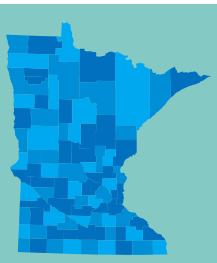
Water Quality

May 2021

Chloride variance framework for preliminary determination

MINNESOTA POLLUTION CONTROL AGENCY



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Introduction

The chloride water quality 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). The underlying standards 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, as discussed in this document.

A. Federal and State Water Quality Standard (WQS) rules

The U.S Environmental Protection Agency (EPA) adopted variance regulations in Title 40 Code of Federal Regulations (CFR) 131.14. EPA uses 40 CFR 131.10(g) as the criteria to determine eligibility for a variance. Commissioner of the MPCA has the authority to grant variances from water quality standards (see Minnesota Statutes 115.03, 115.44, 116.02 and 116.07) and governs the issuance of variances through Minnesota Rules (See Minn. R. 7050.0190, 7000.7000, 7052.0280, and 7053.0195). The state updated its variance rules in 2016 to align with federal requirements.

In accordance with Minnesota Rules 7050.0190, subp. 4 item 6 and Federal Regulations 40 CFR 131.14 and 131.10(g)(6), the variance is being sought because controls more stringent than those required by Sections 301(b) and 306 of the CWA would result in substantial and widespread economic and social impact.

The water quality standard at issue is total chloride, a pollutant that affects aquatic life. EPA first issued 'Ambient Water Quality Criteria for Chloride' in 1988. It was adopted as a water quality standard in the state of Minnesota in 1990. Different values are associated with the protection of different water uses. Class 2 waters are those protected for aquatic life and recreation. Class 2B waters are defined as waters that support or may support fish, other aquatic life, bathing, boating, or other recreational purposes. The chronic standard for total chloride to protect for 2B uses is 230 milligrams per liter (mg/L). The chronic standard is defined as the highest water concentration of a toxicant to which organisms can be exposed indefinitely without causing chronic toxicity. The value is based on a 4-day exposure. The maximum standard to protect for 2B uses is 860 mg/L, and is defined as the highest concentration of a toxicant in water to which organisms can be exposed for a brief time with zero to slight mortality. This value is based on a 24-hour exposure.

B. History of salty parameter monitoring

Municipal wastewater treatment facilities (WWTF) are designed to treat domestic waste. All WWTFs provide a minimum level of water quality that is defined based on achieving specific effluent quality for total suspended solids (TSS), five-day carbonaceous biochemical oxygen demand ($CBOD_5$), potential hydrogen (pH), and phosphorus.

With the growth of knowledge of how our waters are being used, sampling of other pollutants has increased. As the amount of data has grown, so has our knowledge of these pollutants impact on the environment. This was a result of the increase in Minnesota's ethanol industry and the use of concentrating treatment technologies (reverse osmosis, ion exchange, membrane filtration, etc.). Many

other industries, including food processing using salt density-based sorting, were required to monitor for "salty parameters". These parameters include hardness, total dissolved salts (aka solids), bicarbonates (HCO_3), specific conductance, total salinity, sulfates (as SO_4), and sodium.

To be fair and equitable, MPCA developed a policy that required municipal facilities to monitor for salty parameters if the effluent dilution ratio was low (less than 5:1) or if there was a known concentrated source coming into the WWTFs. In 2010, MPCA also started requiring monitoring of total dissolved solids (TDS) at municipalities that had an average wet weather design flow of greater than 0.1 million gallons per day (mgd) to be consistent with 40 CFR 122.21(j)

This additional monitoring resulted in a more robust statewide dataset. As the data were reviewed, MPCA began to see that municipalities would likely have reasonable potential to cause or contribute to an exceedance of the WQS for one or more salty parameter pollutants. Reasonable potential is the statistical test used to determine whether a WQBEL is necessary in a permit.

C. Treatment of chloride & research in permitting options

MPCA has assessed whether limits for chloride and other salty parameters can be met by treatment at the WWTFs. Because these parameters are "dissolved", removal is difficult. The method for removal of chloride are listed in the 'Alternatives for addressing chloride in wastewater effluent' (Appendix A); herein referred to as Alternatives Analysis.

Because of our growing knowledge of salty parameters in wastewater, as well as the need to determine permitting options for municipalities, MPCA began to research methods used by other states. Wisconsin has been using variances for decades to relieve municipalities from costly treatment that may prove a hardship to citizens. In 1999, the state of Wisconsin put together a chloride implementation strategy alongside a chloride criterion. This was due to the understanding that of the state's 529 publically owned treatment works (POTWs), approximately 100 of those would incur substantial costs in order to comply with the new water quality criteria. Wisconsin's implementation rules (NR106.80) also included a provision for a variance from the chloride water quality standard based on substantial and widespread economic and social impact (NR 106.83(2)).

