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MINNESOTA POLLUTION CONTROL AGENCY

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January 11, 2022

The Honorable Rick Hansen Chair, House Environment & Natural Resources Finance and Policy Committee 407 State Office Building 100 Rev. Dr. Martin Luther King Jr. Blvd. Saint Paul, MN 55155

The Honorable Josh Heintzeman Republican Lead, House Environment & Natural Resources Finance and Policy Committee 353 State Office Building 100 Rev. Dr. Martin Luther King Jr. Blvd. Saint Paul, MN 55155

The Honorable Bill Ingebrigtsen Chair, Senate Environment and Natural Resources Finance Committee 95 University Avenue W. 3207 Minnesota Senate Bldg. Saint Paul, MN 55155 The Honorable Patricia Torres Ray Ranking Minority Member, Environment and Natural Resources Finance Committee 95 University Avenue W. 2225 Minnesota Senate Bldg. Saint Paul, MN 55155

The Honorable Carrie Ruud Chair, Senate Environment and Natural Resources Policy and Legacy Finance Committee 95 University Avenue W. 3233 Minnesota Senate Bldg. Saint Paul, MN 55155

The Honorable Foung Hawj Ranking Minority Member, Senate Environment and Natural Resources Policy and Legacy Finance Committee 95 University Avenue W. 2201 Minnesota Senate Bldg. Saint Paul, MN 55155

RE: National Pollutant Discharge Elimination System/State Disposal System Permits, Water Quality Standards, and Municipalities

Dear Committee Chairs and Ranking Minority Members:

Please find attached the 2021 National Pollutant Discharge Elimination System/State Disposal System Permits, Water Quality Standards, and Municipalities, written and submitted by the Minnesota Pollution Control Agency. This report is being submitted pursuant to Laws of Minnesota 2015, First Special Session chapter 150, article 4, section 101. This law changed the language of Minn. Stat. § 115.44, subd. 9. This report presents the Municipal Wastewater Division activities in permitting, standards development, outreach, and innovative approaches.

If you have any questions regarding this report, please call Alexis Donath at 651.757.2312, or Dana Vanderbosch, at 651.757.2601.

Sincerely,

Meijs Donet

Alexis Donath Legislative Coordinator Commissioner's Office AD/DV:JP:cmg



NPDES/SDS permits, water quality standards, and municipalities

Year 2021 activities to implement water quality standard and classification requirements into National Pollutant Discharge Elimination System/State Disposal System permits held by municipalities.



Legislative charge

This report fulfills the requirement of Minn. Stat. § 115.44, subd. 9, which requires the agency to report on the activities of the previous calendar year to implement standard and classification requirements into National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) permits held by municipalities. This report includes:

- A summary of permits issued or reissued, including any changes to effluent limits due to water quality standards adopted or revised during the previous permit term.
- Highlights of innovative approaches implemented by the agency and municipalities to develop and achieve permit requirements in a cost-effective manner.
- A summary of standards development and water quality rulemaking activities over the previous calendar year, including economic analyses.
- A summary of standards development and water quality rulemaking activities anticipated for the next three years, including economic analyses.
- A process and timeframe for municipalities to provide input to the agency regarding their needs based on information provided.
- A list of anticipated permit initiatives in the next calendar year that may impact municipalities.
- The agency's plan for involving municipalities throughout the planning and decision-making process, including opportunities for input and public comment from municipalities on rulemaking initiatives prior to preparation of Statements of Need and Reasonableness (SONAR).

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Minnesota Pollution Control Agency

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This report is available in alternative formats upon request, and online at <u>www.pca.state.mn.us</u>.

Foreword

This report includes a description of activities that occurred during the previous calendar year to implement water quality standard and classification requirements into National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) permits held by municipalities.

