

SHRWD Project No. 27

Union Lake-Lake Sarah Outlet

Modifications to Address Zebra Mussels





Agenda

- **Introductions**
- **Project Background**
- **Discovery of Zebra Mussels & Permit Modification**
- **Alternatives to Resume Operation**
- **Flood Hazard Mitigation Grant Opportunity**
- **Public Comment**



Introductions

Sand Hill River Watershed District

- April Swenby.....District Administrator
- Zach Herrmann.....District Engineer
- Board of Managers
 - Stuart Christian.....Chairman
 - Don Andringa.....Vice-Chairman
 - Shawn Brekke.....Secretary
 - Clayton Bartz.....Treasurer
 - Todd Peterson.....Manager



Project Background

- **Prior to the Project:**

- Water levels increased steadily from 1993-1999
- High water threatened cabins, septic systems, shorelines, and private property.
- Led to the organization of the Lake Improvement District to develop solutions to high water.

- **Implementation of the Project:**

- Lake Improvement District worked collaboratively with Polk County and Minnesota to develop solutions.
- Resulted in a pumping system and linkage between Union and Sarah Lakes.
- Construction occurred in 1999 under severe high water conditions.

- **After the Project:**

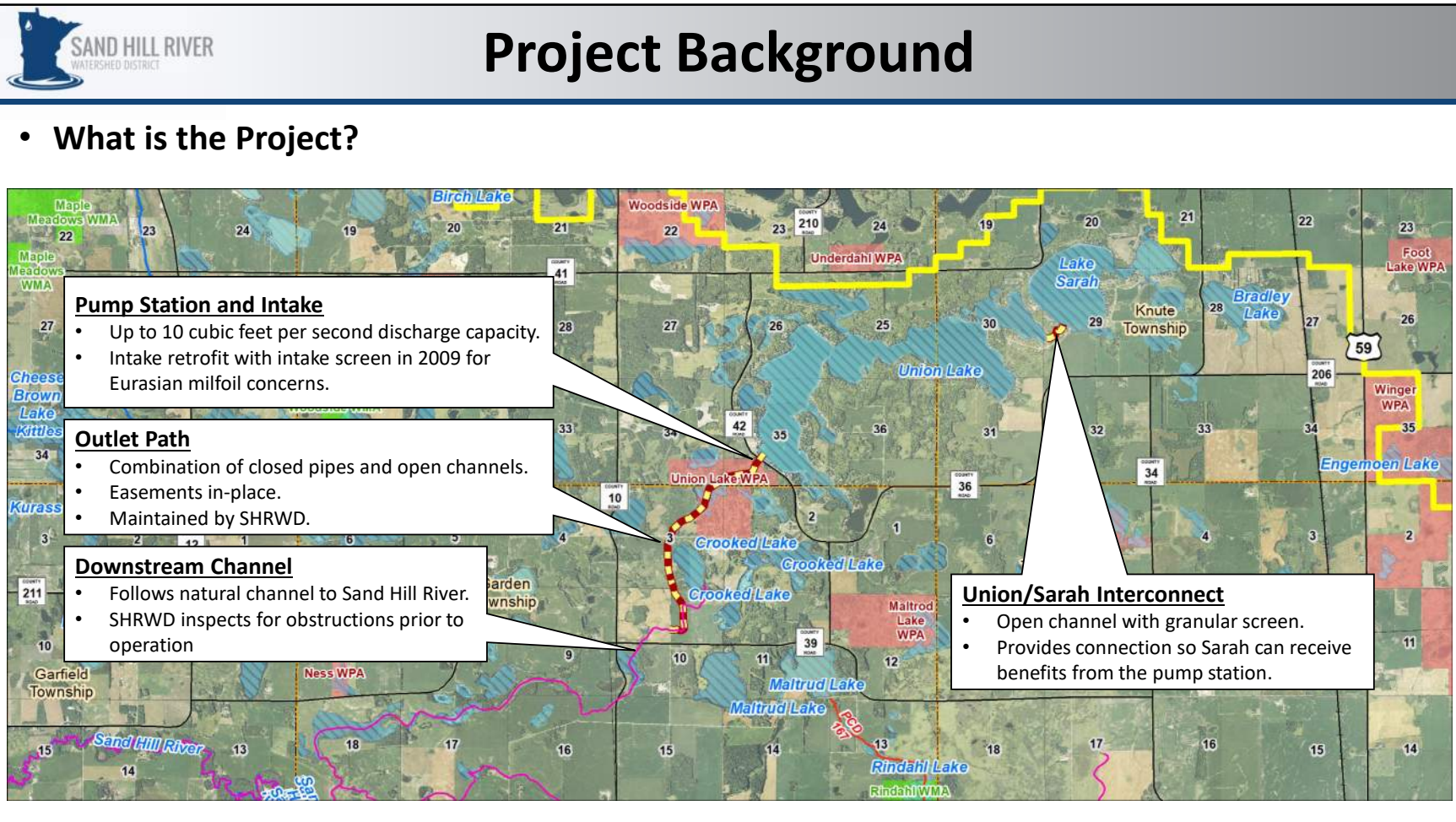
- Lake Levels began to stabilize.
- Pump operated periodically by the LID until 2012.
- Project transferred to the Sand Hill River Watershed District in 2021.
- Continued operation in 2020 and 2022 due to high runoff years.

