

# Chloride and Sulfate Water Quality Values Implementation Plan

## EGLE Response to Chloride and Sulfate Workgroup Comments

The Department of Environment, Great Lakes, and Energy (EGLE) developed a draft Chloride and Sulfate Water Quality Values Implementation Plan (plan) to provide next steps for implementation of the chloride and sulfate water quality values (WQV). The plan was developed with input from workgroup members representing a range of sectors having the potential to discharge chloride or sulfate to surface waters of the state as part of a National Pollutant Discharge Elimination System (NPDES) permit. A list of workgroup members is included in the plan.

Workgroup members were provided the opportunity to review the draft plan. The following document provides responses to the comments received by workgroup members. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) appreciates the input and comments received from workgroup members as it provided an opportunity to have the plan reflect the experience and perspective from sectors that may need to reduce chloride or sulfate in the future. EGLE incorporated this experience and perspective into developing the next steps for implementation identified in the plan, including a monitoring period to allow for adequate characterization of sulfate or chloride in the discharge, compliance schedules that align with member-suggested planning timeframes, a focus on long-term solutions to address elevated levels (e.g. variances), and flexibility with best management practices (BMP) selection.

### Overall Comments

- 1. Point sources in Michigan (like municipal treatment plants) continue to do a great job of improving water quality. Yet they continue to receive more stringent regulation with each NPDES Permit period by a “ratcheting down” of pollutant limits. Non-point sources of pollutants are not as easily identifiable but cannot continue to be ignored. Soft regulatory language like “recommended” or “suggested best management practices” is far different than a published concentration limit with enforcement authority. At some point, pollutants from nonpoint sources will need to be addressed in a more comprehensive manner, and responsible parties held accountable for their discharge.**

**EGLE Response:** The focus of this plan is on evaluating discharges of chloride and sulfate as part of an NPDES permit; however, we agree the role of reducing nonpoint sources of chloride is important to improve and protect water quality as was discussed during the workgroup meetings. For example, owners of commercial buildings and the associated parking lots are not required to obtain an NPDES permit for the discharge of storm water runoff. This sector has the

potential to apply salt in excess of the amount necessary to maintain safe travel conditions. The workgroup discussed opportunities to partner with other organizations to create certification programs focused on educating salt applicators serving commercial real estate on smart salting practices. EGLE plans to focus on reducing salt applications to address point and nonpoint sources of chloride as we consider both to be equally significant.

## **Section 2. Chloride and Sulfate Impacts to Water Quality**

- 2. We believe this is not the appropriate ‘process’ for establishing new water quality standards with new parameters like chlorides, sulfates. In accordance with MCL 324.3103, EGLE must undergo the formal rulemaking process in order to amend its existing administrative rules and regulations. The Stakeholder group workshops included a select group of interested and invited participants, but circumvented the full public process that formal rulemaking requires. In fact MCL 324.3103 clearly states that ...*“the department shall not promulgate any additional rules under this part after December 31, 2006”*.**

***EGLE Response:*** It is correct to state that under current regulations EGLE must undergo the formal rulemaking process to amend existing administrative rules and regulations; however, Rule 323.1057 of Part 4, Water Quality Standards (Part 4 Rules), promulgated pursuant to Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), is a narrative rule that describes the process by which WQVs for toxic substances are developed. This process was followed for chloride and sulfate aquatic life value development, as it has been for approximately 300 other toxic substances in Michigan over the past 20-plus years of the Rule’s existence. The WQV developed following Rule 323.1057 are used for assessment, permitting, and compliance; this is no different for any values developed following this Rule.