D. Minnesota's chloride variance approach based on Factor 6

After looking at what Wisconsin had achieved, MPCA developed an Alternatives Analysis (Appendix A). All the alternatives, feasibility, and cost are outlined in the appendix and are not repeated here. Minnesota's Alternatives Analysis considered all chloride removal treatment options; both end-of-pipe and upstream removal. The conclusion of this analysis is that the three most feasible strategies for reducing chloride in source water and ultimately meeting the chloride limit at the WWTF are:

- Centralized lime softening and removing point-of-entry softeners.
- Centralized reverse-osmosis softening and removing point-of-entry softeners.
- Upgrade residences and business to high efficiency point-of-entry softeners.

The U.S. Environmental Protection Agency (EPA) provides a detailed guideline titled the *Interim Economic Guidance for Water Quality Standards Workbook*. The MPCA used this to create the 'Eligibility tool for streamlined chloride variance approach'. This eligibility tool uses public information available about Minnesota cities to calculate the cost per household for 1) end-of-pipe treatment using reverse osmosis for wastewater, 2) construction of centralized softening at the drinking water treatment plant

using lime, or 3) centralized softening at the drinking water plant using reverse osmosis. The last two options also include removal of point-of-entry softeners. Once this cost per household is determined, the percent of median household income for that community is calculated. If above 2%, the POTW is shown as 'eligible'.

An "eligible" result does not guarantee the issuance of a variance. The calculator is simply a tool to help eliminate the more time-consuming and costly aspects of evaluating whether or not the municipality should consider proceeding with the variance application process. In addition, this tool does not mean that MPCA will require a City to soften drinking water. Instead, it finds that centralized softening is the most feasible alternative to meet the effluent limit, and then takes into account the cost and a municipalities' eligibility for a variance. Once this tool is submitted, MPCA works with the City to determine the best approach for the permittee to comply with the standards. This tool and the Alternatives Analysis are considered MPCA's streamlined chloride variance approach.

E. Background - Implementation of chloride reduction and permitting options

With growing knowledge of chloride in wastewater, the MPCA Commissioner at the time directed staff to form a work group of community representatives to study the chloride problem and make recommendations on how to implement the standard in municipal wastewater permits (regarding chloride in industrial wastewater permits, the MPCA will continue work on a case-by-case basis). The group consisted of eight municipal representatives and two consulting engineers. Members met several times from December 2016 - April 2017. The group created a "Chloride Work Group Policy Proposal: Recommendations for addressing chloride in municipal wastewater effluent" (Appendix B). The group recommended that City officials and MPCA staff use a decision tree developed by the group to help a Permittee determine whether to request a schedule of compliance, or consider a variance to allow time to determine a solution to comply with a new chloride limit. Factors in the decision tree (on page 4 of the above referenced document) include:

- Is a reduction in chloride needed? This relates to reasonable potential. Many cities are finding they have reasonable potential to violate the chloride standard, thereby needing a WQBEL.
- Is the facility close to meeting the standard? Some cities are closer to the WQBEL than others are and this is taken into consideration.
- Is construction needed to meet the chloride limit? A few municipalities are finding that if small changes are needed, it can be done under a schedule of compliance.
- Is the solution economically feasible? Many cities are finding that end-of-pipe treatment and building or upgrading a drinking water system will result in an adverse economic and social impact, thereby leading them to apply for a variance.

Compliance with the underlying WQS is always the goal, and will remain the goal. Data shows that construction of the necessary treatment technologies (both drinking water treatment and end-of-pipe treatment) would result in substantial and widespread social and economic hardship. Under the chloride variance, the permittee will be required to maintain the alternate effluent condition that reflects the greatest pollutant reduction achievable and the adoption and implementation of a Pollutant Minimization Program, which include source investigation and reduction activities that further reduce the pollutant. The Permittee will also be required to continue to investigate the cost and economic feasibility of installing a treatment technology to comply with the final WQBEL.

F. Highest attainable condition

The highest attainable condition (HAC) is identified as the alternate effluent limit that reflects the greatest pollution reduction achievable with the pollutant control technologies installed at the time Minnesota adopts the variance, and the adoption and implementation of a Pollutant Minimization Program [40 CFR 131.14 (b)(1)(ii)(A)(3)]. For each discharger, this will be reflected in a document titled "discharger specific variance information".

