits	95th Percentile <sup>1</sup>
Number of Non-Fatal MI Cases Avoided .....	1,251.5	6,081.0	11,738.7	1,251.5	6,081.0	11,738.7
Number of Non-Fatal IS Cases Avoided .....	1,814.0	8,870.8	17,388.5	1,814.0	8,870.8	17,388.5
Number of CVD Deaths Avoided .....	753.6	3,584.6	7,030.9	753.6	3,584.6	7,030.9
Total Annualized CVD Benefits (Million \$2021) <sup>2</sup> .....	\$111.78	\$533.48	\$1,051.00	\$85.94	\$421.10	\$822.88

TABLE 56—NATIONAL RCC BENEFITS, PROPOSED OPTION  
[PFOA and PFOS MCLs of 4.0 ppt and HI of 1.0]  
[Million \$2021]

Benefits category	3% Discount rate			7% Discount rate		
	5th Percentile <sup>1</sup>	Expected benefits	95th Percentile <sup>1</sup>	5th Percentile <sup>1</sup>	Expected benefits	95th Percentile <sup>1</sup>
Number of Non-Fatal RCC Cases Avoided .....	1,313.6	6,872.0	17,387.8	1,313.6	6,872.0	17,387.8
Number of RCC-Related Deaths Avoided .....	308.7	1,927.8	5,049.3	308.7	1,927.8	5,049.3
Total Annualized RCC Benefits (Million \$2021) <sup>2</sup> .....	\$54.23	\$300.56	\$758.03	\$45.36	\$217.37	\$515.89

TABLE 62—NATIONAL BLADDER CANCER BENEFITS, PROPOSED OPTION  
[PFOA and PFOS MCLs of 4.0 ppt and HI of 1.0]  
[Million \$2021]

Benefits category	3% Discount rate			7% Discount rate		
	5th Percentile <sup>1</sup>	Expected benefits	95th Percentile <sup>1</sup>	5th Percentile <sup>1</sup>	Expected benefits	95th Percentile <sup>1</sup>
Number of Non-Fatal Bladder Cancer Cases Avoided .....	4,079.1	5,238.6	6,475.3	4,079.1	5,238.6	6,475.3
Number of Bladder Cancer-Related Deaths Avoided .....	1,436.0	1,844.4	2,280.0	1,436.0	1,844.4	2,280.0
Total Annualized Bladder Cancer Benefits (Million \$2021) <sup>2</sup> ..	\$173.09	\$221.30	\$273.62	\$102.08	\$130.63	\$161.56

# Implementation procedures

## Question 10: If the rule is finalized, what will public water systems have to do?

In addition to establishing MCLs and MCLGs, the proposed regulation, if finalized, would require water systems to take the following steps:

- **Monitor.** EPA is proposing requirements for monitoring for the six PFAS that build upon EPA's long-established monitoring frameworks under which monitoring frequency depends on previous results. The proposal also includes flexibilities allowing systems to use some previously collected data to satisfy initial monitoring requirements.
- **Notify consumers.** Public water systems would be required to notify the public if monitoring detects these PFAS at levels that exceed the proposed regulatory standards.
- **Treat to achieve the MCLs.** Public water systems would be required to take actions to reduce the levels of these PFAS in drinking water if they exceed the proposed regulatory standards. This could include removing these chemicals through various types of treatment or switching to an alternative water supply that meets the standard.

# Implications for state standards

**Question 19: My state (or Tribe or territory) currently has a different safety level for PFOS, PFOA, PFHxS, GenX Chemicals, PFNA, and PFBS than EPA's proposed values.**

**Why is this?**

Some states have established drinking water regulations or guidance values for some PFAS prior to this proposed rule and have led the way in monitoring for and limiting some of these chemicals. The NPDWR proposed by EPA, if finalized, will provide a nationwide, health protective level for these six PFAS in drinking water. The rule reflects regulatory development requirements under the Safe Drinking Water Act (SDWA), including EPA's analysis of the best available and most recent peer-reviewed science; available drinking water occurrence, treatment and analytical feasibility information; and consideration of costs and benefits.

At this time, communities and water systems should follow all applicable current state requirements, recognizing that EPA's proposed rule does not require water systems to take any action at this time. When the final NPDWR goes into effect, states will be required to have a standard that is no less strict than the NPDWR, as SDWA requires.

# Assistance for costs

## Question 21: What funding is available to support communities that are addressing PFAS contamination in drinking water?

The Bipartisan Infrastructure Law provides an unprecedented \$9 billion specifically to invest in communities with drinking water impacted by PFAS and other emerging contaminants. This includes \$4 billion to the Drinking Water State Revolving Fund (DWSRF) and \$5 billion through EPA's Emerging Contaminants in Small or Disadvantaged Communities Grant Program. States and communities can further leverage an additional nearly \$12 billion in the DWSRF dedicated to making drinking water safer, and billions more that the federal government has annually provided to fund DWSRF loans. These funds will help communities make important investments in solutions to remove PFAS from drinking water.

EPA will ensure that states, Tribes, and localities get their fair share of this federal water infrastructure investment – especially disadvantaged communities. More information about the Bipartisan Infrastructure Law and its emerging contaminant funding can be found at <https://www.epa.gov/infrastructure>.



# Potential for additional PFAS standards

## **Question 22: Will EPA develop drinking water regulations for other PFAS?**

At this time, EPA is not proposing drinking water regulations for PFAS chemicals other than PFOS, PFOA, PFHxS, GenX Chemicals, PFNA, and PFBS. The Agency and other research organizations are actively working to better understand potential health risks for other PFAS in drinking water. EPA is gathering information from public water systems across the nation on the occurrence of 29 PFAS under the Fifth Unregulated Contaminant Monitoring Rule between 2023 and 2025. Using this and other occurrence information, as well as evolving research on PFAS health effects, treatment technologies, and other available scientific and technical information, EPA will evaluate if other PFAS should be regulated in the future.

The drinking water treatment technologies that EPA has found to effectively reduce the six PFAS that the Agency is proposing to regulate are also expected to reduce the levels of other PFAS.

# EPA response to comments – what to expect

## **Response to Comments for the Clean Water Rule: Definition of "Waters of the United States"**

The Response to Comments Document, together with the preamble to the final Clean Water Rule, presents the responses of the EPA and the Department of the Army to the more than one million public comments received on the proposed rule (79 FR 22188 (Apr. 21, 2014)). The agencies have addressed all significant issues raised in the public comments.

Because of the volume of comments received, the Response to Comment Document is presented in a number of different topical compendiums. Each of these compendiums is available below. The compendiums were numbered for convenience based on the database used to track incoming comments, and no particular meaning is intended by the numbering system. In total, all of these compendiums represent the agencies' formal Response to Comment Document.