Final PFAS National Primary Drinking Water Regulation

> “Every American deserves to be able to turn on their water tap or faucet and be able to drink clean water.
>
> **- Joseph Biden**, President of the United States

Overview

> “PFAS pollution in drinking water has plagued communities across this country for too long. Today, I am proud to finalize this critical piece of that Roadmap, and in doing so, save thousands of lives and help ensure our children grow up healthier.
>
> - EPA Administrator **Michael Regan**

Key Messages

- PFAS exposure over a long period of time can cause cancer and other illnesses that decrease quality of life or result in death.
- PFAS exposure during critical life stages such as pregnancy or early childhood can also result in adverse health impacts.
- PFAS pollution can have disproportionate impacts on small, disadvantaged, and rural communities already facing environmental contamination.
- As the lead federal agency responsible to protect drinking water, EPA is using the best available science on PFAS to set national standards.

Key Messages

- The Biden-Harris Administration has finalized the first-ever national drinking water standard for per- and polyfluoroalkyl substances (PFAS)
- EPA is issuing this rule after reviewing extensive research and science on how PFAS affects public health, while engaging with the water sector and with state regulators to ensure effective implementation.
- EPA also considered 120,000 comments on the proposed rule from a wide variety of stakeholders.
- The final rule will reduce PFAS exposure for approximately 100 million people, prevent thousands of deaths, and reduce tens of thousands of serious illnesses.

Summary of Final Rule

> “EPA is taking a signature step to protect public health by establishing legally enforceable levels for several PFAS known to occur individually and as a mixture in drinking water.

- **Jennifer McLain,** Director
Office of Ground Water and Drinking Water

Regulatory Levels: Maximum Contaminant Level Goals

- EPA is taking a signature step to protect public health by establishing levels for several PFAS known to occur individually and/or in a mixture in drinking water.
- For PFOA and PFOS, EPA is setting a non-enforceable health-based goal of **zero**. This is called a Maximum Contaminant Level Goal (MCLG).
  - This reflects the latest science showing that there is no level of exposure to these two PFAS without risk of health impacts.
- For PFNA, PFHxS, and HFPO-DA (GenX Chemicals), EPA is setting MCLGs of **10 parts per trillion**.

Regulatory Levels: Maximum Contaminant Levels

- EPA is setting enforceable Maximum Contaminant Levels (MCLs) at **4.0 parts per trillion** for PFOA and PFOS, individually.
  - This standard will reduce exposure from these PFAS in our drinking water to the lowest levels that are feasible for effective implementation.
- For PFNA, PFHxS, and HFPO-DA (GenX Chemicals), EPA is setting MCLs of **10 parts per trillion**.

Regulatory Levels: Hazard Index

- EPA is also regulating, through a Hazard Index (HI), mixtures of four PFAS—**PFHxS, PFNA, HFPO-DA,** and **PFBS**.
- Decades of research show some chemicals, including some PFAS, can combine in mixtures and have additive health effects, even if the individual chemicals are each present at lower levels.
- PFAS can often be found together and in varying combinations as mixtures.

Regulatory Levels: Hazard Index

- The Hazard Index is a long-established approach that the EPA regularly uses, for example in the Superfund program, to determine the health concerns associated with exposure to chemical mixtures.
- The Hazard Index is calculated by adding the ratio of the water sample concentration to a Health-Based Water Concentrations.

$$HI\ MCL = \left(\frac{[HFPO\text{–}DA_{water}]}{[10\ ppt]}\right) + \left(\frac{[PFBS_{water}]}{[2000\ ppt]}\right) + \left(\frac{[PFNA_{water}]}{[10\ ppt]}\right) + \left(\frac{[PFHxS_{water}]}{[10\ ppt]}\right) = 1$$