The discharger specific document and the permit will include requirements that will not result in any lowering of the currently attained ambient water quality. The alternate effluent limit will be based on data collected through the effluent limits review, which occurs approximately every five years (in line with the term of the permit). The alternate limit will reflect the level currently achievable by that individual WWTF and will also protect existing conditions. The discharger-specific variance information document will also contain the date the discharge began. This will be compared to any existing and historic ambient water quality monitoring and November 28, 1975, the day EPA promulgated the original water quality standards regulation.

An alternate daily maximum limit (reporting based on facility classification and monitoring schedule) and pollutant reduction/minimization plan requires the discharger to aim below this level, resulting in an overall reduction. All of this will protect existing conditions and currently attained ambient water quality will be maintained. Alternate limits will not allow the WWTF to increase its effluent levels for total chloride.

G. Schedule of compliance activities and MPCA review of submittals

MPCA has worked with communities to create compliance schedules that achieve the final chloride effluent limit. These compliance schedules were created with the idea that investigation and reduction would lead to knowledge. The intent was that completion of the specific activities would result in compliance with the underlying water quality standard. Throughout these compliance schedules, it was discovered that installation of alternative treatment technologies would lead to substantial and widespread social and economic impacts. As recommended by our Chloride Working Group, MPCA supports a chloride variance.

The variance will require Permittees to evaluate the feasibility of centralized softening, but will not require that centralized softening (or other alternative technologies) be implemented if they would result in substantial and widespread social and economic impact. Instead, Permittees must focus on source investigation and reduction. This starts with an inventory. The Permittee must identify where the majority of the chloride is coming from and categorize the sources. Below are the requirements that will be given for each of the categories of sources identified by the municipality:

1. If **industrial**, then the Permittee will be asked to control those entities by updating/creating industrial user agreements. Specifically, look at industrial water treatment systems that send their reject water [RO, ion exchange (water purification), ultrafiltration systems] to the WWTF. Also, leachate from landfills, food processors (meat, jerky or cheese production), rendering, breweries, ethanol, biofuels, drink bottlers, metal finishing, or metal painting (including powder coat painting).
2. If an **institutional** source (often an institutional water softener), then work with the institution to determine the timeline in which to optimize or install new softeners.

3. If a **municipal** source (city-owned softener), then the Permittee will be asked to control the source (optimize, update/replace, etc.). If the source is the backwash from the municipal water treatment plant, the Permittee must document the type of treatment (RO, filtration, etc.), whether there is a problem with arsenic or radium, and flow. The Permittee will then be asked to assess other options for the discharge, focusing on re-use of water treatment plant effluent and evaluating alternative water treatment technologies, including those that provide central softening.
4. If a **commercial** entity, such as a hotel, restaurant or office building, determine the type of softener being used, and then work with the entity to determine the timeline in which to optimize or install new softeners.
5. If the problem is a result of **residential** softeners, then break down all the possibilities:
    a. Evaluate the age and condition of the softeners;
    b. Consider optimization and/or updates to residential softeners;
    c. Create an ordinance that will require flow-based water softeners; and
    d. Evaluate regional softening.

MPCA has assigned staff (including an engineer) to review plans when first submitted, coordinating with compliance and enforcement staff to develop a reply to Permittees. MPCA will verify that the plan includes the components that are required in the Permit. These include an inventory (highlighted above), development of an investigation and minimization plan, and working with the various sources to control chloride. An important part of this includes monitoring and metrics, so MPCA will notify the Permittee if more attention needs to be paid to collecting 'cause and effect' information for the actions, and will be addressed as part of the annual progress reports. An annual progress report is required by January 31. During review of the annual progress report, the MPCA determines if the appropriate steps have been taken and what needs to change to further reduce chloride.

If the progress report is determined to be inadequate (See Section L), steps taken by the MPCA may include contacting the Permittee and asking for additional information within a set time frame, asking the Permittee to re-submit a complete submittal addressing all permit requirements, noting and/or citing the missing requirements in an inspection report, and/or citing the missing requirements in an enforcement document. The MPCA's response will vary in each situation based upon the overall quality of the submittal, the Permittee's willingness to address deficiencies, whether or not the deficient submittal is recurring, etc.

MPCA has created an 'action tree' to highlight the different kinds of work that will be done throughout the term of the variance (Appendix C). MPCA recognizes that to justify the variance term that either the source identification and reduction activities that will occur cannot be completed in less than the proposed term of the variance or that there are sufficient opportunities for source identification and reduction activities to fulfill at least the term of the variance to result in greater chloride reductions and an improved HAC as long as the variance remains in effect. MPCA is confident that there are sufficient opportunities for reductions to satisfy the term of the variance, and that an improved HAC will occur as long as the variance is in effect.

