

3M Settlement update

October 22 and 24, 2019

Meeting outline

- MDH PFAS health effects and water guidance Jim
- MDH PFAS sampling in the East Metro Ginny
- How we got here Kirk
- 3M Settlement Kirk
 - What's being done to address drinking water
 - What is the Conceptual Drinking Water Supply Plan?

MDH health effects, water guidance, and sampling

What are Per- and Polyfluoroalkyl Substances (PFAS)?

- Large (4,000+) class of surfactants with unique chemical & physical properties that make some of them (like PFOS & PFOA) extremely persistent and mobile in the environment
- Used since 1940s in wide range of consumer and industrial applications
 - PFOS Perfluorooctane sulfonate, key ingredient in the stain repellant Scotchgard. Used in surface coatings for common household items such as carpets, furniture, and waterproof clothing.
 - PFOA Perfluorooctanoic acid, used to make nonstick coatings, such as Teflon. It was also used to make carpets, upholstery, clothing, floor wax, sealants, and grease repellant paper coatings.
- Some bioaccumulative PFAS (PFOS, PFOA, PFHxS, etc.) phased out in in most western nations (incl. US)

















Source: open access images - bing.com

DEPARTMENT OF HEALTH

PFAS Health Effects and Water Guidance

Jim Kelly – Minnesota Department of Health

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Why Do We Develop Water Guidance?

- Groundwater Protection Act (1989)
- Clean Water Fund supported
- Contaminants of Emerging Concerns Initiative
 - New chemicals, chemicals with new uses, chemicals with new data
 - Proactive

Internal Dose – Serum is Key Factor

- PFOA, PFHxS and PFOS are eliminated very slowly from the human body
- With repeated ingestion of contaminated water serum levels plateau (flatten off) in the body.
- It takes years to reach this plateau



MDH Guidance

- Accumulated Maternal Levels
 - Cross the placenta
 - Excreted into breast milk
 - Maternal transfer from chronically exposed mothers can result in higher exposure to infant than directly drinking contaminated water
- Guidance
 - Keep accumulated maternal serum levels low so that exposure to infant is below levels of concern
 - Driven by protection of exposure to infant
 - "Over protective" of rest of population

Breastfeeding is important for the short and long term health of both a mother and infant.

MDH recommends that women currently breastfeeding, and pregnant women who plan to breastfeed, continue to do so.

Why do state guidance numbers differ?

- Fast moving area of research
- Some differences due to timing
- Some differences due to differences in calculating the water guidance number



Factors Impacting Numerical Value of PFAS Drinking Water Guidelines

Drinking Water Guideline = <u>Reference Dose (mg/kg/day) x Relative Source Contribution (%)</u> Drinking Water Consumption Rate (L/kg/day)

,	Factor	Explanation	Examples	Impact
Reference Dose (POD ÷ Total UF; also includes animal-to- buman	Point of Departure (POD): • NOAEL • LOAEL • Benchmark Dose (BMDL)	Dose (mg/kg/day) from animal study used as starting point	 LOAEL for ↓ offspring body weight in rats NOAEL for ↓ immune response in mice. 	↑ POD → ↑ Guideline
	Uncertainty factors (UFs)	 POD is divided by individual UFs of 1-10 Total UF generally 30-300 	InterindividualAnimal-to-humanData gaps	↑ Total UF→ ↓ Guideline
extrapolation factor)	Animal-to-human dose extrapolation	To account for higher internal levels in humans than lab animals from same dose	 Serum PFAS levels as dose metric Human-to-animal half- life ratio 	Depends on specifics of approach.
F	Drinking water consumption rate	 L/kg/day. Based on daily ingestion (L/day) and body wt. (kg) 	Infant > Lactating Woman > Default Adult	 ↑ Ingestion rate → ↓ Guideline
exposure	Relative Source Contribution (RSC)	Accounts for non-drinking water exposure sources (e.g. food, air).	 Default - 20% Up to 80% based on chemical-specific data. 	↑ RSC → ↑ Guideline