- Details provided in EPA Hazard Index Fact Sheet

Hazard Index MCL Calculation Examples

	HFPO-DA	PFBS	PFNA	PFHxS	Hazard Index	
• **Example 1**	$\left(\frac{[0\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ +	$\left(\frac{[200\ \text{ppt}]}{[2000\ \text{ppt}]}\right)$ +	$\left(\frac{[4\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ +	$\left(\frac{[4\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ =	**0.9**	No exceedance of final Hazard Index MCL
• **Example 2**	$\left(\frac{[5\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ +	$\left(\frac{[200\ \text{ppt}]}{[2000\ \text{ppt}]}\right)$ +	$\left(\frac{[6\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ +	$\left(\frac{[15\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ =	**3 (2.7 rounds to 3)**	Exceedance of final Hazard Index MCL (and exceedance of PFHxS MCL)
• **Example 3**	$\left(\frac{[14\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ +	$\left(\frac{[0\ \text{ppt}]}{[2000\ \text{ppt}]}\right)$ +	$\left(\frac{[0\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ +	$\left(\frac{[0\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ =	**1 (1.4 rounds to 1)**	No exceedance of final Hazard Index MCL (only one PFAS present)
• **Example 4**	$\left(\frac{[9\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ +	$\left(\frac{[100\ \text{ppt}]}{[2000\ \text{ppt}]}\right)$ +	$\left(\frac{[4\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ +	$\left(\frac{[3\ \text{ppt}]}{[10\ \text{ppt}]}\right)$ =	**2 (1.65 rounds to 2)**	Exceedance of final Hazard Index MCL (no individual MCL exceedances)

*MCL compliance is determined by running annual averages at the sampling point

Regulatory Levels: Summary

Chemical	Maximum Contaminant Level Goal (MCLG)	Maximum Contaminant Level (MCL)
PFOA	0	4.0 ppt
PFOS	0	4.0 ppt
PFHxS	10 ppt	10 ppt
HFPO-DA (GenX chemicals)	10 ppt	10 ppt
PFNA	10 ppt	10 ppt
Mixture of two or more: PFHxS, PFNA, HFPO-DA, and PFBS	Hazard Index of 1 (unitless)	Hazard Index of 1 (unitless)

*Compliance is determined by running annual averages at the sampling point

Implementation

> “Our responsibility through the Safe Drinking Water Act is to protect people’s drinking water, and we are taking action to reduce the threat of PFAS contamination.

- Eric Burneson, Director
Standards and Risk Management Division
Office of Ground Water and Drinking Water

Implementation

Under the rule requirements, public water systems must:

- Conduct initial and ongoing compliance monitoring for the regulated PFAS
- Implement solutions to reduce regulated PFAS in their drinking water if levels violate the MCLs
- Inform the public of the levels of regulated PFAS measured in their drinking water and if an MCL is exceeded

Implementation: Initial Monitoring Requirements

- Final rule requirements for community water systems and non-transient, non-community water systems for initial monitoring of regulated PFAS concentrations include:
  - Two or four samples collected at each entry point to the distribution system over a period of one year, dependent on system size and type; and/or
  - Use of recent, previously acquired PFAS drinking water data from the fifth Unregulated Contaminant Monitoring Rule (UCMR 5) or state-level drinking water occurrence data or other appropriate collection program.
- Initial monitoring results will determine initial compliance monitoring schedule for each individual entry point within the system.
- Initial monitoring (or demonstration of previously acquired data) must be completed in the three years following rule promulgation.

Implementation: Compliance Monitoring Requirements

- Requirements for compliance monitoring of regulated PFAS are based on the Standardized Monitoring Framework and include:
  - Reduced triennial monitoring for sampling locations with all sample results below the rule trigger levels based on initial monitoring results;
  - Default quarterly monitoring for sampling locations with any initial monitoring sample results that are at or exceed the rule trigger levels;
    - Rule trigger level: 1/2 of MCLs for regulated PFAS (i.e., 2.0 ppt for PFOA and PFOS, 5 ppt for PFHxS, PFNA, and HFPO-DA, and 0.5 (unitless) for Hazard Index)
  - Following one year of quarterly monitoring, annual compliance monitoring for sampling locations with four consecutive quarterly samples determined by the primacy agency to all be reliably and consistently below the MCLs.
  - If sampling location results remains reliably and consistently below the MCLs (even if at or above trigger levels), can continue monitoring annually and possibly reduce further to triennial monitoring if all sample results are consistently below trigger levels.
  - Sampling frequency is the same for all regulated PFAS.