H. Resources and outreach efforts

MPCA developed a strategy to guide municipalities to chloride reduction. It is available on our permit holder chloride webpage, and will be referenced in communication with Permittees that receive a chloride limit. (https://www.pca.state.mn.us/sites/default/files/wq-wwprm2-71.pdf).

MPCA also plans to have a special session at our Annual Wastewater Operator Conference that occurs annually in March or April regarding chloride source reduction. This will allow wastewater operators to share successes and failures that have taken place in their communities, thereby allowing other communities to use tools that have been developed and avoid missteps.

The MPCA is updating the Smart Salting Assessment Tool (SSAt) that was first designed to help assess and reduce salt use during winter maintenance and dust control activities. The goal is to create a new chloride source assessment model and generate the BMPs and needed water-softening data that will allow Minnesota communities to fully evaluate their specific sources and magnitude of chloride and develop a community specific chloride reduction plan. As part of this project, water softening and agricultural-related chloride BMPs will be researched and developed to be added to the SSAt. The development of the new BMPs will be done using a collaborative process with local experts and future users of the tool to ensure the tool meets their needs and supports their work. The update has been funded but will take 1.5 to 2 years to complete and be made available.

Lastly, the MPCA NPDES Permitting Program partnered with the Resources Management and Assistance Division (RMAD) to develop a better webpage in 2018. This webpage includes basic information (Chloride 101), training and BMPs for salt applicators and better information for water permit holders (municipal wastewater and stormwater). It also includes a breakdown of resources for LGUs and homeowners. It can be found at https://www.pca.state.mn.us/water/chloride-salts. Specifically, the Water permit holder's portion of this page has information related to the variance. The statewide resources page is where MPCA plans to make available reductions achieved by Permittees and barriers to compliance, and methods to overcome the barriers.

I. Chloride variance term

The chloride variance term will take into consideration specific issues at individual facilities. The specific term is identified in the *discharger specific* document. Two Minnesota communities that received a variance for chloride have differing variance terms. This is due to the activities that took place in previous permit terms. The City of Avon received a 15-year variance term. Alexandria Lake Area Sanitary District (ALASD) received an 8-year variance term, as the previous permit included a schedule to investigate options for compliance with the final WQBEL. Therefore, future variance request terms will be considered on a case-by-case basis.

MPCA has identified that there are sufficient opportunities for source identification and reduction activities to fulfill at least the term of the variance and will result in greater chloride reductions and an improved HAC. MPCA has identified ongoing efforts to help communities identify opportunities for source identification and reduction, and will review the Chloride Investigation and Minimization Plans submitted. This is an iterative process and MPCA is confident that ongoing efforts will help the community improve upon the HAC in the term of the variance.

The variance and permit will require the Permittee focus on chloride monitoring, source identification, and source reduction. The variance term allows time for the Permittee to conduct a comprehensive investigation of chloride sources and implement chloride reduction actions. Although this preliminary approval for the variance is based on the cost of treatment resulting in widespread economic and social impacts, the Permittee must still investigate long-term compliance options. This may include planning for and funding of a water supply system with centralized softening and the removal of in-home softeners, as necessary.

In 2015, the statutory language for the Point Source Implementation Grant (PSIG) program was amended to expand eligibilities to include changes to drinking water treatment facilities when necessary to meet the city's wastewater discharge requirements. This funding has the possibility of taking some of the capital cost burden off the City, making it more reasonable for a WWTP to obtain compliance. However, it is still unknown if all in-home water softeners will be required to be removed. Investigation (and therefor time) is needed for this activity, further supporting a variance term greater than 5 years.

Different alternatives for compliance with the underlying water quality standard were considered in "Alternatives for addressing chloride in wastewater effluent" (Appendix A). What became evident is that all methods of treatment will take prolonged periods of time and political will. It should not be assumed that removal of old softeners will solve the chloride problem. Although water softeners are a distinct source (and the largest portion of chloride in some cities), unless cities and the state take the time to educate homeowners and take thoughtful and meaningful steps, time, money, and goodwill can be wasted with no outcome. Careful consideration and time is needed to do proper investigation.