Acronyms

ASIM	Activated Sludge SIMulation Model
BMP	best management practice
BMPs	best management practices
BNR	Biological Nutrient Removal
BWSR	Board of Water and Soil Resources
CBOD	Carbonaceous Biological Oxygen Demand
EJ	Environmental Justice
EPA	U.S. Environmental Protection Agency
IJC	International Joint Commission
IRRB	International Red River Board
HSPF	Hydrological Simulation Program – FORTRAN
LCCMR	Legislative Citizens Commission on Minnesota Resources
MAWQCP	Minnesota Agricultural Water Quality Certification Program
MDA	Minnesota Department of Agriculture
MDNR	Minnesota Department of Natural Resources
MnTAP	Minnesota Technical Assistance Program
MPCA	Minnesota Pollution Control Agency
MS4	Municipal Separate Storm Sewer System
NPDES	National Pollutant Discharge Elimination System
PFA	Public Facilities Authority
PFAS	Per- and polyfluoroalkyl substances
PFOS	Perfluorooctane sulfonate
RES	river eutrophication standards
RRBC	Red River Basin Commission
SAR	sodium adsorption ratio
SDS	State Disposal System
SONAR	Statement of Need and Reasonableness
SWCD	Soil and Water Conservation District
TMDL	total maximum daily load
ТР	total phosphorous
TSD	Technical Support Document
TSR	Triennial Standards Review
TSS	total suspended solids
U of M	University of Minnesota
WQBEL	Water Quality Based Effluent Limit(s)
WQS	Water Quality Standard(s)
WWTF	Wastewater Treatment Facility
WWTP	Wastewater Treatment Plant

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Municipal wastewater permits, new effluent limits, and innovative approaches

This section includes a summary of permits issued or reissued during the previous calendar year, including any changes to permit limits (i.e. effluent limits) due to Water Quality Standards (WQS) adopted or revised during the previous permit term. In addition, this section includes a summary of the innovative permitting approaches implemented to achieve permit requirements in a cost-effective manner.

The challenge of wastewater treatment Cleaning our wastewater protects our rivers for fishing, recreation and drinking water uses, but removing contaminants requires investment in our facilities, as they age and new problems emerge. Commercial and Residential institutional Industrial Additional pollutants We know these may have to Drinking pollutants are a be removed water drawn from the river problem, but we depending on don't yet have a other factors feasible way to remove them. Downstream: PRIMARY SECONDARY TERTIAR be used for -Emerging 岆 ъ drinking water concerns: Solids & All plants do Phosphorus Chloride Sulfate PFAS, medications. ? Nitrogen Mercury bacteria primary treatment Bio-solids Wastewater treatment facility water for fishing, PIVER Aging wastewater treatment and MINNESOTA POLLUTION CONTROL AGENCY collection systems require investments

Permits actions and new limits

New water quality based effluent limits (WQBELs) may be assigned when a NPDES/SDS permit is issued or reissued. From January through November 2021, the MPCA issued or reissued 188 NPDES/SDS wastewater permits. Of these, 75 were industrial permits (35 individual and 40 general permits). One hundred and thirteen were municipal permits (86 individual and 27 general permits). Seven permits

received new WQBELs due to a new water quality standard being revised or adopted during the previous permit term (Table 1). All seven of these permits received new phosphorus limits derived from river eutrophication standards, which were adopted in 2015.

Table 1. Wastewater treatment facilities receiving new or modified phosphorus WQBELs in 2021 based on a water quality standard adopted over five years ago.

Facility
Brownton WWTP
Cokato WWTP
Cosmos WWTP
Mankato Water Resource Recovery Facility
Maynard WWTP
Rollingstone WWTP
Silver Lake WWTP

Chloride variances: update

Communicating with municipal permittees about the unique permitting issues presented by chloride has been a major effort since 2018. In 2017, a Chloride Working Group was assembled to develop and recommend permitting options that the MPCA could implement. Upon their recommendations, MPCA developed a process by which public data are used to determine if a community is eligible for a variance based on the cost of either: 1) updating a WWTP or 2) constructing a centralized softening system for drinking water and removing home water softeners. The MPCA has found that many communities are eligible for a variance based on economic hardship because costs to comply with the chloride limit would exceed 2% Median Household Income (MHI).

To date, six chloride variances have been developed by the MPCA and approved by the U.S. Environmental Protection Agency (EPA), four of which were processed in 2021 for the following cities.

- City of Albert Lea WWTP
- Glacial Lakes SSWD
- City of Sherburn WWTP
- City of Worthington WWTP

The MPCA has also received and is evaluating three variance applications for mercury variances based on cost. These cities discharge to the Lake Superior Basin. Therefore, variances will be limited to five years (the term of the permit).