- 3. Establishing the need for the proposed Implementation Plan is predicated on Figure 1, which includes about 250 dots. The proposed Plan would be greatly enhanced by providing more transparency with these data points, which are anywhere from 6 to 15 years old. We recommend an Appendix or accompanying passage that shows how old each data point is, what entity collected the sample, what time of year it was collected (e.g. winter or not?), whether each dot represents one sample, the micrograms per liter (ug/L) identified in the sample, and where it was collected (a state highway, paved county road, subdivision, etc.).**

***EGLE Response:*** Data displayed in Figure 1 comes from the EGLE Water Chemistry Monitoring Program (WCMP) stream sampling sites but is only a portion of the potential impacts from chloride and sulfate on water quality in

Michigan. The WCMP is an ongoing program monitoring monthly to quarterly at streams around the state. As such, the program has a rigorous sampling protocol and quality assurance procedures and the data are used to identify trends in water quality parameters around the state on a broad scale. The data used in Figure 1 comes from the most recent WCMP summary report and is meant to be illustrative of where elevated chloride levels have been found instream around Michigan; these are not specific to permitted outfalls. For increased data transparency, EGLE added a link to that WCMP report, which includes appendices with specific data results as well.

While the ability to interpret these surface water data relative to the aquatic life values developed for chloride and sulfate is one way that water quality protection is advanced, another is the ability to better understand the potential for NPDES permitted outfalls throughout the state to impact water quality.

**4. On what basis did EGLE determine that chloride and sulfate are the most toxic components discharged in stormwater outfalls?**

**EGLE Response:** The reference to chloride and sulfate as the toxic components was limited to total dissolved solids (TDS). TDS represents the total concentration of dissolved substances in water. The chloride and sulfate components of TDS may negatively impact fish and insect community structure, diversity, and population. Other pollutants discharged through storm water outfalls are considered as part of NPDES Municipal Separate Storm Sewer System (MS4) permits (e.g. sediment and nutrients).

**Section 3. Chloride and Sulfate Water Quality Values Development**

**5. Can EGLE provide the public notice and EPA approval mentioned on the bottom of paragraph 1 under 3. Chloride and Sulfate WQV Development? Was EPA's approval part of its overall review and approval of the water quality rule package developed in response to the federal Great Lakes Initiative?**

**EGLE Response:** Rule 323.1057 in its present form was developed following the 1995 Great Lakes Initiative and was reviewed and approved by the United States Environmental Protection Agency (USEPA) on August 4, 2000, and included as a Final Rule in the August 4, 2000, Federal Register (available on request). The approval letter sent between Regional Administrator Lyons and Director Harding specifically notes in the enclosure that, among other Part 4 Rules and Part 8, Water Quality-Based Effluent Limit Development for Toxic Substances (Part 8 Rules), promulgated pursuant to Part 31, Water Resources Protection, of the NREPA, Rule 323.1057 (2), under which aquatic life values are developed, were consistent with Guidance (available on request).

- 6. The values (limits) proposed for both chlorides (320mg/L acute; 150mg/L chronic) and sulfates (600mg/L acute; 370mg/L chronic) are significantly more restrictive than those published by the EPA or the five (5) surrounding Great Lakes States of Minnesota, Wisconsin, Illinois, Indiana, and Ohio. In many cases, Michigan's requirements are many times as restrictive as EPA or other Great Lakes States.**

***EGLE Response:*** As noted during the workgroup presentations, although the development of WQV for chloride and sulfate in Michigan has trailed most other USEPA Region 5 states, one reality of that delay is manifest in Michigan's ability to use the most recently generated, quality assured toxicological data for these toxic substances. Recent studies using freshwater mussels and mayflies, both of which are widely present in Michigan lakes and streams, has found the increasing susceptibility to chloride and sulfate by these organisms. The use of the most updated and protective data to develop Michigan's WQV sets us apart from others as using more relevant values so that the quality of Michigan's wetlands, streams, rivers, inland lakes, and Great Lakes can be more fully protected.

