



Water Quality Program
Facility-specific preliminary determination for
water quality standard variance for chloride

Permittee: Kandiyohi County
Facility Name: Glacial Lakes Sanitary Sewer and Water District
(GLSSWD) MN0052752 / AI

A. Issue Statement

The chloride standard is located in Minn. R. 7050.0222 subp 2. A variance is a temporary change in a state water quality standard for a specified pollutant and its associated water quality-based effluent limit (WQBEL) that reflects the highest attainable condition (HAC) for a permittee during the term of the variance (Minn. R. 7050.0190). All other applicable standards not addressed in this variance request remain applicable, and the underlying standard for chloride remains applicable. Compliance with the chloride water quality standard is not feasible because controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act (CWA) would result in a substantial and widespread economic and social impact to the community. Upon review of the application, MPCA staff have determined that the Glacial Lakes Sanitary Sewer and Water District (Permittee) has satisfied the conditions necessary to grant a variance and, as a result, recommends the Commissioner grant the variance and include variance conditions in the Permittee's National Pollutant Discharge Elimination System/State Disposal System (NPDES/SDS) permit No. MN0052752. Glacial Lakes SSWD discharges to Middle Fork of the Crow River (WID -07010204-511).

B. Glacial Lakes Sanitary Sewer and Water District (GLSSWD) MN0052752

The Facility has a Class A facility located in Irving Township, Kandiyohi County, Minnesota with a discharge (SD002) with an average wet weather design flow of 0.889 million gallons per day (mgd) with a 5-day carbonaceous biochemical oxygen demand strength of 195 milligrams per liter (mg/L). This facility discharges to Middle Fork of the Crow River with a water ID (WID) of 07010204-511. This waterbody is a Class 2Bg, 3C, 4A, 4B, 5, 6 water in the North Fork of the Crow River. The Facility serves the Cities of New London, Spicer, Kandiyohi and the Green Lake area (see Attachment 1 for Service Map).

C. Factor 6-substantial and widespread economic and social impacts

The variance is being pursued because compliance with the WQBELs would result in substantial and widespread social and economic impacts. The municipality used the alternatives analysis and eligibility tool developed by MPCA and used since 2019.

Based on end-of-pipe reverse osmosis and evaporation & crystallization as a tertiary method of treatment, the calculator shows the final limit would cost 3.8% of the median household income (MHI).

There is an existing water treatment plant operated by the Permittee that treats 1.2 million gallons of water per day. Treatment consists of four wells drawing water from the quaternary buried artesian aquifer followed by aeration and settling, and addition of potassium manganite, followed by dual media filtration (sand & anthracite) with filter backwash returned to the head of the plant. Finally, chlorine, fluoride and orthophosphate are added. Treated water is then pumped to the Spicer, New London and Green Lake water towers, 250,000 gallon capacity each, for consumer use. The water is at a grains per gallon hardness of 14 (~240 mg/L CaCO₃). Currently, 2,866 households are connected to the sanitary system and 1,052 of those homes have private wells (are not connected to the drinking water system supplied by the Permittee).

The current eligibility tool addresses capital costs and annual O&M costs of a lime softening or a reverse osmosis water treatment plant. Because there are already existing components of a WTP, MPCA contacted the Permittee to inquire about costs calculated from a 2011 Capital Improvements Plan. The Permittee identified 11 million dollars of capital costs would be required to soften water at the existing system, but this did not include additional piping to connect the ~35% of users that were on private wells, nor did it include O&M costs. Due to these unknowns, MPCA is using the cost calculations for construction, O&M and delivery (piping) from the eligibility tool. Therefore, it would cost 4.5% of the MHI to pay for a drinking water lime-softening plant and removal of all point-of-entry ion exchange water softeners. A reverse osmosis drinking water system and removal of all point-of-entry ion exchange water softeners would cost 4.0% of MHI.

