White Bear Lake Area Comprehensive Plan Meeting #6

Draft Scope of Work – Two Studies

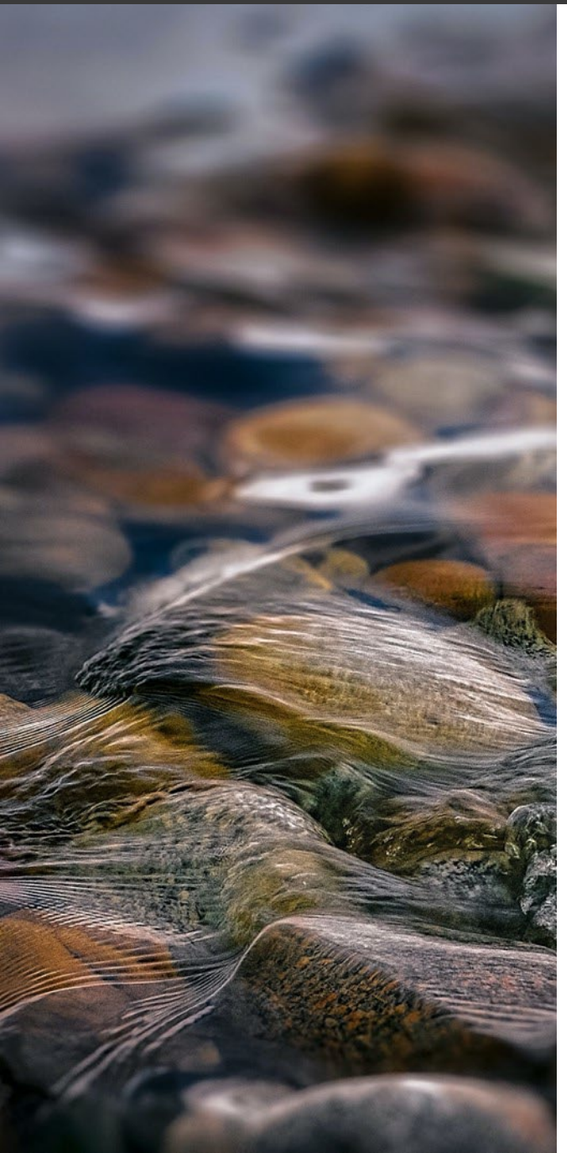
METROPOLITAN COUNCIL

February 4, 2024

Greg Johnson, Principal Engineer

metrocouncil.org

Converting water supplies that are groundwater dependent to total or partial supplies from surface water

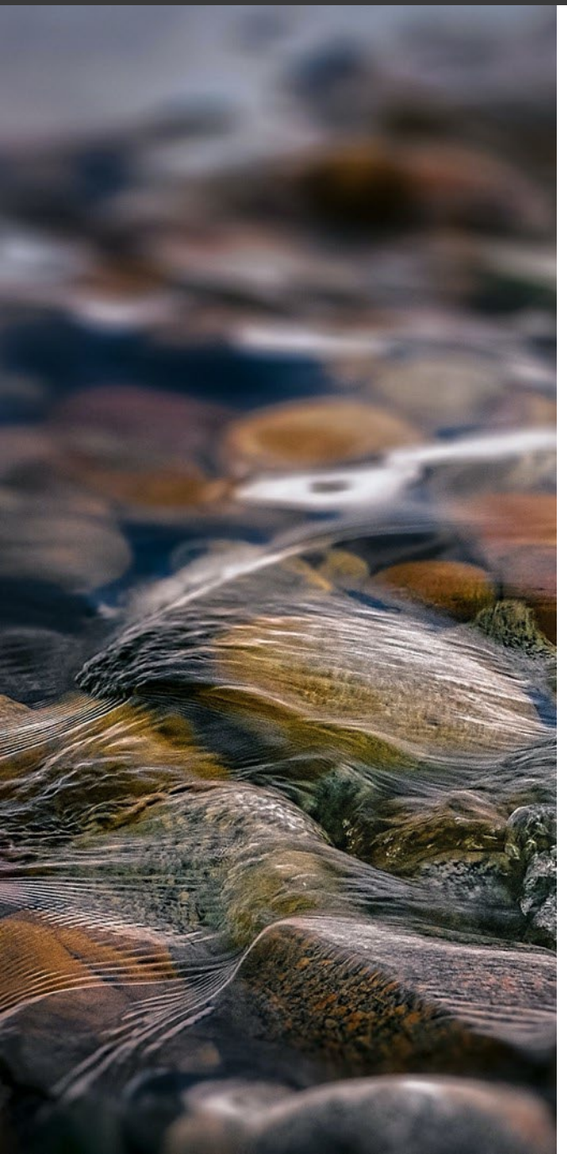


Study No. 1 - Redirect stormwater to augment White Bear Lake

Study No. 2

1. Convey treated surface water from St. Paul Regional Water Services to north and east communities
2. Construct a regional surface water treatment plant near the chain of lakes in the north metro and convey treated surface water to north and east communities
3. Convey treated surface water from St. Paul Regional Water Services to north and east communities and construct a regional surface water treatment plant near the chain of lakes in the north metro and convey treated surface water to north and east communities

