

# PFAS Drinking Water Rule: Calculating the Hazard Index



*The Hazard Index (HI) calculations in this document evaluate a single sample's HI value. This value informs monitoring frequency. For MCL compliance beginning April 26, 2029, utilities will calculate a running annual average Hazard Index by using results from the previous four quarters of sampling.*

- A Hazard Index (HI) is a tool used by the EPA to account for the increased health risk from mixtures of PFAS that may be found in drinking water.
- The PFAS National Primary Drinking Water Regulation (NPDWR) includes a Hazard Index maximum contaminant level (MCL) of 1 for mixtures of PFHxS, PFNA, HFPO-DA, and PFBS.
- To calculate the Hazard Index, testing must detect at least two of the four PFAS.

## Hazard Index Formula

The Hazard Index formula uses sampling results of each PFAS divided by their Health-Based Water Concentration (HBWC). The HBWC is the level below which no negative health effects are known or expected for that PFAS.

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

Where [PFHxS] = sample results of PFHxS (ppt)

[PFNA] = sample results of PFNA (ppt)

[HFPO-DA] = sample results of HFPO-DA (ppt)

[PFBS] = sample results of PFBS (ppt)

### **Significant Figures**

- All Hazard Index calculations are rounded to one significant figure because the MCL of 1 has one significant figure.
- A Hazard Index must be at least 1.5 before rounding to one significant figure to be an MCL exceedance.
- A Hazard Index of 1.499 would round down to 1, and therefore would not be an MCL exceedance.

## Hazard Index Calculation: Example 1

Step 1: Check if at least two of the four HI PFAS were detected.

HI PFAS	Results (ppt)
PFHxS	Non-detect
PFNA	Non-detect
HFPO-DA	2.02
PFBS	4.7

*Non-detects will be written as zero in the formula*

Step 2: Enter the results of each PFAS into the formula.

$$HI = \left( \frac{[0 \text{ ppt}]}{[10 \text{ ppt}]} \right) + \left( \frac{[0 \text{ ppt}]}{[10 \text{ ppt}]} \right) + \left( \frac{[2.02 \text{ ppt}]}{[10 \text{ ppt}]} \right) + \left( \frac{[4.7 \text{ ppt}]}{[2000 \text{ ppt}]} \right)$$

Step 3: Divide the results for each PFAS by the HBWC. The units cancel out.

$$HI = (0) + (0) + (0.202) + (0.00235)$$

Step 4: Add the values together.

$$HI = 0.20435$$

Step 5: Round to 1 significant figure.

$$HI = 0.2$$

**Since the rounded Hazard Index of 0.2 is less than the MCL of 1, this is not an MCL exceedance.**

## Hazard Index Calculation: Example 2

Step 1: Check if at least two of the four HI PFAS were detected.

HI PFAS	Results (ppt)
PFHxS	6
PFNA	Non-detect
HFPO-DA	5.05
PFBS	2.3

Step 2: Enter the results of each PFAS into the formula.

$$HI = \left( \frac{[6 \text{ ppt}]}{[10 \text{ ppt}]} \right) + \left( \frac{[0 \text{ ppt}]}{[10 \text{ ppt}]} \right) + \left( \frac{[5.05 \text{ ppt}]}{[10 \text{ ppt}]} \right) + \left( \frac{[2.3 \text{ ppt}]}{[2000 \text{ ppt}]} \right)$$

Step 3: Divide the results for each PFAS by the HBWC. The units cancel out.

$$HI = (0.6) + (0) + (0.505) + (0.00115)$$

Step 4: Add the values together.

$$HI = 1.01615$$

Step 5: Round to 1 significant figure.

$$HI = 1$$

**Since the rounded Hazard Index of 1 is equal to the MCL of 1, this is not an MCL exceedance.**

*Although this is not a single sample MCL exceedance, it is a trigger level exceedance (HI trigger level=1/2 MCL= 0.5). If this was an initial monitoring sample, the utility would not be eligible for reduced monitoring and would be on quarterly monitoring starting April 27, 2027.*

## Hazard Index Calculation: Example 3

Step 1: Check if at least two of the four HI PFAS were detected.

HI PFAS	Results (ppt)
PFHxS	2
PFNA	14.2
HFPO-DA	Non-detect
PFBS	9.7

Step 2: Enter the results of each PFAS into the formula.

$$HI = \left( \frac{[2 \text{ ppt}]}{[10 \text{ ppt}]} \right) + \left( \frac{[14.2 \text{ ppt}]}{[10 \text{ ppt}]} \right) + \left( \frac{[0]}{[10 \text{ ppt}]} \right) + \left( \frac{[9.7 \text{ ppt}]}{[2000 \text{ ppt}]} \right)$$

Step 3: Divide the results for each PFAS by the HBWC. The units cancel out.

$$HI = (0.2) + (1.42) + (0) + (0.00485)$$

Step 4: Add the values together.

$$HI = 1.62485$$

Step 5: Round to 1 significant figure.

$$HI = 2$$

**Since the rounded Hazard Index of 2 is greater than the MCL of 1, this is an MCL exceedance.**

*Single sample MCL exceedances will result in increased monitoring frequency. After April 26, 2027, utilities on reduced monitoring with a single sample MCL exceedance will begin monitoring quarterly. Utilities on quarterly monitoring will calculate the running annual average (RAA) to determine MCL compliance beginning April 27, 2029.*

### Check out these resources to learn more!

- [EPA Hazard Index Quick Reference Guide](#)
- [EPA NPDWR Per- and Polyfluoroalkyl Substances \(PFAS\)](#)
- [Drinking Water Compliance - Kentucky Energy and Environment Cabinet](#)

Contact us at [PFAS@KY.GOV](mailto:PFAS@KY.GOV)