D. Highest Attainable Condition

MPCA has determined the HAC of the receiving water is achieved through alternate effluent limits combined with a Chloride Investigation and Minimization Plan per 40 CFR 131.14(b)(1)(iii). Thus, the alternate limit included in the table below reflects the greatest chloride reductions achievable with the current treatment processes, in conjunction with the implementation of the permittee's Chloride Investigation and Minimization Plan.

These values are based on data collected through the effluent limit review for permit reissuance. The maximum measured effluent value is of 693 milligrams per Liter (mg/L) and is considered the alternate limit. A subsequent alternate limit for chloride must not be defined as less stringent than 693 mg/L. In other words, this limit will never be less restrictive.

Pollutant Parameter	Alternate Effluent Limit (Daily Maximum)	Underlying WQS Calendar Month Average Limit	Underlying WQS Daily Max Limit
Chloride	693 mg/L (August 2015)	230 mg/L	271 mg/L

E. Existing Conditions and ambient water quality

The variance alternate limit for chloride is listed above. This reflects the level currently achievable. The alternate limit and the implementation of the permittee's Chloride Investigation and Minimization Plan will protect existing conditions.

As referenced above, the existing WTP provides water with a hardness of 14 grains per gallon (~240 mg/L CaCO₃). This is considered very hard by USGS. Private wells in the area have similar hardness. Water softeners have been used and have been discharging to wastewater treatment plants since the 1940's, meaning chloride has been in the discharge prior to 1978. This variance alternate limit is based on the maximum discharged. Pollutant reduction required during the variance term and a maximum alternate limit requires the discharger to aim below this level, resulting in an overall reduction. All of this will protect existing conditions. Alternate limits will not allow the Facility to increase its effluent levels of chloride.

Many of the field sampling results taken in the Crow River watershed by MPCA occurred in 2007, although data exists from 2001-2020. The average at the ambient monitoring point downstream closest to the WWTP is 42 mg/L (Site S002-293). The following point downstream is an average of 27 mg/L. Attachment 2 includes this information by map and associated data points. There are no known downstream impairments for chloride.

F. Protection of human health & endangered species and conformance with antidegradation

Chloride is not considered a pollutant that harms human health at the levels being addressed here. The variance (alternate limit and source reduction measures) is consistent with the protection of the public health, safety and welfare. No endangered or threatened species were identified downstream of the discharge. This variance conforms to MPCA's antidegradation rules and procedures (Minn. R. 7050.0250 to 7050.0335). No increase to chloride in the discharge are requested or approved; the variance will lead to a decrease.

G. Term of the Variances

The MPCA proposes a variance term of 15 years. To ensure progress, this variance establishes an iterative process during which the City must focus on source reduction. GLSSWD is required to:

1. investigate sources and identify reductions that can be achieved using the best management practices (BMPs) required in the variance (see draft permit for specific language);
2. document successful reductions and barriers to success; and
3. adjust BMPs to achieve further reductions.

The variance term allows time for 15 years to conduct a comprehensive investigation of chloride sources and implement chloride reduction actions. In addition, the variance requires investigation of long-term compliance options. The term of 15 years is reasonable and appropriate to allow the Permittee to identify sources, evaluate the effectiveness of source control, and ultimately identify whether there is drinking water or wastewater treatment technology available to attain compliance with the final limit that would not result in substantial and widespread negative economic and social impacts. Every five years, at permit renewal, the MPCA will re-evaluate the conditions of the variance, emerging and available technologies, costs associated with meeting the final WQBEL, and pollutant minimization strategies. This re-evaluation ensures that the Permittee is required to reduce chloride to the maximum extent possible. It also ensures the final effluent limits are met as soon as possible if the conditions under which the variance was approved have changed.

MPCA supports the 15-year variance term while including permit requirements that allow for the Permittee to request a subsequent variance if compliance with the final WQBELs remain infeasible and

would result in substantial and widespread economic and social impact. This term will also allow for long-term compliance options.