Reuse water

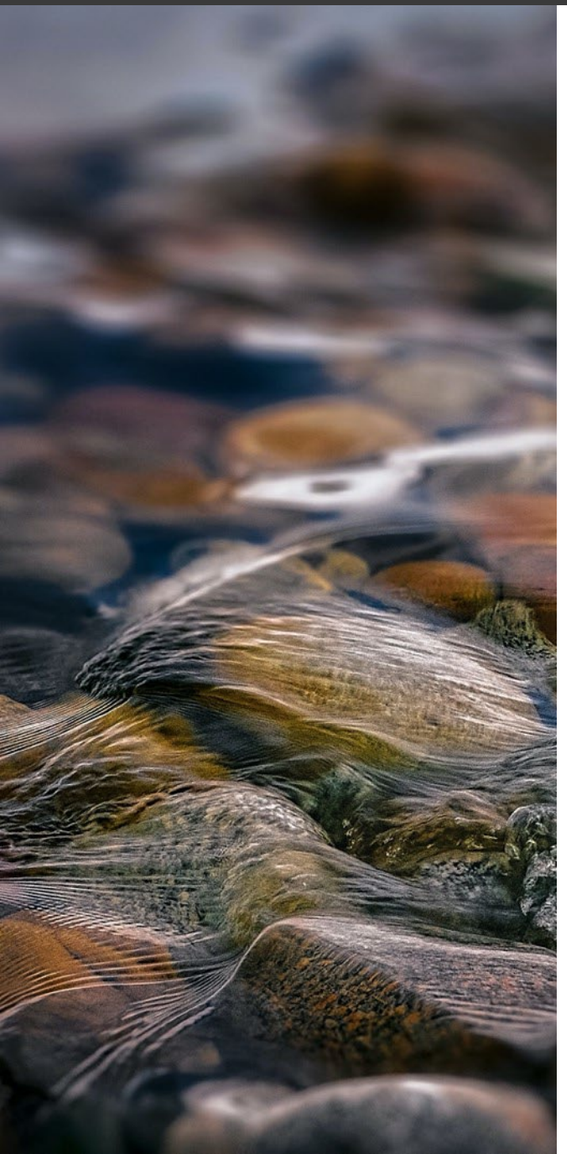


Study No. 3 - Reuse of treated wastewater from local Met Council interceptors for industrial and agricultural users

Study No. 4 - Stormwater reuse for irrigation

Study No. 5 - Reuse water discharged from contaminated wells – MPCA Project 1007

Projects designed to increase groundwater recharge (1/2)

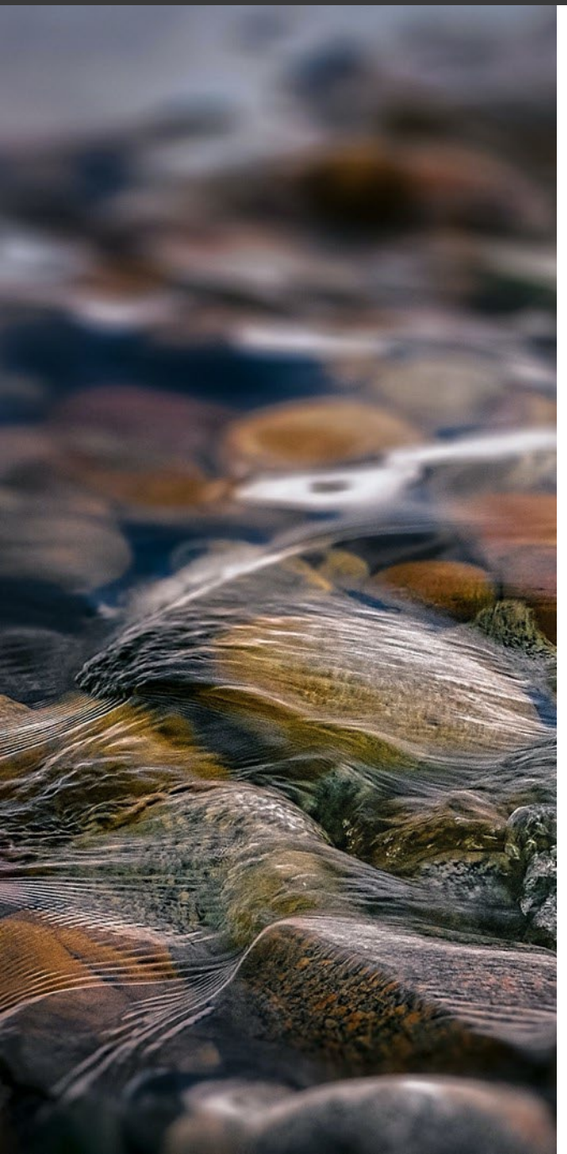


Study No. 6 - Treat wastewater from local Met Council interceptors and inject the treated wastewater into the aquifer to raise groundwater elevations

Study No. 7A – Surface water quality study as it relates to lake augmentation study

Study No. 7B - Lake augmentation by pumping treated surface water from the chain of lakes into White Bear Lake

Projects designed to increase groundwater recharge (2/2)

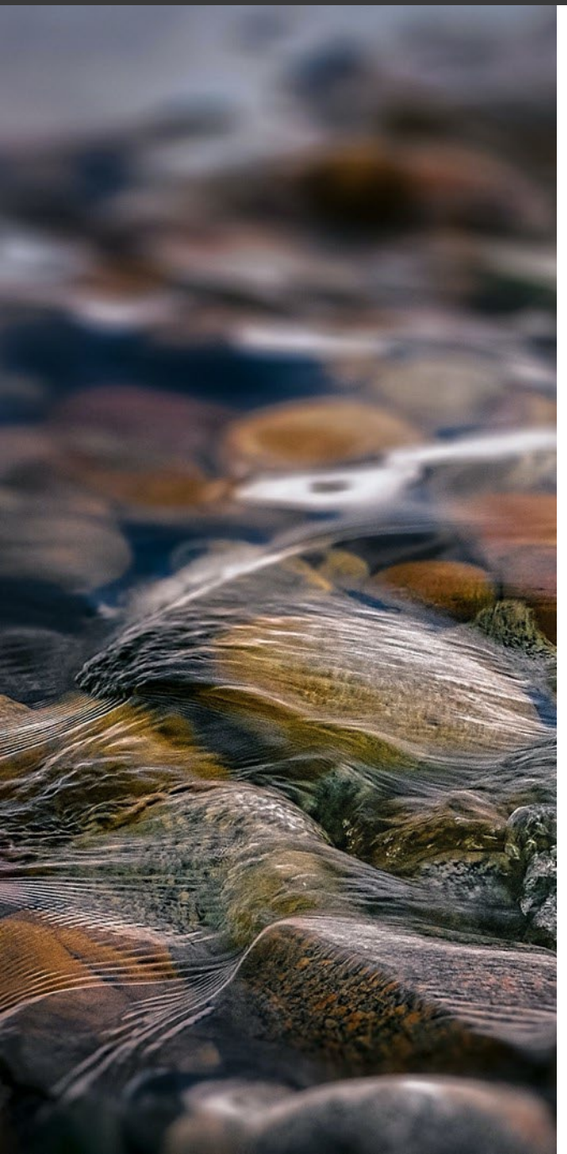


Study No. 8 - Stormwater collection and infiltration to raise groundwater elevations