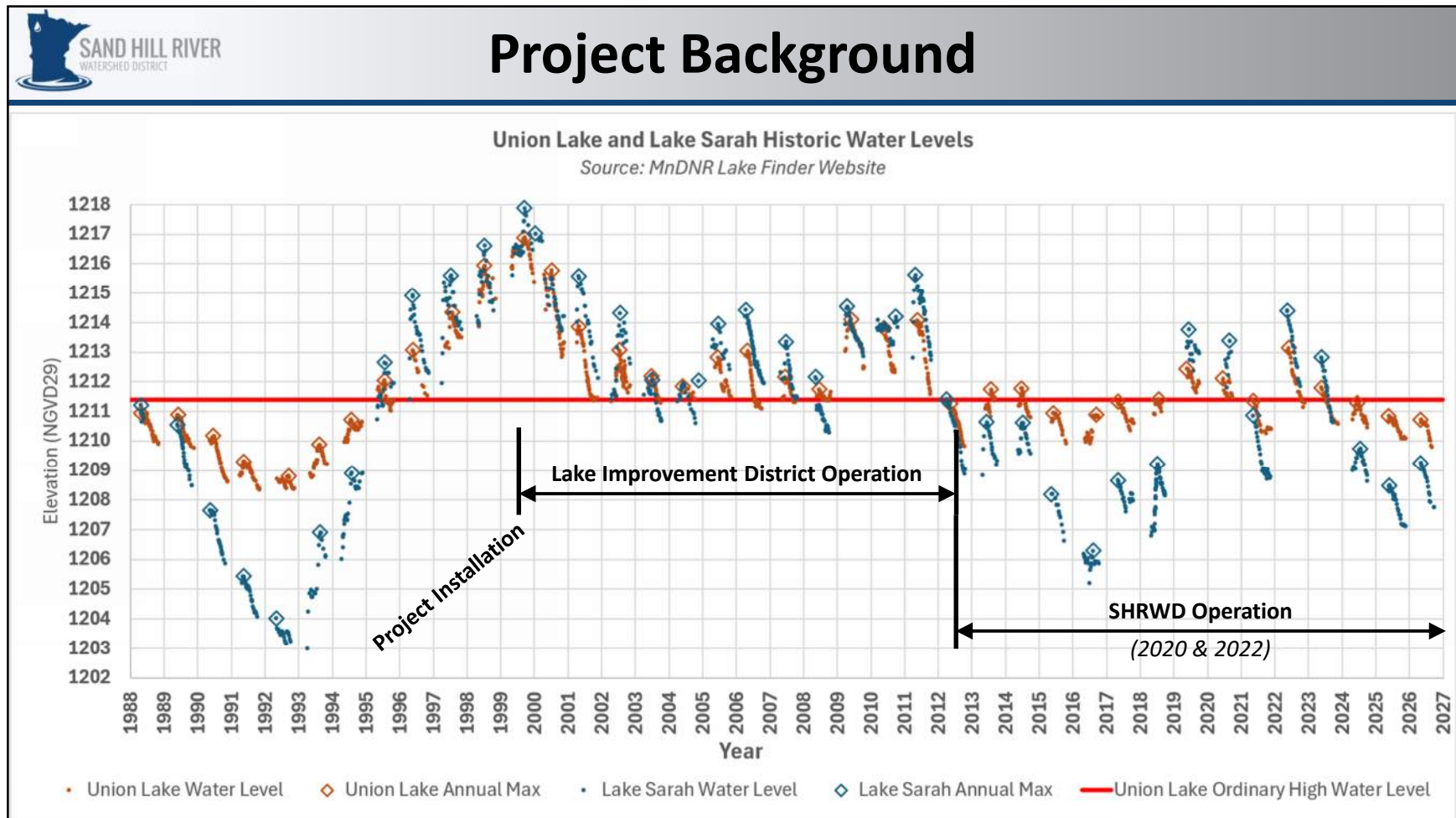
Example Cabin, Union Lake – 1984



Same Cabin, Union Lake – 1999









Zebra Mussels

- **MN DNR confirmed Zebra Mussels in Union Lake in 2024**
- **MN DNR Suspended Public Waters Work Permit in July 2024**
 - Letter notice provided to the Lake Improvement District and the Sand Hill River Watershed District.
 - MN DNR cites authority to modify permits to prevent the spread of Aquatic Invasive Species (MN Rules part 6216.05000).
 - All operations must cease until appropriate modifications or conditions are met to prevent the spread of zebra mussels.
- **MN DNR Suggestions (from July 2024 letter notice)**
 1. Operational modifications to discharge during seasonal periods when spread risk is mitigated.
 2. Modification to the project to provide filtration of zebra mussel larvae.
 3. Water treatment including chemical, ultraviolet, heat, or other treatments.





Alternatives

- **Operational modifications to discharge during seasonal periods when spread risk is mitigated.**
 - Seasonal restrictions would allow pumping when water temperature is below 48 degrees (F).
 - Temperature testing could occur at the inlet depth or above.
 - Requires water sampling and testing prior to pumping to confirm no zebra mussel larvae present.
 - MN DNR concern over the presence of adult zebra mussels in inlet pipes, pumps, etc. would require either removal and/or treatment any components in contact with Union Lake water.
 - If removal/cleaning of components is not completed, it requires a 35-micron screen. (Same as project modification requirements)
 - Deemed not feasible to remove infrastructure seasonally.



Alternatives

- **Water treatment including chemical, ultraviolet, heat, or other treatments.**
 - Hasn't been implemented or permitted on a lake outlet application by the MN DNR.
 - The burden of proof that it successfully eliminates zebra mussels from effluent would be the responsibility of the permit holder.
 - Given its an unproven method for this application, the Sand Hill River Watershed District determined its not feasible for this application.



Alternatives

