



Indiana Water Summit

August 11, 2023

Matt Prater
Drinking Water Branch Chief
Office of Water Quality
IDEM



Per- and Polyfluoroalkyl Substances (PFAS)

- A class of man-made chemicals found in many common consumer products
- Chains of carbon (C) atoms surrounded by fluorine (F) atoms
- Water-repellent (hydrophobic)
- Stable C-F bond that is very difficult to break (“forever chemical”)
- Some PFAS include oxygen, hydrogen, sulfur and/or nitrogen atoms, creating a polar end



PFAS Consumer Uses

- Stain repellents (carpets, upholstery, clothing)
- Food containers (pizza boxes, fast food wrappers)
- Cookware
- Polishes, waxes, paints
- Cleaning products



PFAS and Human Health

- PFAS has been found in the blood of 97% of all Americans
- PFAS accumulate in fatty tissues and can pass from mother to child through breastmilk
- Concentrations of PFOS and PFOA in blood has been declining due to their removal from consumer products in the 2000s
- PFAS exposure can lead to harmful health effects including:
 - Increased risk of kidney or testicular cancer
 - Changes in liver enzymes
 - Increased cholesterol levels
 - Decrease in infant birth weigh
 - Decrease in vaccine response in children
 - Increased risk of high blood pressure in pregnant women

<https://www.niehs.nih.gov/health/topics/agents/pfc/index.cfm>

<https://www.atsdr.cdc.gov/pfas/health-effects/index.html>



Regulation of PFAS in drinking water

- EPA has been moving towards developing a National Primary Drinking Water Regulation (MCL) for some PFAS compounds
- In 2016, health advisory levels (HALs) were issued for PFOS and PFOA at 70 ppt (combined)
 - HALs are non-enforceable and non-regulatory



Regulation of PFAS in drinking water

- In June 2022, EPA issued updated interim HALs for PFOS (0.02 ppt) and PFOA (0.004 ppt)
 - Below the detection level, indicating that some negative health effects may occur with concentrations that are near zero and below the ability to detect at this time.
- Final HALs were also issued for PFBS (2000 ppt) and “GenX” (10 ppt)



Regulation of PFAS in drinking water

- In March 2023, EPA announced the proposed National Primary Drinking Water Regulation (NPDWR) for six PFAS compounds
- Proposed MCL for:
 - PFOA (4.0 ppt)
 - PFOS (4.0 ppt)
- Hazard Index Calculation for:
 - PFNA
 - HFPO-DA (“Gen X”)
 - PFHxS
 - PFBS