Study No. 9A – Raise outlet elevation of White Bear Lake – initial evaluation of potential flood impacts

Study No. 9B – Raise outlet elevation of White Bear Lake – potential water storage and downstream hydraulic capacity

Other methods for reducing groundwater use



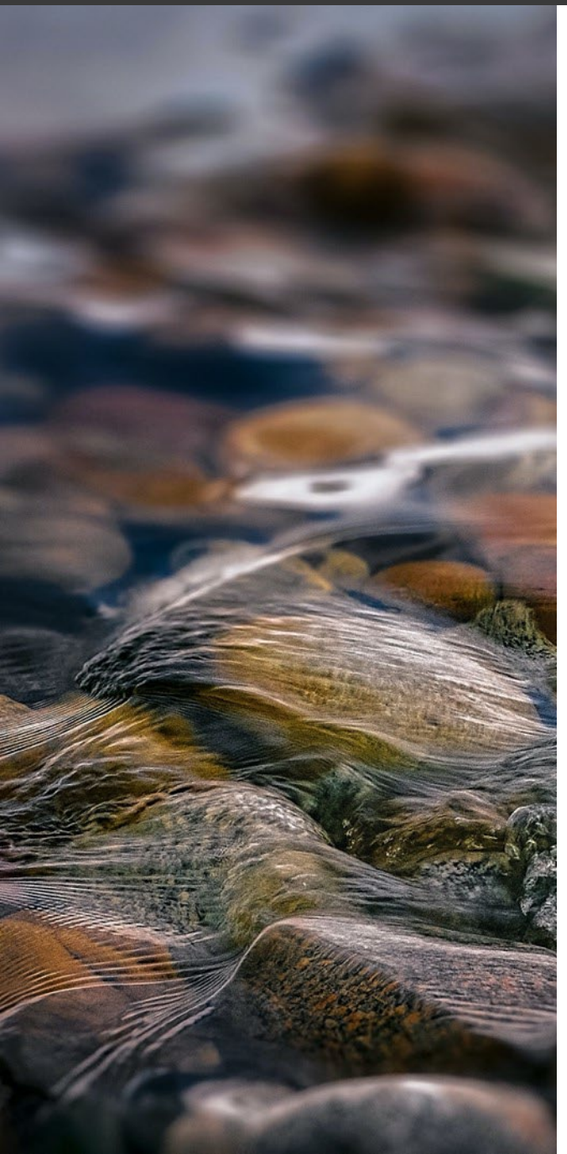
Study No. 10 - Lawn water restrictions (day of week and time)

Study No. 11 - Implement/require/encourage non- or less-potable water reuse for irrigation and process water

Study No. 12 - Tiered increasing block water utility rates

Study No. 13 - Potential water savings from alternative low input turf grasses

Other studies depending on project funds being available

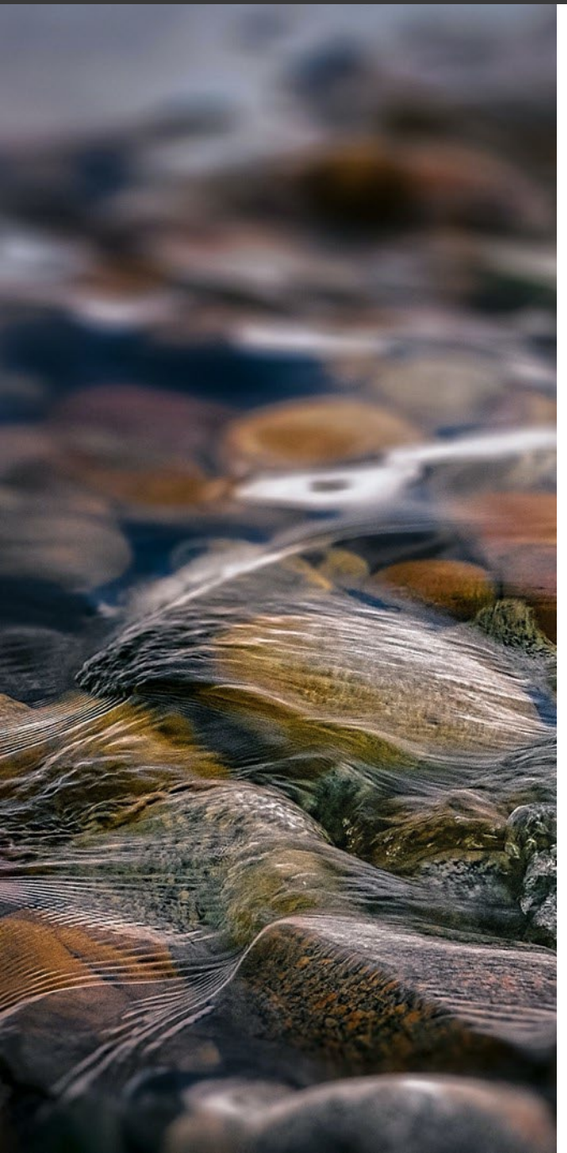


Study No. 14A – Future community impacts from PFAS groundwater contamination with groundwater modeling

Study No. 14B – Estimated capital and long-term O&M costs of PFAS water treatment for impacted communities

Study No. 15 – Estimated capital and long-term O&M costs to construct two additional wells in Shoreview and expand the city's existing water treatment plant capacity to serve drinking water for North Oaks

