

April 9, 2018

The Honorable Bill Ingebrigtsen, Chair
Senate Environment and Natural Resources Finance
Committee
Minnesota State Senate
3207 Minnesota Senate Building
95 University Avenue West
St. Paul, MN 55155

The Honorable Carrie Ruud, Chair
Senate Environment and Natural Resources Policy
and Legacy Finance Committee
Minnesota State Senate
3233 Minnesota Senate Building
95 University Avenue West
St. Paul, MN 55155

The Honorable Chris Eaton, Ranking Minority Member
Senate Environment and Natural Resources Policy and
Legacy Finance Committee
Minnesota State Senate
3233 Minnesota Senate Building
95 University Avenue West
St. Paul, MN 55155

The Honorable Dan Fabian, Chair
House Environment and Natural Resources Policy
and Finance Committee
Minnesota House of Representatives
365 State Office Building
100 Rev. Dr. Martin Luther King Jr. Boulevard
St. Paul, MN 55155

The Honorable Rick Hansen, DFL Lead
House Environment and Natural Resources Policy and
Finance Committee
Minnesota House of Representatives
247 State Office Building
100 Rev. Dr. Martin Luther King Jr. Boulevard
St. Paul, MN 55155

RE: SF2983/HF3280 Wild Rice Water Quality Standards

Dear Legislators:

Due to legal constraints, the Minnesota Pollution Control Agency (MPCA) has provided very limited testimony concerning these bills related to Wild Rice Water Quality Standards. On March 27, 2018, the Agency provided our formal response to the Chief Administrative Law Judge (ALJ) concerning the January 11, 2018 report. The Agency's response is public information and the complete filing can be viewed at <https://www.pca.state.mn.us/sites/default/files/wq-rule4-15nn.pdf>.

I write today to articulate my concerns about this legislation, which would prevent the MPCA from moving forward with the rulemaking to revise Minnesota's water quality standard to protect wild rice from the adverse impacts of sulfate.

SF2983/HF3280 prevents the MPCA from using sound, verified science to effectively and efficiently protect wild rice – a critical Minnesota resource. Furthermore, the legislation would:

- Short-circuit the administrative rulemaking process and stop the current wild rice rulemaking activity (which was undertaken at legislative direction);

- Waste the significant investment of state resources in understanding the science of sulfate impacts on wild rice;
- Nullify the existing federally-approved wild rice sulfate standard, setting up a conflict between state and federal law that would undoubtedly be the source of litigation;
- Jeopardize Minnesota's delegation of Clean Water Act program authority from the U.S. Environmental Protection Agency (EPA); and
- Exacerbate the existing regulatory uncertainty around the standards that apply to water quality discharges.

In 2011, the Minnesota Legislature directed the MPCA to update the existing sulfate water quality standard to protect wild rice. We have done just that. Extensive scientific studies were conducted including experiments in the laboratory, outdoor systems, and more than 100 lakes and streams across Minnesota. Those studies were peer reviewed by independent scientific experts and published in international scientific journals. The findings are clear: sulfate **does** impact wild rice. Further, the *way* sulfate harms wild rice is much more complicated than had been earlier understood.

We learned that sulfate in the water transforms to sulfide in water of river and lake sediments, and that sulfide harms wild rice when it reaches levels above 120 parts per billion. That process is affected by the amount of carbon and the amount of iron in the sediment; lakes right next to each other can have very different levels of carbon and iron in their sediment.

Because it's not just sulfate but also carbon and iron that have a role in affecting wild rice, we proposed to revise the standard to an equation that accounts for these additional players. Since each water body's sediment is different, an equation-based standard is much more precise, and therefore more accurate, because it accounts for that natural variability. In fact, equation-based water quality standards are becoming more common across the U.S. due to their improved precision in protecting water quality.

My specific concerns with the bill are as follows:

First, the bill is based on the faulty idea that the science of wild rice and sulfate is not yet settled. Two international scientific journals have reviewed and published four articles based on our science, providing independent scientific confirmation of the validity of our work¹. This research was also highlighted in the following publications of the American Geophysical Union (AGU) and Ecological Society of America:

¹ Myrbo, A., Swain, E.B., Engstrom, D.R., Coleman Wasik, J., Brenner, J., Dykhuizen Shore, M., Peters, E.B. and Blaha, G., 2017. Sulfide generated by sulfate reduction is a primary controller of the occurrence of wild rice (*Zizania palustris*) in shallow aquatic ecosystems. *Journal of Geophysical Research: Biogeosciences*. 122: 2736-2753.

