DEPARTMENT OF AGRICULTURE

MDA Responses to 2025 Pesticide Management Plan Committee Comments

March 2026

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Introduction

The Minnesota Department of Agriculture (MDA) hosted the annual Pesticide Management Plan Committee (PMPC) meeting virtually on June 10, 2025. The MDA's pesticide water quality data from the 2024 monitoring season were presented and discussed.

The MDA invited all members to share additional written comments following the meeting. Comments were received from eight of the 15 active members (Table 1).

Table 1. 2025 PMPC members and written comment submission record

PMPC Position	Member Name	Written Comments Rec'd
MN Dept. of Health Representative	Deanna Scher	Yes
MN Pollution Control Agency Representative	Bill Cole	Yes
MN Dept. of Natural Resources Representative	Jason Garms	Yes
University of MN Extension Representative	Bob Koch	No
University of MN Extension Representative	Debalin Sarangi	No
Environmental Organization Representative	Howard Markus	No
Farmer Organization Representative	Sergio Cabello Leiva	No
Industry Representative	David Flakne	No
Farmer Representative	Brandon Fast	No
Farmer Representative	Steve Anderson	Yes
At Large Member	Jerome Lensing	No
At Large Member	Jill Trescott	No
At Large Member	Mark Smith	Yes
Tribal Representative	Renee Keezer	Yes
Urban Pesticide Specialist	Chris Aumock	Yes

All comments were carefully reviewed and shared with the Commissioner. Comments requiring responses from the MDA are summarized in the following sections. Efforts were made to group comments by chemical or topic. Full comments are available on the MDA's PMPC webpage.

Member Comments and MDA Responses

1. Common Detection Status Guidelines

The MDA should update the guidelines in the Pesticide Management Plan (PMP) and/or its guidance to the PMPC on evaluating pesticide for Common Detection Status

MDA Response

- The MDA plans to review and expand the guidance provided to PMPC members regarding Common Detection Status; however, the guidelines within the PMP will not be revised at this time. The PMP offers general guidance for designating pesticides in common detection status, including certain factors to consider, and notes that PMPC member recommendations play a key role in common detection status determinations. To allow flexibility in prioritizing pesticides and account for the many factors influencing detections in groundwater, the MDA intentionally does not set strict numeric thresholds for designation.
- The MDA is exploring ways to provide additional context at PMPC meetings that will allow members to compare currently designated pesticides with potential new pesticides and focus on the intent of the common detection designations.

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2. Common Detection Status: Fomesafen, Bentazon, Clothianidin, Thiamethoxam, Sulfentrazone

Comment 1: The MDA should prioritize fomesafen for Common Detection Status.

Comment 2: The MDA should consider placing bentazon, clothianidin, fomesafen, sulfentrazone, and thiamethoxam in Common Detection Status to provide an avenue to establish BMPs for these active ingredients.

MDA Response

- Based on internal review, the Commissioner has decided not to pursue common detection status for fomesafen, bentazon, clothianidin, thiamethoxam, or sulfentrazone at this time. The MDA will continue to carefully track detections of these pesticides and their degradates in groundwater and may consider designation in the future.
- Detections of fomesafen, bentazon, clothianidin, thiamethoxam, sulfentrazone, and their associated degradates in groundwater (2020-2024) are summarized in Appendix A. Factors noted in the PMP and comment guidance were considered in the Commissioner's decision, including the frequency of detections, trends in detections, pesticide use patterns, and the existence of an HRL. In addition to considering simply whether HRLs existed, the Commissioner also considered how concentrations detected compared to available HRLs or other human health-based reference values. Detections in groundwater remain below human health-based reference values for fomesafen (Figure 1), bentazon (Figure 2), clothianidin (Figure 3), thiamethoxam (Figure 4), and sulfentrazone (Figure 5).

