

WILD RICE AND THE SULFATE STANDARD¹

FACT: Minnesota's water quality rule limiting sulfates to 10 milligrams per liter (mg/L) in wild rice waters was enacted in 1973 in order to protect natural stands of wild rice, not only irrigation waters for cultivated paddy rice. After a contested case hearing and on the basis of research from the Minnesota Department of Natural Resources (MDNR) the Minnesota Pollution Control Agency (MPCA) determined that "sulfate concentrations above this level are a serious detriment to the growth of wild rice."²

FACT: Minnesota's 10 mg/L (10 ppm) wild rice protection rule was based on MDNR's initial study of the relationship of water chemistry to wild rice production on more than 200 lakes by Dr. John Moyle, one of the nation's foremost experts on natural wild rice. This relationship was confirmed in MDNR's analysis of natural wild rice stands and sulfates in some 2,000 Minnesota bodies of water over a period of decades.³

FACT: Dr. Moyle explained that the MDNR's field research demonstrated that about 90 percent of the areas in Minnesota in which wild rice was found had waters with 10 ppm or less and that "there were no large and important natural and self-perpetuating wild rice stands in Minnesota where the sulfate ion content exceeded 10 ppm."⁴

FACT: Experience in Minnesota environments has tested the 10 mg/L sulfate standard for wild rice. Over the years, MDNR encouraged the planting of wild rice in lakes where it did not grow naturally in order to support waterfowl. In higher sulfate environments (40 ppm), the wild rice would produce plants the first year, a thin stand in the second year and none by the third year.⁵

FACT: Studies purportedly showing that wild rice can survive in higher concentrations of sulfates have one or more of the following limitations: they apply to wild rice plants in laboratory pots, they apply to cultivated wild rice beds that are planted and drained each year, they apply in different (e.g. sandy) soils, and/or they are provided in paid expert testimony rather than peer-reviewed scientific journals.⁶

FACT: The nature of soil and drainage are critical in setting sulfate standards. It is undisputed that sulfates can be chemically converted to hydrogen sulfide in bottom soil sediments, particularly under anaerobic conditions, and that hydrogen sulfide is toxic to wild rice.⁷

FACT: Minnesota has an administrative process where a discharger can request a variance from any water quality limit due to facts specific to its situation. In the 1975 process where the wild rice sulfate limit was applied to the Clay Boswell plant, Dr. John Moyle supported a variance to 20 mg/L due to the high flow level at that point of the Mississippi River, and the MPCA granted the Clay Boswell plant a variance from strict application of the wild rice sulfate rule.⁸

FACT: In addition to sulfate discharge, industrial mining activities that cause fluctuations in the water level during the wild rice growing season can be highly detrimental to natural stands of wild rice. Water fluctuations of six inches due to upstream wetlands filling or other changes during the floating leaf time frame are sufficient to destroy wild rice.⁹

FACT: The 1997 amendments to Minnesota's wild rice protection rule included a narrative about the importance of wild rice to ecology and to Indian tribes. No new numerical standards were considered, and the objective of the rule change was to "heighten awareness of the value of the resource." The 1997 amendments were viewed by the MPCA as a "starting

point” of a process that would “expand the identification and listing of significant wild rice waters.”¹⁰

GENERAL FACTS ABOUT WILD RICE

- Wild rice is a unique plant in that it is the only cereal grain native to North America with well-documented food uses and the only wild grain that is harvested in significant quantities in its natural state.¹¹
- Wild rice stands serve as resting, foraging, nesting, and brood rearing sites for both migratory and resident water birds. It is one of the most important and nutritional foods for waterfowl in Minnesota. From early May to late November, ducks, geese, and other water birds feed on the sprouting seeds, young shoots, and ripe grain. More than 35 species of shore birds and wading birds have been observed using wild rice fields.¹²
- Minnesota has more natural wild rice stands than any other state or Canadian province.¹³
- Even though Minnesota has a substantial number of naturally-reproducing stands of wild rice, the evidence suggests that there has been an overall decline in the number and size of these wild rice beds.¹⁴
- Declines in natural wild rice stands result in: 1) the reduction in harvestable yields; 2) the reduction of potential food sources for water birds and other animals; and 3) the loss of the genetic diversity among the wild rice plant species. The MPCA has concluded that loss of diversity is the most serious problem, both from the standpoint of maintaining natural stands, and from its potential impact to Minnesota’s commercial wild rice production industry.¹⁵

¹ Prepared for WaterLegacy by Paula Maccabee, 651-646-8890, pmaccabee@justchangelaw.com March 2011.