EPA's Proposed Action for the PFAS NPDWR

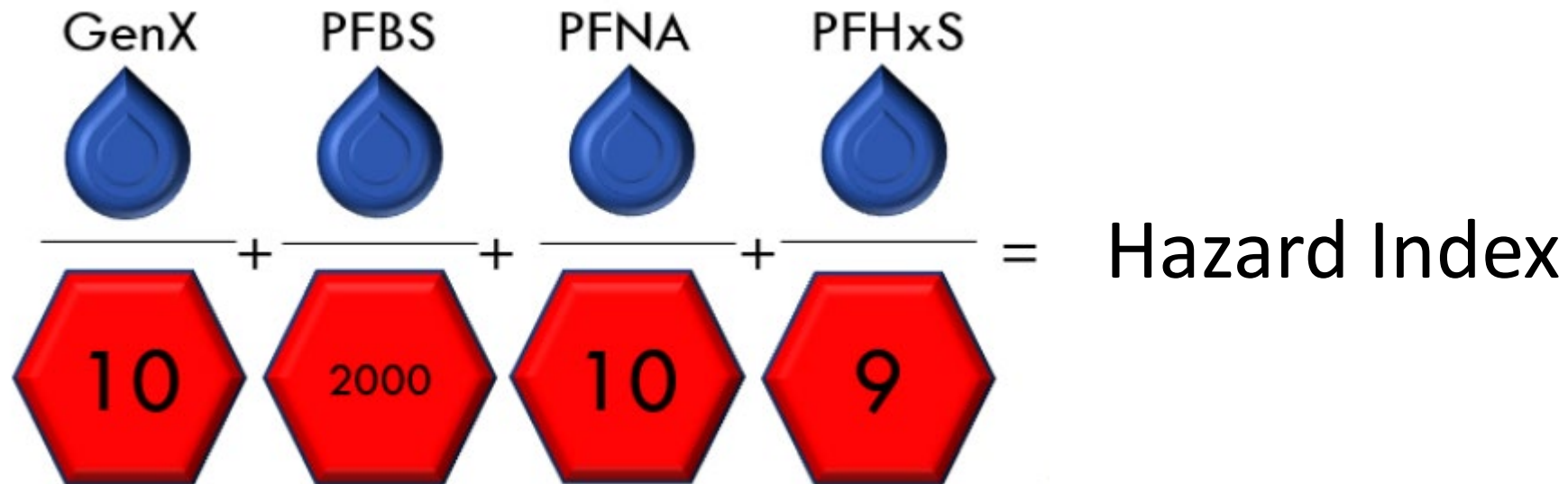
Compound	Proposed MCLG	Proposed MCL (enforceable levels)
PFOA	zero	4.0 ppt*
PFOS	zero	4.0 ppt*
PFNA		
PFHxS	1.0 (unitless)	1.0 (unitless)
PFBS	Hazard Index	Hazard Index
HFPO-DA (commonly referred to as GenX Chemicals)		

The Hazard Index is a tool used to evaluate potential health risks from exposure to chemical mixtures.

*ppt = parts per trillion (also expressed as ng/L)

Regulation of PFAS in drinking water

- What is a Hazard Index?
 - The Hazard Index is made up of a sum of fractions. Each fraction compares the level of each PFAS measured in the water to the level determined not to cause health effects.


$$\frac{\text{GenX}}{10} + \frac{\text{PFBS}}{2000} + \frac{\text{PFNA}}{10} + \frac{\text{PFHxS}}{9} = \text{Hazard Index}$$



Regulation of PFAS in drinking water

- The proposed rule would require public water systems to:
 - Monitor for these PFAS;
 - Notify the public of the levels of these PFAS; and
 - Reduce the levels of these PFAS in drinking water if they exceed the proposed standards.



IDEM PFAS Sampling Initiative

- The purpose of the sampling project is to evaluate the state-wide occurrence of PFAS compounds at approximately 778 Community Public Water Systems across the state.
- Workplan began to be developed in Spring of 2020
- In July 2020, IDEM applied for an Emerging Contaminants Grant from the EPA from the Public Water System Supervision (PWSS) Grant Program; approved in September 2020
- Matching funding also provided by the Indiana Finance Authority (IFA)



Timeline

	Population Served	Active Systems	Dates
Phase 1	3,300 to 10,000	123	March 2021 - October 2021
Phase 2	< 3,300	570	November 2021 – January 2023
Phase 3	>10,000	85	January 2023 – August 2023



IDEM PFAS Sampling Project

- Phase 1: Out of 78 systems, 6 systems had PFOS or PFOA above the proposed MCL in finished (treated) drinking water
- Phase 2: Only two of the 324 systems exceeded the proposed MCL for PFOS or PFOA in drinking water
- Compounds most frequently detected so far: PFBS, PFOS, PFOA, and PFHxA



Resources

- IDEM PFAS website:
<https://www.in.gov/idem/resources/nonrule-policies/per-and-polyfluoroalkyl-substances-pfas/>
- EPA Proposed PFAS NPDWR website:
<https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>
- Overview of Drinking Water Treatment Technologies:
<https://www.epa.gov/sdwa/overview-drinking-water-treatment-technologies>



Contact Information

Groundwater Section

(317) 232-8728 or GWSection@idem.in.gov

Matt Prater

(317) 234-7437 or mprater@idem.in.gov