Figure 1. Fomesafen detections in groundwater compared to the reference value

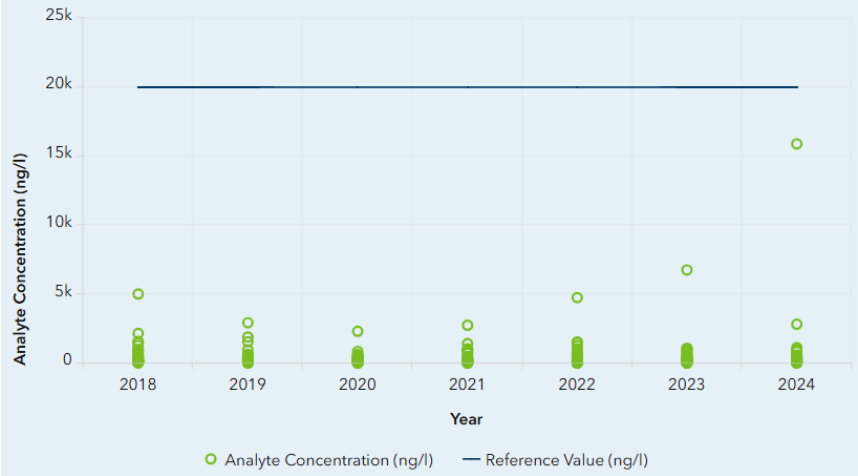


Figure 2. Bentazon detections in groundwater compared to the reference value

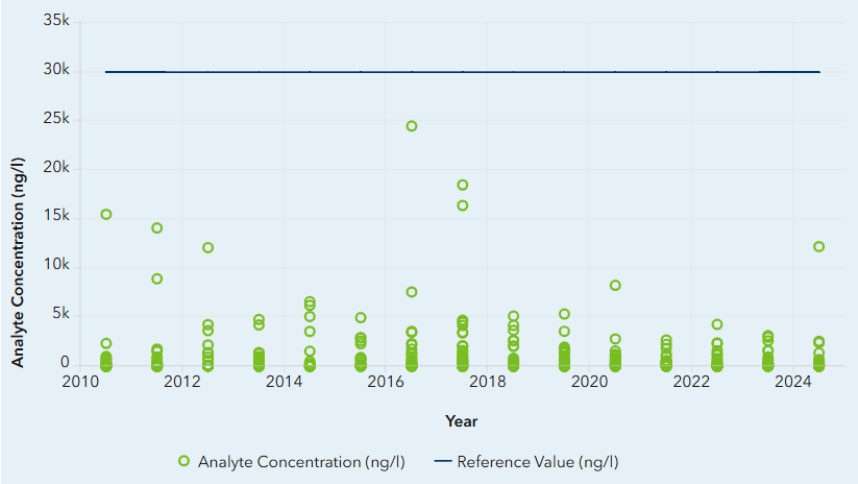


Figure 3. Clothianidin detections in groundwater compared to the reference value

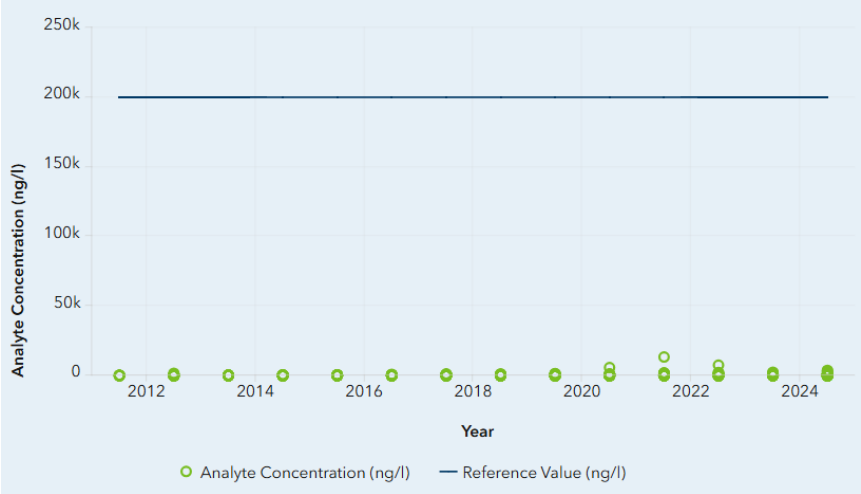


Figure 4. Thiamethoxam detections in groundwater compared to the reference value

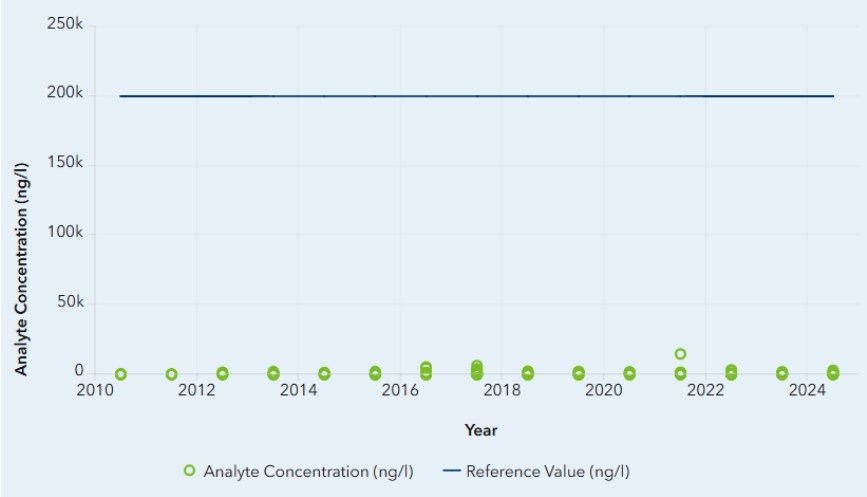
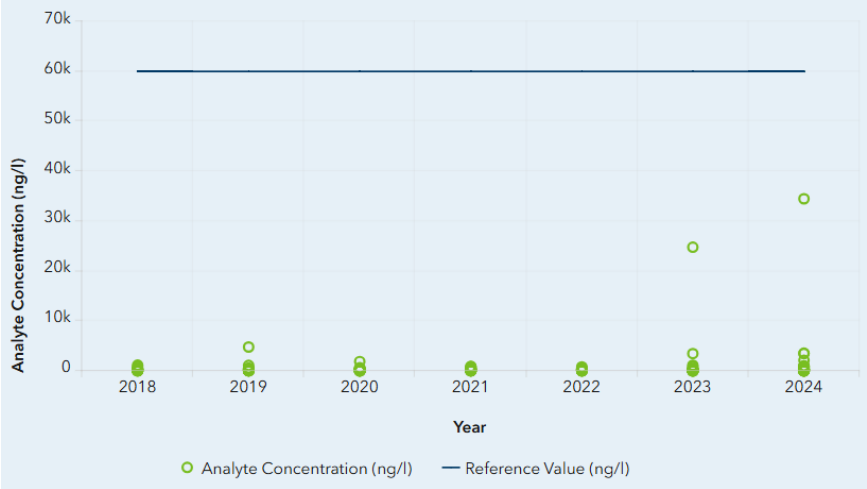


Figure 5. Sulfentrazone detections in groundwater compared to the reference value



3. Chlorothalonil Common Detection Status

Commentor 1: The MDA should prioritize chlorothalonil for Common Detection Status.

Commentor 2: Chlorothalonil does not need to be considered for Common Detection Status yet.

MDA Response

- Chlorothalonil and 4-hydroxychlorothalonil monitoring data and related PMPC member comments have been presented to the Commissioner. The Commissioner is not designating chlorothalonil as Common Detection Status at this time.
- If the Commissioner determines that chlorothalonil should be designated, the MDA will publish the preliminary decision in the State Register and open a 60-day public comment period. PMPC members would be directly notified.

4. Chlorothalonil Product Restrictions in Minnesota

Comment 1: The MDA should use its regulatory authority to require the use of federally mandated, lower chlorothalonil application rates in Minnesota by next growing season.

Comment 2: There is a need for product restrictions for chlorothalonil in PMR 4. Restrictions could include decreased application rates, prohibiting applications within a certain amount of time prior to rainfall, or prohibiting use in specific areas (e.g., those with sandy soil).