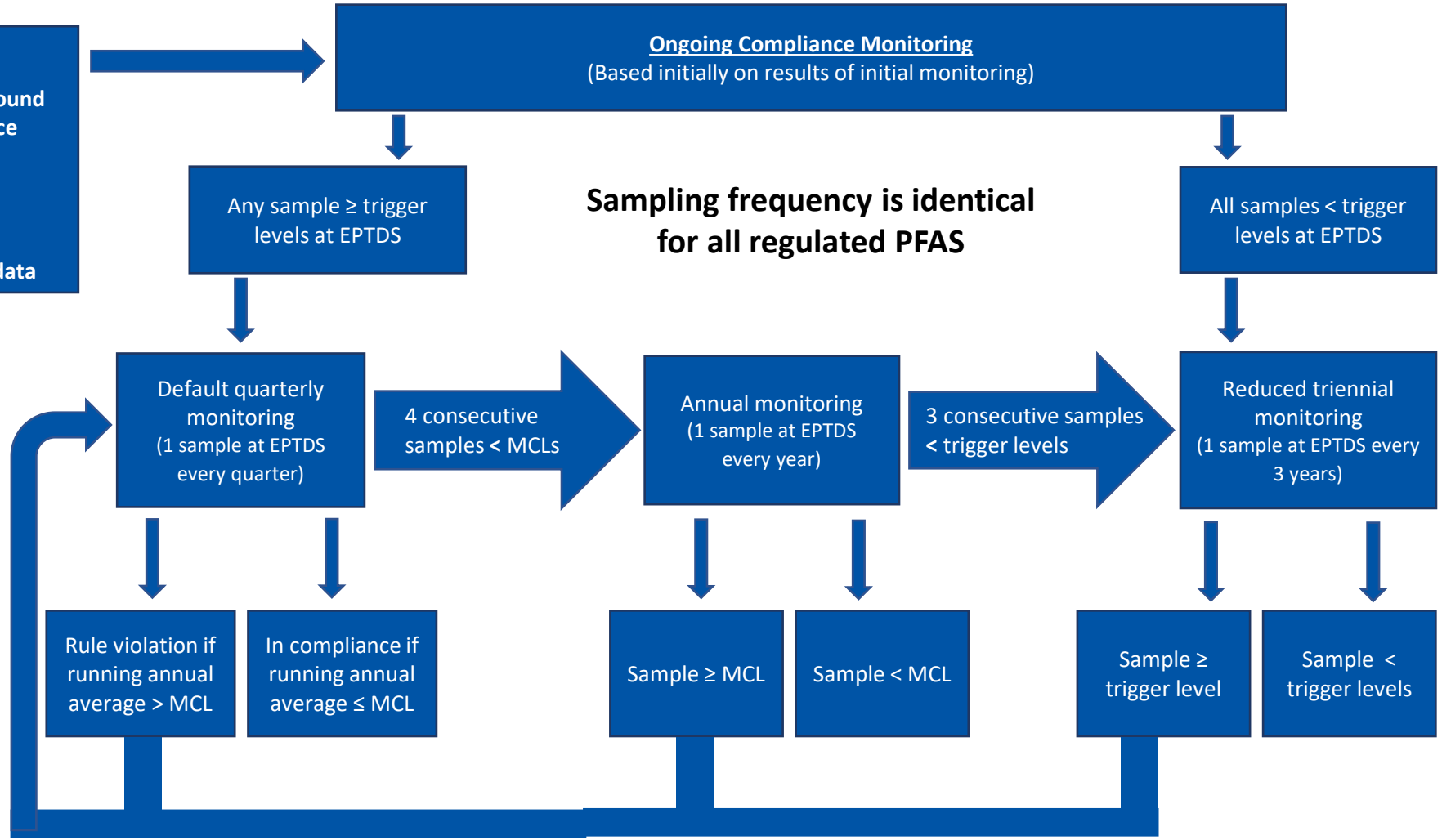
Implementation: Monitoring Requirements Summary

Initial Monitoring

- **Four quarterly samples within a 12-month period for ground water systems serving greater than 10,000 and all surface water systems**
- **Two semi-annual samples within a 12-month period for ground water systems serving 10,000 or fewer**

OR

- **Use of recent, existing PFAS drinking water occurrence data**



Rule Trigger Levels (1/2 MCLs)

- **PFOA and PFOS = 2.0 ppt**
- **PFHxS, HFPO-DA, and PFNA = 5 ppt**
- **Hazard Index = 0.5 (unitless)**

