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February 7, 2025

Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194
ATTN: Triennial Standards Review

Dear Sir or Madam:

Reference: 2025-2027 Triennial Standards Review

NewRange Copper Nickel LLC (NewRange) appreciates the opportunity to comment on the Minnesota Pollution Control Agency's (MPCA) water quality standards (WQS) work plan for 2025-2027, along with Minnesota Rules chapters 7050 and 7052, active variances, and modified Class 2 and class 7 limited resource value waters that may be able to attain higher use classes. We are providing comments on the following topics:

- Revisions to Classes 2A (cold water)/2B (cool and warm water) modifications
- Revision to dissolved oxygen (DO) standard
- Revision to aluminum standard to protect aquatic life
- Revision to mercury standard in fish tissue to protect human health
- Revision to chloride standard and new sulfate standard to protect aquatic life

Revisions to Classes 2A (cold water)/2B (cool and warm water) modifications

MPCA's work plan explains these revisions as being the third set of revisions related to implementation of the TALU framework, which adds new Class 2 beneficial use tiers for aquatic life. NewRange would like to inquire about a Class 2A water near our property.

NewRange has been working with Cliffs Erie L.L.C. (CE) on the transfer of former LTV Steel Mining Company's Mining Area 5 to NewRange for a number of years. In its April 2018 Draft Long-Term Mitigation Evaluation and Implementation Plan for SD030, CE formally requested that DNR and MPCA evaluate the regulatory status of Wyman Creek, the results of which "may be to reassess the suitability of classification of Wyman Creek as a Trout Stream (DNR) and as a Class 2A water (MPCA)." (Barr Engineering, April 2018, pg. 16-17). This request followed detailed studies of Wyman Creek by CE for the Consent Decree submitted to the MPCA.

Wyman Creek is a water listed as impaired for aquatic life use. MPCA evaluated potential causes of this impairment in their St. Louis River Watershed Stressor Identification Report (MPCA, Dec. 2016). In this report, MPCA determined that elevated water temperatures, low DO, and loss of connectivity due to beaver dams and road crossings were confirmed stressors on Wyman Creek, with habitat impacts from iron precipitate, iron toxicity, and sulfate toxicity being potential stressors, and TSS/turbidity being ruled out as a stressor for the listed impairment. Elevated water temperatures were attributed to the extensive beaver dams and former mine pits in the watershed. Low DO caused by extensive beaver dams was determined to not be favorable to supporting a quality coldwater fish assemblage. Elevated iron precipitates and beaver impoundments were blamed for high turbidity and TSS and loss of habitat and habitat connectivity. Sulfate concentrations in the watershed are primarily from mining, although MPCA states that these concentrations would meet the WQS being applied in Illinois, Indiana, Iowa, and Pennsylvania, where the toxicity of sulfate on fish and aquatic macroinvertebrate is dependent on chloride and water hardness.

MPCA stated in this report that "[h]istorically, small populations of Brook Trout have been sampled in the lower reaches of Wyman Creek, which are steeper in gradient and dominated by cobble and small boulder substrate" and that "[b]ased on the historical presence of Brook Trout, Wyman Creek remains a designated trout stream, despite the lack of trout in the more recent monitoring reports" (MPCA, Dec. 2016, pp. 265). Further it states that "[d]ata from the early 1980's confirm that Wyman Creek once supported a small population of naturally reproducing native Brook Trout." (MPCA, Dec. 2016, pp. 275). This report does not document that Brook Trout were stocked in Wyman Creek in the late 1970s, according to the published stocking report from that time.