H. Nonpoint source control

The draft permit includes language to address nonpoint sources of pollution, such as road salt application. Due to chloride levels increasing in Minnesota waters, MPCA developed a Smart Salting Assessment tool (SSAt). This web-based tool will help winter maintenance organizations assess operations, identify opportunities to reduce salt using proven best management practices and track progress. Along with this tool are Smart Salting training opportunities. The permit will require GLSSWD to provide funding for the winter maintenance staff at the cities of New London and Spicer to attend Smart Salting Training and use the Winter Maintenance Assessment Tool. The staff chosen shall be a decision-maker(s) in road maintenance and become certified within first three years of permit issuance. This will satisfy the requirement that Permittees with a variance will implement cost-effective and reasonable best management practices for nonpoint source control (Minn. R. 7050.0190 subp. 1(B)). This training will also reduce the amount of chloride being discharged to the WWTP from spring melting events and inflow and infiltration (I&I). Road salt intrusion is something that a WWTP needs to reduce by maintaining the collection system, and this training will benefit the WWTP.

I. Compliance and Enforcement

It is staff’s job to review submittals to determine compliance and appropriateness of Plans. MPCA has a monthly meeting to pull together compliance and enforcement (C&E) staff from different regions of the state to discuss various topics. A standing agenda item will be the level of detail being looked for in chloride investigation and minimization plans. As more Plans are submitted and reviewed, a guidance will be developed to help staff review Plans, with an eye toward successes in other Cities. Because this is the first plan of its kind where success hinges on reductions made far in advance of wastewater reaching the WWTP, MPCA staff must be aware of the detailed actions planned by the Permittees. First, staff will assess the permit to see that all permit conditions have been addressed. Second, the assessment/review will verify the timeline for implementation to determine adequacy in relation to community resources (for example, staff time financial ability). Should MPCA have questions about the priority of actions or timeline, MPCA will reach out to Permittees and ask for more information. The hope is to work with Permittees to update Plans before enforcement becomes necessary.

Should a Regulated Party be in noncompliance with permit conditions, MPCA has the authority to take compliance and enforcement action. The MPCA has an Enforcement Response Plan (ERP) that describes how noncompliance situations are handled. The water quality point source standard guidance in the ERP outlines how non-construction related compliance schedule violations can be addressed. Below is a table outlining the response actions, including environmental harm and other variables that may impact the general starting point. The situations and potential responses are intended solely for the guidance of MPCA staff, and may change based on specific circumstances. As variances become a more common part of NPDES/SDS permits in the state, MPCA acknowledges that the ERP needs to be updated if non-compliances with a variance is encountered. Noncompliance with a schedule of compliance activities in a permit associated with a variance is considered a violation of a water quality standard.

Violation	Situation	General Starting Point	
		Minor	Major
Non-construction Related Schedule	30 days late, no environmental harm, nuisance condition, or limit violations	LOW	LOW

Implementation (i.e. I & I Study, Water Balance, etc.)	≥ 30 days late, no environmental harm, nuisance condition, or limit violations	LOW	NOV
	Environmental harm, nuisance condition, or limit violations > 90 days late = SNC (regardless of enviro harm/nuisance condition or limit violation)	NOV	APO

LOW –Letter of Warning

NOV – Notice of Violation

APO – Administrative Penalty Order

J. Submittals

The complete application and eligibility tool were submitted on October 28, 2019. Further information was requested on January 8, 2021 and received on February 1, 2021. A forum was held to discuss this document on April 15, 2021.

K. Conclusions / Recommendations

Upon review of the variance request for Glacial Lakes SSWD, MPCA staff have determined that the Permittee has satisfied the conditions necessary to grant the variance. MPCA staff recommend the Commissioner grant the variance and associated alternate effluent limit and Chloride Inventory and Minimization Plan in the MN0052752 permit for Glacial Lakes SSWD. A permit has been drafted and attached that includes the variance and additional requirements.

Attachment 1. Map showing GLSSWD service area

Attachment 2. Map and ambient monitoring results for chloride

Attachment 3. Completed variance request and eligibility tool – *available upon request*