- 7. We have concern that in the first of the three work group meetings, EGLE set out new values for chloride and sulfate discharges – which are significantly lower than our surrounding states and the US Environmental Protection Agency's own levels. EGLE indicated such lowered levels were long overdue and were not open for discussion. County road agencies – which maintain 75% of Michigan's road miles – were not contacted to provide input when these levels were established. The proposed Plan should include data that indicates why reductions are needed, with consideration of the impacts and feasibility of implementing them.**

***EGLE Response:*** The technical process for developing these WQV, as dictated by Michigan's Part 4 Rules, and specifically the Rule 323.1057. Toxic Substances rule is fairly prescribed and not the place for conversations about implementation, treatability, or economics. It is these implementation processes that we hope to address, at least in part, through the workgroup process and the plan (i.e. monitoring data, schedules of compliance, possible variances, and use of BMPs). The plan provides the data in Section 2. to support why reductions are needed.

We appreciate the County Road Association participating in all workgroup meetings. The plan was developed to allow for flexibility with selecting BMPs as part of an overall chloride reduction strategy. Consistent with the CRA's comments, the plan acknowledges current effective BMPs that may be adopted by other road agencies. EGLE understands that not every road agency has the same salt application needs and annual funding; therefore, the plan is focused on

a comprehensive review of all salt-related practices to fully optimize salt use while also planning for longer-term improvements (e.g. equipment purchases).

**8. Expert traffic and safety input is needed in the proposed Plan to establish a best practice balance between maintaining public safety and ensuring water quality protection.**

**EGLE Response:** The chloride WQV were developed using the Rule 323.1057 process, but the NPDES permit sets the conditions to meet water quality standards, including the flexibility to select best management practices (BMP) to reduce chloride as part of an MS4 permit. Further, this plan with input from workgroup members was intended to understand approaches to reduce salt application in concert with maintaining public safety. The Michigan Department of Transportation (MDOT) study is a good example of using the study results to identify the best strategies for salt application, which reduces the amount of salt applied and saves on costs. It is important to note that there is no feasible way to remove chloride from water and it doesn't break down over time.

**Section 4. Municipal and Industrial Wastewater NPDES Permits**

**9. Will a TDS controllability demonstration be required of MS4 permittees?**

**EGLE Response:** A TDS controllability demonstration is not required for MS4 permittees. A TDS controllability demonstration will be required of wastewater treatment facilities serving industrial operations. EGLE considers municipal wastewater treatment plants (WWTP) as non-controllable.

**10. For over 40 years, total dissolved solids (TDS) in municipal treatment plant influents have been considered “uncontrollable”, and therefore not subject to the published number of 500mg/L TDS monthly average or 750mg/L TDS daily limit “as a result of controllable point sources”. Additionally, Rule 51 was designed specifically to address only TDS, not two (2) specific components of TDS: chlorides and sulfates. Using Rule 323.1057 (Rule 57) to ‘reinterpret’ Rule 51 is also not appropriate. Rule 57 was designed to set water quality values for a variety of toxic substances, but chlorides and sulfates are not included in the published tables. It should be noted that the Federal Water Pollution Control Act (which governs NPDES Permits) does not include chlorides or sulfates on its list of toxic pollutants.**

**EGLE Response:** Rule 51, Dissolved Solids, of the Part 4 Rules, Water Quality Standards, promulgated under Part 31, Water Resources Protection, of the NREPA, (R 323.1051); while addressing TDS, also addresses the “addition of any dissolved solid” as well as specifically addressing chloride under Rule 51(2) from the perspective of protecting public water supplies. Additionally, Rule 57(1) states that “...toxic substances shall not exceed the WQV specified in, or developed pursuant to, the provisions in subrules (2) to (4) of this rule...”. The

definition of “toxic substance” in Rule 323.1044 of the Part 4 Water Quality Standards is “..a substance, except for heat, that is present in sufficient concentration or quantity that is or may be harmful to plant life, animal life, or designated uses.” The broad definition of toxic substance affords the ability to develop protective values following processes spelled in Rule for an ever-expanding range of toxic threats to water quality, many of which weren’t understood in the early days of water quality programs. As an example, it is this flexibility that enables Michigan to develop water quality values for chemicals like perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), thereby remaining able to adequately protect both human health and the environment in Michigan.