- City of Grand Marais
- City to Silver Bay
- Western Lake Sewer and Sanitary District

Red River Basin management plan: update

The Red River Basin management plan, facilitated by the Red River Basin Commission (RRBC), is a collaborative effort between the MPCA; the cities of Breckenridge, Thief River Falls, Moorhead, Warroad, and Roseau; the Minnesota Department of Agriculture; private engineering groups; and other unregulated stakeholders.

RRBC organized meetings are designed to address topics such as permitting and efforts to identify and reduce non-point sources of phosphorus released to surface waters within the Red River Basin.

During 2021 the MPCA issued the municipal NPDES/SDS Permits to all of the five cities participating in the RRBC meetings. The recently reissued permits all include a schedule that provides the cities with time to work with the RRBC to establish phosphorus limits and a plan to reduce phosphorus in the Red River from Minnesota sources by 700 metric tons. The next reissued permits in five years' time will include any necessary schedules to meet the limits depending on each city's specific needs.

Summary of water quality standards development – current and upcoming

This section includes a summary of standards development and water quality rulemaking activities over the previous year (January – December 2021) and a summary of the rulemaking activities anticipated for the upcoming three years. This section also includes a summary of the process and timeframe for municipalities to provide input to the agency on the rulemakings.



Water Quality Standard (WQS) development in 2021

Amendments to Class 3 and 4 WQS: Completed

This rulemaking was adopted by the MPCA on June 4, 2021 and was approved by the EPA on October 3, 2021.

Class 3 standards govern water quality for industrial use and Class 4 standards govern agricultural and wildlife usage of state waters. More than 150 municipal wastewater treatment plants and some industrial plants that discharge treated wastewater to state waters are impacted by these standards.

The amended standards are the result of years of engagement and input from community partners across the state. The MPCA received thousands of comments expressing concerns about the amended standards' potential impact on agriculture, industry, and wildlife.

The amended standards reflect several changes. For Class 3 waters protected for industrial consumption:

- The Class 3A to CD subclasses were removed and condensed into a single class.
- All numeric Class 3 standards were removed.
- All narrative standards were maintained and clarified.

• Implementation in wastewater permits was clarified and a translator was incorporated.

For Class 4A waters protected for irrigation:

- Numeric standards for bicarbonate, pH, specific conductance, and total dissolved salts were removed.
- Numeric standards for boron and sulfate wild rice were retained, and the duration and frequency were defined.
- Narrative standards were maintained and clarified.
- Implementation in wastewater permits was clarified and a translator was incorporated.

For Class 4B waters protected for livestock and wildlife drinking:

- The total salinity standard was replaced based on current science with Total Dissolved Solids.
- Nitrate, sulfate, and pH standards were retained.

A summary of the economic analysis of impacts related to this standards revision is provided in the SONAR for this rulemaking. Impacts are anticipated to be minimal (<u>SONAR p. 169</u>).

"The MPCA expects that the majority of small cities and businesses would not have any new costs in the first year after the proposed rule takes effect. This is primarily because only a small number of cities and small businesses that operate wastewater treatment plants are likely to receive a new effluent limit because of the proposed rule."

Use classification changes for trout stream portion of the Dark River in St. Louis County: Withdrawn

The MPCA received a petition to change use classifications Class 1B (drinking water), Class 3 (industrial consumption) and Class 4A (agricultural irrigation) for the trout stream portion of the Dark River in St. Louis County in August 2018, on the basis that these are not existing or attainable uses.

The MPCA reviewed the petition and preliminarily found it supported a review of the designated uses. A Request for Comment in response to the request was published in the March 18, 2019 *State Register*. Later information provided showed that it was inappropriate to remove the Class 4A use from the Dark River trout reach. In addition, the MPCA recently adopted broader revisions to the statewide Class 3 and Class 4 water quality standards and is considering revisions to the Class 1 standards. Use class changes have been, or will be, considered in these statewide revisions.

MPCA published a notice in the November 15, 2021 *State Register* announcing it is withdrawing the Dark River rule from the rulemaking process.

