

Perfluorooctanoic Acid (PFOA) and Water

Perfluorooctanoic acid (PFOA) is one of a group of related chemicals known as perfluorinated alkylated substances (PFAS). This group is commonly used in non-stick and stain-resistant consumer products, food packaging, fire-fighting foam, and industrial processes. The 3M Company was once a major manufacturer of PFOA and products containing PFOA, but production was phased out in 2002. PFOA production has been phased out nationwide but continues in other countries.

The Minnesota Department of Health (MDH) Risk Assessment Unit evaluates health risks for contaminants in drinking water and develops health-based guidance values for groundwater. The toxicological summary for PFOA can be found at the MDH Human Health-Based Water Guidance Table website.¹ MDH maintains a PFAS webpage with a range of related information that is regularly updated, including the history of PFAS, PFAS monitoring, and how to reduce exposure to PFAS.² MDH works in collaboration with the Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Agriculture (MDA) to understand the occurrence and environmental effects of these contaminants.

PFOA in Minnesota Waters

PFOA has been detected in Minnesota surface water and groundwater for more than 20 years. MDH recently completed a major effort to collect and test water samples from 920 community water supplies (CWS) around the state, representing 99% of the state's CWS users. PFOA has been detected in ~6% of CWS statewide, with a maximum concentration of 0.027 micrograms per liter ($\mu\text{g/L}$). Microgram per liter is the same as one part per billion (ppb). In 2022, MDH released the Interactive Dashboard for PFAS Testing in Drinking Water³, an online tool that shows the status and results of this statewide PFAS testing program.

MDH and MPCA have measured PFOA levels in private wells, mostly in areas known to have been contaminated in the past. PFOA levels in private wells in the East Metro region of the Twin Cities can be viewed through an interactive map on the MPCA website.⁴

MDH Guidance Value

Based on available information, MDH developed a guidance value of 0.0000079 ppb for PFOA in drinking water. This is equivalent to 0.0079 parts per trillion (ppt; also 0.0079 nanograms per liter [ng/L]). MDH does not use guidance values to regulate water quality, but they may be useful for situations in which no regulations exist. MDH develops guidance values to protect people who are most highly exposed and people who are most sensitive to the potentially harmful effects of a contaminant, including pregnant people, fetuses, infants, and children. A person drinking water at or below the guidance value would be at little or no risk for harmful health effects.

Potential Health Effects

In epidemiology studies, PFOA has been associated with decreased antibodies in infants and young children, lower birth weights, increased cholesterol in adults, and increased liver enzymes in adults. Additionally, an epidemiology study determined there is an association between long-term exposure to PFOA and the development of renal cell (kidney) cancer. People with questions about their personal risk of health impacts from PFOA should consult with their physician.

In general, there is agreement between the effects observed in epidemiology studies and controlled laboratory animal studies.

Potential Exposure to PFOA

Although almost everyone is exposed to small amounts of PFOA, large-scale biomonitoring programs show that PFOA levels in people’s blood are declining. For most Minnesotans, the majority of PFOA exposure comes from non-drinking water sources.⁵ These can include eating food packaged in material that contains PFAS, using some consumer products treated with PFAS such as stain resistant carpeting and water-repellent clothing, and others.

Drinking water can be a major route of exposure in areas where there has been substantial PFOA contamination of groundwater and surface water. Effective treatments exist to remove PFOA from drinking water. Information on how to reduce PFAS exposures from all sources can be found on MDH’s website.²

PFOA can also pass from mother to infant during pregnancy and during breastfeeding. Breastfeeding is a healthy activity for both baby and parent. If you have concerns about possible risks from PFOA during breastfeeding, consult with your physician.

PFOA in the Environment

PFOA use has declined in recent years, so new releases of PFOA into the environment are rare. PFOA is persistent in the environment, meaning it does not break down easily in soil or water. How PFOA moves through soil is dependent on the makeup of the soil and its chemistry. In several large areas of Minnesota, PFOA has moved into groundwater over the course of many years. Information on PFAS in the environment can be found on MDH’s website.²

References

1. Minnesota Department of Health (MDH). (January 2024). Human Health-Based Water Guidance Table. “Toxicological Summary for: PFOA.”
<https://www.health.state.mn.us/communities/environment/risk/docs/guidance/gw/pfoa2024.pdf>.
2. MDH. (December 2023). Per-and Polyfluoroalkyl Substances (PFAS).
<https://www.health.state.mn.us/communities/environment/hazardous/topics/pfcs.html>.
3. MDH. (March 2023). Interactive Dashboard for PFAS Testing in Drinking Water.
<https://www.health.state.mn.us/communities/environment/water/pfasmapp.html>.
4. Minnesota Pollution Control Agency (MPCA). Well Sampling in the East Metro.
<https://www.pca.state.mn.us/air-water-land-climate/well-sampling-in-the-east-metro-area>.
5. Bogdan, A. R., Fossen Johnson, S., & Goeden, H. (2023). Estimation of Serum PFOA Concentrations from Drinking and Non-Drinking Water Exposures. *Environmental Health Perspectives*, 131(6), 067701.
<https://ehp.niehs.nih.gov/doi/10.1289/EHP12405>.

Minnesota Department of Health
Health Risk Assessment Unit
PO Box 64975, St. Paul MN 55164
651-201-4899
health.risk@state.mn.us
www.health.state.mn.us



DECEMBER 2023

To obtain this information in a different format, call: 651-201-4899.