



*Protecting, Maintaining and Improving the Health of All Minnesotans*

June 7, 2017

City of Cottage Grove  
c/o Mr. Les Burshten  
8635 West Point Douglas Road  
Cottage Grove, MN 55016

**Subject: Notice of Health Risk Advisory for Perfluorochemicals (PFCs)**

Gentlemen/Ladies:

This letter is to notify you that the Minnesota Department of Health (MDH) is issuing a Notice of Health Risk Advisory for Cottage Grove Well Nos. 2 – 8 and 10.

Based on a recent MDH review of information related to exposure and health effects of Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS), MDH has developed new Health-Based Values (HBVs) for these two chemicals. The updated values are 0.035 µg/L for PFOA and 0.027 µg/L for PFOS.

In addition, MDH uses the HBV for PFOS (0.027 µg/L) as a surrogate for Perfluorohexanesulfonate (PFHxS). PFHxS remains in the body longer than PFOS and appears to be similar in toxicity.

These new HBVs take into account recent findings regarding the risk of adverse developmental effects to fetuses during pregnancy or to breastfed infants, who are the groups most exposed to PFCs.

Because each of these PFCs cause similar types of adverse health effects, Minnesota Administrative Rules section 4717.7880 requires that when a combination of PFOA, PFOS, PFHxS, Perfluorobutanoic acid (PFBA), or Perfluorobutanesulfonate (PFBS) are found in drinking water, a health risk index is calculated to determine if the combined health risk exceeds a level of concern. Information about how this health risk index is calculated is attached and can also be found in Minnesota Administrative Rules section 4717.7880. A health risk index greater than 1.0 indicates that the acceptable health risk level is exceeded.

MDH staff reviewed the results of analyses conducted on water samples collected recently from Cottage Grove's wells, which had the following PFC concentrations:

*An equal opportunity employer.*

**Exhibit  
2487**

State of Minnesota v. 3M Co.,  
Court File No. 27-CV-10-28862

**2487.0001**

Cottage Grove Community Well PFC Samples Collected on April 20, 2017

Well Number	PFOS (ug/L)	PFOA (ug/L)	PFBA (ug/L)	PFBS (ug/L)	PFHxS (ug/L)	Health Risk Index
1	ND	0.012	0.73	0.023	ND	0.45
2	ND	0.029	0.46	0.069	0.034	2.16
3	ND	0.022	0.86	0.13	0.077	3.62
4	ND	0.020	0.83	0.10	0.067	3.19
5	ND	0.031	0.99	0.023	ND	1.03
6	ND	0.018	0.62	0.10	0.049	2.43
7	ND	0.025	0.75	0.031	0.018	1.49
8	ND	0.024	0.72	0.034	0.019	1.50
9	ND	ND	0.56	0.015	ND	0.08
10	ND	<b>0.061</b>	0.84	0.020	ND	1.87
11	ND	ND	0.43	ND	ND	0.06
HBV/HRL	0.027	0.035	7	7	0.027*	

ND = Not Detected

**Bold** indicates exceedance of an individual HBV/HRL

\*PFOS HBV used as a surrogate for PFHxS for Health Risk Index purposes

Because the HBV for PFOA has been exceeded in Well No. 10 and the Health Risk Index has been exceeded for Well Nos. 2 – 8, MDH is issuing this Notice of Health Risk Advisory to the City of Cottage Grove. MDH recommends that the City of Cottage Grove take action to reduce the levels of PFCs to below the HBV for PFOA and/or the Health Risk Index of 1.0 in the management of its potable water supply.

For questions about health concerns or more information about PFCs, contact the MDH Site Assessment and Consultation Unit at 651-201-4897 or [health.hazard@state.mn.us](mailto:health.hazard@state.mn.us). For technical assistance, please contact Lucas Martin, District Engineer, at 651-201-4144 or [lucas.martin@state.mn.us](mailto:lucas.martin@state.mn.us).

Sincerely,

Tom Hogan  
 Division Director  
 Environmental Health Division

cc: Kathy Sather, Director, Remediation Division, Minnesota Pollution Control Agency

## Enclosure: Health Risk Index Calculation

### Health Risk Index Calculation

In many situations, a sample of groundwater contains multiple chemicals. MDH applies the procedure described in the Health Risk Limit (HRL) Rules (Minnesota Administrative Rules section 4717.7880) to evaluate exposure to multiple chemicals. This process is based on an additive model. The U.S. Environmental Protection Agency (EPA) also uses this model as a reasonable approach given what is unknown about how chemicals interact in the body.

- Chemicals that share a common health endpoint are evaluated together. Chemicals for which no health endpoint is specified are not included.
- For each chemical sharing a health endpoint, a ratio is calculated by comparing the groundwater concentration of the chemical to the exposure duration-specific health-based guidance for that chemical. The individual ratios are then added together. This process creates a number called a Health Risk Index (HRI).
- An HRI over one is considered an exceedance; similar to the concentration of a single chemical exceeding its respective Health-Based Value (HBV) or HRL.
- Below is an example of how MDH calculates the Health Risk Index for mixtures of Perfluorochemicals (PFCs) for which we have health-based guidance values:

$$\frac{XX \mu\text{g PFBA/L}^*}{\text{PFBA HBV}} + \frac{XX \mu\text{g PFBS/L}^*}{\text{PFBS HBV}} + \frac{XX \mu\text{g PFHxS/L}^*}{\text{PFHxS 'HBV'***}} + \frac{XX \mu\text{g PFOA/L}^*}{\text{PFOA HBV}} + \frac{XX \mu\text{g PFOS/L}^*}{\text{PFOS HBV}} = \text{Health Index}$$

\* Detected drinking water concentration

\*\*use PFOS HBV as interim substitute