- **Use infiltration into groundwater to prevent spread of zebra mussels.**
 - Review of available soil/well log
 - Approximate 1.5-mile radius from outlet.
 - Sediments within the study area are primarily clays with low infiltration rates.
 - The present clays have very low infiltration capacities.
 - Well logs suggest the gravel pit at parcel 74-00229-00 is largely surficial and isolated.
 - 1.5-miles of new force main to deliver effluent is likely very costly (\$1M or more just for pipe and installation).
 - Additional costs likely for land rights, infiltration maintenance, and potential pumping modifications.





Alternatives

- **Modification to the project to provide filtration of zebra mussel larvae.**
 - Requires filtration of project effluent with a maximum 35-micron screen filter.
 - *For reference, fine sand = 100-500 microns; human hair = 60-80 microns*
 - Filter requirement create additional resistance for the pump to push against.
 - Increased resistance requires a higher capacity pump from the existing pump.
 - Increased maintenance required for screens to ensure filters are not plugged.
 - Filters would be installed at the pump station for ease of service and maintenance.
 - Inlet infrastructure and outlet infrastructure would remain unchanged.



Alternatives

SUMMARY:

- Operational modifications to discharge during seasonal periods when spread risk is mitigated.
 - Not feasible after detailed discussion with MN DNR specific to our Project.
- Water treatment including chemical, ultraviolet, heat, or other treatments.
 - Treatment options were viewed as “theoretical” and could lead to high costs without guaranteed operation of the Project.
- Use infiltration into groundwater to prevent spread of zebra mussels.
 - Appears not feasible within a reasonable proximity of the pump. Moving water to other locations will come at high costs.
- Modification to the project to provide filtration of zebra mussel larvae.
 - Determined the most reasonable means to meet new permitting requirements.



SAND HILL RIVER
WATERSHED DISTRICT

Current Proposal

Filter System (Not to scale)

Installed in-line with pump discharge.