Anticipated/Future WQS development: Next 3 years

The MPCA recently completed the 2020 – 2021 Triennial Standards Review (TSR). The public's comments informed development of the final <u>WQS work plan for 2021 to 2023</u>, which will guide the agency's WQS development work over the next three years. The MPCA's <u>work plan for 2021 to 2023</u> includes projects currently in the rulemaking process and others that are in development and not yet ready for rulemaking. The work plan and <u>TSR webpage</u> also includes more detail about each project and the expected WQS development timelines.

Over the next three years, the MPCA is committed to completing WQS development/rulemaking on the following:

- Revisions to Class 2A and 2B waters revisions are needed to update and align these
 designations with the improved tools now used by the MPCA to assess the condition of
 Minnesota's waters, including the indices of biotic integrity and other biological criteria;
- Revisions to Class 1 waters Revisions to the Class 1 rules are needed to better define and protect waters used for domestic consumption (drinking water use and food processing), and address the inconsistencies and gaps in Minn. R. chs. 7050 and 7060 (underground waters);
- Revisions to Lake Eutrophication WQS This revision potentially includes several elements needed to update and modernize the eutrophication WQS for lakes;
- Development of a Class 2 Nitrate Aquatic Life WQS This has been a priority from a long time, EPA-sponsored toxicity studies are now complete, such that the MPCA can move forward with rulemaking; and
- Revision to ammonia WQS EPA revised criteria in 2013. The MPCA will be revising the standard to include EPA's criteria.

There will be opportunities for public engagement and input on all of these rulemaking efforts over the next three years.

When water quality standards are proposed or revised, an economic impact analysis is required as part of the rulemaking process. The economic impact analysis requires the estimation of future limits, statewide, and the cost of treatment technologies to remove pollutants, as needed. For the activities listed above, the analysis will be provided along with the rule making process to allow for public input.

Permit initiatives

This section includes a summary of the current and future permit initiatives that may impact municipalities.

Wastewater treatment plant and pond optimization pilot project: 2018-2021

In 2018, the Legislature approved an appropriation of \$1.2 million from the Environment and Natural Resources Trust Fund to conduct a wastewater treatment plant and pond optimization pilot program. The goal was to evaluate the opportunities to improve wastewater treatment without costly capital improvement projects. Project partners with the MPCA were Minnesota Rural Water Association (MRWA) and Minnesota Technical Assistance Program (MnTAP). From 2018 until its completion this year, we completed one-on-one technical assistance with 10 mechanical plants and 14 wastewater ponds, and provided assistance to dozens more who did not complete the pilot.

This project found that Minnesota's mechanical wastewater treatment plants may achieve better biological nutrient removal through low-cost operational changes. These improvements were modeled using special software to determine the specific plant operational parameters required to achieve BNR. On average, mechanical plants in this pilot were modeled to have average nitrogen reduction of 14.14 mg/L, average phosphorus reduction of 1.84 mg/L (most sites already treat phosphorus chemically to 1 mg/L) and chemical reductions of 886 lb. chemical/Million Gallons flow.

Wastewater ponds can achieve much better nutrient treatment by utilizing the 'Steady-State Primary' strategy developed during this project. This strategy involves holding the first pond at six feet, or the maximum depth permitted) with a slide gate. Raw influent continues flowing into pond 1, while treated

effluent from pond 1 is used to fill pond 2. Meanwhile, pond 3 is also held full. This strategy maximizes treatment time and drastically improves nutrient treatment quality. The two developed case studies showcase a 69% reduction in phosphorus and 43% reduction in nitrogen when compared to the prior year's effluent. Secondary recommendations to wastewater ponds is to reduce inflow and infiltration, reduce fecal loading from waterfowl, and to encourage the growth of aquatic plants, with a specific emphasis on the growth of coontail.

By quantifying the role that optimization has in effective wastewater treatment, Minnesota's lakes and streams may be able to meet standards in a more cost effective means.