In Appendix D of the 2018 St. Louis River Watershed Total Maximum Daily Load Report (MPCA, 2018), Tetra Tech used QUAL2K to calculate the loading capacity for Wyman Creek, which is impaired due to high temperatures and low DO conditions (Tetra Tech, 2017). Based on this QUAL2K modeling, Tetra Tech concluded:

- "Beaver dams play a significant role in channel dynamics in Wyman Creek (Tetra Tech, 2017, pp 30)
- "[T]he maximum water temperature target (20 degrees Celsius) could not be met across the entire system at any time" (Tetra Tech, 2017, pp 63)
- "There were no scenarios for which the entire system met the dissolved oxygen WQS" (Tetra Tech, 2017, pp 63)
- "Dramatic changes to the upstream end of Wyman Creek will not have a significant impact downstream of Reach 5" (Tetra Tech, 2017, pp 67)
- "The results of these [modeling] scenarios indicate that dramatic changes to the upstream end of Wyman Creek will not have a significant impact downstream of Reach 5. A targeted approach to improvements downstream of Reach 6 likely has the best chance for successfully improving conditions" (Tetra Tech, 2017, pp 67). Reach 5 ends at the railroad grade just south of Dunka Road, whereas Reach 6 ends at the start of the braided section of Wyman Creek, approximately 9 miles downstream of the headwaters.

Given the conclusions on each of these studies, NewRange formally reiterates CE's 2018 request that DNR and MPCA evaluate the regulatory status of Wyman Creek and reassess the suitability of classification of Wyman Creek as a Trout Stream (DNR) and as a Class 2A water (MPCA) along its entire length.

Revisions to Dissolved Oxygen Standard

MPCA's work plan includes revising the dissolved oxygen (DO) standard to account for streams with naturally low DO concentrations. We support this revision. Low-gradient, organic-rich streams typical of wetland-dominated landscapes in northeast Minnesota have been shown to have low DO concentrations *and* thriving communities of fish and other aquatic organisms.

Revision to Aluminum Standard to Protect Aquatic Life

MPCA is considering revising the aluminum water quality standard to protect aquatic life to be consistent with EPA's 2018 revision of aquatic life ambient water quality criteria for aluminum in freshwaters. Aluminum concentrations in waterbodies of northeast Minnesota are naturally elevated, due to naturally abundant aluminum in soils and low- to circumneutral-pH waters. Exceedances of the current aluminum water quality standard for aluminum are common in waterbodies that are unimpacted by aluminum, because the aluminum is not bioavailable or toxic to aquatic life. We support the adoption of the revised EPA water quality criteria for aluminum, because the criteria take into account the influence of water chemistry, particularly dissolved organic carbon (DOC), hardness, and pH on bioavailability and toxicity of aluminum. Of note, however, the maximum DOC concentration in the EPA model is 12 mg/L, which is regularly exceeded in waterbodies of northeast Minnesota. Concentrations of DOC >12 mg/L are by default set to a modeled value of 12 mg/L; thus, the criteria are likely overprotective for high DOC waters. MPCA should consider the water chemistries across the state when evaluating this WQS revision.

Revisions to Mercury Standard in Fish Tissue to Protect Human Health

MPCA's work plan describes the mercury standard in fish tissue to protect human health as "outdated". Minnesota's current standard of 0.2 ppm (or mg/kg wet weight) is lower than EPA's water quality criterion for methylmercury in fish tissue of 0.3 ppm. The difference between Minnesota's standard and the EPA criterion is an assumption that Minnesotans have a higher exposure rate than the general U.S. population, because of the importance of sport fishing in Minesota. We agree that it is time to review the parameters and assumptions that were used in calculating the standard, including human body weight and fish intake. We also note that it is within the mandate of MDH to issue fish consumption advice and they have done so, in a manner consistent with the EPA and FDA, by stressing the importance of fish as an important part of a healthy, well-balanced diet and recommending safe choices. Although not the intention, designating waters as impaired due to exceedances of the mercury standard in fish tissue has the effect of deterring fish consumption. For its proposed revisions, MPCA should again justify any difference it proposes from EPA's recommended criterion.

