DEPARTMENT: POLLUTION CONTROL AGENCY

STATE OF MINNESOTA
Office Memorandum

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TO: 3M PFC Settlement Priority One Working Group

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SUBJECT: 2024 Private Well Sampling for Per - and Polyfluoroalkyl Substances Compounds

As specified in Minn. Stat. 115B.171, the Minnesota Pollution Control Agency (MPCA) is providing the following information to the communities in the East Metropolitan area (Site) impacted by per- and polyfluoroalkyl substances (PFAS) groundwater contamination. The information below describes the private well sampling activities during 2024, broken down by community.

Overall, the MPCA received 806 online groundwater sampling requests, sampled 892 private wells, installed 119 whole-home treatment systems at residences, and coordinated with the Minnesota Department of Health (MDH) to issue 420 well advisories in 2024 throughout the Site. These values account for approximately 11.3% of all private wells sampled (7,875), 9.6% of all treatment systems installed/maintained (1,246), and 20.7% of all well advisories issued (2,028) since PFAS sampling began throughout the Site in 2003. In addition, approximately $767,900 of the 3M Settlement funds were spent on private well sampling in 2024, which covered costs associated with conducting sampling and lab analysis.

Since 2003, the MPCA and MDH have coordinated efforts to sample and monitor private residential drinking water supply wells in southern Washington County. The objective of the sampling is to characterize PFAS impacts and identify wells eligible to receive treatment. Wells are eligible for treatment when either scenario occurs: an individual PFAS compound is detected at a concentration above the drinking water guidance value or when the mixture of PFAS in a sample exceeds a Health Risk Index (HI) value of 1. The HI is a calculated value that allows MDH to evaluate the additive effect of multiple chemicals in drinking water that have similar health effects with varying toxicities. When a well meets either of these criteria, MDH issues a well advisory. When an advisory is issued, the MPCA offers to install and maintain a whole-home treatment system or reimburse costs for that residence to connect to city water, if available. Bottled water is also offered as an alternative drinking water source until a treatment system or connection is in place.

In 2024, MDH lowered the HBVs for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) based on new research including human epidemiology studies. The U.S. Environmental Protection Agency (EPA) also finalized new maximum contaminant levels (MCLs) for six PFAS compounds in 2024 including PFOA, PFOS, and perfluorohexane sulfonate (PFHxS). This change in HBVs and MCLs also resulted in a change from the HI calculation used in previous years. The HI is calculated using the most conservative guidance value for each compound, which includes MDH values for PFOS, PFOA, perfluorohexanoic acid (PFHxA), perfluorobutanoic acid (PFBA), perfluorobutane sulfonate (PFBS) and EPA MCLs for PFHxS. MPCA staff are in the process of re-evaluating private well sample data collected in previous years using the new guidance values, and anticipate a significant increase in well advisories in calendar year 2025 as a result.

PFAS samples collected from private drinking water wells are analyzed by the MDH Public Health Laboratory. In 2023, MDH started using EPA method 533 on a regular basis to analyze drinking water samples for PFAS instead of MDH method 555. Method 533 has lower reporting limits, meaning PFAS can be detected at much smaller concentrations. As a result of this change, around 1,300 private wells that previously used MDH method 555 in the East Metro have been or will be resampled and analyzed using EPA method 533.

During the 2024 sampling effort, wells were sampled for three main purposes: 1) Private wells located in areas of known concern; 2) Resampling wells to monitor plume conditions, especially those that have not been sampled with EPA method 533; and 3) Confirmation of plume boundaries and monitoring of contaminant movement in areas that have not been recently investigated. A single well sample typically serves more than one purpose, as residential requests may also be resamples or in areas where additional data are needed to confirm current plume conditions.

In 2024, the MPCA sampled 892 private wells, more than triple the number of wells in 2023 (265). Many of these wells were sampled in previous years, while others were sampled for the first time in 2024. This increase in sampling was primarily driven by an increase in sample requests from residents. The MPCA received 806 online groundwater sampling requests from residents in 2024, almost triple the number of online requests received in 2023 (299). MPCA staff evaluated these requests to ensure wells were within the East Metro, not serviced by municipal water, and that they were not already sampled in 2024. The number of well advisories issued also saw an increase in 2024, with 420 wells receiving an advisory compared to 14 in 2023. This increase in well advisories is attributed to the increased sampling effort, utilizing a newer laboratory method capable of detecting lower concentrations of PFAS, and changes in drinking water guidance values. The MPCA maintains an online interactive map, Private Well Sampling in the East Metro Area, which indicates locations of wells sampled and well advisories issued.

Major focus areas of the 2024 sampling effort included:

- Further defining the edges of the PFAS advisory areas (particularly in the Tri-Lakes area of Lake Elmo, West Lakeland Township, Afton, and southwest Woodbury).
- Establishing plume definition by sampling in zones around the advisory areas where no PFOA or PFOS are detected.
- Evaluating areas where wells exceed the health-based guidance values and didn't previously.
- Evaluating results from prior sampling years against updated HBVs and MCLs to retroactively issue well advisories and contact residents who now exceed regulatory criteria and are eligible for a treatment system.
- Resampling wells without advisories that haven't been analyzed using EPA method 533 for comparison to updated regulatory guidance values.
- Resampling wells to evaluate water quality trends within the plume boundaries.

