

October 31, 2023

Stillwater City Council
 c/o Clerk
 216 Fourth Street N
 Stillwater, MN 55082

Subject: Health Risk Advisory for Per- and Polyfluoroalkyl Substances (PFAS) in the Stillwater Drinking Water System (PWSID# 1820024)

Dear Council Members:

This letter is to notify you that the Minnesota Department of Health (MDH) is issuing a Health Risk Advisory for PFAS at Well #6.

MDH recommends that the city of Stillwater notify its consumers about PFAS in their drinking water supply. It is important that people consuming the water be informed about any potential health risks and actions they can take to reduce exposure to PFAS from their drinking water, as well as any actions the water system is taking. We encourage the water system to lead this messaging.

In addition, MDH recommends that the city of Stillwater plan for and take action to reduce exposure to PFAS to a Health Risk Index (HRI) of 1.0 or below in the drinking water supply. An HRI of 1.0 and below represents a safe level where health effects are unlikely to occur. MDH recommends public health actions once the HRI is 1.1 or greater.

More information about the HRI and how it is calculated is provided in this letter.

Sample Results

The results for the most recent PFAS samples collected from Well #6 Entry Point and analyzed by EPA Method 533 are shown in the table below. The running annual average level of PFAS at Well #6 exceeds an HRI of 1.0, so MDH is issuing this Health Risk Advisory.

Stillwater Well #6 Entry Point Sample Results

Collection Date	PFBS (ng/L)	PFBA (ng/L)	PFHxS (ng/L)	PFHxA (ng/L)	PFOS (ng/L)	PFOA (ng/L)	HRI	Running Avg. HRI
8/16/2023	2.2	100	8.5	1.9	14	2.7	1.2	1.3
4/27/2023	2.5	100	9.3	2.3	15	3.4	1.3	1.3
3/7/2023	2.4	120	9.5	2.1	15	3.1	1.3	1.3
11/22/2022	2.4	120	8.5	2.1	14	3.4	1.3	-

ng/L = nanograms per liter

Bold means that the concentration exceeds a Health Based Value, Health Risk Limit or Health Risk Index

HRI and Health Effects for PFAS

MDH has developed health-based guidance values for some PFAS found in drinking water. These guidance values are set at levels which pose little or no health risk to people, including the most sensitive populations. Although the potential for harm increases as the level of a contaminant increases above the guidance value, health scientists may not be able to precisely estimate the change in risk. These guidance values are designed to be protective for exposures over short periods of time as well as over a lifetime. The table below shows the current guidance values for PFAS that MDH uses to evaluate drinking water samples.

Current MDH Guidance Values

Name of PFAS	Guidance Value (ng/L)
Perfluorobutane Sulfonate (PFBS)	100
Perfluorobutanoic Acid (PFBA)	7000
Perfluorohexane Sulfonate (PFHxS)	47
Perfluorohexanoic Acid (PFHxA)	200
Perfluorooctane Sulfonate (PFOS)	15
Perfluorooctanoic Acid (PFOA)	35

Because each of these PFAS chemicals can cause similar types of adverse health effects, Minnesota Rules part 4717.7880 requires that when multiple PFAS are found in drinking water, an HRI must be calculated to determine if the combined chemicals increase risk for possible health impacts. Information about how the HRI is calculated is attached and can also be found in Minnesota Rules part 4717.7880. An HRI greater than 1.0 indicates that although a single chemical may not pose a health risk alone, the combined chemicals may indicate an increased risk for possible health impacts.

For More Information

As a standard practice, MDH notifies the governor's office and area legislators when health risk advisory letters are issued. In addition, MDH is sending a copy of this letter to your local public health department.

If you have any questions about health concerns or would like more information about PFAS, contact the MDH Health Risk Assessment Unit at 651-201-4899 or health.risk@state.mn.us. For technical assistance related to the drinking water system, please contact Lucas Martin, District Engineer, at 651-201-4144 or lucas.martin@state.mn.us. More information about PFAS is also available on our website at: [MDH PFAS Website](https://www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html) (<https://www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html>)

Sincerely,



Thomas P. Hogan
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cc: Kirk Koudelka, Assistant Commissioner, Minnesota Pollution Control Agency
Pam Anderson, Interim Division Director, Remediation Division, Minnesota Pollution Control Agency
David Brummel, Director, Washington County Public Health & Environment

Enclosure: Health Risk Index Calculation

Health Risk Index Calculation

Groundwater can contain multiple chemicals. Combinations of chemicals may cause health effects that are different from the health effects of each individual chemical. MDH evaluates the health effects of groups of chemicals using the following process:

- Chemicals that share a common health endpoint (such as change to the liver, kidney, or other organ) are evaluated together. If a chemical has no known health effect, it is not included in the group.
- For each chemical in the group, MDH calculates a ratio of the groundwater concentration of the chemical to the health-based guidance value (HBV) appropriate to the length of exposure for that chemical. MDH adds the ratios for all of the chemicals in the group to create a number called a Health Risk Index (HRI).
- An HRI over one indicates a possible health risk from the group of chemicals.

Below is an example of how MDH calculates the HRI for mixtures of Perfluoroalkyl Substances (PFAS) for which we have health-based guidance values:

$$HRI = \frac{C_{PFOS}}{PFOS\ HBV} + \frac{C_{PFOA}}{PFOA\ HBV} + \frac{C_{PFBS}}{PFBS\ HBV} + \frac{C_{PFBA}}{PFBA\ HBV} + \frac{C_{PFHxS}}{PFHxS\ HBV} + \frac{C_{PFHxA}}{PFHxA\ HBV}$$

C_N = the concentration of N chemical that has been detected in groundwater

MDH uses procedures stated in the Health Risk Limits Rules for Groundwater for evaluating exposure to multiple chemicals. This process is based on an additive model. The U.S. Environmental Protection Agency uses this model as a reasonable approach given what is unknown about how chemicals interact in the body.

Significant Digits and Rounding

When health-based guidance values are derived, the calculations include safety factors which may reduce the value by hundreds or thousands of times. Therefore, the final HRI represents a “safe dose” where health effects are unlikely to occur.

In general, MDH calculates HRIs to one significant digit. Since HBVs typically have a single significant digit, rounding the HRI to more than one significant digit introduces false precision and can give an inaccurate depiction of risk.

For risk management decisions, it can be useful to include an additional significant figure (e.g. decimal point) for HRIs at or slightly above 1. This additional significant figure can be used by risk managers to inform potential actions rather than as a direct indicator of health risk. In these circumstances, MDH uses the following to determine if the HRI is above 1 and further evaluation may be warranted:

- HRI of 1-1.04 rounds down to 1.0
- HRI of 1.05-1.09 rounds up to 1.1

When the HRI is below 1.1, the health risk is minimal. MDH recommends close monitoring of the situation when an HRI is just below or just above 1 and considering public health actions once the HRI is 1.1 or greater. Although the risk at 1.1 is also unlikely to result in health effects, this value represents a reasonable action level for risk managers to use for further evaluation and decision-making.

Calculating an HRI is just the first step in assessing whether a potential risk may need to be addressed. Depending on the situation, further actions may be necessary to ensure the prolonged safety of the water, such as increased monitoring or planning to find a new water source. While the HRI is not a precise predictor of risk, it is one of many tools intended to help risk assessors and managers make more health protective decisions when there are multiple chemicals involved and the health consequences, if any, may not be clear.