

# Bald Eagle Lake Water Reuse & Phosphorous Reduction Project

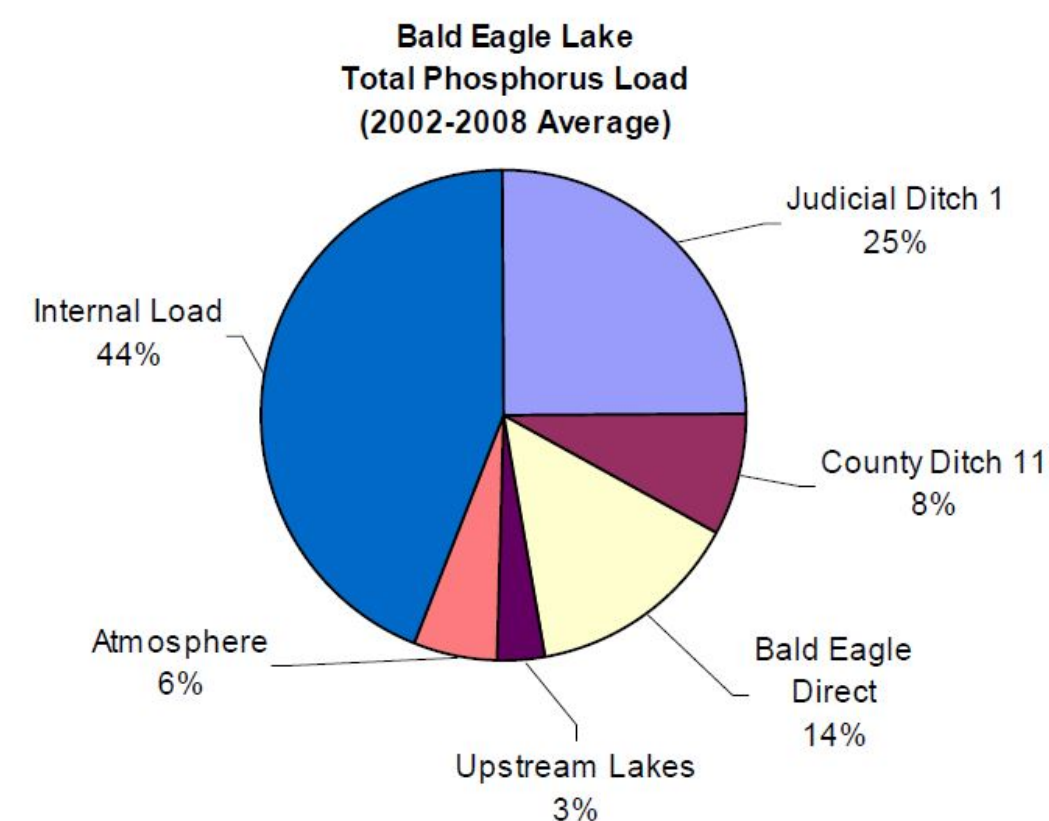
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## PROBLEM

In 2002, Bald Eagle Lake was placed on Minnesota's 303(d) List of Impaired Waters for excess phosphorous. Average summer total phosphorous concentrations ranged from 50 mg/L to greater than 100 mg/L and the lake consistently exceeded the state eutrophication standard of 40 mg/L for almost 30 years. Severe algal blooms had become common place and were negatively impacting aquatic recreation. RCWD worked in partnership with the Minnesota Pollution Control Agency to complete a Total Maximum Daily Load (TMDL) study to determine the phosphorous reduction needed for Bald Eagle Lake to begin meeting state standards. The study concluded that a 91% reduction in internal phosphorous loading and a 38% reduction in watershed loading will be needed to meet state standards.

The primary watershed load is coming from the Judicial Ditch #1 (JD1) subwatershed, which accounts for 75% of the land area draining to Bald Eagle Lake. RCWD identified this stormwater reuse irrigation project at Oneka Ridge Golf Course as one way to begin addressing the phosphorous load from the JD1 subwatershed. Estimates suggest that this project will reduce phosphorous by 75 pounds annually, depending upon annual precipitation patterns. 75 pounds of phosphorous can grow between 12 and 18 tons of algae annually so this project represents an important step towards helping Bald Eagle Lake meet state water quality standards.



Pre-Construction: ORGC 18<sup>th</sup> Tee



Post-Construction: ORGC 18<sup>th</sup> Tee



## NEXT STEPS

Construction was complete in early October 2014. After final testing in the fall, system operation will resume in the spring of 2015 and monitoring will continue according to the O&M plan. Minor project maintenance will be the responsibility of the golf course while major maintenance such as replacement of the pumps, pond dredging, etc. will be the responsibility of the government partners.

Should land use change within the 25 year project term, RCWD and Hugo are still obligated to operate the system. This could be operating the irrigation system in concert with new development or reverting to use of the infiltration system alone.

This stormwater reuse irrigation project has value not only in the immediate local benefits to water quality and groundwater protection, but also as an example for other communities to observe and alter to meet their own needs. Stormwater reuse can be adapted to operate at nearly any scale of size and budget. During a time when groundwater consumption is increasingly important to District residents, cities such as Hugo are stepping forward to make reuse projects such as this one a priority.

## OPERATIONS & MONITORING

RCWD staff began monitoring the system in July 2014 and plans to continue for a minimum of five years to determine the system's effectiveness at removing phosphorous from the watershed. The lift station's controls record the total volume pumped and another flow meter on the 2.5" forcemain to the infiltration system allows us to determine precisely how much water is used for irrigation vs. infiltration. Water samples are taken every two weeks during the operational season (approximately April through November) to monitor nitrogen, phosphorus, and other standard water quality parameters from three locations.

Samples are taken from (1) the private ditch at Goodview Avenue when water is flowing out of the system down to Bald Eagle Lake, (2) the surface of the new stormwater pond, and (3) the lift station "downstream" of the pumps and filters. This level of data will allow us to calculate precisely how much phosphorus is removed by the system on an annual basis.

The RCWD, project engineer, and ORGC are currently developing a formal operation and monitoring plan that, among other things, will set a minimum pond surface elevation to deactivate the lift station and revert to using groundwater for irrigation as needed. Once the pond fills again due to rainfall, the lift station will automatically re-engage its operation.

Lift Station Pumps (left) and Filter (right)



Runoff entering new stormwater pond



## PROJECT PARTNERS

RCWD received a Clean Water Fund grant from the Clean Water, Land and Legacy Amendment in the amount of \$497,100 for the Oneka Ridge Water Reuse Irrigation Project. Matching funds and in-kind project support were provided by the RCWD, the City of Hugo, and the Oneka Ridge Golf Course.