The project and its results have been presented in 17 different events and conferences by members of this team, including MRWA's annual conference, MPCA's annual conference, the Conference on the Environment, and many others. However, only one mechanical treatment plant has elected to move ahead with a pilot study, and one additional has expressed interest in doing so in the near future. The team has heard from staff and consultants of participating facilities that without a nitrogen standard as a driver, they feel little urgency to adopt optimization recommendations. Other facilities are meeting phosphorous limits under current flow, but would face difficulty at increased flow. Additionally, BNR design and operation is not a common treatment system in our Minnesota climate, and there may be some trepidation to moving toward that form of treatment until other facilities lead the way.

We have seen eight pond systems adopt the steady-state-primary flow regime in their operations, with more hoping to do so in the near future. Those that have done so already have reported roughly 50% reduction in nutrient discharge. The flow regime still needs additional validation. But, more discharge events will add more confidence with additional datasets from daily monitoring reports. Better flow management through infrastructure maintenance – making sure the control structures function as designed – is going to continue to be an area of importance in order to prevent short circuiting of the treatment in isolated pond cells.

The final report, the final work product of operator field guides for mechanical and pond treatment facilities, case studies of participating facilities, and additional findings, can all be found here, at the <u>Minnesota Technical Assistance Program's wastewater webpages</u>.

In 2022, the Legislature appropriated \$700,000 through the Environment and Natural Resources Trust Fund to the MPCA to work with partners MnTAP and MRWA to implement pond optimization strategies and provide technical assistance in cities smaller than 5,000 in population. Emphasis will be on educating operators in the steady-state primary flow regime, but will also include a capital replacement grant to repair and replace infrastructure such as control structures and valves. The project is scheduled to wrap up by June 30, 2023.

Zumbro River Watershed meeting: 2021

On April 15, 2021 the MPCA held a meeting for wastewater professionals and interested parties on wastewater discharge permits in the Zumbro River Watershed. About 23 people from the Zumbro River Watershed connected with the agency to discuss such topics as:

- General overview of Zumbro River Watershed and relevant total Maximum Daily Loads (TMDLs)
- Lake Zumbro site specific standard, monitoring, assessment, and role of future TMDL
- Current facility performance vs. waste load allocation/limits
- Chloride, salty limits, linkage, and Class 3/4 water quality standard revision
- Salty compliance options and permitting next steps

Staff engaged with participants and answered questions over the course of three hours. Certified wastewater operators who attended the event were eligible for three credit hours.

Watershed effluent limit and permitting meetings were initially developed to provide advanced notification of new phosphorus effluent limits. Since the formal adoption of river eutrophication standards in 2015, a full five-year permit cycle has transpired and new limits on the basis of these standards, have largely been included in permits or communicated to permittees.

North Fork Crow water quality trading pilot

After the second Ag/Urban Partnership Forum in December 2020, the MPCA, BWSR, MDA initiated a pilot project aimed at working with local partners within the North Fork Crow watershed to support the development of water quality trading projects within the watershed. The purpose of this project was to discuss water quality trading opportunities with NPDES/SDS permittees, local resource managers, and agricultural producers, to better understand the challenges in identifying and developing trade proposals, and identify how state agencies and local partners can work together and provide the tools and resources necessary to yield positive results (i.e. make local connections, identify innovative solutions, and partner in water quality trading opportunities).

The North Fork Crow Watershed was chosen for this pilot project based on a variety of factors. The watershed includes a mix of WWTP and Municipal Separate Storm Sewer System (MS4) permittees with current or upcoming phosphorous and total suspended solids effluent limits or waste load allocations that will require pollutant load reductions. These pollutants are good candidates for water quality trading agreements between the point and nonpoint source sectors. The watershed is also home to several highly competent local natural resources management organizations and is predominantly agricultural land (72%).

The project partners identified and invited to participate in the pilot project included NPDES/SDS Permit holders (both wastewater and stormwater), local natural resources managers (Soil and Water Conservation Districts and Watershed Districts), state agency staff (BWSR, MDA, MPCA), agricultural producers, agricultural commodities representatives, engineering consultants, and environmental organizations.