Projects started to date

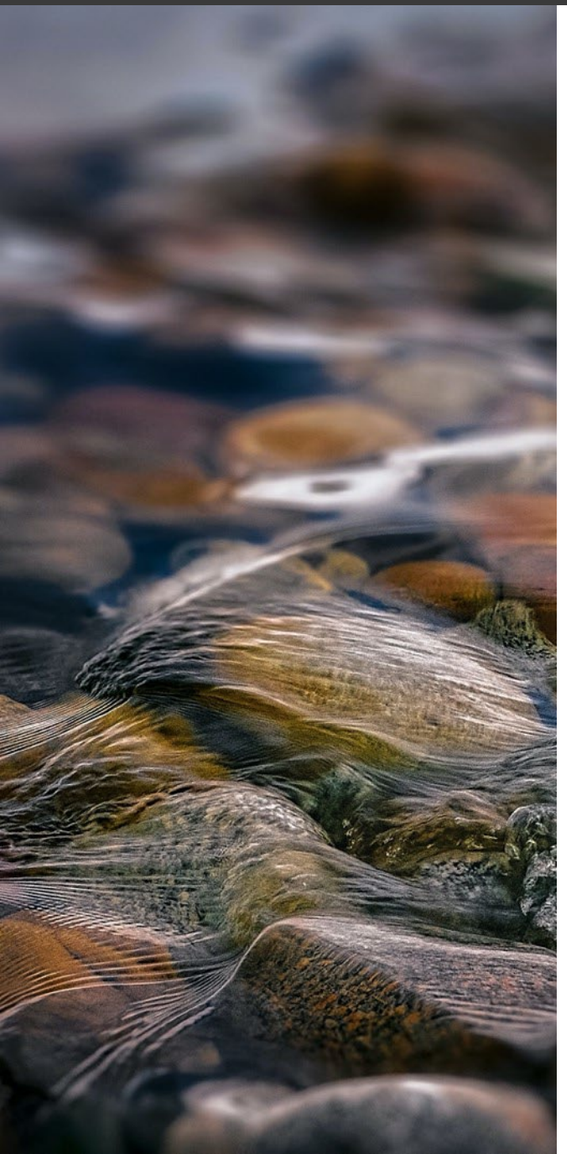


Study No. 3 - Reuse of treated wastewater from local Met Council interceptors for industrial and agricultural users

Study No. 5 - Reuse water discharged from contaminated wells – MPCA Project 1007

Study No. 6 - Treat wastewater from local Met Council interceptors and inject the treated wastewater into the aquifer to raise groundwater elevations

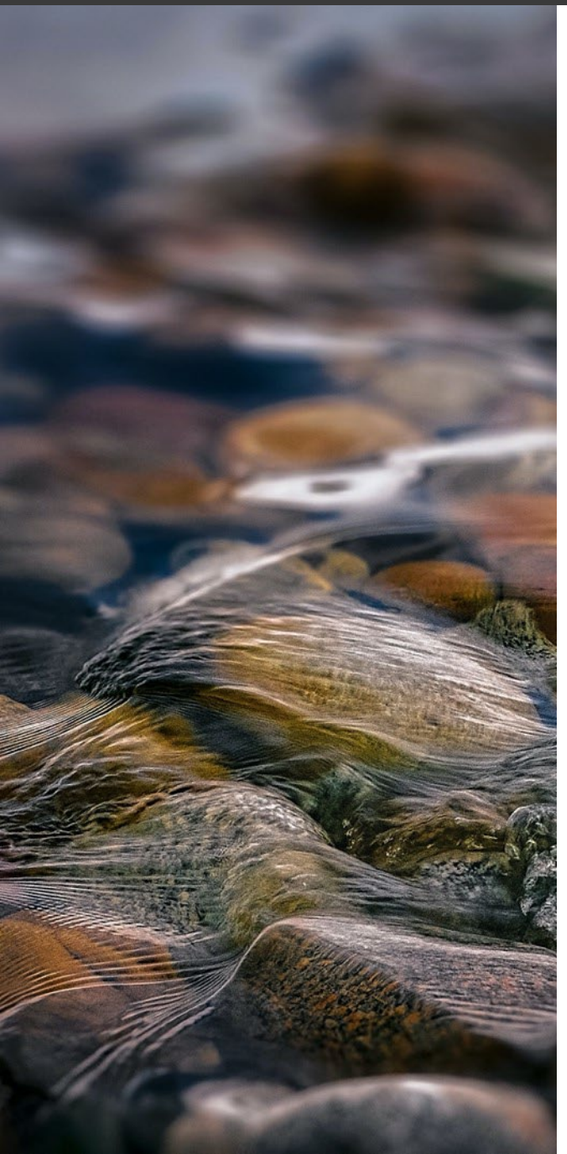
Scope of Work – Two Studies



Study No. 7A – Surface water quality study as it relates to lake augmentation study

Study No. 9A – Raise outlet elevation of White Bear Lake – initial evaluation of potential flood impacts

Scope of Work – Study No. 7A – Surface water quality study as it relates to lake augmentation study (1/6)