An example of extended time could be garnered from the state of Wisconsin. As noted in section C above, several cities in Wisconsin have qualified and been approved for a chloride variance. (See https://www.epa.gov/sites/production/files/2014-12/documents/wiwqs-variances-2004.pdf for specifics). The Village of Yorkville (population 3,131) is an example of the need for a variance to have a 15-year term. The village just received a subsequent approval for a chloride variance on July 15, 2019. Upon review of a source reduction plan from April 2018, this is the third subsequent approval of a chloride variance. The state of Wisconsin has 5-year chloride variance terms. Thus, the Permittee has had 10 years to investigate and implement source reduction, but still needs a variance. The final WQBEL the City of Yorkville is 369 mg/L weekly average. The variance interim limits in 2013 were 450 mg/L weekly average from May-Nov and 710 mg/L weekly average from Dec-April. Also in 2013, target values for the City were 395 mg/L weekly average May-Nov; 550 mg/L weekly average Dec-April. In the 2019 reissued permit, the interim limits and target limits have been retained with the addition of a 1,400 mg/L daily maximum.

The Village of Paddock Lake is another example of a village in Wisconsin to have a chloride variance for an extended time. This City has shown reductions since 2013, but not to the extent of meeting the WQBEL of 400 mg/L weekly average. Therefore, a subsequent variance was requested and became final on September 18, 2019. The interim limit in this permit is 510 mg/L weekly average. Previously, the permit had an interim limit of 612 mg/L May-Nov and 685 mg/L Dec-April. The Chloride Management Plan was shared with MPCA and will be posted on our webpage as an example of the work that can be done to reduce chloride. This plan is a good example of a sewershed approach and activities to reduce high sources of chloride (high school and car washes).

Minnesota and Wisconsin share characteristics and have similar demographics. Minnesota has 5.6 million people and Wisconsin has 5.8 million people. Both have 70 to 75% of the population in an urban area and have a greater portion of the population in the south (which includes both metropolitan areas). The cities in Wisconsin that have received a variance are similar in size to the cities in Minnesota that have requested a variance. For example, the Village of New Holstein, WI (1,413 households) and the City of Avon, MN (631 households) have residential water softeners and road salt as likely sources of chloride. Another example is the Village Twin of Lake, WI and Alexandria Lakes Area Sanitary District (ALASD), where a significant portion of the population are second homes (or seasonal) with residential softeners.

MPCA demonstrates through this document and associated permit requirements and supporting information that there are sufficient opportunities for source identification and reduction activities to fulfill at least the term of the variance and result in greater chloride reductions and an improved HAC as long as the variance remains in effect. MPCA has identified ongoing efforts to help communities identify opportunities for source identification and reduction, and will review the Chloride Investigation and Minimization Plans submitted. This is an iterative process and MPCA is confident that ongoing efforts will help the community improve upon the HAC in the term of the variance.

This variance establishes an iterative process during which the Permittee must focus on source reduction. The Permittee is required to: 1) investigate sources and identify reductions that can be achieved using the best management practices (BMPs) required in the variance (see Section G and draft permit for specific language); 2) document successful reductions and barriers to success; and 3) adjust BMPs to achieve further reductions.

J. HAC re-evaluated every five years

Throughout the variance term, every 5 years, the City and State must re-evaluate the alternate limit in accordance with Minn. R. 7050.0190, subp. 8. This complies with the federal requirement that the State re-evaluate the HAC for variances greater than 5 years (40 CFR 131.14(b)(1)(v)). The primary purpose of the re-evaluation is to ensure that the conditions upon which the variance was granted are still applicable, measure the reductions made, and review the alternate limit.

Upon re-evaluation, if a more stringent alternate limit is calculated, the new value will become the applicable alternate limit in the reissued permit. In addition, the re-evaluation will allow MPCA to consider and evaluate changes in costs and economic impacts associated with the technology, operation or design of the existing wastewater treatment system, as well as drinking water treatment. The MPCA will revise the permit to include implementation of such technology as soon as possible if it is found to be feasible and would not result in substantial and widespread negative economic and social impacts.

MPCA is developing an application form to be submitted by the Permittee as part of their permit reissuance application for the variance and HAC re-evaluation as required in the permit. The re-evaluation will occur alongside the permit reissuance ensuring water quality effluent limit review staff in Minnesota will be reviewing this data. This analysis will be part of the permit file. Because this is required alongside the 5-year permit reissuance, this information will be made available in the public notice document of the reissued permit.

K. Public participation

There are multiple avenues for public review in the variance process.

- First, the permit will be public noticed, as well as the fact sheet that will include additional supporting information. This will allow for permit language and components of the variance to be modified based on comments received. Additionally, during the public notice period, a public meeting will be held in which members of the public are encouraged to attend and participate.
- Second, every three years the MPCA shall provide the public with a list of variances currently in effect at the time of public notice, consistent with the triennial review of water quality standards (Minn R. 7050.0190, subp. 9 and 40 CFR 131.20). This public notice includes a statement that a person may submit information that has become available relevant to the variance.