- 11. Under 4.1, TDS Rule 51 standards are stricter than the chloride and sulfate standards which contribute to TDS. Multiple manufacturers will never be able to meet them. EGLE is allowing municipal WWTP NPDES Permits a waiver to consider them uncontrollable. By the same token, multiple private companies hope they might be afforded the same exemption.**

***EGLE Response:*** Many Industrial NPDES Permits have already been afforded the same exemption based on conducting a TDS Controllability Demonstration. All NPDES permittees are allowed to conduct a TDS controllability demonstration to demonstrate whether TDS discharged is either controllable or uncontrollable. The only time when municipal WWTPs will be considered controllable is when there is a specific indirect discharger to the WWTP with high TDS. The source of the high TDS must be controlled per the local limits established by the WWTP.

- 12. Under 4.2 Chloride & Sulfate paragraph 4: If an NPDES holder exhibits there is no reasonable potential after at least 50 samples in accordance with the Part 8 Rules, why does chloride and sulfate monitoring need to be continued in the next permit and apparently forever? Some companies believe chloride and sulfate should not go in the next permit and be tested for in the permit application process as most other pollutants are.**

***EGLE Response:*** NPDES permits are issued for a five-year period and are reissued every five years. Continued monitoring for chloride and sulfate may be included in future NPDES permit reissuances to verify concentrations continue to stay at or below Michigan Water Quality Standards. If no reasonable potential exists, then an appropriate monitoring frequency of less than 50 samples will be considered. Consideration for a lesser monitoring frequency or elimination of monitoring in the NPDES permit will be determined based on the reasonable potential analysis, available dilution with the receiving water, and concentrations of chloride and sulfate.

- 13. While a verbal discussion regarding the potential for a municipal treatment plant to request a waiver from the new proposed stringent chloride/sulfate**

**limits, we would prefer the ‘waiver’ option be granted in writing within the NPDES permit process to all existing municipal treatment plants because their influents have been considered ‘uncontrollable’.**

***EGLE Response:*** Existing municipal wastewater treatment plants have not been designated as uncontrollable for chloride and sulfate, but for TDS. This type of determination is not applicable to WQVs established under Rule 57. The Part 4 Rules and Part 8 Rules regulations do not allow EGLE any type of waiver option from complying with Water Quality Standards. However, Variances are one option available under the Part 4 Rules that allow NPDES permittees to submit a demonstration that compliance with a Water Quality Standard cannot be achieved within a reasonable timeframe. This demonstration shall be in accordance with Rule 323.1103, Variances and approved by both EGLE and USEPA. EGLE believes the Variance option is an important aspect to the plan.

**14. EGLE should consider developing a regionally based variance from the standards in areas like the Upper Peninsula and Northern Lower Michigan, since the plan establishes little to no detrimental chloride or sulfate impacts in these areas.**

***EGLE Response:*** The plan allows for the use of variances if all other options to comply with water quality based effluent limits (WQBEL) for chloride and sulfate are not practical. At this time, it is not known if NPDES permittees in the Upper Peninsula and Northern Michigan will be subject to WQBELs for chloride and sulfate. These facilities along with facilities in the entire state will be evaluated as their respective NPDES permits are reissued to determine if there is a reasonable potential for chloride and/or sulfate to be discharged at levels exceeding Michigan Water Quality Standards. Variance requests will ultimately be a decision the facility holding an NPDES permit will need to make after all other options to comply with WQBEL’s have been evaluated.