Revisions to Chloride Standard and New Sulfate Standards to Protect Aquatic Life

MPCA's work plan explains that scientific studies have shown that the toxicity of chloride and sulfate to aquatic life are based on the interactions of ions (e.g., chloride, sulfate, calcium, and others). It explains that MPCA expects EPA's broad consideration of ionic toxicity will result in better and more comprehensive protection for aquatic life compared to more narrowly defined parameter approaches used by states now. Except for those that are hardness-based, most of Minnesota's WQS are based on single parameters.

As discussed earlier, the St. Louis River Watershed Stressor Identification Report (MPCA, Dec. 2016) evaluated sulfate standards from other locations, as shown in the tables below, which were extracted from that report (pp 41).

Table 9: Summary of aquatic life standard for sulfate used in several U.S. states

Location	Author	Test species or biological response variable	Other WQ Factors	Sulfate Target or Biological Response
British Columbia	Elphick et al.; 2010	**Invertebrates** *(C. dubia, Brachionus calyciflorous, H. azteca)* **Fish** (Rainbow Trout, coho salmon, Fathead Minnow) **Amphibian** (Pacific tree frog)	Hardness	Values based on SSD* Data: Hardness 10-40 mg/L -----> 129 mg/L SO4 Hardness 80-100 mg/L -----> 644 mg/L SO4 Hardness 160-250 mg/L -----> 725 mg/L SO4 Values based on "safety factor approach": Hardness 10-40 mg/L -----> 75 mg/L SO4 Hardness 80-100 mg/L -----> 625 mg/L SO4 Hardness 160-250 mg/L -----> 675 mg/L SO4
California	Buchwalter, 2010)	Sulfate toxicity data from EPA's ECOTOX database	None; mentions need to further evaluate impacts of chloride/hardness	Acute Criterion -----> 234 mg/L SO4 Chronic Criterion -----> 124 mg/L SO4
Ohio	Ohio EPA (Rankin, 2003,2004)	Paired water quality and biological data from wadable streams in Ohio	Chloride	Reduced Invertebrate IBI @ SO4 around 400 mg/L Reduced # Quality EPT Taxa @ SO4 > 500 mg/L *(2004 paper revealed reduced biological response to sulfate toxicity when chloride concentrations are elevated above background levels)*

Table 8: Summary of research focusing on the toxicity of sulfate to fish and macroinvertebrates

Location	Author	Test species or biological response variable	Other WQ Factors	Sulfate Water Quality Standards
Illinois	Soucek and Kennedy (2004)	Toxicity tests of over 30 organisms through a collaboration between State of Illinois and USEPA Duluth Toxicity Laboratory	Hardness / Chloride	PROPOSED SULFATE CRITERIA FOR IOWA WATERS
Pennsylvania	Pennsylvania Dept. Env. Protection			
Iowa	Iowa DNR (2009)			

Hardness mg/L as $CaCO_3$ \ Chloride	Cl- < 5 mg/L	5 ≤ Cl- < 25	25 ≤ Cl- ≤ 500
H < 100 mg/L	500	500	500
100 ≤ H ≤ 500	500	[-57.478 + 5.79 (hardness) + 54.163 (chloride)] * 0.65	[1276.7 + 5.508 (hardness) – 1.457 (chloride)] * 0.65
H > 500	500	2,000	2,000

This shows there are many scientific studies that justify different ways to evaluate potential sulfate toxicity. Minnesota currently has three WQS for sulfate: one for wild rice (10 mg/L), one for drinking water (250 mg/L), and one for wildlife (600 mg/L). If MPCA is going to evaluate sulfate standards, it should evaluate the scientific evidence around each of these current sulfate standards at that same time it evaluates a new standard to understand the best solution to protection our waters and water uses.

Closing

Thank you for the opportunity to comment on these proposed changes to water quality standards. Please do not hesitate to contact either one of us with any questions or concerns regarding these comments.

Sincerely,

NewRange Copper Nickel LLC

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