

Memorandum



To: Le Sueur County Drainage Authority

From: Bailey Bocchino, PE

Date: January 9, 2026

Subject: Recommendations for Modifications of Hydraulic Control on Le Sueur County Ditch 58 (Lake Henry Outlet)

INTRODUCTION

The Minnesota Department of Natural Resources (DNR) has petitioned to modify the Lake Henry outlet structure to allow for drawdown for shallow lake vegetation management. The project includes addition of safety features and channel excavation from the structure to the open water portion of Lake Henry. Originally, the outlet structure was established and constructed as part of CD 58 in 1955. In 2020, the DNR approached Le Sueur County due to failures being present at the structure. The DNR had interest in including variable crest drawdown structure for shallow lake management and requested that it be considered as an alternative to static crest structure replacement. The drainage authority considered both alternatives and associated costs. The drainage authority approved variable crest structure replacement, and it was installed 2021. At the time, a Lake Management Plan or Joint Powers Agreement had not been developed, therefore, the structure was not to be modified to alter water levels. Additional features were needed to be added to operate the structure such as safety features and excavation of the channel to the open water portion of Lake Henry. The DNR contracted with Duck's Unlimited (DU) to complete the design and construction plans for the project. The DNR submitted petition to complete this work and developed a Lake Management Plan as well as Joint Powers Agreement for the structure. ISG has been ordered by the drainage authority to review the DNR/DU design, construction plans, Lake Management Plan, and Joint Powers Agreement and provide any recommendations.

HISTORY

Originally, the outlet structure was established and constructed as part of CD 58 in 1955. In a major repair that took place in 1984, the structure at Lake Henry was replaced. In 2020, the DNR requested site investigation and repair to the structure to Le Sueur County due to its condition at the time. The outlet pipe had detached from the concrete structure. The CMP outlet pipe was also rusted, bent, and crushed in some locations. Due to the state of the outlet pipe, water had rerouted overland creating a sink hole and eroded channel through the field crossing which acted as impoundment for the outlet structure's outlet pipe. The state of the outlet structure at the time created safety concern as well as risk of failure to the outlet structure.

ISG developed concept options for the drainage authority to consider for repairs to the structure. Two concepts were considered. Option 1 included a replacement of the structure to the same hydraulic configuration and size of the existing structure, which was a static crest, 6'x6' concrete drop structure with 36-inch outlet pipe. This followed repair statute through 103E with replacement to the As-constructed or Subsequently Improved Condition (ACSIC). The second option was requested to be considered by the DNR which was similar design, but allowed for variable crest drawdown. There was some concerns with additional costs associated with variable crest design from the drainage authority. After careful consideration, the drainage authority approved variable crest design, but only implemented critical structural components to the structure at the time, knowing a second phase would need to be developed to add additional safety features and excavate channel between the structure and the open water portions of Lake Henry to allow for drawdown. Until a Lake Management Plan and Joint Powers Agreement was developed, the drawdown features were not to be utilized. The costs of the structure were paid for by system landowners and costs that went above and beyond to implement the variable crest drawdown structure were paid for by the county gravel tax. The structure was installed in 2021 by Rehneit Excavating, LLF of Kasota, Minnesota. The final contract price for construction of the structure was \$56,220.40.

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ASSESSMENT OF PROPOSED PROJECT

ISG was provided the following documents for review:

- Lake Henry Enhancement construction plans dated 10-03-2025
- Lake Henry Management Plan dated 1-16-2025
- Lake Henry Design Report dated 4-24-2026
- Joint Powers Agreement (unexecuted)

The review focused on process, potential flooding or drainage impacts to benefited landowners, future maintenance concerns, and cost or life-cycle savings resulting from the proposed modifications to the drainage system. Below is an outline of the review.

The project does not propose to change the outlet elevation utilizing the structure installed in 2021. The full-service runout elevation is 1024.87 (NAVD 88) and the function of the structure is not expected to change from its current condition. The Lake Management Plan does not allow drawdown during high water conditions and includes notification process to respond to localized flooding during active drawdown periods.

The project will include excavation of 771 linear feet of channel from the structure to open water portions of Lake Henry. The proposed channel is a 10-foot wide bottom with 2:1 side slopes. The maximum cut depth for the channel is 7.2-feet. Upon excavation of the channel, the stop logs may be lowered with full drawdown elevation at 1019.20 (NAVD 88), 5.7-feet lower than full-service runout elevation. Riprap will be placed around the structure. A handrail and locking mechanism for the stop logs is proposed to be bolted to the existing structure for safety and anti-tampering purposes. Erosion control blankets and seeding restoration are planned for areas around the structure that will be disturbed during construction.

Three drawdown scenarios are outlined in the lake management plan. The drawdowns have various timings of when to begin the drawdown and the duration of the drawdown. Beginning of drawdown will depend on water levels targeting timing for when water levels are low. Scenarios also consider fish populations targeting winter drawdown to help control undesirable fish such as carp and bullheads. The duration of drawdowns under outlined scenarios is between 8 months to 1.5-years. The estimated time for the lake to refill and return to normal water conditions is estimated to be 1.5-years under typical weather conditions. Drawdowns will not occur for longer than two consecutive years as defined under Minnesota Rules. The drawdown will be a 0.5-foot increments to reduce hydraulic impacts downstream and provide stability to lake channel and drainage system outlet channel.

At least two of listed conditions outlined in the Lake Management Plan must be met in order for the drawdowns to take place. The criteria focuses on water clarity data, water quality data, abundance of submerged aquatic plants, and fish populations present in the lake. Flooding criteria are not considered.

At least 5-days notice will be provided to Le Sueur County prior to drawdown. Le Sueur County should notify DNR wildlife during localized flooding during active draw down period. DNR will respond to the event by reducing or stopping outlet flows until conditions improve.

The Joint Powers Agreement outlines responsibilities for the DNR and Le Sueur County. Below outlines cost considerations and future maintenance responsibilities for the project and in the future. The DNR is responsible for costs associated with completing this project, operation and maintenance associated with water level management and drawdowns, and operation and maintenance of the project including cleaning vegetation and debris from the outlet structure and inlet channel cleanout to facilitate drawdown. The county will continue to own the structure and therefore provide capital maintenance of the project including major repairs or replacement of the structure to maintain full-service runout elevation, provide right to access through ditch right of way beginning at Le Sueur County Road 15, and maintain CD 58 immediately downstream of the water control structure.

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RECOMMENDATIONS

Below outlines the following recommendations for the project based on the review:

DNR/DU plans may want to consider including a J-hook tool to remove stop logs and stop log storage box to store them on site when removed. These features were not included in the 2021 structure construction.

The Joint Powers Agreement and Lake Management Plan indicate written notice through email to the ditch inspector 5-days prior to drawdown. The County may want to consider internal county notification processes and recommend notification of 10 to 15 days to allow for any appropriate landowner notifications, if desired.

The legal ditch for CD 58 extends approximately 245 linear feet from the structure into Lake Henry. The petition did not include abandonment as part of the project, and it's assumed that this portion of the channel will remain public ditch. The drainage authority maintains authority under 103E for this part of the public ditch channel. This overlaps for part of proposed excavation channel.

As-built documentation of the structure and outlet modification should be provided to Le Sueur County upon completion of construction to save in the ditch record to serve as the As-Constructed or Subsequently Improved Condition (ACSIC). The as built conditions of the channel will serve as the ACSIC for the channel.

Please feel free to contact me at 952.426.0699 or a Bailey.Bocchino@ISGInc.com if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Bailey Bocchino". The signature is written in a cursive, flowing style.

Bailey Bocchino, PE
Civil Engineer