- Third, every five years the variance will be re-evaluated as required by the permit [40 CFR 131.14 (b)(1)(v)]. The results of the re-evaluation of the variance requirements will include:
  - Summary of the chloride investigation and minimization plan activities over the last 5 years
  - Changes to the activities during the next permit term
  - Any resulting changes to the alternate limit or HAC that pertain to the reductions made and plans to continue reductions

This will be documented in the fact sheet and public noticed as part of the reissuance of the permit, giving the public continued opportunities to comment. Changes to the permit will result should pertinent comments be received. The re-evaluation will look at progress made by the Permittee and determine if the HAC should be adjusted based on progress made by the Permittee. MPCA is in the process of creating a re-evaluation application. This will include an evaluation of the alternate effluent limit and whether successful BMP implementation will result in a stricter alternate effluent limit.

L. 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.

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, the MPCA has the authority to take an enforcement action in accordance with the MPCA's Enforcement Response Plan.

M. Nonpoint source control

Permit language includes requirement to address nonpoint sources of pollution under which the Permittee has control, 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 BMPs and track progress. Along with this tool are Smart Salting training opportunities. MPCA is asking wastewater districts, such as ALASD, who do not maintain roads, to provide funding and opportunities for City employees involved in winter maintenance to attend trainings. An employee who has decision-making authority for the application of road salt may attend at least one of these trainings. This will satisfy the requirement that Permittees with a variance implement cost-effective and reasonable best management practices for nonpoint sources under the Permittee's control as established under state authority (Minn. R. 7050.0190, subp 1(B)).

Appendix A – Alternatives for addressing chloride in wastewater effluent: MPCA analyzes treatment options for salty parameters (https://www.pca.state.mn.us/sites/default/files/wq-wwprm2-18.pdf).

Appendix B – Chloride work group policy proposal for Minnesota: recommendations for addressing chloride in municipal wastewater effluent (https://www.pca.state.mn.us/sites/default/files/wq-wwprm2-24.pdf).

Appendix C – Streamlined chloride variance action tree (https://www.pca.state.mn.us/sites/default/files/wq-wwprm2-88.pdf)**.**

Crosswalk of federal and state regulations/rules

§ 131.14 Water quality standards variances.	
States may adopt WQS variances, as defined in § 131.3(o). Such a WQS variance is subject to the provisions of this section and public participation requirements at § 131.20(b). A WQS variance is a water quality standard subject to EPA review and approval or disapproval.	Under Minn. R. 7050.0190, subp. 6, the agency must hold at least one meeting that meets the minimum public participation requirements in 40 CFR Section 25.5, before the agency makes a final decision on the variance request. MPCA plans to host the meeting in the in the City requesting the variance.
131.20 (b) Public participation. The State shall hold one or more public hearings for the purpose of reviewing water quality standards as well as when revising water quality standards, in accordance with provisions of State law and EPA's public participation regulation (40 CFR part 25). The proposed water quality standards revision and supporting analyses shall be made available to the public prior to the hearing.	The state and federal government have different definitions for public hearing. "Public hearings" under federal definition are similar to Minnesota's "public meetings". In Minnesota, a "public hearing" would require an administrative law judge. Therefore, this document will use the term "public meeting". The state of Minnesota will host a public meeting on-line or in the affected city if requested. The state is responsible for making available the supporting analysis and documentation 45 days prior to the meeting. The state publicizes the meeting under the state's Administrative Procedures Act (APA). This is done using MPCA's .gov delivery, which sends notices to parties and posts the public notice on our webpage. The preliminary determination is linked alongside the draft permit and public notice, as well as the date and time for the public meeting.
(a)Applicability.	
(1) A WQS variance may be adopted for a permittee(s) or water body/waterbody segment(s), but only applies to the permittee(s) or water body/waterbody segment(s) specified in the WQS variance.	The variance will only apply to the applicable WWTP identified in *discharger specific variance information.*
(2) Where a State adopts a WQS variance, the State must retain, in its standards, the underlying designated use and criterion addressed by the WQS variance, unless the State adopts and EPA approves a revision to the underlying designated use and criterion consistent with §131.10 and §131.11. All other applicable standards not specifically addressed by the WQS variance remain applicable.	Minnesota will retain the underlying designated use and associated standards in state rules.

