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Christine Sieger, Director
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Steve Elmore, Director
Drinking Water and Groundwater Program
Department of Natural Resources
101 S Webster St, Box 7921
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Subject: Reassessing cumulative risk of PFAS using Cycle 12 PFAS recommended public health enforcement standards

Dear Ms. Sieger and Mr. Elmore:

Recently, the Wisconsin Department of Health Services (DHS) provided the Wisconsin Department of Natural Resources (DNR) updated public health groundwater standard recommendations for six per- and polyfluoroalkyl substances (PFAS).^{1a}

As you are aware, DHS has used a hazard index approach to evaluate the risk from exposure to multiple PFAS in drinking water since 2019.² In this approach, we first calculate the hazard quotient for each PFAS by dividing the PFAS concentration in drinking water by its health guideline. The hazard index is then obtained by summing the hazard quotients. We use our recommended enforcement standards as the health guidelines.

We have made several changes to our PFAS hazard index calculation as a result of the updated public health groundwater standard recommendations.

1) We have removed PFOA, PFOS, NtFOSE, NtFOSAA, NtFOSA, and FOSA from the hazard index calculation.

In Cycle 12, DHS is no longer recommending a combined enforcement standard for PFOA,

^a Perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexanesulfonate (PFHxS), perfluorononanoic acid (PFNA), perfluorobutane sulfonic acid (PFBS), and hexafluoropropylene oxide dimer acid (HFPO-Da or GenX).

PFOS, and the precursors: NEtFOSE, NEtFOSAA, NEtFOSA, and FOSA. Instead, DHS is recommending removing these six compounds from the hazard index calculation.

The United States Environmental Protection Agency's (EPA's) MCL for PFOA and PFOS is set at 4 nanograms per liter (ng/L).³ The EPA determined that PFOA and PFOS are likely carcinogens and have no safe level of exposure.^{3,4} As such, they set the maximum contaminant level for public water systems at the level that EPA determined is the lowest feasible detectable level based on technological limitations in measurement and removal from drinking water.³

Because the hazard index is determined by calculating the ratio of concentration to health guidelines and DHS' recommended enforcement standard for PFOA and PFOS are now based on technology limitations and not health information, DHS determined that it is no appropriate to include these compounds in the HI calculation.

2) The hazard index no longer includes the four precursors to PFOA and PFOS.

In Cycle 11, DHS recommended combined standards for PFOA, PFOS, NEtFOSE, NEtFOSAA, NEtFOSA, and FOSA.^{4b} The basis for this recommendation was that NEtFOSE, NEtFOSAA, NEtFOSA, and FOSA can turn into PFOS into the body and environment.⁴

For Cycle 12, DHS is recommending individual standards for PFOA and PFOS.¹ Given this and the updated basis for the recommended enforcement standards for PFOA and PFOS, DHS has determined that it is not appropriate to include these compounds in the HI calculation.

3) The health guidelines values for PFHxS, PFBS, HFPO-DA, and PFNA have been updated.

For the Cycle 12 enforcement standards, DHS recommends setting the standard equal to the EPA's maximum contaminant level (MCL) for PFHxS, FPO-DA, and PFNA, and the lifetime drinking water health advisory level for PFBS (Table 1 shows the changes in the recommended values).^{3,5}

Wisconsin Stat. ch. 160, requires that DHS use the most recent federal number as the recommended enforcement standard.⁶ DHS is allowed to recommend a value different from a federal number **only if** there is significant technical information that was not considered when the federal number was established and this information indicates a different number should be used to set the standard.

For these six PFAS, we did not locate any significant technical information to indicate that that a value other than the federal number should be used to establish the standards. Because of the updated enforcement standard recommendations, we updated the HI calculation to include these updated values.