ITRC PFAS Training Workshop (2019): "Managing PFAS Contamination at Your Sites – Site Characterization, Sampling, Fate and Transport, Remedial Alternatives, and Risk Assessment"

Perfluorobutane Sulfonate (PFBS)	2
Perfluorohexane Sulfonate (PFHxS)	0.047
Perfluorooctane Sulfonate (PFOS)	0.015
Perfluorobutanoic Acid (PFBA)	7
Perfluorooctanoic Acid (PFOA)	0.035

PFAS Detected in Minnesota

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Drinking Water Guidance Value (ppb)

Guidance Journey - Mixtures

Health Risk Index (HI) methodology (since 1993) allows MDH to evaluate mixtures of chemicals that affect the same health endpoint.

• HI > 1 considered an exceedance

PFAS	Health Endpoints ¹	Water Guidance (µg/L)
PFBA	Liver, Thyroid	7
PFBS	Kidney, Thyroid	2
PFHxS	Liver, Thyroid	0.047
PFOA	Developmental, Liver, Immune, Kidney	0.035
PFOS	Adrenal, Developmental, Liver, Immune, Thyroid	0.015

$$HI_{[thyroid]} = \frac{PFBA_{[conc]}}{7} + \frac{PFBS_{[conc]}}{2} + \frac{PFHxS_{[conc]}}{0.047} + \frac{PFOS_{[conc]}}{0.015}$$



PFAS Sampling in the East Metro

Ginny Yingling – Minnesota Department of Health

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Samples Collected in The East Metro

- 13,714 groundwater samples collected since 2003
- Approximately 3,500 wells
 - 76 community wells
 - 3,200+ residential & non-community public wells
- Drinking water samples: 10,315
 - Community water supply samples: 1,347
 - Residential & non-community public water samples: 8,968
 - ~1,000 residential well samples/year since 2016

Well Advisories & Response Actions

City wells:

- Oakdale: 6 (of 8; GAC filtration, flow control, new well)
- Woodbury: 6 (of 19; flow control)
- Cottage Grove: 8 (of 12; GAC filtration, flow control, new well)
- Lake Elmo: 1 (of 3; flow control; new well pending)
- St Paul Park: 2 (of 3; flow control; GAC filtration pending)
- Residential & non-community public wells: 1,250+
 - Bottled water (interim)
 - GAC filter system (whole-house) or connection to city water

Groundwater and PFAS Movement: Big Picture



PFOA and PFOS Plumes





PFAS Transport in Oakdale, Lake Elmo, West Lakeland, and Afton

Groundwater flow

Surface water flow



Sampling Priorities

- Higher Priority:
 - Wells in or downgradient of the PFOS and PFOA plumes that have not been sampled previously
 - Wells near the PFOS and PFOA plumes (to define edges)
 - Re-sample wells with Health Risk Index > 0.75
- Medium Priority:
 - Resample wells with Health Risk Index (HI) > 0.5
 - Resample wells with PFOS and/or PFOA detections
- Lower Priority:
 - Testing filtered water (on request)
 - Sample wells in lower priority areas (on request)



Woodbury City Wells

6 wells have been issued advisories

- 5 in 2017 (when PFOS and PFOA guidance values lowered)
- 1 in 2019 (when PFOS guidance value lowered again)

Earlier guidance values, including EPA's lifetime health advisory values were not exceeded

Of those wells with advisories:

- 2 have decreasing trends
- 2 have stable trends
- 2 have increasing trends

7 wells have had more than one detection of PFOA and/or PFOS

- 3 have increasing trends
- 4 are stable or decreasing



3M Settlement and activities

PFAS East Metro area – How we got here

- 2002: 3M informs MPCA of PFAS in wells at Cottage Grove facility
- 2007: MPCA and 3M agree to Consent Order outlining 3M responsibility
- 2010: Attorney General files Natural Resource Damage (NRD) lawsuit, with MPCA and DNR as trustees
- 2018: State of Minnesota and 3M come to an agreement on NRD lawsuit. MPCA and DNR are co-trustees of Settlement
- 2018 now: Long-term planning, developing Conceptual Drinking Water Supply Plan