(3) A WQS variance, once adopted by the State and approved by EPA, shall be the applicable standard for purposes of the Act under § 131.21(d) through (e), for the following limited purposes. An approved WQS variance applies for the purposes of developing NPDES permit limits and requirements under 301(b)(1)(C), where appropriate, consistent with paragraph (a)(1) of this section. States and other certifying entities may also use an approved WQS variance when issuing certifications under section 401 of the Act.	The variance applies only to the applicable WWTP. The permit contains an alternate effluent limit based on the variance, and a Pollutant Minimization Plan (PMP). The underlying water quality standard remains the applicable standard for the purposes of the Act.
(4) A State may not adopt WQS variances if the designated use and criterion addressed by the WQS variance can be achieved by implementing technology-based effluent limits required under sections 301(b) and 306 of the Act.	There are no technology-based effluent limits (TBELs) applicable to domestic waste that control the discharge of chloride.
(b) Requirements for Submission to EPA.	
(1) A WQS variance must include:	
(i) Identification of the pollutant(s) or water quality parameter(s), and the water body/waterbody segment(s) to which the WQS variance applies. Discharger(s)-specific WQS variances must also identify the permittee(s) subject to the WQS variance.	Total chloride is a Class 2B water quality standard (WQS). The affected water body segment will be included in *discharger-specific variance information.* MPCA applies Class 2B chloride standard because chloride is a conservative pollutant. Low stream flow in Class 7 waters means the Class 2 chloride standard limit is applied at end-of-pipe.
(ii) The requirements that apply throughout the term of the WQS variance. The requirements shall represent the highest attainable condition of the water body or waterbody segment applicable throughout the term of the WQS variance based on the documentation required in (b)(2) of this section. The requirements shall not result in any lowering of the currently attained ambient water quality, unless a WQS variance is necessary for restoration activities, consistent with paragraph (b)(2)(i)(A)(2) of this section. The State must specify the highest attainable condition of the water body or waterbody segment as a quantifiable expression that is one of the following: (A) For discharger(s)-specific WQS variances:	Minnesota defines the highest attainable condition (HAC) using (A)(3) of this part. The alternate effluent limit is the maximum discharged during the period of time identified in the *discharger-specific variance information.* An important part of the variance is the identification and implementation of a Pollutant Management Plan. These requirements are listed specifically in the draft-reissued permit, and referenced in Section F of this document.

(1) The highest attainable interim criterion; or (2) The interim effluent condition that reflects the greatest pollutant reduction achievable; or (3) If no additional feasible pollutant control technology can be identified, the interim criterion or interim effluent condition that reflects the greatest pollutant reduction achievable with the pollutant control technologies installed at the time the State adopts the WQS variance, and the adoption and implementation of a Pollutant Minimization Program.	
(B) For WQS variances applicable to a water body or waterbody segment: (1) The highest attainable interim use and interim criterion; or (2) If no additional feasible pollutant control technology can be identified, the interim use and interim criterion that reflect the greatest pollutant reduction achievable with the pollutant control technologies installed at the time the State adopts the WQS variance, and the adoption and implementation of a Pollutant Minimization Program.	This variance is not related to a waterbody or water body segment, so this section does not apply.
(iii) A statement providing that the requirements of the WQS variance are either the highest attainable condition identified at the time of the adoption of the WQS variance, or the highest attainable condition later identified during any re-evaluation consistent with paragraph (b)(1)(v) of this section, whichever is more stringent.	The highest attainable condition (HAC) is identified as the alternate effluent limit and the creation and implementation of a Pollutant Management Plan (PMP) in the permit (as of the date of that reissued permit). At the five-year expiration of this permit, a re-evaluation will occur. If a more stringent alternate limit is identified based on activities conducted under the permit and PMP, then a more stringent limit will be applied in the permit.
(iv) The term of the WQS variance, expressed as an interval of time from the date of EPA approval or a specific date. The term of the WQS variance must only be as long as necessary to achieve the highest attainable condition and consistent with the demonstration provided in paragraph (b)(2) of this section. The State may adopt a subsequent WQS variance consistent with this section.	The term of the variance is specified in the *discharge specific variance information.* This term is assessed on a case-by-case basis and allows the permittee to develop and implement a Pollutant Management Plan that will reduce sources of chloride being discharged to the WWTP. This time will allow actions to be taken and data to be collected that will reflect source reductions made and allow for future source reduction planning and/or planning for the construction of alternative wastewater or drinking water treatment technologies.
(v) For a WQS variance with a term greater than five years, a specified frequency to re-evaluate the highest attainable condition using all	Consistent with Minn. R. 7050.0190, subp. 8, MPCA will include a requirement in the permit that the Permittee submit a request for

