PFBS and Drinking Water

PFBS

Perfluorobutane sulfonate (PFBS) is one of a group of related chemicals known as per- and polyfluoroalkyl substances (PFAS). This group of chemicals is commonly used in non-stick and stain-resistant consumer products, food packaging, fire-fighting foam, and industrial processes.

PFBS has been used as a surfactant in industrial processes and in water-resistant or stain-resistant coatings on consumer products such as fabrics, carpets, and paper.[1,2] The 3M Company has been a major manufacturer of PFBS and products containing PFBS.

PFBS in Minnesota Waters

The Minnesota Pollution Control Agency (MPCA) has detected PFBS in Minnesota rivers that have been tested for PFAS. Most test locations were downstream from towns or cities and may be influenced by wastewater discharged into the river.[3,4,5]

PFBS has been detected in private drinking water wells and public drinking water systems in several parts of Minnesota where known industrial use or disposal of PFBS occurred in the past. PFBS has been detected in sources of public drinking water at levels up to 0.3 µg/L*.[6] MDH and MPCA routinely sample affected areas for PFBS and related chemicals.

*One microgram per liter (µg/L) is the same as one part per billion (ppb).

MDH Guidance Value

Based on available information, MDH developed a guidance value of 0.1 ppb for PFBS in drinking water. MDH guidance values are developed to protect people who are most vulnerable to the potentially harmful effects of a contaminant. MDH does not use guidance values to regulate water quality, but they may be useful for situations in which no regulations exist. 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 laboratory animal studies, effects of PFBS exposure included developmental effects (e.g., lower body weight, delayed development) and female reproductive effects in offspring of mothers exposed during pregnancy as well as changes in thyroid hormone levels and cellular changes to the kidneys. Studies of health effects from PFBS exposure in people are lacking.

Potential Exposure to PFBS

You can be exposed to PFBS if you use products containing PFBS or treated with stain-resistant coatings containing PFBS. PFBS is more easily eliminated from the body than some PFAS, such as PFOA and PFOS. As a result, the build-up in the body over time is much lower.

For people living in areas affected by PFAS release or disposal, drinking water may be a major source of PFBS exposure. Reverse osmosis and activated carbon filter treatment systems can reduce the levels of PFBS in drinking water in your home.

PFBS in the Environment

PFBS is persistent in the environment, meaning it does not break down easily in soil or water. Like other PFAS, PFBS can enter groundwater and move with the flow of groundwater, but it can also bind to soil and sediment.

Health Risk Assessment Unit

The MDH Health Risk Assessment Unit evaluates the health risks from contaminants in drinking water sources and develops health-based guidance values for drinking water. MDH works in collaboration with the Minnesota Pollution Control Agency and the Minnesota Department of Agriculture to understand the occurrence and environmental effects of contaminants in water.

References

1. National Institute of Environmental Health Sciences (NIEHS). 2017. "Testing Status of Perfluorobutane sulfonate (PFBS)." Retrieved from https://ntp.niehs.nih.gov/testing/status/agents/ts-m040006.html#Known-Uses. Accessed April 2017.
2. 3M Company. 2002. "Technical Data Bulletin: Environmental, Health, Safety, and Regulatory (EHSR) Profile of Perfluorobutane Sulfonate (PFBS)." Retrieved from http://multimedia.3m.com/mws/media/172303O/ehsr-profile-of-perfluorobutane-sulfonate-pfbs.pdf. Accessed April 2017.
3. National Water Quality Monitoring Council. 2017. Water Quality Portal (https://www.waterqualitydata.us). Accessed April 2017.
4. Minnesota Pollution Control Agency (MPCA). 2008. "PFCs in Minnesota's Ambient Environment: 2008 Progress Report." Retrieved from https://www.pca.state.mn.us/sites/default/files/c-pfc1-02.pdf. Accessed April 2017.
5. Minnesota Pollution Control Agency (MPCA). 2013. "Perfluorochemicals in Mississippi River Pool 2: 2012 Update." Retrieved from https://www.pca.state.mn.us/sites/default/files/c-pfc1-21.pdf. Accessed April 2017.
6. Minnesota Drinking Water Information System (MNDWIS). 2017. Accessed by MDH staff April 2017.

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