



Minnesota Pollution Control Agency

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Date: 20 November 2013
To: Susan Thornton, Director of LCCMR
From: Bruce Monson, Project Manager for ENTRF ID 045-B
Subject: Proposed approach for LCCMR-funded Mercury Study: ENTRF ID 045-B

LCCMR has recommended funding of \$743,000 for our proposal, *Identifying Causes of Exceptionally High Mercury in Fish*, and directed that the study focus on the Roseau River. The purpose of this proposed mercury study is to test the hypothesis that high mercury in fish from northern Minnesota rivers is caused by efficient uptake of methylmercury throughout the aquatic food web (insects to fish) rather than by more mercury entering the watershed. The results of this study should reveal if there are actions that MPCA can take to reduce mercury levels in addition to the reduction of mercury sources that was addressed in the Statewide Mercury Reduction Implementation Plan.

The key element of the original proposal was a *comparison of rivers* with exceptionally high mercury in fish. Multiple sites are scientifically necessary to measure the relative importance of factors driving the elevated mercury levels. Therefore, we propose using the \$743,000 to compare the Roseau to other rivers. Movement of mercury and other key water quality parameters would be measured in the Roseau River and two other tributaries to the Red River of the North. This would provide the necessary comparison of mercury movement within watersheds of close proximity but of differing physical and chemical characteristics. In addition, the drivers of mercury biomagnification in the food web would be compared among the five rivers in the original proposal (activities 2, 3, and 4 in the original proposal). All five rivers have exceptionally high mercury levels in walleye. This study would measure the rates of mercury converted to methylmercury, the removal of methylmercury, and the uptake of methylmercury in the food webs. In addition to measuring mercury in the water, sediment, and all levels of the food web, stable isotopes of carbon and nitrogen will be measured at all levels of the food web to identify the source of the methylmercury (sediments or open water) and the rate of biomagnification.

This approach would provide us with the greatest scientific value for the recommended ENTRF funds. It would significantly enhance our understanding of the drivers of the exceptionally high mercury levels by providing the necessary comparative data, while completing all the monitoring and analyses originally proposed for the Roseau River.