² Findings of Fact, *In the Matter of Proposed Amendments to the Regulation for the Establishment of Standards of Quality and Purity for Interstate Waters, WPC 15*, Minnesota Pollution Control Agency (September 6, 1973), p. 11; Rulemaking Hearing Testimony of John McGuire, MPCA (May 31, 1973), pp. 26-27

³ MP&L Clay Boswell Permit Hearing Testimony of Dr. John Moyle (March 19, 1975), pp. 44-45. Sulfate concentrations in Minnesota waters with significant wild rice stands, including those in flowing water are usually between 2 and 10 mg/L. *Id.*, p. 53. John Stewart of Manitoba, hired by industry to testify in favor of the Clay Boswell variance acknowledged his own work tended to support the work of Dr. Moyle, finding stands of good commercial wild rice in waters with 12 mg/L of sulfates and not in waters with higher levels. MP&L Clay Boswell Permit Hearing Testimony of John Stewart (March 7, 1975), pp. 33-34.

⁴ John Moyle, *Review of the Relationship of Wild Rice to Sulfate Concentration of Waters* (March 16, 1975), p. 1.

⁵ John Moyle, *Review of the Relationship of Wild Rice to Sulfate Concentration of Waters* (March 16, 1975), p. 2; MP&L Clay Boswell Permit Hearing Testimony of Dr. John Moyle (March 19, 1975), pp. 47-48.

⁶ Note, for example, MP&L Clay Boswell Permit Hearing Testimony of Dr. Janis Grava (March 19, 1975), pp. 5, 7, 12-13, 15, 18-19.

⁷ MP&L Clay Boswell Permit Hearing Testimony of John Stewart (March 7, 1975), pp. 43-44; MP&L Clay Boswell Permit Hearing Testimony of Dr. Janis Grava (March 19, 1975), p. 19.

⁸ Findings of Fact, Conclusions of Law and Recommendations, *In the Matter of Applications for National Pollutant Discharge Elimination System Permits to Discharge for three Steam Generating Plants of Minnesota Power and Light Co. (Clay Boswell)* (accepted October 28, 1975) p. 5, ¶ 18. A variance was granted, see p. 10, ¶ 36

⁹ Statement of Need and Reasonableness, *Amended Rules Governing Water Quality Standards for Protection of Quality and Purity, Minn. R. 7050.0180, 7050.0185, 7050.0210, 7050.0216, 7050.0224, 7050.0460 and 7050.0470; and Proposed New Rules Governing Water Quality Standards, Standard Implementation, and Nondegradation Standards for Great Lakes Initiative Pollutants in the Lake Superior Basin, Minn. R. Ch. 7052* (1997) (“SONAR, 1997”), pp. 30-31. MPCA Staff, Final Post-Hearing Responses, *In the Matter of Proposed Amendments to Rules Governing Water Quality Standards, Minn. R. ch. 7050, and Proposed New Rules Governing Water Quality Standards, Standard Implementation, and Nondegradation Standards for Great Lakes Initiative Pollutants in the Lake Superior Basin, Minn. R. ch. 7052* (October 22, 1997), p. 18

¹⁰ SONAR, 1997, *supra*, pp. 40, 43.

¹¹ SONAR, 1997, *supra*, p. 22.

¹² SONAR, 1997, *supra*, p. 27

¹³ SONAR, 1997, *supra*, p. 22

¹⁴ SONAR, 1997, *supra*, p. 23

¹⁵ SONAR, 1997, *supra*, pp. 23, 27