**15. Under 4.3 Compliance Options: Clarify the options and probability to obtain a variance. Due to the necessary steps in several manufacturing processes, there is a strong likelihood some companies will never be able to meet the chloride and sulfate limits, in particular the Final Chronic Values. These companies had questions:**

- **Can EGLE make it clear in the plan that variances, if issued, will continue in subsequent permit renewals, and that variances for specified industries most directly impacted by the standards (such as kraft pulp mills and mining operations) will be developed?**
- **Pollutant Minimization programs (PMPs) are time-consuming and expensive. Michigan Manufacturing Association would suggest that the plan provide for waiver of PMPs in subsequent permits upon a showing that a PMP has been fully implemented and monitoring establishes no**

**increased/steady chloride/sulfate levels. The plan should also state that limits will not be added to permits in addition to PMPs.**

**EGLE Response:** NPDES permittees will need to evaluate all options to comply with final effluent limitations for chloride and/or sulfate prior to making a variance request. This evaluation will likely be completed during the schedule of compliance to meet final chloride and sulfate effluent limits. If all viable options to achieve compliance with a final effluent limitation for chloride and/or sulfate cannot be achieved, the permittee has the option to submit a request for a variance. Requests for a variance shall be in accordance with Rule 323.1103, Variances, in the Part 4 Rules. A variance demonstration in accordance with these regulations will be required. Permittees will need to demonstrate that highest attainable conditions can be achieved under a variance with the demonstration describing what activities the permittee will implement instead of complying with a final effluent limitation, what demonstration(s) will be conducted to demonstrate the highest level achievable or highest attainable condition, and activities the permittee will implement to reduce/eliminate sources. The USEPA is the final decision maker of a variance request, after review by EGLE. The duration of a variance shall not exceed the term of the NPDES permit; however, variances may be renewed as described in Rule 323.1103(8). EGLE recognizes that it may be necessary for variances to be renewed during NPDES permit reissuances for particular dischargers.

Development of variances will need to be prepared and submitted by the permittee that holds the NPDES permit. Variances for specific industries or types of discharges will not be developed at this time due to the limited monitoring data available. For NPDES permittees that do not currently have a monitoring requirement, a monitoring requirement to adequately characterize the discharge of chloride or sulfate will be established for the permit term. This approach will allow for future evaluation of chloride and sulfate data by sector/industry.

Limitations for Chloride and Sulfate are required to be included in the NPDES permit if a variance is granted. PMP's will be required as part of a variance approval so that progress towards complying with the final effluent limitations for Chloride and Sulfate can be evaluated and tracked. The PMP is necessary to meet the USEPA variance requirement of ensuring the highest level achievable or highest attainable conditions during each permit term.

**16. The Pollutant Minimization Program (PMP) requirements in Section 4.3 should be revised to consider that cost-effective treatment methods may not be available.**

**EGLE Response:** The PMP requirements are language taken from the Part 4 Water Quality Standards. The requirements focus on permittees implementing reasonable cost-effective control measures to address sources of



chloride/sulfate. This evaluation includes considering the significance of sources, economic considerations, and technical/treatability considerations. As part of the evaluation, permittees must consider the full range of options, including optimizing process improvements through reuse and source reduction.

## **Section 5. Chloride in Stormwater Discharges**

### **17. Fiscal constraints alone suggest that road agencies use only what [salt] is necessary to reasonably secure safety of the traveling public.**

**EGLE Response:** EGLE staff performs audits and inspections of MS4 permittees. During these audits and inspections, EGLE staff has observed that even with proper written procedures, salt is applied using older technology and practices. The plan seeks to provide options for developing a salting strategy that meets the dual goal of maintaining safe traveling conditions and water quality protection. By performing a comprehensive review of all salt-related practices, a road agency may be able to optimize salt use through newer technology and application methods while maintaining safe travel conditions. For example, MDOT has started to use direct liquid application of brine based on certain storm conditions. Using this type of application method has been found to require 50 percent less salt.