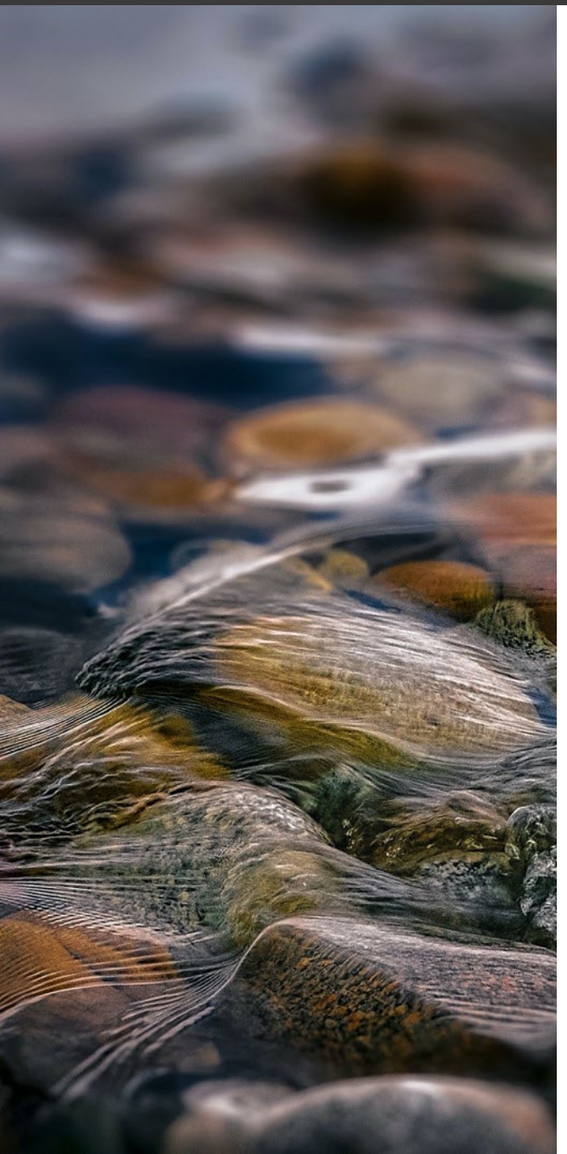


Review existing water quality and establish water quality goals

- Review existing water quality data and additional water quality data to be obtained for the Mississippi River, chain of lakes, and White Bear Lake, and provide recommendations for additional sampling as needed

- Form a subworking group to establish water quality goals for White Bear Lake

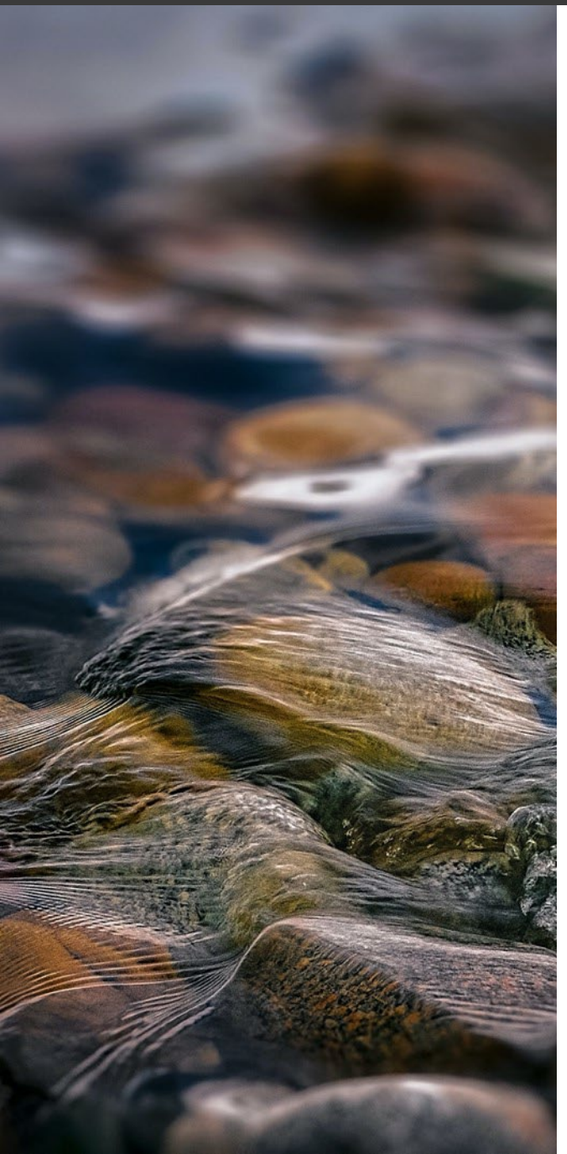
Scope of Work – Study No. 7A – Surface water quality study as it relates to lake augmentation study (2/6)



Obtain additional water samples though spring, summer, and fall 2025

- Additional water samples that could be obtained and analyzed by others could include, but are not limited to, phosphorus, nitrogen compounds, PFAS, alkalinity, hardness, pH, dissolved oxygen, temperature, sulfide, chloride, metals, dissolved solids, bacteria, trace chemicals, invasive species, and emerging contaminants (pharmaceuticals, estrogen disruptors, etc.).

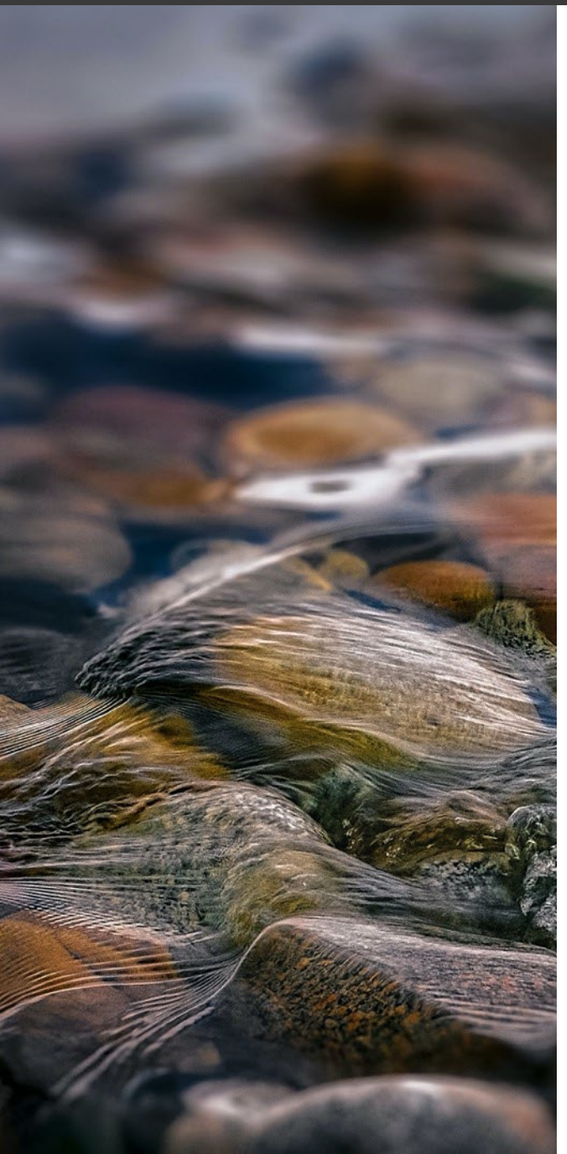
Scope of Work – Study No. 7A – Surface water quality study as it relates to lake augmentation study (3/6)