existing and readily available information and a provision specifying how the State intends to obtain public input on the re-evaluation. Such re-evaluations must occur no less frequently than every five years after EPA approval of the WQS variance and the results of such re-evaluation must be submitted to EPA within 30 days of completion of the re-evaluation.	re-evaluation 180 days prior to permit expiration to ensure the variance continues. This re-evaluation coincides with the permit term (5 years). MPCA will submit this re-evaluation to EPA upon completion.
vi) A provision that the WQS variance will no longer be the applicable water quality standard for purposes of the Act if the State does not conduct a re-evaluation consistent with the frequency specified in the WQS variance or the results are not submitted to EPA as required by (b)(1)(v) of this section.	Minn. R. 7050.0190, subp.8 states, "If the Permittee does not request a re-evaluation, the variance expires at the end of the five-year period". The state intends to evaluate the request for re-evaluation in a timely manner to adhere to federal law.
2) The supporting documentation must include:	
(i) Documentation demonstrating the need for a WQS variance. (A) For a WQS variance to a use specified in section 101(a)(2) of the Act or a sub-category of such a use, the State must demonstrate that attaining the designated use and criterion is not feasible throughout the term of the WQS variance because: (1) One of the factors listed in 131.10(g) is met, or (2) Actions necessary to facilitate lake, wetland, or stream restoration through dam removal or other significant reconfiguration activities preclude attainment of the designated use and criterion while the actions are being implemented.	This variance is being sought under the final factor in § 131.10(g) - controls more stringent than those required under sections 301(b) and 306 of the Clean Water Act, United States Code, title 33, sections 1311(b) and 1316, would result in substantial and widespread negative economic and social impacts. The following serve as documentation of the variance: • APPENDIX A: Alternatives for addressing chloride in wastewater effluent; • *Discharger specific variance information* • Draft permit language
(B) For a WQS variance to a non-101(a)(2) use, the State must submit documentation justifying how its consideration of the use and value of the water for those uses listed in § 131.10(a) appropriately supports the WQS variance and term. A demonstration consistent with paragraph (b)(2)(i)(A) of this section may be used to satisfy this requirement.	The chloride standard protects for 101(a)(2) uses.
(ii) Documentation demonstrating that the term of the WQS variance is only as long as necessary to achieve the highest attainable condition. Such documentation must justify the term of the WQS variance by describing the pollutant control activities to achieve the highest	The term of the variance as documented in the *discharger specific variance information* and is valid from the date of MPCA's final issued permit following EPA approval of the variance. This time is needed to achieve the HAC, which is identified as the alternate effluent limit that reflects the

attainable condition, including those activities identified through a Pollutant Minimization Program, which serve as milestones for the WQS variance.	greatest pollutant reduction achievable with the pollutant control technologies installed at the time this variance is adopted by the State, and the adoption and implementation of a Pollutant Minimization Program. The draft permit language outlines the requirements throughout the term of the variance.
(iii) In addition to paragraphs (b)(2)(i) and (ii) of this section, for a WQS variance that applies to a water body or waterbody segment: (A) Identification and documentation of any cost-effective and reasonable best management practices for nonpoint source controls related to the pollutant(s) or water quality parameter(s) and water body or waterbody segment(s) specified in the WQS variance that could be implemented to make progress towards attaining the underlying designated use and criterion. A State must provide public notice and comment for any such documentation. (B) Any subsequent WQS variance for a water body or waterbody segment must include documentation of whether and to what extent best management practices for nonpoint source controls were implemented to address the pollutant(s) or water quality parameter(s) subject to the WQS variance and the water quality progress achieved.	This variance does not apply to a water body or waterbody segment; it applies to the Permittee identified in the *discharger specific variance information.* To comply with Minn. R. 7050.0190, subp 1 (B), the permit will require Smart Salting training/certification and use of the assessment tool to reduce nonpoint discharges of chloride that the Permittee can control. This will help winter maintenance organizations assess operations, identify opportunities to reduce salt using proven BMPs and track progress. See draft permit language.
(c) Implementing WQS variances in NPDES permits	
A WQS variance serves as the applicable water quality standard for implementing NPDES permitting requirements pursuant to § 122.44(d) of this chapter for the term of the WQS variance. Any limitations and requirements necessary to implement the WQS variance shall be included as enforceable conditions of the NPDES permit for the permittee(s) subject to the WQS variance.	The limitations and requirements to implement the variance are included as enforceable conditions of the draft permit.