



## **Comments of WaterLegacy to Peer Review Panel (August 13, 2014) Wild Rice Sulfate Standard Studies for Minnesota Pollution Control Agency**

WaterLegacy is a non-profit organization formed to protect Minnesota's waters and the communities that rely on them. We believe this Peer Review Panel must consider the questions prescribed by the Legislature in setting up the wild rice studies:

- 1) Is Minnesota's existing water quality standard limiting sulfate to 10 milligrams per liter in wild rice waters needed to protect wild rice?
- 2) Should this sulfate limit be applied year-round or only during specific times?

We count on your expertise to apply science and analyze these key questions.

**First Question:** Do the field surveys, mesocosm experiments and hydroponic experiments taken together support the existing 10 milligrams per liter sulfate standard?

**Answer:**

The most striking result of Minnesota's wild rice studies is that all study modalities support Minnesota's existing 10 milligrams per liter sulfate standard.

Before the Pollution Control Agency withdrew its February 2014 summary in the face of political pressure, the Agency concluded, "**The 10 mg/L sulfate standard is needed and reasonable to protect wild rice production from sulfate-driven sulfide toxicity.**"

In fact, were Minnesota to seek protection of 95 percent of the resource, as suggested in some federal guidance, a *more stringent* limit on sulfate would be required.

**Second Question:** Do data on sulfide and incubation studies of conversion of sulfate to sulfide support any limit on the time of the year when the sulfate standard should apply to protect wild rice?

**Answer:**

The studies do not support any temporal limit on the application of Minnesota's wild rice sulfate standard.

The primary mechanism by which sulfate discharge becomes toxic to wild rice is through conversion to sulfide. Dr. Nate Johnson's research shows that, after about 80 days, a great majority of the sulfate that diffuses into sediments will react to form sulfide, even under cold conditions.

There is no time of year when discharge of sulfates will not harm wild rice.

Should amendments to wild rice rulemaking come out of this process, decision-makers will assume that peer reviewers have analyzed these two basic questions about the wild rice sulfate

standard. To exclude these questions from your discussion would undermine and marginalize the work of this Panel.

A third basic question has been posed to this Panel. If iron levels are high, should there be an exception to the sulfate standard?

From our perspective, the question whether iron in porewater mitigates the effects of sulfate and sulfide on wild rice is a “Hail Mary” pass thrown by industry once they realized the studies support retaining Minnesota’s wild rice sulfate standard of 10 milligrams per liter. But it is still a worthwhile question

**Third Question:** Are the wild rice sulfate studies sufficient to support a theory that high concentrations of iron in porewater prevent sulfate from harming wild rice?

**Answer:**

The wild rice studies are insufficient to support this theory:

- 1) There are no experiments varying iron and sulfate to assess effects on sulfide or wild rice.
- 2) The only basis for a claim that iron “mitigates” effects of sulfate on wild rice are correlations; and these field correlations are from sampling that was intentionally biased.
- 3) The field data suggesting wild rice may survive in higher sulfate waters doesn’t apply to lakes, and river systems may have confounding factors.
- 4) Mesocosm experiments suggest iron sulfide plaques on wild rice roots may interfere with nutrient uptake.

Proposing “site-specific” standards to permit more sulfate discharge where there is high iron may seem like good politics, but it is not good science.

In closing, WaterLegacy asks that the Peer Review Panel analyze the two basic questions that the wild rice sulfate studies were designed to answer and that the Panel find the iron theory premature.

Science seeks simplicity in the pursuit of truth, while politics seeks exceptions and deviations in the service of powerful interests. Help Minnesota use science, not politics, to determine what rules should protect wild rice.

Thank you.

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