^b N-ethyl perfluorooctane sulfonamideoethanol (NEtFOSE), N-ethyl perfluorooctane sulfonamidacetic acid (Net-FOSAA), N-ethyl perfluorooctane sulfonamide (Net-FOSA), and perfluorooctane sulfonamide (FOSA)

DHS' 2025 PFAS Hazard Index Equation

$$\text{Hazard Index} = \text{HQ}_{\text{HFPO-DA}} + \text{HQ}_{\text{PFBS}} + \text{HQ}_{\text{PFHxS}} + \text{HQ}_{\text{PFNA}} + \text{HQ}_{\text{DONA}} + \text{HQ}_{\text{PFBA}} + \text{HQ}_{\text{PFDA}} + \text{HQ}_{\text{PFDoA}} + \text{HQ}_{\text{PFHxA}} + \text{HQ}_{\text{PFODA}} + \text{HQ}_{\text{PFTeA}} + \text{HQ}_{\text{PFUnA}}$$

Where:

$$\text{HQ} = \frac{\text{PFAS}_x \text{ Concentration}}{\text{PFAS}_x \text{ Health Guideline}}$$

To evaluate the risk from PFAS in drinking water, DHS now recommends a two-step process.

- 1) Compare PFOA, PFOS, PFHxS, PFBS, HFPO-DA, PFNA, and other PFAS compounds with recommended enforcement standards as stated in DHS' Cycle 12 recommended groundwater standards levels to individual recommendations.
- 2) If levels are below individual recommendations, calculate the revised Hazard Index that no longer includes PFOA, PFOS, or precursor compounds.

When a hazard index value is equal to or exceeds 1.0 or there is a detection of PFOA or PFOS above recommendation/health advisory, DHS recommends the following:

- Bottled water or another safe alternative water source should be used for drinking and preparing food, preparing infant formula, watering fruit and vegetable gardens, and for drinking water for pets.
- Because PFAS do not easily enter the body through skin, tap water can be used for showering, bathing, and washing hands. However, children and infants should be monitored to discourage swallowing of bath or shower water. Tap water may also be used for doing laundry, washing dishes, brushing teeth, and filling a swimming pool.

Please note that the inclusion of site-specific exposure parameters may be appropriate for this determination when using this approach. Therefore, DHS should be consulted prior to proceeding with the use of a hazard index approach.

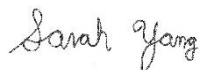
If you have any questions regarding the information contained in this letter, please contact me at the email address below.

Sincerely,



Jeremiah Yee

Toxicologist – Site Evaluation program



Sarah Yang

Manager – Hazard Assessment Section

Bureau of Environmental and Occupational Health

Table 1. DHS Recommended PFAS Enforcement Standards from Cycle 11 (2020) and Cycle 12 (2024).

PFAS Compound	Cycle 11	Cycle 12
PFOA		4 ⁽ⁱⁱ⁾
PFOS		4 ⁽ⁱⁱ⁾
NEtFOSE	20	N/A
NEtFOSAA		N/A
NEtFOSA		N/A
FOSA		N/A
PFBS	450,000	2,000
PFBA	10,000	10,000
PFDA	300	300
PFDoA	500	500
PFHxS	40	10
PFHxA	150,000	150,000
PFNA	30	10
PFODA	400,000	400,000
PFTeA	10,000	10,000
PFUnA	3,000	3,000
HFPO-DA ⁽ⁱ⁾	300	10
DONA	3,000	3,000

Values are shown in nanograms per liter (ng/L).

⁽ⁱ⁾ GenX is the trade name for HFPO-DA4

⁽ⁱⁱ⁾ Cycle 12 PFOA and PFOS recommendations apply individually and no longer include the four precursor compounds. These recommendations are not included as part of the updated DHS PFAS Hazard Index.

Highlighted rows indicate the PFAS for which DHS reviewed and recommended updated groundwater standards in Cycle 12.

References

1. Scientific Support Documents for Public Health Recommended Groundwater Standards - Cycle 12 (2025).
2. Assessing cumulative risk of PFAS using Cycle 11 PFAS recommendations for public health enforcement standards (2020).
3. FR. PFAS National Primary Drinking Water Regulation
In: AGENCY EP, editor. 40 CFR Parts 141 and 142: Federal Registry; 2024. p. 32532-32757.
4. 815R24006 Human Health Toxicity Assessment for Perfluorooctanoic Acid (PFOA) and Related Salts (2024).
5. Drinking Water Health Advisory: Perfluorobutane Sulfonic Acid (CASRN 375-73-5) and Related Compound Potassium Perfluorobutane Sulfonate (CASRN 29420-49-3) (2022).
6. Wisconsin. Chapter 160 Groundwater Protection Standards. 2021.