



Capital Improvement Project Lakeville: Phosphorous Treatment Enhancements at County Road 50



A treatment train of bioretention and an iron-enhanced sand filter allows for the capture of particulate bound and dissolved phosphorus, helping to improve water quality.

Vermillion River Watershed Joint Powers Organization

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Protecting Lake Marion

No one enjoys going to the lake in the summer and finding it covered in green, smelly algae. Too many nutrients flowing into lakes and rivers feed this algae growth. Lake Marion, a popular recreational lake, will have less of these harmful nutrients due to a bioretention cell (raingarden) and iron-enhanced sand filter installed to remove phosphorous, the algae causing nutrient of concern.

Bioretention and iron-enhanced sand filters are effective treatment practices for removing phosphorus.

Bioretention works to filter out particulate-bound phosphorus. Iron-enhanced sand filters use iron filings mixed with sand to act as a natural magnet trapping both dissolved phosphorus and particulate-bound phosphorus. Less phosphorous entering Lake Marion results in less algae.

Dakota County reconstructed County Road 50 in 2017. During the design phase, City of Lakeville and the Vermillion River Watershed Joint Powers Organization (VRWJPO) worked with the County to design a practice that would provide phosphorus treatment for a portion of the City that had no stormwater treatment previously. By constructing this practice, the City, County, and VRWJPO provided Lake Marion the protection it needs to continue meeting state water quality standards.

A treatment train of bioretention with an iron-enhanced sand filter to remove particulate and dissolved phosphorus was implemented. The water quality improvements in Lake Marion will enhance year-round fishing and recreation.

Problem:

- Stormwater drainage under County Road 50 is piped, untreated, and contributes to the phosphorus load to Lake Marion, worsening water quality

Actions:

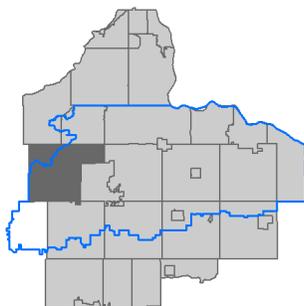
- A treatment train of a bioretention cell and an iron-enhanced sand filter will remove particulate bound and dissolved phosphorus from stormwater runoff.

Benefits:

- Reduces phosphorus and sediment loading to the lake by 25.5 lbs./year and 1.99 tons/year, respectively
- Reduces water quality problems such as cloudiness and algae blooms in Lake Marion
- Allows for education, outreach, and stewardship
- Design and construction costs were minimized by working to include design and construction with the County Road 50 reconstruction project

Costs and contributions:

- Vermillion River Watershed Joint Powers Organization: \$30,000 cash match and design assistance
- Dakota County: \$19,641.34 cash match, design assistance, and construction oversight.
- Clean Water Fund: \$126,583 grant



City of Lakeville, MN
near the intersection of Kenwood Tr.
and Jaguar Ave.

Below is the bioretention cell and iron-enhanced sand filter treatment train.



A project completed cooperatively by:

- Vermillion River Watershed Joint Powers Organization
- City of Lakeville
- Dakota County
- Clean Water Fund Grant

A grant from the Clean Water Fund, one of four funds established by the Clean Water, Land & Legacy Amendment, supported this project. [Clean Water Stories](#) can be found on the Minnesota Board of Water and Soil Resources website.