2018 Settlement: major components

- \$850 million grant to the State
- \$720 million immediately available to provide long-term solutions in the east metro area for:
 - Clean and sustainable drinking water
 - Restoration and enhancement of natural resources
- Restrictions about how the grant can be used
- Expectations for community participation
- Preserves 3M's obligations under the 2007 consent order
 - Also serves as a "bridge" until long-term solutions implemented (covers temporary drinking water needs up to \$40 million or 5 years)

3M Settlement

- Highest priority Ensure safe drinking water in sufficient supply to residents and businesses to meet current and future needs for <u>all</u> communities
- Money to achieve the goal is not infinite
 - Success requires both effective planning <u>and</u> efficient implementation
- Determine long-term projects for all of the communities in the region through the Conceptual Drinking Water Supply Plan

What's being done now to address drinking water?

Separate funding already exists for short-term fixes to ensure residents have safe drinking water until long-term solutions are implemented

- Private wells with health advisories receive bottled water or whole-house treatment
 - Interactive map at <u>3msettlement.state.mn.us</u>
- City wells tested regularly



What is the Conceptual Drinking Water Supply plan?

The Conceptual Drinking Water Supply Plan is a key component to ensure drinking water needs and options for the East Metropolitan Area are appropriately and thoroughly considered.

- The plan is expected to be finalized in March 2020
- Five step process to develop the plan



Step one

Regional Background Information and Community Profiles

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Develop background and community profiles, including:

- Population
- Growth
- Drinking water needs for today and tomorrow
- Existing resources
- Contamination
- Groundwater and drinking water supply models

Step two



Identify a list of water supply improvement options.

- Whole-house water treatment
- Create a neighborhood water supply system
- Connect private wells to a community's existing water system
- Treat existing public water system
- Drill new municipal well(s) in optimal location(s) and treat if needed
- Connect to a neighboring community's public water system
- Connect to a centralized regional groundwater treatment plant
- Regional surface water treatment plant

Step three



Conceptual projects look at the options in greater detail for each community, for example:

- If we treat an existing public water system, then what size and number of treatment systems are needed? Who are they serving? How does it affect pressure zones?
- If private wells are connected to a community's existing water system, can the system handle the additional demand? Which homes would be connected?
- If we treat individual homes, then how many need treatment? How often are filters replaced?
- Long-term project list available at: <u>3MSettlement.state.mn.us</u>

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Conceptual Drinking Water Supply Plan

Step four



- Build scenarios using the conceptual projects to address all communities
- Apply drinking water and groundwater models to the scenarios
- Develop cost estimates for scenarios, including long-term operation costs

Step five

Recommended Scenarios



Recommend good/better/best scenario to provide safe and sustainable drinking water.

- Use criteria developed with working groups, such as:
 - Is it cost-effective? What are the infrastructure, administrative, and operation and maintenance costs?
 - Is it a sustainable option for future water supply and demand?
 - Does it fit with the local community development?
 - Can it treat for potential future new health based values?

Key dates

- Preliminary summary December 2019
 - Public comment January/February 2020
- Good/better/best options by March 2020
- Work with communities to implement

In summary

- Safe drinking water is actively being addressed now while long-term planning is happening
- Priority is to ensure safe drinking water in sufficient supply to residents and businesses to meet current and future needs for <u>all</u> communities through the Conceptual Drinking Water Supply Plan.
- Your input is needed!
- <u>3MSettlement.state.mn.us</u>
 - Follow work group activities
 - Potential project ideas
 - Sign up for email updates
 - Legislative reports

Questions

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