Replacement Pump

- *Filter system places additional hydraulic head (IE... resistance) to pump against.*
- *Existing pump is not adequate, and high capacity is required.*

Pump and Filter Housing

- *Protect against elements.*
- *Temporary heating to prevent filter damage due to freezing temperatures during operation*



Example from another project



Current Proposal

Union/Sarah Lakes Outlet Pump Modifications Preliminary Opinion of Probable Costs

Item No.	Description	Cost
1	Vertical Turbine Pump	\$ 390,000
2	Filter (35 Micron)	\$ 210,000
3	Pipes/Valves	\$ 81,000
4	Structural	\$ 201,000
5	Electrical/Controls	\$ 100,000
6	Enclosure	\$ 59,000
Construction Subtotal		\$ 1,041,000
Construction Contingency (20%)		\$ 208,000
Construction Total with Contingency		\$ 1,249,000
Non-Construction Costs		
	Legal and Administrative	\$ 15,000
	Engineering	\$ 156,000
	Permitting	\$ 25,000
Non-Construction Subtotal		\$ 196,000
Non-Construction Contingency (20%)		\$ 39,000
Non-Construction Total with Contingency		\$ 235,000
Total Project Costs with Contingency		\$ 1,484,000

Disclaimer: This preliminary Opinion of Probable Cost represents Houston Engineering, Inc.'s professional judgment regarding the anticipated cost to complete the proposed work based on the level of design and information available at the time of preparation. As project planning and design progress, quantities, assumptions, and project requirements may change, and this Opinion of Probable Cost is subject to revision. It is provided for planning and budgeting purposes only and is not a bid, quote, or guarantee of actual construction costs. All construction work for public entities shall be procured in accordance with applicable Minnesota public bidding and contracting laws, and final construction costs will be determined through the bidding or other authorized procurement process.



Funding

- Sand Hill River Watershed District actively pursuing legislative appropriated funding to address project upgrades needed for current permit requirements.
- Application submitted to the MN DNR Flood Hazard Mitigation (FHM) program in August of 2025.
- In-person testimony during legislative session in March 2026.
- Notified by the MN DNR that we were **AWARDED up to \$750,000 at a 1:1 match** through the MN DNR FHM program in August of 2026.



Funding

- In addition, the Sand Hill River Watershed District has pursued the following funding opportunities:
 - Federal funding through the U.S. Army Corps of Engineers
 - Clean Water Fund programs
 - One Watershed One Plan funding
 - MPCA Clean Water Partnership (loan only)
 - AIS prevention and outreach grants (not infrastructure eligible)
 - Habitat and invasive plant grants (not applicable to pump infrastructure)
- None have been successful to date.



MN DNR FHM Grant: Background

- Program was established in 1987 to provide state assistance to local government units for reducing flood risk and damage.
- Provides for up to 50% reimbursement for awarded projects.
- Primarily funded through an appropriation in the stated bonding bill (typically passed on even numbered years).
- Eligible activities:
 - Acquisition and removal of flood-prone and flood-damaged structures and property.
 - Levees, floodwalls, pumping stations, flood storage facilities, diversions, and other long-term capital flood risk reduction measures.
 - Water level control structures.



MN DNR FHM Grant: Moving Forward

- The Sand Hill River Watershed District has been in communication with MN DNR on next steps for the grant.
- First step is for the District Board of Managers pass resolution committing the local match (50%).
- After a resolution is passed, then project development requirements in line with MN Statute 103D requirements.
- Passing the resolution first allows for eligible costs during project development to be reimbursed.
- Maximum timeline requirements (ideally earlier)
 - End of 2027 – Finalize permitting and construction funding.
 - End of 2029 – Substantial completion of construction.
 - Mid 2030 – Final completion and all grant funds dispersed.



MN DNR FHM Grant: Moving Forward

- **If authorized, remaining tasks include:**
 - Prepare Engineer's Report to include technical and cost specifications.
 - Conduct Hearing on the Engineers Report.
 - Order to proceed and levy against affected properties.
 - Permitting and regulatory
 - Preparation of bid documents.
 - Contractor procurement.
 - Construction.
 - Operation and maintenance.



Public Comment

- First decision is whether to proceed with the current proposal.
- The Sand Hill River Watershed District needs your input!

Questions and Comments

20