*** EPTDS = Entry point to the distribution system**

Implementation: MCL Compliance Determination

- The compliance determination is done through a running annual average (RAA) calculation for systems conducting quarterly monitoring.
- Systems are out of compliance with an NPDWR if the RAA of quarterly samples at a sampling point exceeds a respective MCL (PFOA, PFOS, PFHxS, PFNA, HFPO-DA, and/or Hazard Index).
- PQLs are factored into the compliance calculation. If a sample result is less than the PQL for the monitored PFAS, zero will be used to calculate the RAA.
  - For example, if a system quarterly sampling results for PFOA that are 2.0, 2.0, 5.0, and 2.5 ppt for their last four quarters at a sample location, the values used to calculate the RAA for that sample location would be 0, 0, 5.0, and 0 ppt with a resulting PFOA RAA of 1.3 ppt (i.e., (0+0+5.0+0) / 4 = 1.25 ppt (rounded to 1.3 ppt)).
- A system will not be considered in violation of an MCL until it has completed one year of quarterly sampling, unless a sampling result will cause the RAA to exceed an MCL regardless of any future monitoring (e.g., the analytical result is greater than four times the MCL).

Implementation: Communication with the Public

- PWSs will be required to issue public notification to customers if PFAS levels in drinking water violate an MCL.
- For all PFAS MCL violations, the final rule will require public notification to be provided within 30 days of an MCL violation.
- The final rule requires annual public notification for violations of monitoring and testing procedures.
- Community water systems are also required to include PFAS information in the Consumer Confidence Report distributed to their customers including:
  - The level of PFAS that is measured in the drinking water.
  - The potential health effects of any PFAS detected in violation of an EPA MCL.

Implementation: Timeframes

Within **three years** of rule promulgation (2024 – 2027):

- Initial monitoring must be complete

Starting **three years** following rule promulgation (starting 2027- 2029):

- Results of initial monitoring must be included in Consumer Confidence Reports
- Regular monitoring for compliance must begin, and results of compliance monitoring must be included in Consumer Confidence Reports
- Public notification for monitoring and testing violations

Starting **five years** following rule promulgation (starting 2029)

- Comply with all MCLs
- Public notification for MCL violations

Implementation: Reducing PFAS in Drinking Water

- EPA's final rule does not dictate how water systems remove these contaminants. The rule is flexible, allowing systems to determine the best solutions for their community.
- Drinking water utilities can choose from multiple proven treatment options.
- Water treatment technologies exist to remove PFAS chemicals from drinking water including granular activated carbon, reverse osmosis, and ion exchange systems.
- In some cases, systems can close contaminated wells or obtain new uncontaminated source of drinking water.

Implementation: Treatment Residuals and Disposal

- Treatment technologies that remove PFAS from drinking water produce PFAS containing materials that eventually must be disposed of when they are exhausted or are not reactivated or regenerated.
- The current practice for many PFAS drinking water treatment systems is to dispose of treatment residuals as non-hazardous waste. Typically, GAC is reactivated, anion exchange media is landfilled or incinerated, and reverse osmosis/nanofiltration brine is treated prior discharge to surface water or sanitary sewers in accordance with pretreatment or permit requirements.
- Concurrent with this drinking water rule, EPA released an updated version of the *PFAS Destruction and Disposal Guidance* to include new information about disposal of residuals.
- EPA recently announced a final rule to designated PFOA and PFOS as hazardous substances under CERCLA. This designation of PFOA and PFOS as CERCLA hazardous substances does not require waste to be treated in any particular fashion, nor disposed of at any specific type of landfill. The designation also does not restrict, change, or recommend any specific activity or type of waste at landfills.
- EPA has prioritized research on PFAS disposal options in different environmental media and best management practices.

Costs and Benefits

> “On a personal level, every life saved and every life that’s improved as a result of this Rule is priceless.
>
> - **Bruno Pigott**, EPA Acting Assistant Administrator for Water

Costs and Benefits

- By reducing exposure to PFAS, this final rule will:
  - Save **thousands of lives.**
  - Prevent **tens of thousands of serious illnesses**, including cancers, liver disease, heart attacks, and strokes.
  - Reduce immune system impacts and developmental impacts to pregnant people and babies.
- The benefits are quantified by considering the costs of illness such as lost wages, medical bills, and the value of every life lost.
- The quantifiable health benefits of this rule are estimated to be **$1.5 billion** annually.
- There are also many other health impacts that will be avoided which EPA does not have data to quantify.

Costs and Benefits

- EPA estimates that between about 6% and 10% of the 66,000 public drinking water systems subject to this rule may have to take action to reduce PFAS to meet these new standards.
- Compliance with this rule is estimated to cost approximately $1.5 billion annually.
- These costs include water system monitoring, communicating with customers, and if necessary, obtaining new or additional sources of water or installing and maintaining treatment technologies to reduce levels of the six PFAS in drinking water.
- EPA considered all available information and analyses for costs and benefits, quantifiable and non-quantifiable, of this rule and determined that the **benefits justify the costs**.