Evaluating PFAS concentration trends

Some private wells have been routinely monitored since the mid-2000s, particularly those that are closest to the known disposal sites and in areas with many well advisories; however, wells in other areas were first sampled more recently making long-term trend analysis challenging. In addition, recent advancements in PFAS laboratory analytical methods and detection limits have allowed for detections of lower concentrations of PFAS in areas previously thought to be outside the plume boundaries. Updates in analytical methodology adds to the complexity of long-term trend analysis and interpretation, especially in areas of the Site with lower PFAS concentrations.

Despite the limitations of the dataset, some general patterns in PFAS concentrations in private wells are emerging:

- **Near the known 3M disposal sites** in Oakdale, Lake Elmo, and Woodbury, PFAS concentrations show slow, steady decreases likely due to plume diffusion (migration) over time. In parts of southwest Lake Elmo (Torre Pines development) these decreases are significant (as much as 90%), although the PFAS levels in most wells are still above MDH and EPA drinking water guidance values. Wells will continue to be monitored to evaluate plume behavior and further characterize the current extent and magnitude of PFAS impacts.
- **Near the edges of the plumes** as they approach the Mississippi and St. Croix Rivers, PFAS concentrations appear to be slowly increasing. Some examples include west and southwest Woodbury, southeast Maplewood, south and southeast Cottage Grove, and Grey Cloud Island Township. In some isolated areas (near the I-94 corridor in West Lakeland, northern Afton, and Lakeland) concentrations may be increasing more rapidly in some aquifers.
- **Near the central portion of the plumes** (including most of Lake Elmo, Woodbury, northern Newport, and Cottage Grove), concentrations appear to be relatively stable. Improved analytical detection limits have allowed for the detection of low levels of PFOS and PFOA where not previously detected, resulting in higher HI values and giving the appearance of increasing concentrations.

- **Downgradient areas**, including large portions of Afton (south of 15th Street South), St. Mary's Point, and most of Denmark Township (aside from the southeast area) currently appear to be largely unaffected by the PFAS groundwater contamination. Wells in this area may show low levels of PFBA in concentrations similar to those seen elsewhere in the Twin Cities metro region. Additionally, many wells in Afton and Denmark Township have not been sampled with updated analytical methods capable of detecting lower levels of PFAS that are often seen downgradient from the source areas. As more wells are prioritized for resampling with EPA method 533, long-term trends in these areas will become more clear.

The MPCA and MDH will continue to monitor levels of PFAS compounds in groundwater and evaluate trends in concentrations in all of the areas mentioned above.

In 2025, the MPCA plans to focus on the following:

- Continue resampling wells that were evaluated using older analytical methods, especially in areas lacking newer data such as Denmark Township, eastern Woodbury, eastern Cottage Grove, residential areas east and northeast of the 3M Cottage Grove facility, and southwestern Lake Elmo. Current contamination levels, using current methods, are needed to make decisions with new guidance values.
- Continue with the long-term monitoring program based on well sampling history, nearby well data, and plume behavior to determine sampling frequencies. Adjust areas sampled and/or frequency of sampling in response to changing guidance values.
- Continue to provide sampling of private wells within the PFAS sampling area, upon request from residents.
- Continue coordination between the MPCA and MDH for well sampling, analytical services, and determination of well advisories in the East Metro.
- Target areas of interest for additional sampling to aid in plume delineation and source characterization. These areas include central and northern Lake Elmo (including the tri-lakes area), southeastern Cottage Grove, and southeastern Denmark. MPCA will continue to sample private wells in these areas.
- Contacting residences whose private drinking water wells are eligible for treatment, as outlined in the Conceptual Plan, to offer the installation and maintenance of treatment systems or reimburse costs for connecting to city water.
- Additional performance testing of treatment systems to ensure protection with new lower HBVs and MCLs.

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Community	Private Wells Sampled in 2024	Private Well Advisories Issued in 2024	Treatment Systems Installed in 2024	Sampling Cost by Community in 2024	Private Wells Sampled Since 2003	Private Well Advisories Issued Since 2003	Treatment Systems Installed Since 2003
Afton	145	54	12	$124,827	390	57	51
Cottage Grove	82	41	5	$70,592	1,330	247	114
Denmark Township	60	20	7	$51,653	138	6	7
Grey Cloud Island Twp	7	9	3	$6,026	217	72	63
Hastings	1	0	0	$861	1	0	0
Lake Elmo	269	127	25	$231,576	2,644	365	123
Lake Saint Croix Beach	8	3	0	$6,887	17	2	0
Lakeland	20	8	1	$17,218	159	66	9
Lakeland Shores	3	0	0	$2,583	18	14	2
Maplewood	22	9	2	$18,939	100	17	15
Newport	12	9	4	$10,331	64	7	8
Oakdale	5	6	2	$4,304	30	6	1
Saint Mary's Point	41	3	1	$35,296	11	0	0
Saint Paul Park	0	0	0	$0	26	15	9
West Lakeland Twp	114	69	30	$98,140	1,389	704	667
Woodbury	50	46	23	$43,044	369	17	54
Sentinel Well Network*	53	16	4	$45,627	80	13	4
Totals	892	420	119	$767,902	6,983	1,608	1127

*Sentinel well network consists of wells that may be outside of the 3M Settlement area for plume delineation purposes. These numbers include older data records with well locations that need further verification.