Project activities included:

- A kick-off meeting on April 26, 2021 All project partners were invited to a virtual meeting to learn about the project, its goals and deliverables. The meeting also provided time for attendees to ask questions and provide some initial feedback to agency staff. Feedback was collected during the meeting using Mentimeter and the meeting chat. Following the meeting, a survey was sent out to all stakeholders to get feedback on interest in participating in the project.
- Sector specific meetings (wastewater, stormwater, and nonpoint source), were held throughout the summer/fall 2021. The sector specific meetings included topics that were specific to the interests and needs of each sector and provided time for more focused conversations and feedback on barriers that they face and how water quality trading could benefit the work of each sector. After each meeting, a follow up survey and/or calls were made to collect additional feedback from meeting participants. More focused meetings took place at the request of external stakeholders and for additional information gathering purposes for agency staff.
- A MPCA-developed modeling tool that can be used to evaluate the optimal credit generation location based on watershed pollutant delivery coefficient. The primary objective of this tool is to identify optimal locations for BMPs within the North Fork Crow River Watershed. The model can provide phosphorus reductions resulting from specific BMP projects within the watershed.

These delivery coefficients can be calculated not only to provide information on the best BMP locations for any target water of interest, but they can also be determined based on the time period of interest (e.g., month, season, or year). Due to the temporal variability in phosphorus cycle processes, delivery coefficients will vary with time. Thus, consideration of the time period for a BMP is important.

- A Minnesota Agricultural Water Quality Certification Program (MAWQCP) proposal for integrating water quality trading into their program. The MAWQCP staff, structure, and relationships are well positioned to serve critical roles for the promotion of water quality trading including:
 - Identification participating sellers and the baseline conditions.
 - Implementation of approved practices, including engineering and financial assistance.
 - Provision of practice verification as required for project audits.

Recommendations for the tools, processes, and/or resources needed for the state agencies to provide adequate support to water quality trading projects in Minnesota were developed in response to the feedback that we heard by our external stakeholders throughout the project.

Key themes in the feedback included:

- Provide guidance, tools, and/or policy decisions to clarify key components of water quality trading (e.g. stormwater trading, funding for LGUs, cost of implementation to inform cost/benefit analysis, use of the various models/tools, etc.).
- Provide real-life scenarios/examples of water quality trading to show the roles of the various partners.
- Provide dedicated state resources (staff and tools) to support long term implementation and integration of water quality trading programs and efforts into the water programs at both the state and local levels.

The final project recommendations include:

Recommendation	Project Type	Lead Agency
BWSR and MDA statement on project funding and credit generation	Policy	BWSR/MDA
Provide loan opportunities for BMPs through clean water partnership funding	Policy	МРСА
Develop Stormwater WQ Trading Guidance	Short Term	MPCA – Municipal Stormwater Program
Research/Identify funding for LGUs	Short Term	BWSR
Develop guidance on use of existing models/tools	Short Term	BWSR/MPCA/ MDA
Develop BMP cost data	Short Term	BWSR/MPCA/ MDA
Complete demonstration project – provide example scenarios	Short Term	BWSR/MPCA/ MDA
Hire staff responsible for leading water quality trading efforts (Water Quality Trading Coordinator)	Long Term	TBD
Develop BMP tool into online application	Long Term	MPCA

Wastewater Nitrogen Reduction and Implementation Strategy Development

The MPCA is committed to working with wastewater stakeholders and municipalities to develop a nitrogen reduction and implementation strategy for wastewater. This strategy will identify the nitrogen limits and reductions needed to meet the point sources goals identified in the Statewide Nutrient Reduction Strategy and to implement the forthcoming nitrate and revised ammonia water quality standards. The strategy will also include actions that will be taken to support implementation efforts and identify innovative solutions to meet the nitrogen limits and goals. The MPCA will be contacting wastewater stakeholders and municipalities in spring of 2022 to participate in the stakeholder process.

PFAS monitoring and source reduction

In November 2021, the MPCA sought feedback on its statewide per- and polyfluoroalkyl substances (PFAS) monitoring plan. The PFAS monitoring plan calls for monitoring PFAS in various media (air, solid waste, industrial and municipal wastewater, etc.). Upon finalization of the monitoring plan, the MPCA will be working with the impacted municipalities to provide the guidance needed to implement the monitoring and source reduction activities called for in the final plan. The MPCA anticipates providing additional guidance and initiating work with the appropriate municipalities in spring/summer of 2022.