MDA Response

- The Commissioner does not plan to implement any state-level restrictions on chlorothalonil products at this time. This decision was based in part on the pending federal label changes and recent cancellation of Special Local Need registrations. Additionally, the MDA's approach to water quality, as outlined in the PMP, prioritizes starting with voluntary actions (e.g., BMPs) prior to regulation.
- Federal label changes
    - In Jan. 2025, the EPA released its Interim Registration Review Decision for Chlorothalonil which includes rate reductions that could help mitigate detections of 4-hydroxychlorothalonil in groundwater.
    - EPA directed registrants to submit copies of amended product labels within 60 days after the announcement of the interim decision in the Federal Register. Updated labels have been submitted to EPA; however, no new labels have been published as of February 2026.
- The EPA stated in November they are actively reviewing new labels and may be completed prior to the next growing season, but existing stocks provisions will allow the continued use of (previously purchased) products with the old labeling.
    - If updated product labels become available in spring of 2026, new rates would not be expected to go into effect until 2027 due to the 12-month existing stock provision.
    - The MDA may revisit the need to implement state-level label changes depending on when updated federal labels are made available.
- Special Local Need (FIFRA Section 24(c)) registrations
    - All 24(c) registrations that increased the total allowable rate from 11.25 to 16 lb ai/A/yr for potatoes were voluntarily cancelled for chlorothalonil products in MN in 2025. These registrations had been in place for multiple years.
    - Reducing the allowable rate is expected to help mitigate 4-HDC in groundwater, assuming growers were previously using greater than 11.25 lbs ai/A/yr on potatoes in PMR 4.
- Voluntary mitigation actions
    - The MDA published draft water quality BMPs for chlorothalonil for public comment in September 2025 (50 SR 307). Two comments were received, both requesting the MDA wait to publish the final BMPs until the updated federal labels are published. The MDA plans to publish the final chlorothalonil BMPs in April 2026.
    - The MDA has begun conducting outreach to inform chlorothalonil users about 4-hydroxychlorothalonil detections in groundwater and encourage judicious use.

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5. Chlorothalonil Expanded Sampling

Expanded sampling for 4-hydroxychlorothalonil is necessary.

MDA Response

- In 2025, monitoring for 4-hydroxychlorothalonil was expanded as part of Phase 3 of the Private Well Pesticide Sampling Project. Approximately 140 private drinking water wells were sampled for 4-hydroxychlorothalonil, including wells near golf courses and wells near potato fields. In 2026, the MDA plans to sample approximately 350 wells near golf courses and/or potato fields.
- No changes to the ambient groundwater monitoring network are planned at this time. Changes to this network must carefully be considered to avoid interfering with the long-term analysis of the MDA's monitoring data.

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6. Chlorothalonil Degradate Analysis

Laboratory testing procedures need to be improved to better analyze 4-hydroxychlorothalonil.

MDA Response

- The MDA will continue to work toward further refining its methods for 4-hydroxychlorothalonil and carefully evaluate any flagged samples.
- 4-Hydroxychlorothalonil continued to be characterized in the 2024 annual report as a "marginally performing analyte" because some samples were flagged with an "L3" qualifier code. The L3 code means that the associated QC recovery was outside of the lab's acceptable range (40-150%). In the case of flagged 4-hydroxychlorothalonil samples, the recovery was <40%, which suggests that the reported concentration would be underestimating the actual concentration in these samples.
- It's important to note that not all 4-hydroxychlorothalonil samples had the L3 code. In 2024, 17 of 227 groundwater and 14 of 402 surface water samples analyzed had this code.
    - 6 of the 24 4-hydroxychlorothalonil detections in groundwater in 2024 had an L3 code.
    - None of the 3 surface water detections in 2024 had an L3 code.
- Private well samples are analyzed by an external lab; therefore, the categorization of 4-hydroxychlorothalonil as a "marginally performing analyte" by the MDA Lab does not apply.

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7. 2,4-D Surface Water Pesticide of Concern Status

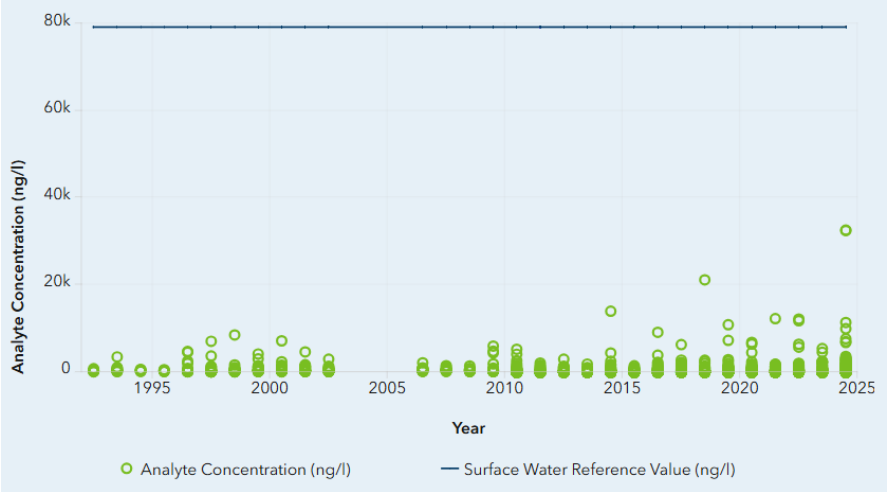
Comment 1: The MDA should designate 2,4-D as a Surface Water Pesticide of Concern.

Comment 2: The MDA could further review 2,4-D and consider it for a new status in surface water.

MDA Response

- Based on internal review, the Commissioner has decided not to pursue designation of 2,4-D as a Surface Water Pesticide of Concern at this time. The MDA will continue to carefully track 2,4-D in surface water and may consider designation in the future. The MDA will also continue to promote its water quality BMPs for all agricultural herbicides.
- Detections of 2,4-D (2020-2024) are summarized in Appendix B. Factors noted in the PMP and comment guidance were considered in the Commissioner's decision, including the frequency of detections, trends in detections, and concentrations detected relative to available surface water reference values. While 2,4-D is frequently detected, concentrations remain below levels of concern (Figure 6). In 2024, the 90th percentile concentration for 2,4-D was 751 ng/L, approximately 1% of the reference value.