Surface water quality modeling and analysis

- Prepare a computerized 3D surface water quality model with hydrodynamic, water quality, and sediment transfer modules.
- Simulate and analyze water quality from the mixing of Mississippi River and the chain of lakes surface water as a whole with White Bear Lake surface water
- Determine the long-term water quality results for multiple scenarios including their impacts and expected water quality and clarity for the chain of lakes and White Bear Lake

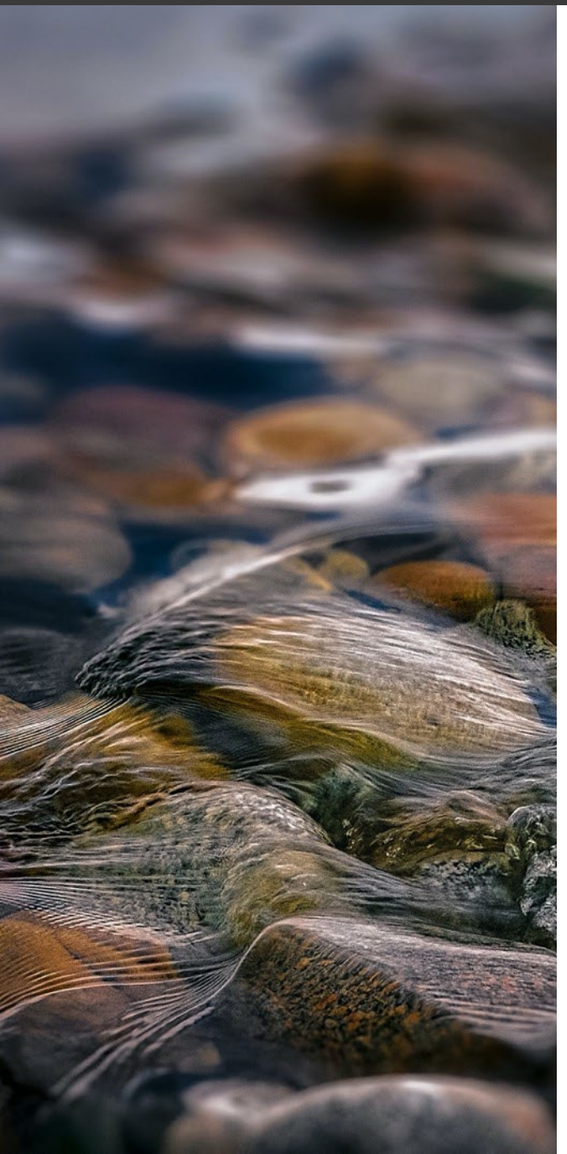
Scope of Work – Study No. 7A – Surface water quality study as it relates to lake augmentation study (4/6)



Additional surface water modeling analysis

- Model and determine lake responses and eutrophication impacts with mass balances for high-risk constituents to determine the magnitude of their impacts for each scenario
- Complete a sensitivity analysis by modeling higher, fictitious concentrations of the various contaminants
- Conduct a risk assessment for toxics, pesticides, organics, and other toxic substances using Mississippi River data and estimate parameter concentrations in each of the lakes
- Provide an overall mitigation plan to prevent, treat, and address contaminants of concern in the chain of lakes and White Bear Lake

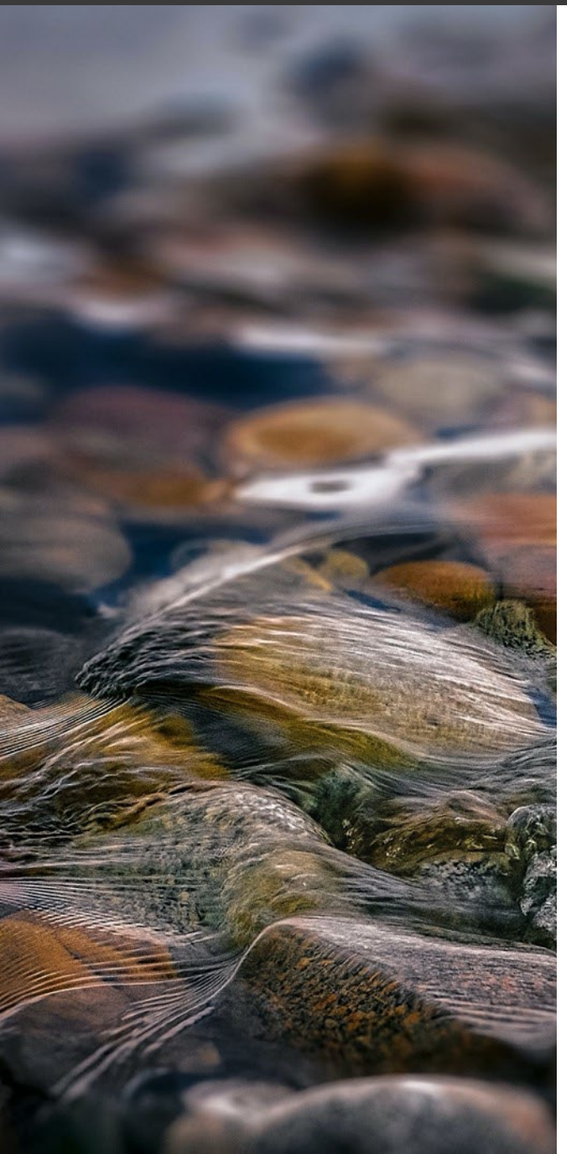
Scope of Work – Study No. 7A – Surface water quality study as it relates to lake augmentation study (5/6)