### **18. The plan should be crafted so that the discharges of county road agencies, homeowner soft water discharges, private winter plow contractors and other industrial chloride uses are not conflated.**

**EGLE Response:** The audience for the plan is NPDES permittees; more specifically for storm water, the audience is MS4 permittees. EGLE recognizes that there are other sources of chloride not regulated under an NPDES permit that will require further attention. The workgroup discussed additional outreach needed for the other sectors. For example, Michigan State University Extension developed a Michigan Winter Maintenance Education Program with a training component in the past. The program was designed to assist businesses and organizations in developing sound practices and procedures for winter maintenance to maintain public safety and encourage environmental protection. This type of program was discussed to target other sources of chloride discharges in addition to MS4 permittees.

### **19. Some of the best performance results in the MDOT's study require more equipment and staff than is customary to maintain the public's expected deicing response time.**

**EGLE Response:** EGLE understands the fiscal constraints of road agencies. The MS4 Program allows road agencies to identify cost-effective BMPs as part of developing and updating procedures. The MDOT study provided examples of

equipment that may be used to reduce salt applications. MDOT is a good example of continuing to evaluate cost-effective application practices to optimize salt use, such as direct liquid application during the winter event.

- 20. The Equipment Options section provides information on specific salt spreader mechanisms based on a singular MDOT presentation and makes no statement regarding the cost of this equipment.**

***EGLE Response:*** This section was updated to include additional options for modifying equipment that may be less costly. EGLE is aware of a variety of available salt spreader mechanisms and does not recommend a particular option, but instead is focused on developing an overall strategy to reduce salt application, which may include updating equipment. Although expensive, the long-term savings from reduced salt use may offset the expense.

- 21. A December 2018 Auditor General Performance Report found that 59% of salt storage sites are in poor or fair condition. The plan should acknowledge that funding to replace/upgrade existing facilities has been severely limited for years.**

***EGLE Response:*** EGLE understands funding limitations with larger infrastructure investments, such as a modern salt barn sized and sited appropriately. This type of investment should be part of a road agency's asset management plan (AMP). Lower-level BMPs can be implemented until funding becomes available as part of the schedule in the AMP. Storage of brine and other additives should also be considered as part of this planning.

## **Appendix B. Treatment Memo**

- 22. Although the Treatment Memo presents some conceptual options for reducing TDS, chloride, and sulfate in wastewater, the reality is that there are no feasible treatment options for food processors to achieve the standards.**

The treatment memo was developed to provide information to EGLE permit writers on treatment options and applicable flowrates that may provide treatment of certain waste streams. EGLE staff will use this information to guide the review of demonstrations. The demonstration will be provided by the NPDES permittee and will contain more detail. Specific issues can be addressed when permit applications are reviewed.

- 23. The treatment technologies identified with the capability of removing TDS are far too costly for the average community. The rates charged to the average customer would have to be increased significantly to pay for equipment and operation of these types of systems (sometimes requiring numerous acres to support the treatment footprint). This can represent millions of dollars of additional costs for small community treatment plants**

**with customers on wells that have softening systems discharging to the sewer (a source of chlorides).**

The application of the treatment memo to municipal dischargers is more for education and working with homeowners to help reduce the discharge of chloride from home water softeners. Municipal WWTPs may choose to work through local limits on addressing issues with indirect discharges to their systems or construct a regional drinking water system. Specific equipment at municipal WWTPs to address chloride or sulfate is not envisioned by EGLE.

**24. The plan would benefit from a more holistic review of cross-media impacts that will result from application of the new standards because of the treatment technologies that would be required to meet the standards for many dischargers.**

**EGLE Response:** The treatment technologies identified in the plan are intended to provide options to reduce the discharge of chloride and sulfate to meet the WQVs. Facilities discharging chloride and sulfate may opt to evaluate the potential for cross-media impacts as part of the treatment selection process. As part of the workgroup, we learned that this type of holistic facility-specific evaluation is a routine for industry.

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