Kohlman Lake Fact Sheet

Draft TMDL: Excess nutrients (phosphorus)

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Minnesota Pollution Control Agency

Contents

The Kohlman Lake watershed comprises a total of 7,484 acres (excluding the lake surface area) and drains portions of the cities of Gem Lake, White Bear Lake, Vadnais Heights, Maplewood, North St. Paul, Little Canada, and Oakdale. The 74-acre lake has an average depth of four feet. Shallow lakes are more susceptible to excessive phosphorus pollution, which can degrade lake water quality and contribute to summer algae blooms. Low-density residential housing (1-4 units/acre) is the dominant land use (approx. 41%) in the Kohlman Lake watershed. The remaining breakdown is natural/park/open space/agriculture at 21 percent, commercial and wetlands (9% each) comprise 18 percent, and 20 percent "Other" land uses.

Water quality concerns

Kohlman Lake has been identified for impairment of aquatic recreation (swimming) due to excess nutrients. As a result, it has been placed on Minnesota's list of impaired waters. Because of the excedance, Ramsey Washington Metro Watershed District conducted a Total Maximum Daily Load (TMDL) study. A TMDL is defined as the maximum quantity of a pollutant that a water body can receive and continue to meet water quality standards for designated beneficial uses.

The problem

Nutrient reductions for Kohlman Lake are set for phosphorus because it is the limiting nutrient for aquatic plants. While phosphorus is an essential nutrient for algae and plants, it is considered a pollutant when it stimulates excessive growth of algae or aquatic plants. This can significantly affect recreational use, aesthetics and wildlife.

Excess nutrients in Kohlman Lake: the problem at a glance

Kohlman Lake 1997-2006 June-September average phosphorus concentration: 98 ug/l,

Standard: 60 µg/l Phosphorus (North Central Hardwood Forest shallow lake standard)

Watershed population: Approximately 35,000 (from census tract data)

Sources

Internal: Sediment resuspension by rough fish (carp, black bullheads etc.), wind mixing and/or boat propellers. Internal loads of phosphorus from lake sediments, senescing macrophytes (curlyleaf pondweed).

External: Stormwater runoff from impervious surfaces (rooftops, driveways, parking lots, roads, etc.), lawns, atmospheric deposition, point sources (Municipal Separate Storm Sewer Systems, MS4s), lawns and inflow from lakes upstream.

The process

1. Collect information on the condition of the watershed, including water chemistry, biology and land use.
2. Use this information to assess whether water quality is impaired
3. For this impaired watershed, conduct water quality monitoring, investigative studies, and computer modeling of the lake system.
4. Utilize studies to develop a watershed recovery plan to meet water quality goals based on public input and watershed modeling.
5. Implement the management practices identified in the watershed plan.
6. Conduct a monitoring program to verify that water quality goals are being met.

The sources

The mean surface water concentrations of phosphorus in Kohlman Lake have ranged from 66 µg/L (in 2002) to 171 µg/L (in 1982) over the past 26 years, giving the lake a hypereutrophic classification. The *mean growing season* phosphorus concentration over the last 10 years (1997 to 2006) is 98 µg/L.

The external phosphorus load to Kohlman Lake, based on an average precipitation model and summed over the growing season (June through September) was 943 pounds. The internal phosphorus load over the growing season, maximum measured (from sediment analysis and macrophyte survey) is 872 pounds.

Reductions

The water quality goal will be set at 60 micrograms per liter (µg/l) for the mean total phosphorus concentration during the growing season (June 1 –September 30). Sixty micrograms per liter is the state phosphorus standard for shallow lakes in the North Central Hardwood Forest Eco-region.

Because the assimilated capacity of a waterbody varies with the water load and ultimately precipitation, the TMDL was set for dry, average and wet years.

Results indicate that phosphorus loading into and within Kohlman Lake must be reduced by 38 percent, depending on yearly precipitation, to achieve the water quality goal of 60 µg/l.

Implementation strategies

To reach the reduction goals, Ramsey Washington Metro Watershed District will rely largely on its current Water Management Plan, which identifies the District as the local agency for implementing best management practices. However, cities and other MS4s in the Kohlman Lake Watershed are expected to fulfill their existing responsibilities in storm water management to help meet the goals of this TMDL.

Implementation goals not covered in the Water Management Plan will be identified and added to the implementation plan. A final implementation plan that allocates watershed loads will be developed within a year of the final approval of the TMDL report by the United States Environmental Protection Agency (EPA).

Because of the uncertainties involved in the development of the TMDL and the success of management strategies used to reduce pollution, it is necessary to use an "adaptive management" approach to implementation. This approach involves continual evaluation and monitoring of implementation actions taken to reduce pollution over a period of several years.

For more Information

For more information, review the Kohlman Lake Excess Nutrients TMDL Draft report and Fact Sheet on the Ramsey Washington Metro Watershed District web site at ***www.rwmwd.org*** Ph # 651-792-7950 or the MPCA web site at ***http://www.pca.state.mn.us/water/tmdl/tmdl-draft.html***.

General information on TMDLs can be found on the MPCA Web site at ***www.pca.state.mn.us/water/tmdl*** Direct questions, comments and requests for more information to the MPCA project manager, Roger Ramthun, 651-757-2663 e-mail ***roger.ramthun@state.mn.us***