Figure 6. 2,4-D detections in surface water compared to the reference value



8. Pyroxasulfone Surface Water Pesticide of Concern Status & Vegetative Buffer Strips

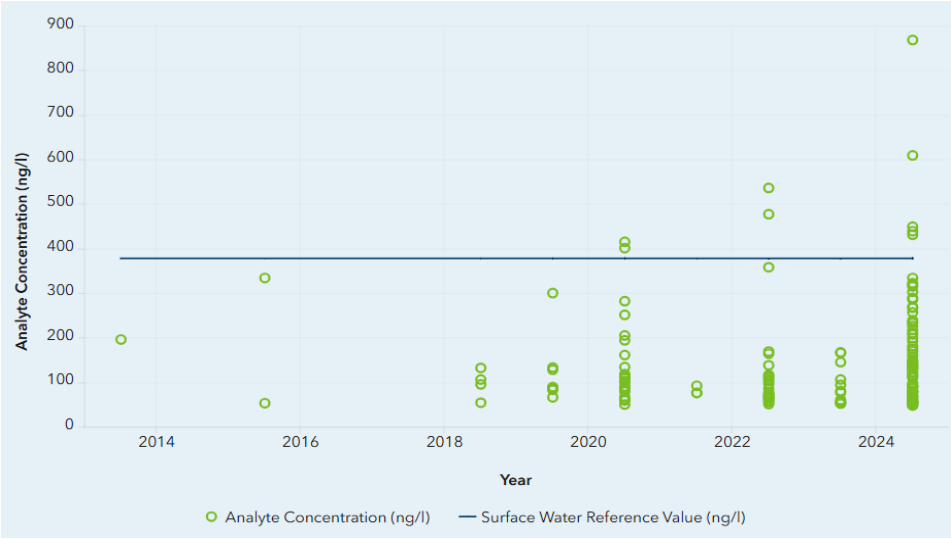
Comment 1: The MDA should designate pyroxasulfone as a Surface Water Pesticide of Concern.

Comment 2: Moving forward with requiring vegetative buffer strips on product labels is expected to be a more effective approach than developing BMPs to address pyroxasulfone detections in surface water.

MDA Response

- Based on internal review, the Commissioner has decided not to pursue designation of pyroxasulfone as a Surface Water Pesticide of Concern at this time. While pyroxasulfone was detected above its reference value in surface water in 2020, 2022, and 2024, these elevated concentrations are not consistently detected (Figure 7). The MDA will continue to carefully track pyroxasulfone and its degradates in surface water and may consider designation in the future.
- Detections of pyroxasulfone and its degradates are summarized in Appendix B.

Figure 7. Pyroxasulfone detections in surface water compared to the reference value



- The MDA's approach to water quality outlined in the PMP begins with voluntary actions prior to regulatory actions. The MDA agrees that vegetative buffer strips could be an effective approach to helping address pyroxasulfone detections in surface water; however, in accordance with the PMP, buffer strips should first be promoted as a voluntary action.
- Establishing and maintaining vegetative buffer strips is a practice the MDA promotes through its generic herbicide BMPs for water quality. Minnesota's Buffer Law (MINN. STAT. 103F.48) also requires perennial vegetative buffers for public waters and public drainage systems.
- The MDA's current plan is to work with our Education and Promotion Team to raise awareness about pyroxasulfone detections in Minnesota's surface waters and promote the use of vegetative buffers along with other practices included in the MDA's general herbicide BMPs. The MDA will continue to monitor pyroxasulfone and evaluate the effectiveness of the initial voluntary approach prior to considering making vegetative buffer strips a requirement.
- Pyroxasulfone is an important alternative to acetochlor, which is a Surface Water Pesticide of Concern.

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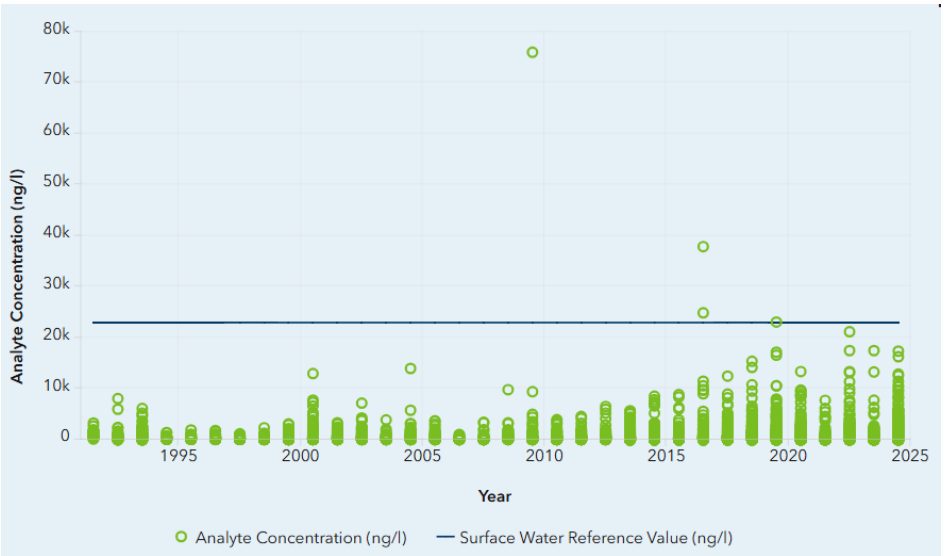
9. Metolachlor Surface Water Pesticide of Concern Status

Comment 1: The MDA should designate metolachlor as a Surface Water Pesticide of Concern.

MDA Response

- Based on internal review, the Commissioner has decided not to pursue designation of metolachlor as a surface water pesticide of concern at this time, but designation may be considered in the future. The MDA will continue to monitor metolachlor and promote its water quality BMPs for all agricultural herbicides and its BMPs specific to metolachlor.
- Detections of metolachlor and its degradates are summarized in Appendix B. While a handful of detections at or above the reference value have occurred in surface water, the vast majority remain below the reference value (Figure 8).

Figure 8. Metolachlor detections in surface water compared to the reference value



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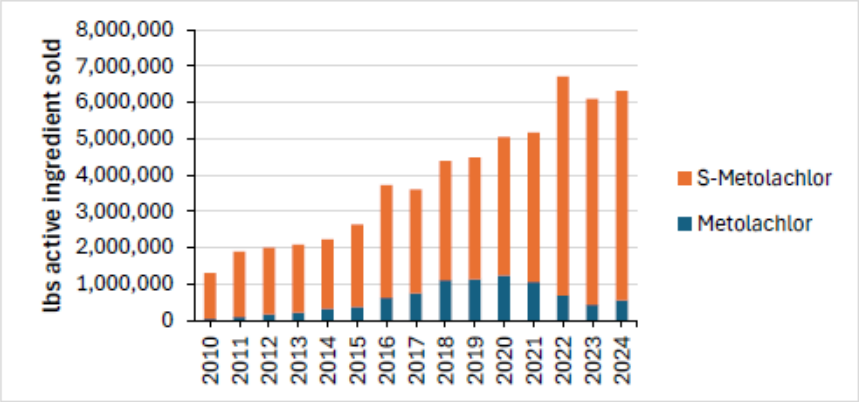
10. Metolachlor Sales

The MDA should assess metolachlor detections in groundwater and surface water next year to see if and how much decreases in sales are reflected in the monitoring data.