Watershed modeling analysis

- Provide watershed modeling analysis for all watersheds that contribute stormwater runoff to the chain of lakes and White Bear Lake to determine runoff volume and pollutant loading to each of the lakes and include these results in the surface water quality modeling analysis

Scope of Work – Study No. 7A – Surface water quality study as it relates to lake augmentation study (6/6)



Requested information from consultant

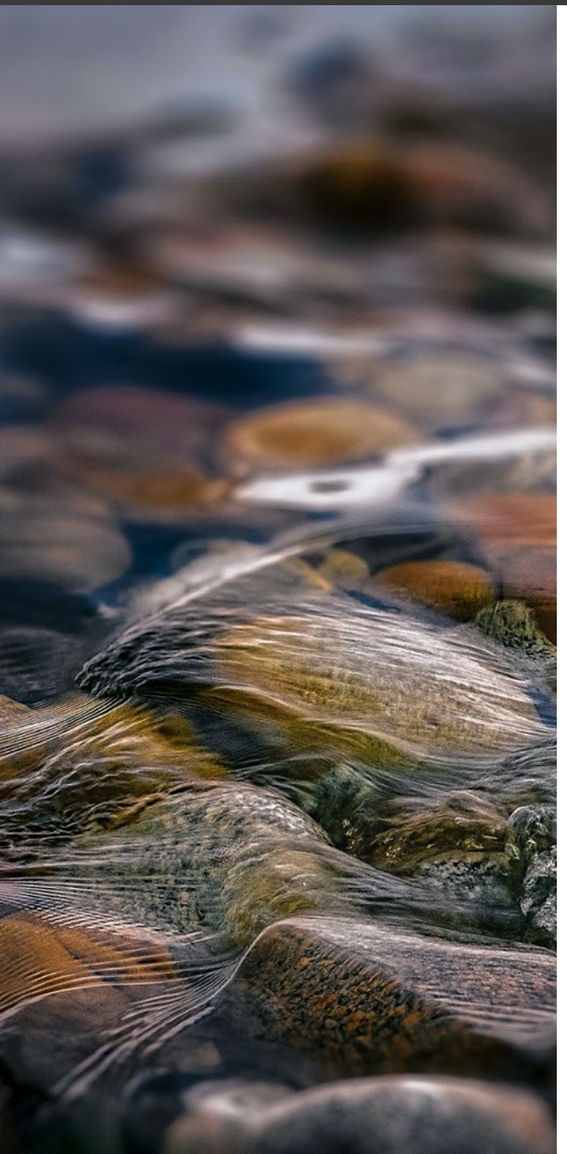
1. Detailed scope of work

2. Project manager and team

3. Estimated fee spreadsheet with scope of work/task breakdown, estimated hours for each task, staff names assigned to each task and their current hourly billing rates, and estimated fees

4. Project schedule for a January 30th, 2026, report submittal date

Study No. 9A – Raise outlet elevation of White Bear Lake – initial evaluation of potential flood impacts (1/4)

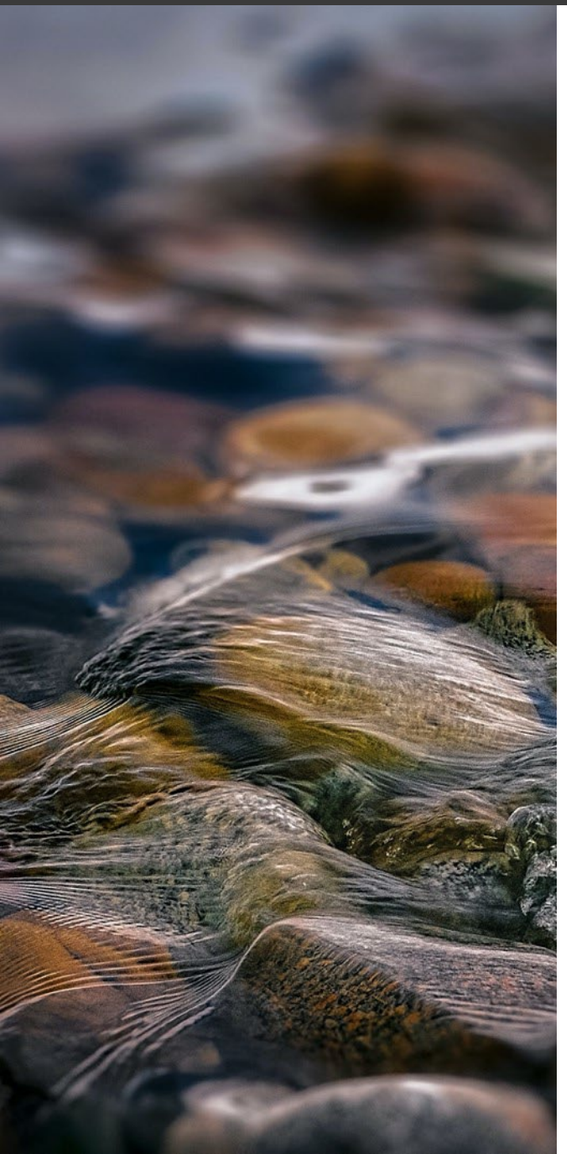


Study potential flooding impacts from raising the existing White Bear Lake outlet elevation

- Study the potential flooding impacts and risks from raising the existing White Bear Lake outlet elevation to collect and store additional rainfall precipitation and stormwater runoff to provide additional lake storage after wet weather events

- The lake's outlet elevation has been lowered twice throughout its history, once in 1943 and a second time in 1982, for a total elevation decrease of two feet.