Costs and Benefits (see fact sheet for details)

	How Much?	What From?	The Potential Impact
Costs	$1.5 Billion per year	Monitoring, communicating with customers, and if necessary, obtaining new or additional sources of water or installing and maintaining treatment technologies.	States, Tribes, and territories with primacy will have increased oversight and administrative costs. **66,000 regulated water systems** will have to conduct monitoring and notifications. **4,100 – 6,700 water systems** may have to take action to reduce levels of PFAS.
	Non-quantified*	Costs for some systems to comply with the Hazard Index, HFPO-DA, and PFNA MCLs.	
Benefits	$1.5 Billion per year	The rule results in fewer cancers, lower incidence of heart attacks and strokes, and fewer birth weight-related deaths. Actions taken to implement the rule may also lead to associated health benefits from reductions in other PFAS and unregulated disinfection byproducts. Benefits will prevent over **9,600 deaths and reduce approximately 30,000 serious illnesses.**	**83 – 105 million people** will have improved drinking water as a result of lower levels of PFAS
	Non-quantified*	Increased ability to fight disease, reductions in thyroid disease and impacts to human hormone systems, reductions in liver disease, and reductions in negative reproductive effects such as decreased fertility.	

***Non-quantified benefits and costs are those that EPA could not assign a specific dollar value to as part of its national level quantified analysis, but it doesn't mean their benefits or costs are less important than those with numerical values.**

Funding & Technical Assistance

> We know that PFAS pollution can have a disproportionate impact on small, disadvantaged, and rural communities, and there is federal funding available specifically for these water systems.

- Yu-Ting Guilaran, Deputy Office Director,
Office of Ground Water and Drinking Water

PFAS Funding and Technical Assistance

- PFAS contamination can have a disproportionate impact on small, disadvantaged, and rural communities, and there is federal funding available specifically for these water systems.
- The Bipartisan Infrastructure Law (BIL) dedicates $9 billion specifically to invest in communities with drinking water impacted by PFAS and other emerging contaminants. $1B of these funds can be used to help private well owners.
- An additional $12 billion in BIL funding is available for general drinking water improvements.

For more: https://www.epa.gov/water-infrastructure

PFAS Funding and Technical Assistance

- EPA collaborates with state, Tribes, territories, community partners, and other key stakeholders to implement Water Technical Assistance (WaterTA) efforts and the end result is more communities with applications for federal funding, quality water infrastructure, and reliable water services.
- EPA's water technical assistance program is ensuring that disadvantaged communities can access federal funding.
- EPA's free WaterTA supports communities to identify water challenges, develop plans, build technical, managerial and financial capacity, and develop application materials to access water infrastructure funding.

For more: https://www.epa.gov/water-infrastructure/water-technical-assistance-programs

PFAS Strategic Roadmap

> The Biden-Harris Administration is committed to utilizing science and holding polluters accountable to address and prevent PFAS contamination.

- **White House Fact Sheet:** Biden-Harris Administration Takes New Action to Protect Communities from PFAS Pollution.

EPA's Commitment to Address PFAS Contamination

- The Agency released its PFAS Strategic Roadmap in October 2021 and established the agency's three overarching goals:
  - Restricting PFAS from entering the environment in the first place.
  - Remediating—or cleaning up—PFAS contamination where it is found.
  - Researching PFAS to strategically address public health and environmental risks.
- Since 2021, the agency has taken many actions to strengthen public health protections and address PFAS in the environment.
- The agency's final PFAS drinking water regulation is a cornerstone of this holistic approach.

Resources

> “EPA is working to help protect communities from PFAS contamination.