Myrbo, A., Swain, E.B., Johnson, N.W., Engstrom, D.R., Pastor, J., Dewey, B., Monson, P., Brenner, J., Dykhuizen Shore, M. and Peters, E.B., 2017. Increase in nutrients, mercury, and methylmercury as a consequence of elevated sulfate reduction to sulfide in experimental wetland mesocosms. *Journal of Geophysical Research: Biogeosciences*. 122: 2769-2785.

Pastor, J., Dewey, B., Johnson, N.W., Swain, E.B., Monson, P., Peters, E.B. and Myrbo, A., 2017. Effects of sulfate and sulfide on the life cycle of *Zizania palustris* in hydroponic and mesocosm experiments. *Ecological Applications*. 27(1): 321-336.

Pollman, C.D., Swain, E.B., Bael, D., Myrbo, A., Monson, P. and Shore, M.D., 2017. The evolution of sulfide in shallow aquatic ecosystem sediments: An analysis of the roles of sulfate, organic carbon, and iron and feedback constraints using structural equation modeling. *Journal of Geophysical Research: Biogeosciences*. 122: 2719-2735.

- October 6, 2017, Research Spotlight at Earth and Space News, sponsored by AGU (62,000 members from 144 countries).
<https://eos.org/research-spotlights/north-american-wild-rice-faces-sulfide-toxicity>
- March 1, 2018, issue of *Frontiers in Ecology and the Environment* (a journal sent to all members of the Ecological Society of America, 10,000 members worldwide).
<https://esajournals.onlinelibrary.wiley.com/doi/10.1002/fee.1772> (scroll down to 9th item in *Dispatches*)

By contrast, an industry-funded study cited by proponents of this legislation² was not highlighted as significant new research by these highly respected scientific organizations.

The robustness of the science of sulfate/sulfide and wild rice was recognized also in the January 11, 2018, ALJ report, which found that:

- “the MPCA presented sufficient evidence to demonstrate that there is an adequate scientific basis to conclude that the proposed equation-based sulfate standard is supported by peer-reviewed science and is needed and reasonable;”³
- “the MPCA demonstrated...that it could rationally choose to proceed with the equation-based sulfate standard from a scientific standpoint;”⁴ and
- “that the science underlying the equation-based standard is reasonable in that it describes a manner of calculating a sulfate level resulting in a level of sulfide in porewater protective of wild rice.”⁵

Some testifiers have noted that in one series of scientific experiments, wild rice was only negatively impacted by very high sulfate or sulfide concentrations, much higher than the levels of concern identified by MPCA in the proposed rulemaking. The testifiers incorrectly cite this as evidence that sulfate and sulfide do not harm wild rice. In truth, those experiments focused on only one stage of the wild rice growing cycle. But when it comes to the survival of wild rice, all growth stages matter. Other studies clearly showed sulfate/sulfide impacts to wild rice at different growth stages and across multiple years. Sound science is not based on cherry-picking research to support a desired conclusion. It involves looking at **all** the available information and drawing conclusions based on these multiple lines of evidence.

Second, the bill prohibits the use of this new science regarding sulfate and wild rice – science that Minnesotans helped pay for through the Clean Water, Land, and Legacy Amendment funding. The bill goes on to prohibit the application of the older science on wild rice and water quality by voiding the existing standard, leaving us with no science upon which to base our water quality protection of wild rice. While the MPCA has proposed a more precise equation-based standard, the science has shown that if a single fixed standard is to be used, 10 milligrams per liter (mg/L) is a protective, appropriate, and

² Fort, D. J., M. B. Mathis, R. Walker, L. K. Tuominen, M. Hansel, S. Hall, R. Richards, S. R. Grattan, and K. Anderson. 2014. Toxicity of sulfate and chloride to early life stages of wild rice (*Zizania palustris*), *Environmental Toxicology and Chemistry*. 33(12), 2802-2809.

Fort, D.J., K. Todhunter, T.D. Fort, M.B. Mathis, R. Walker, M. Hansel, S. Hall, R. Richards, and K. Anderson. 2017. Toxicity of sulfide to early life stages of wild rice (*Zizania palustris*). *Environmental Toxicology and Chemistry*. 36:2217-2226. DOI: 10.1002/etc.3759

³ Report of the Administrative Law Judge, January 11, 2018, Finding 251, p. 60.

⁴ *Id.* at Finding 256, p.61.

⁵ *Id.* at Finding 257, p. 61.

reasonable choice. In other words, despite the testimony given in committee, the MPCA's work **does not** discredit the 10 mg/L existing standard.