MDA Response

- The MDA looks at pesticide sales data to estimate use in Minnesota and considers this data in its evaluation of detection trends. Metolachlor sales in Minnesota are not actually decreasing, rather, sales show an increasing trend when taking into account both metolachlor and S-metolachlor sales (Figure 9).
- Metolachlor and S-metolachlor are listed separately in the MDA's pesticide sales searchable data, which can lead to confusion. While sales appear to be decreasing when looking at metolachlor alone, S-metolachlor shows an increasing trend and is responsible for over 90% of the total metolachlor sales in the state. Analysis performed for water monitoring does not differentiate between metolachlor and S-metolachlor.

Figure 9. S-Metolachlor/metolachlor sales in Minnesota (2010-2024)



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11. High-Use Herbicide Designations and Product Restrictions

There is a need for new Common Detection and/or Surface Water Pesticide of Concern designations and product restrictions for high-use herbicides that are being detected in surface water or groundwater. It is difficult to believe products can be used if the product, when used according to its label, is continually detected in non-target surface waters or groundwater.

MDA Response

- The MDA evaluates active ingredients in all herbicides individually for potential designation as either a common detection pesticide in groundwater or surface water pesticide of concern. Currently, several "high-use" herbicides have one or both designations including acetochlor, metolachlor, atrazine, and metribuzin. Based on detection data and the guidance outlined in the Pesticide Management Plan, the Commissioner has not identified any additional herbicides for designation at this time. Additionally, the Commissioner is not implementing any individual active ingredient or product restrictions for herbicides at this time.
- The MDA is tasked with determining the impact of pesticides on water from their routine, normal use, and monitoring data suggests that pesticides can be present in both groundwater and surface water, even when used according to their labels. However, to evaluate the potential risk, additional

information is also considered (e.g., how detected concentrations compare to toxicity-based reference values).

- The MDA will continue to promote its voluntary water quality BMPs for all agricultural herbicides as well as its pesticide-specific BMPs to help mitigate detections of high-use herbicides in both groundwater and surface water.

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12. Designation for Pesticides in Rainfall

The MDA should develop a new designation for analytes detected in rainfall to allow for the implementation of best management practices for analytes that move more freely through the environment and do not stay where applied.

MDA Response

- Development of a rainfall-specific designation for pesticides has been considered; however, evaluation of rainfall data is less straightforward than detections in groundwater or surface water bodies. For example, some pesticides can travel long distances from where they are applied via atmospheric transport and be detected in rainfall hundreds of miles away. In addition, there are no established reference values to evaluate pesticide concentrations in rainfall, and the MDA has a limited number of rainfall monitoring sites/samples. The MDA may evaluate rainfall data to further support Surface Water Pesticide of Concern determinations.
- While there are limited options for rainfall-specific BMPs, select practices promoted through other MDA BMPs aim to minimize pesticides in rainfall. For example, the MDA's Water Quality BMPs for all Agricultural Insecticides (PDF) and Potato Fungicide BMPs to Prevent Drift and Minimize Volatilization (PDF) advise avoiding applications under weather conditions that favor drift and volatilization.
- The lack of a rainfall-specific designation does not prohibit the MDA from implementing best management practices aimed at rainfall.

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13. Neonicotinoid Water Quality Standards

The MDA should collaborate with the Minnesota Pollution Control Agency (MPCA) to develop Water Quality Standards for clothianidin and imidacloprid.

MDA Response

- The MPCA is responsible for the development of Minnesota state water quality standards. Clothianidin and imidacloprid are currently listed in Group 2 of the MPCA's Draft Water Quality Standards Work Plan for 2025 to 2027. Chemicals in Group 2 (in technical development) are expected to move into Group 1 in the next work plan, where they will be prioritized for active development.
- The MDA has requested that the MPCA develop water quality standards for clothianidin and imidacloprid each year since 2011. The MDA also submitted a public comment on the MPCA's Draft Water Quality Standards Work Plan for 2025 to 2027 requesting that these insecticides be prioritized and move to Group 1. The MDA will continue to communicate the need for these standards to the MPCA.

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14. Neonicotinoid Treated Seed Review

The MDA should conduct a special review of the risks, costs, and benefits of neonicotinoid-treated seed with a focus on surface water impacts. If the review finds unreasonable adverse effects on the environment, MDA should exercise its regulatory authority by implementing use restrictions on neonicotinoid-treated seed.

MDA Response

- In 2025, the Natural Resources Defense Council and the Minnesota Center for Environmental Advocacy brough a lawsuit against the Minnesota Department of Agriculture over neonicotinoid-treated seeds. In early 2026, the MDA entered into a court-sanctioned settlement agreement.
- The MDA is not planning to conduct a review on the risks, costs, and benefits of neonicotinoid-treated seed at this time due to ongoing litigation.
- The MDA is not planning to implement use restrictions on neonicotinoid-treated seed due to ongoing litigation.

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15. Pesticide Treated Seed Sales Tracking

There is a need to track the sale use of pesticide treated seed. Pesticides used to treat seed, including neonicotinoids, are being detected in groundwater and surface water. Tracking may also help improve BMPs in place for imidacloprid and clothianidin.

MDA Response

- The MDA is currently working with registrants to begin voluntary reporting of treated seed sales in Minnesota. Reporting is expected to begin in April 2026.

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16. Data for "Additional Pesticides" in Groundwater

PMPC members would benefit from additional data in the "Assessment of Additional Pesticides" section on the number and percent of pesticide results that have exceeded 10%, 50%, and 100% of their corresponding HBGVs over time as well as comparisons of 95th percentile concentrations to HGBVs. MDH also recommends including the same level of information on pesticides that were found in >15% of samples in any pesticide monitoring region (PMR).

MDA Response

- The MDA is working to expand the "Assessment of Additional Pesticides" section in the 2025 annual report to note which pesticides are detected at frequencies >15% in other PMRs besides PMR 4. Detection frequency in PMR 4 has previously been used to identify "additional pesticides" based on the large fraction of samples collected from this region and the known vulnerability of groundwater in the region.
- The MDA currently reports maximum and 90th percentile concentrations. 95th percentile concentrations are not expected to provide additional key insights and may not be valid for multiple PMRs based on sample counts; therefore, the MDA does not plan to include this data in the report. The MDA can, however, provide this data directly upon request.