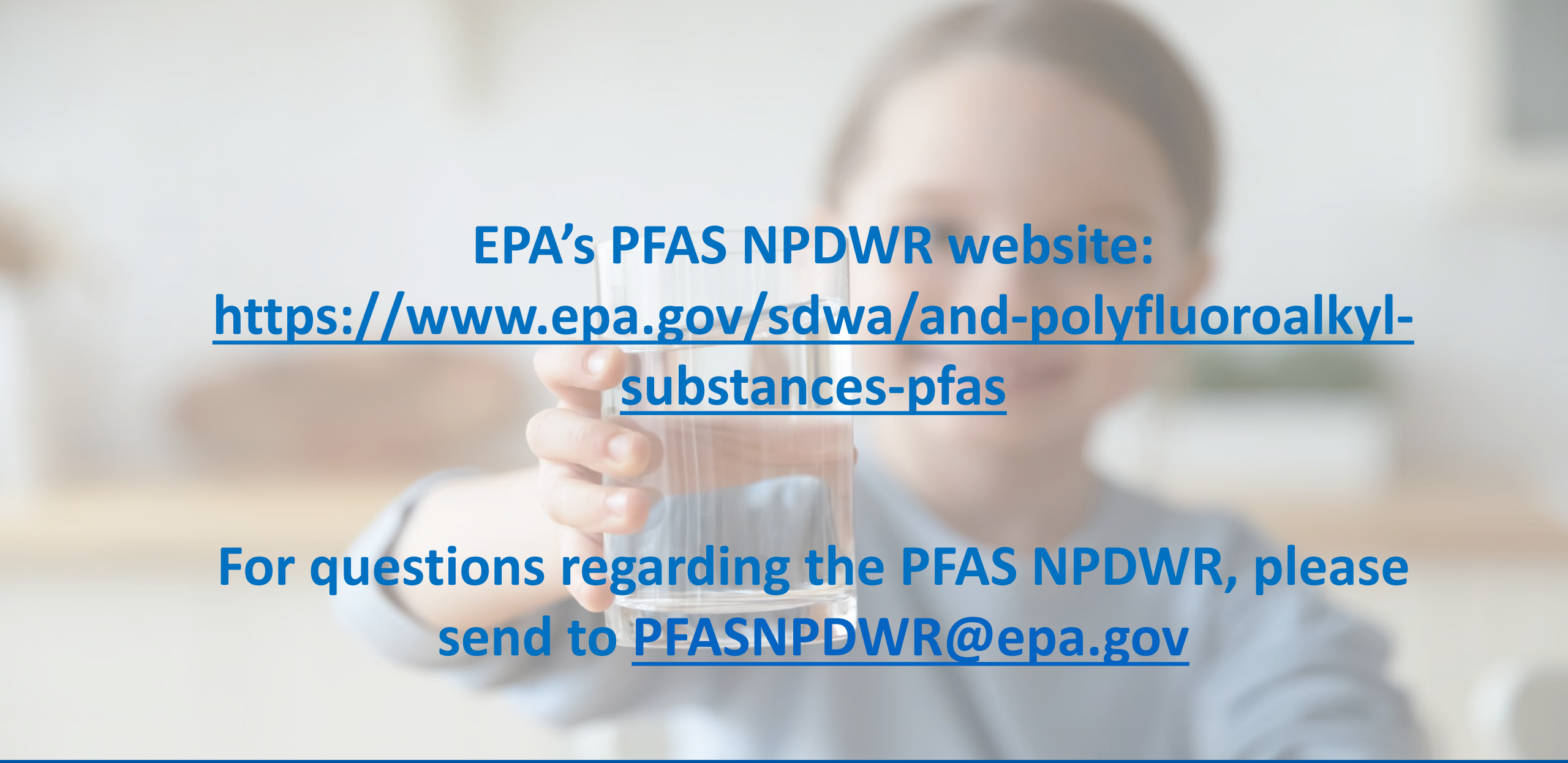
- **Ryan Albert, Branch Chief**
Risk Reduction Branch, Office of Ground Water and Drinking Water

Resources

Materials

- Webinar Presentations and Recordings
- General Q&As
- PFAS NDPWR Fact Sheet
- Fact Sheet: Water Filters
- Fact Sheet: What are the Benefits and Costs of the Rule?
- Fact Sheet: Understanding the Hazard Index
- Fact Sheet: Small Drinking Water Systems
- Fact Sheet: PFAS Drinking Water Treatment Technologies
- Fact Sheet PFAS NPDWR Monitoring Requirements
- Fact Sheet: Comparison of Between EPA"s Proposed and Final PFAS NPDWR
- Detailed Q&As for Primacy Agencies and Water Systems
- PFAS Communications Toolkit (videos, social media, infographics)

Materials available on https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas



EPA's PFAS NPDWR website: https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas

For questions regarding the PFAS NPDWR, please send to PFASNPDWR@epa.gov