Third, this bill creates a conflict with federal law by removing the wild rice water quality standard without replacing it with something at least as protective. Under the federal Clean Water Act, water quality standards must be set based on what is needed to protect the designated uses of waterbodies. In this case, the designated use of wild rice is food for people and wildlife. Under the federal Clean Water Act, once a standard is established it **cannot be changed** without a demonstration that the replacement standard is equally, or more, protective. As EPA noted in a May 13, 2011 letter to legislative members:

“To the extent that any legislation changes the EPA-approved water quality standards for Minnesota, such revised water quality standards must be submitted to EPA for review and approval ... Federal regulations require that criteria be protective of a state's designated uses and EPA's approval is based, among other factors, on determining that there is a scientifically defensible basis for finding that the criteria are sufficient to protect designated uses (see generally 40 C.F.R. §§ 131.5, 131.11, and 131.21). Absent such a showing, EPA would be unable to approve a revised criterion (see generally 40 C.F.R. §13 I.6(b)).”

This conflict creates multiple unintended consequences, including:

- Inability for MPCA to issue permits that comply with state law and the federal Clean Water Act.
- EPA recapture of regulatory authority, which moves water quality standards and permitting decisions away from the MPCA to Chicago or Washington, D.C. This is something most Minnesotans would not favor.
- Third party lawsuits over individual permits, leading to uncertainty and delay for permittees, particularly new or expanding businesses and growing cities. Litigation is always costly for the taxpayers.

Lastly, Section 7 presents a problem that has not been raised or discussed in legislative committees. This section would invalidate the water quality standards for irrigation except in cases where there is a clear water appropriation for irrigation purposes. There are existing rules to ensure that water used to irrigate crops will not harm those crops or soil. The MPCA is currently working to update these water quality standards. This update is needed, and it is also controversial. The initial request for comments generated nearly 500 comments. The MPCA is in the process of refining our rule proposal and planning for additional public process. Section 7 of the bill short-circuits this separate rulemaking process, and instead mandates an approach that is not implementable. Thus, this bill could hamper or eliminate our ability to protect the quality of water that is used to irrigate Minnesota's agricultural crops.

MPCA has long recognized that sulfate is not the **only** stressor that can harm wild rice. Just like high blood pressure is not the only risk factor for heart disease (cholesterol, weight, and lack of exercise being others), sulfate is not the only threat to wild rice (others include water level, climate change, and invasive species). But a doctor would never wait until a patient lost weight before prescribing blood pressure medication. Similarly, it does not make scientific sense to avoid addressing sulfate impacts because we have not yet adopted a standard or strategy to address water level fluctuation. In environmental protection, as in medicine, we apply the knowledge that we have, and as we gain more knowledge and tools we apply these as well.

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The MPCA is also aware of the major concerns about the cost that would result from treating wastewater discharges to reduce sulfate to comply with any proposed sulfate standard. Those concerns are real, and we take them seriously. However, it is absolutely not true that all facilities would be required to treat their wastewater to meet the wild rice sulfate standard. Only about 25% of the proposed wild rice waters are downstream of wastewater discharges, and at least some of those waters are not being negatively impacted by the upstream discharges. In other words, not all facilities that discharge to wild rice waters will need to reduce their sulfate discharge to protect wild rice.

For facilities where sulfate discharge is a concern, we will address cost in the way that federal and state law require: during the *implementation* of the standard -- permits. Under the federal Clean Water Act, water quality standards must be based on the science of protection. Permits are where cost is addressed, through variances, extended timelines, and other tools. We know reverse osmosis, the only way to remove salts like sulfate, is expensive and generally unaffordable. And contrary to some testimony, MPCA does have a track record of issuing variances where treatment costs are prohibitive as defined by the federal Clean Water Act. The MPCA is committed to working with facilities through permit implementation to avoid adverse economic impacts until new technology makes salt removal affordable. Hopefully, that new technology will come from Minnesota-made innovations.

I ask that you support science-based standards and oppose SF2983/HF3280.

Sincerely,

A handwritten signature in black ink that reads "John L. Stine". The signature is written in a cursive, slightly slanted style.

John Linc Stine
Commissioner

JLS/SL/GG/CN:rm

cc: The Honorable Paul Gazelka, Majority Leader, Minnesota State Senate
The Honorable Thomas Bakk, Minority Leader, Minnesota State Senate
The Honorable Kurt Daudt, Speaker of the House, Minnesota House of Representatives
The Honorable Melissa Hortman, Minority Leader, Minnesota House of Representatives
Joanna Dornfeld, Governor Dayton's Office
Erin Campbell, Governor Dayton's Office
Anna Henderson, Governor Dayton's Office
Stephanie Zawistowski, Governor Dayton's Office