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17. Private Well Data in Report

The monitoring of 4-hydroxychlorothalonil and additional pesticides in private wells listed in Table 5-6 of the Report are valuable and should be included in future monitoring reports.

MDA Response

- The MDA has been working to streamline its 300-page annual monitoring report. As part of this effort, the 2025 private well monitoring data will be presented in a separate report; this report will still be shared with PMPC members.

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18. Sum of Parent + Degradate Concentrations

The MDA should include the sum of parent+degradate concentrations in the report in all cases where degrade-specific health-based guidance values are absent (bentazon, pyroxasulfone, sulfentrazone, etc).

MDA Response

- The MDA has confirmed the recommended approach with the Minnesota Department of Health and plans to sum the parent+degradate concentrations in the 2025 monitoring report in cases where degradate-specific reference values are not available.

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19. Ethylene Thiourea (ETU) Monitoring

MDH commends MDA for its decision to contract out analysis of ethylene thiourea (ETU), a major mancozeb degradate…MDH recommends that MDA continue to conduct targeted monitoring for ETU in PMR 4 monitoring wells if initial detections are found.

MDA Response

- The MDA published a Request for Proposals (RFP) in the State Register in February 2025 seeking external labs with the capacity to analyze ETU and published. Unfortunately, the lab that won the RFP was unable to develop a method for ETU and the MDA has not yet been able to begin monitoring for ETU. The MDA plans to continue its efforts to secure an external lab for ETU analysis.

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20. Reverse Osmosis Systems

The MDA should extend its work providing reverse osmosis (RO) systems to owners of wells with exceedances of atrazine/cyanazine health-based guidance values to private well owners with health-based guidance value exceedances of any pesticides identified through MDA's targeted PMR 4 private well monitoring and future private well sampling projects.

MDA Response

- The MDA currently offers RO systems to homeowners with wells tested through MDA's Private Well Pesticide Sampling Project that exceed the health risk limit for any pesticide throughout the state, not only atrazine/cyanazine exceedances at no cost to the homeowner. Once the MDA confirms a detected pesticide exceeds the health risk limit, well owners are sent a letter providing more information about RO systems.

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21. Prioritizing Education

The MDA should prioritize education to the community and industry partners, as it is vital for future successes. Industries need to be aware of the monitoring data and fully consider alternative products and practices.

MDA Response

- The MDA has taken a number of steps to make the community and industry partners aware of its pesticide monitoring data and plans to continue these efforts. The MDA has an Education and Promotion Team (EPT) that includes members from industry, university, soil and water conservation districts, and local government. The EPT plays a key role in educating others on water quality concerns and promoting practices aimed at protecting water resources from pesticide contamination. The MDA also recently developed Pesticide Water Quality Monitoring StoryMaps, which offers a more accessible option for people to explore and interact with the monitoring data. The MDA is open to any additional ideas or suggestions for further disseminating pesticide monitoring data and findings.

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22. Pesticide Manufacturers as Part of the Solution

Manufacturers of pesticides being detected in waters need to be part of the solution.

MDA Response

- The MDA recognizes that the involvement of pesticide manufacturers/registrants is important in preventing and mitigating pesticide detections in water. The MDA works closely with industry groups, including through the MDA's Education and Promotion Team.

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23. Applicator Responsibility

From my point of view, how can an applicator of herbicide (i.e., acetochlor) with environmental warnings on the label, not have some responsibility in the product being found off-site in the public aquifers or waters? If best management practices cannot control these off-site infiltrations, how is change going to occur if applicators are not held accountable for their product choices? It is state agencies' responsibility to protect public waters.

MDA Response

- Legally, applicators are required to follow pesticide product labels. The MDA encourages the implementation of voluntary BMPs to help prevent contamination of water resources before taking regulatory actions. Additionally, if applicators are legally using a registered pesticide, the MDA does not have authority over their product choice. In instances of reported misuse, the MDA may conduct investigations and apply penalties for violations.
- The Pesticide Control Law dictates that the MDA commissioner shall determine the impacts of pesticides on the environment, develop BMPs, and work with other state agencies and local governments to protect public health, pollinators, and the environment from harmful exposure to pesticides (MINN. STAT. 18B.04). The Pesticide Management Plan, which was developed in response to the law (MINN. STAT. 18B.045), outlines the MDA's approach to preventing, evaluating, and mitigating pesticide contamination in groundwater and surface water. The Pesticide Management Plan calls for voluntary

actions (e.g., BMPs) prior to considering regulations. Currently, the MDA is primarily focused on voluntary actions. The Commissioner has not made the determination that additional regulations are required at this time.

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24. Relating Detections to Use

Because no information on the overall use patterns of pesticides is available, it is hard to relate detections to use. The number of farms, co-ops, types of farming, highway departments, or who is contributing and/or responsible for these water-related issues is unclear.

MDA Response

- The MDA agrees that relating pesticide use patterns to detections in water is difficult, particularly for nonpoint source contamination. The MDA considers broader trends relating statewide pesticide sales to statewide detections in water; however, the MDA is unable to quantify contributions from individual used sites based on the data available.

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25. Collaboration with MN DNR

There may be additional opportunities for the MDA and DNR to share resources (e.g., new DNR observation well added in 2024). The DNR is open to considering how DNR observation wells and other DNR administered resources can contribute to MDA's network of sampling locations.

It may behoove the MDA and DNR to occasionally share updates on any emerging research or monitoring efforts related to neonicotinoids.

MDA Response

- The MDA agrees that strengthening communication and collaboration with the DNR could be mutually beneficial.
- The MDA coordinates with DNR to share resources and sample DNR administered sites. For example, the MDA sampled DNR fish hatchery springs in southeast Minnesota and added a new DNR observation well in Fillmore County to its groundwater network in 2024.
- The MDA periodically meets with DNR to discuss both agencies' work related to pesticides, including the DNR's neonicotinoid monitoring in avian species and white-tailed deer, and is open to other future connections.

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26. Posting Responses to Comments on MDA Website

The MDA should post its responses to PMPC member comments on its website to increase transparency.

MDA Response

- The MDA posts PMPC meeting notes, agendas, and member comments (PDF of comments as received) from the previous year to its PMPC webpages. As requested, the MDA's responses to member comments will also be posted to increase transparency.