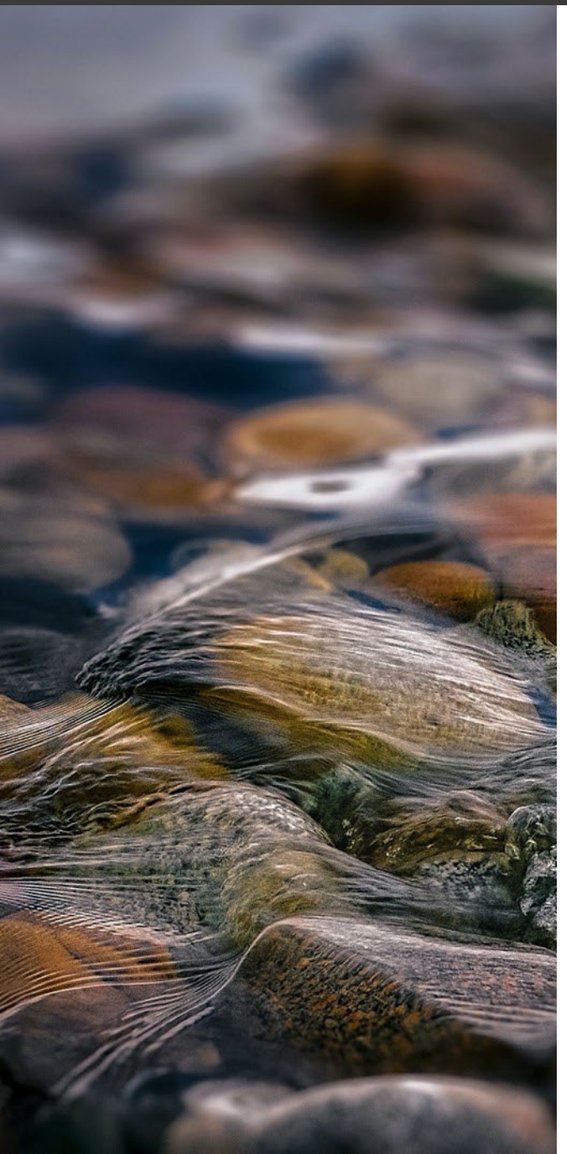
Study No. 9A – Raise outlet elevation of White Bear Lake – initial evaluation of potential flood impacts (2/4)



Scope of work

- Review existing shoreline characteristics, property elevations, and structure/basement elevations around White Bear Lake from existing drawings and databases
- Review bathymetric surveys of water bodies from USGS and other sources
- Review existing flood data from the Federal Emergency Management Agency (FEMA) and other sources
- Review flood history documentation, historical flood complaints, and insurance claims, if any, around White Bear Lake

Study No. 9A – Raise outlet elevation of White Bear Lake – initial evaluation of potential flood impacts (3/4)

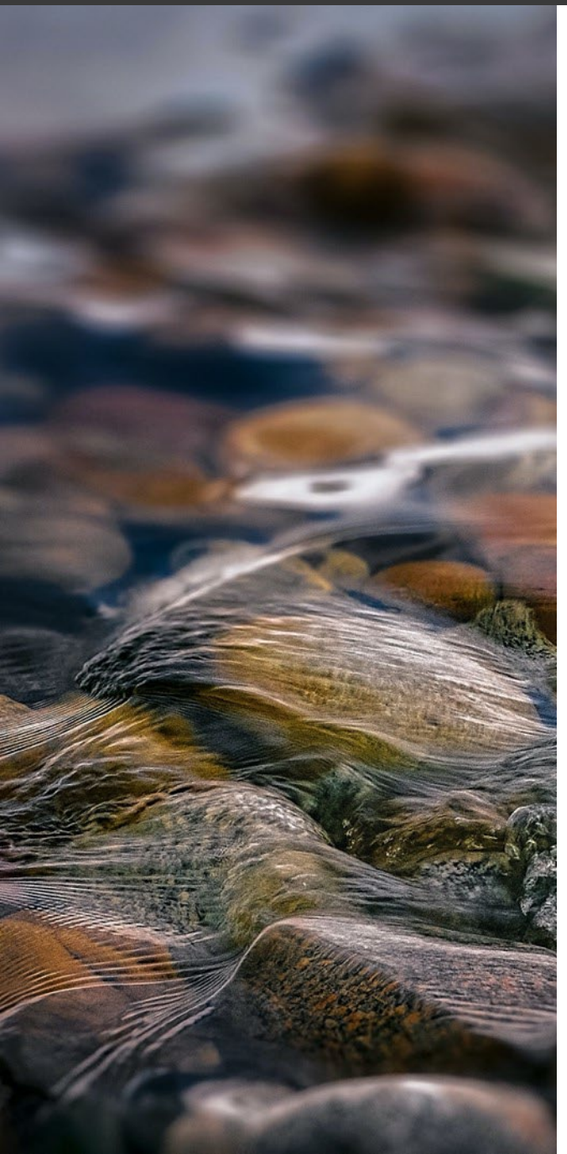


Scope of work (cont.)

- Full report including high resolution GIS flood-risk mapping for all properties around White Bear Lake for up to four increased lake elevations to be determined, descriptions of potential risks and hazards, recommendations, and conclusion

- Results would be used to determine if we should proceed to Study 9B to evaluate the downstream capacities of the existing lake outlet structures, stormwater utilities, and downstream tributary areas, and estimate the infrastructure costs to raise the outlet elevation

Study No. 9A – Raise outlet elevation of White Bear Lake – initial evaluation of potential flood impacts (4/4)



Requested information from consultant

1. Detailed scope of work

2. Project manager and team

3. Estimated fee spreadsheet with scope of work/task breakdown, estimated hours for each task, staff names assigned to each task and their current hourly billing rates, and estimated fees

4. Project schedule for a June 30, 2025, report submittal date

Questions

Any questions about anything discussed today?

Next Steps

- **Next meeting date:** Wednesday, March 26, 2025 from 1-3 pm at Woodbury Public Safety Building (2100 Radio Dr, Woodbury, Minnesota 55125)

  DNR presentation – Groundwater modelling results for four scenarios expected to maintain White Bear Lake levels above the Protective Elevation

- **Following three meeting dates (12:30-3:30 pm):**
  - April 29 at The Rookery in Lino Lakes
  - July 24 at St. Paul Regional Water Services in St. Paul
  - October 21 at Stillwater Public Library in Stillwater