Appendix A. Groundwater detection summary and reference values for select analytes

Table A 1. Detection summary for select pesticides and degradates in groundwater (2020-2024)

Analyte	Year	# Samples	Detection Frequency[1] (%)	90th Percentile Concentration (ng/L)	Max Concentration (ng/L)	Max Concentration as % of Reference Value	PMRs[2] with Detections
Bentazon	2024	225	20	67.2	12,200	41	1, 4, 6, 9, 10A, 10U
Bentazon	2023	224	14	15.8	3,120	10	4, 6, 9
Bentazon	2022	223	17	17.8	4,260	14	4, 6, 9
Bentazon	2021	218	16	57.3	2,670	9	4, 6, 9
Bentazon	2020	223	15	20.8	2,780	9	4, 6, 9
Bentazon AIBA	2024	225	4	<10	67	<1	4
Bentazon AIBA	2023	224	4	<10	55	<1	4
Bentazon AIBA	2022	223	4	<10	2,110	7	4, 8
Bentazon AIBA	2021	218	5	<10	131	<1	4
Bentazon AIBA	2020	223	4	<10	36	<1	4
Chlorothalonil	2024	225	0	<50	<50	--	none
Chlorothalonil	2023	224	0	<50	<50	--	none
Chlorothalonil	2022	223	0	<50	<50	--	none
Chlorothalonil	2021	218	0	<50	<50	--	none
Chlorothalonil	2020	223	0	<50	<50	--	none
4-Hydroxychlorothalonil	2024	225	11	108	16,300	815	4
4-Hydroxychlorothalonil	2023	224	11	128	12,700	635	4
4-Hydroxychlorothalonil	2022	223	10	<100	11,000	550	4
4-Hydroxychlorothalonil	2021	218	10	<100	4,630	232	4
4-Hydroxychlorothalonil	2020	223	9	<100	4,040	202	4
Clothianidin	2024	225	49	185	3,690	2	1, 4, 5, 7, 8, 9, 10A
Clothianidin	2023	224	18	109	2,380	1	4, 5, 7, 9
Clothianidin	2022	223	19	102	7,430	4	1, 4, 9
Clothianidin	2021	218	22	164	13,300	7	1, 4, 5, 7, 9
Clothianidin	2020	223	19	115	5,760	3	1, 4, 5, 7, 9

Analyte	Year	# Samples	Detection Frequency[1] (%)	90th Percentile Concentration (ng/L)	Max Concentration (ng/L)	Max Concentration as % of Reference Value	PMRs[2] with Detections
Fomesafen	2024	225	18	148	15,900	80	1, 4, 5, 8, 9, 10A
Fomesafen	2023	224	17	136	6,780	34	1, 4, 5, 7, 8, 9
Fomesafen	2022	223	18	177	4,780	24	1, 4, 7, 8, 9
Fomesafen	2021	218	16	117	2,780	14	1, 4, 7, 8
Fomesafen	2020	223	15	141	2,340	12	1, 4, 7, 8
Imidacloprid	2024	225	8	<5	285	13	
Imidacloprid	2023	224	10	<5	202	10	4, 10
Imidacloprid	2022	223	8	<5	159	8	4, U
Imidacloprid	2021	218	10	<5	137	7	1, 4, 5, U
Imidacloprid	2020	223	9	<5	136	7	4, U
Sulfentrazone	2024	225	16	132	34,500	58	1, 4, 5, 6, 7, 8, 9, 10A, 10U
Sulfentrazone	2023	224	12	55.7	24,800	41	4, 5, 6, 7, 8, 10
Sulfentrazone	2022	223	11	55.3	831	1	1, 4, 6, 7, 8, 9, U
Sulfentrazone	2021	218	9	<50	903	2	1, 4, 6, 7, 8, 9
Sulfentrazone	2020	223	10	<50	1,900	3	1, 4, 6, 7, 8, 9, U
Sulfentrazone 3-carboxylic acid	2024	225	11	192	4,810	8	4, 5, 6, 8, 10A, 10U
Sulfentrazone 3-carboxylic acid	2023	224	6	<150	2,900	5	4, 5, 6, 8, 10
Sulfentrazone 3-carboxylic acid	2022	223	4	<150	1,050	2	4, 5, 8, U
Thiamethoxam	2024	223	9	<25	3,400	2	4
Thiamethoxam	2023	224	8	<25	2,060	1	4
Thiamethoxam	2022	223	9	<25	3,400	2	4
Thiamethoxam	2021	218	9	<25	14,700	7	4
Thiamethoxam	2020	223	8	<25	1,650	<1	4

[1] Detection frequency based on the following method reporting limits: Bentazon (5 ng/L); Bentazon AIBA (10 ng/L); Chlorothalonil (50 ng/L); 4-Hydroxychlorothalonil (100 ng/L); Clothianidin (25 ng/L [2020-23]; 5 ng/L [2024]); Fomesafen (50 ng/L); Imidacloprid (5 ng/L); Sulfentrazone (50 ng/L); Sulfentrazone 3-carboxylic acid (150 ng/L); Thiamethoxam (25 ng/L)

[2] Pesticide monitoring regions; U = Urban; A = Agricultural. See the MDA's 2024 Water Quality Monitoring Report for a map of PMR locations and descriptions

Table A 2. Groundwater reference values for select analytes

Analyte	Reference Value (ng/L)	Reference Value Type[1]
Bentazon	30,000	HRL15
Bentazon AIBA	30,000	HRL15 (parent)
Chlorothalonil	1,000	HBV22
4-Hydroxychlorothalonil	2,000	RAA22
Clothianidin	200,000	HRL18
Fomesafen	20,000	HBV20
Fomesafen	3,000	RA18
Imidacloprid	2,000	HRL23
Imidacloprid	2,000	HBV20
Sulfentrazone	60,000	HRL25
Sulfentrazone	200,000	RA18
Sulfentrazone 3-carboxylic acid	60,000	HRL25
Sulfentrazone 3-carboxylic acid	200,000	RA21
Thiamethoxam	200,000	HRL18

[1] HBV = Health-based value; HRL = Health risk limit; RAA = Risk assessment advice; RA = Rapid assessment. The number indicates the year of development. Descriptions of each value type can be found in the MDA's 2024 Water Quality Monitoring Report.

Appendix B. Surface water detection summary and reference values for select analytes

Table B 1. Detection summary for select pesticides and degradates in surface water (2020-2024)

Analyte	Year	# Samples	Detection Frequency[1] (%)	90th Percentile Concentration (ng/L)	Max Concentration (ng/L)	Max Concentration as % of Reference Value	PMRs[2] with Detections
2,4-D	2024	385	88	751	32,500	41	1, 2, 4, 5, 6, 7, 8, 9, 10, U
2,4-D	2023	349	76	355	5,410	7	1, 2, 4, 5, 6, 7, 8, 9, 10, U
2,4-D	2022	315	86	608	12,200	15	1, 4, 5, 6, 7, 8, 9, 10, U
2,4-D	2021	289	83	421	12,300	16	1, 4, 5, 6, 7, 8, 9, 10, U
2,4-D	2020	386	84	410	6,840	9	1, 4, 5, 6, 7, 8, 9, 10, U
Clothianidin	2024	385	80	150	468	936	1, 4, 5, 6, 7, 8, 9, 10, U
Clothianidin	2023	349	11	27	112	224	1, 6, 8, 9, 10
Clothianidin	2022	315	27	73	389	778	1, 6, 7, 8, 9, 10
Clothianidin	2021	289	8	<25	132	264	1, 7, 8, 9, 10
Clothianidin	2020	386	24	56	367	734	1, 6, 7, 8, 9, 10
Imidacloprid	2024	385	43	30	274	2740	1, 5, 6, 7, 8, 9, 10, U
Imidacloprid	2023	349	21	9	178	1780	1, 4, 6, 7, 8, 9, 10, U
Imidacloprid	2022	315	27	13	181	1810	1, 4, 6, 7, 8, 9, 10, U
Imidacloprid	2021	289	15	7	61	610	1, 6, 7, 8, 9, 10, U
Imidacloprid	2020	386	26	13	85	850	1, 6, 7, 8, 9, 10, U
Metolachlor	2024	608	83	2,743	17,400	76	1, 2, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor	2023	512	61	634	17,500	76	1, 5, 6, 7, 8, 9, 10, U
Metolachlor	2022	549	77	1,062	21,200	92	1, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor	2021	491	54	313	7,750	34	1, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor	2020	544	74	1,523	13,400	58	1, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor ESA	2024	385	91	2,596	6,740	<1	1, 2, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor ESA	2023	349	89	1,652	6,630	<1	1, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor ESA	2022	315	89	1,800	6,040	<1	1, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor ESA	2021	289	88	1,402	4,200	<1	1, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor ESA	2020	386	89	1,655	4,520	<1	1, 4, 5, 6, 7, 8, 9, 10, U

Analyte	Year	# Samples	Detection Frequency[1] (%)	90th Percentile Concentration (ng/L)	Max Concentration (ng/L)	Max Concentration as % of Reference Value	PMRs[2] with Detections
Metolachlor OXA	2024	385	92	1,186	2,740	<1	1, 2, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor OXA	2023	349	89	775	2,320	<1	1, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor OXA	2022	315	89	669	3,650	<1	1, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor OXA	2021	289	87	456	2,300	<1	1, 4, 5, 6, 7, 8, 9, 10, U
Metolachlor OXA	2020	386	87	573	1,930	<1	1, 4, 5, 6, 7, 8, 9, 10, U
Pyroxasulfone	2024	385	20	133	870	229	1, 6, 7, 8, 9, 10, U
Pyroxasulfone	2023	349	3	<50	169	44	1, 7, 8
Pyroxasulfone	2022	315	9	<50	538	142	1, 6, 7, 8, 9, 10
Pyroxasulfone	2021	289	1	<50	94	25	1, 8, 9
Pyroxasulfone	2020	386	9	<50	417	109	1, 7, 8, 9, 10
Pyroxasulfone M1	2024	385	46	82	413	<1	1, 4, 6, 7, 8, 9, 10
Pyroxasulfone M1	2023	349	21	26	82	<1	1, 7, 8, 9, 10
Pyroxasulfone M1	2022	315	21	33	285	<1	1, 6, 7, 8, 9, 10
Pyroxasulfone M3	2024	385	0	n/a	n/a	n/a	none
Thiamethoxam	2024	385	15	40	390	53	1, 6, 7, 8, 9, 10
Thiamethoxam	2023	349	4	<25	96	13	1, 7, 8, 9
Thiamethoxam	2022	315	4	<25	189	26	1, 6, 8, 9
Thiamethoxam	2021	289	<1	<25	44	6	9, 10
Thiamethoxam	2020	386	5	<25	87	6	1, 8, 9, 10

[1] Detection frequency (DF) based on the following method reporting limits (MRLs): 2,4-D (8.3 ng/L); Clothianidin (25 ng/L [2020-23]; 5 ng/L [2024]); Imidacloprid (5 ng/L); Metolachlor (25 ng/L); Metolachlor ESA (10 ng/L); Metolachlor OXA (10 ng/L); Pyroxasulfone (50 ng/L); Pyroxasulfone M1 (15 ng/L); Pyroxasulfone M3 (25 ng/L); Thiamethoxam (25 ng/L)

[2] Pesticide monitoring regions; U = Urban. See the MDA's 2024 Water Quality Monitoring Report for a map of PMR locations and descriptions.

Table B 2. Surface water reference values for select analytes

Analyte	Reference Value (ng/L)	Reference Value Type[1]
2,4-D	79,200	EPA ALB (fish, chronic)
Clothianidin	50	EPA ALB (aquatic invertebrate, chronic)
Imidacloprid	10	EPA ALB (aquatic invertebrate, chronic)
Metolachlor	23,000	Minn. 7050 Chronic T
Metolachlor ESA	24,000,000	EPA ALB (fish, acute)
Metolachlor OXA	7,700,000	EPA ALB (aquatic invertebrates, acute)
Pyroxasulfone	380	EPA ALB (nonvascular plant, chronic)
Pyroxasulfone M1	56,000,000	EPA ALB (nonvascular plant, chronic)
Pyroxasulfone M3	38,000,000	EPA ALB (nonvascular plant, chronic)
Thiamethoxam	740	EPA ALB (aquatic invertebrate, chronic)

[2] Minn. 7050 Chronic T = Water quality standard established in Minnesota Rule Chapter 7050. Chronic Standard values are toxicity-based for aquatic organisms and protective for an exposure duration of 4 days. EPA ALB = EPA Aquatic Life Benchmark. Descriptions of each value type can be found in the MDA's 2024 Water Quality Monitoring Report.