

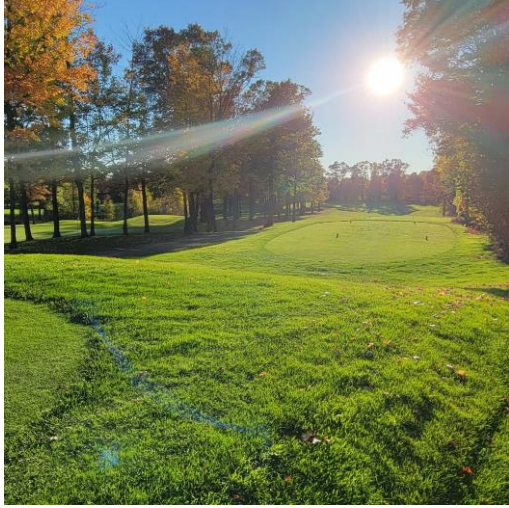


**City Of East Gull Lake**



# 2023/2024 Wastewater Treatment Project

MARCH 8, 2023



Tourism



Rapid Housing Development



Year-Round & Seasonal Residents



Natural Resources

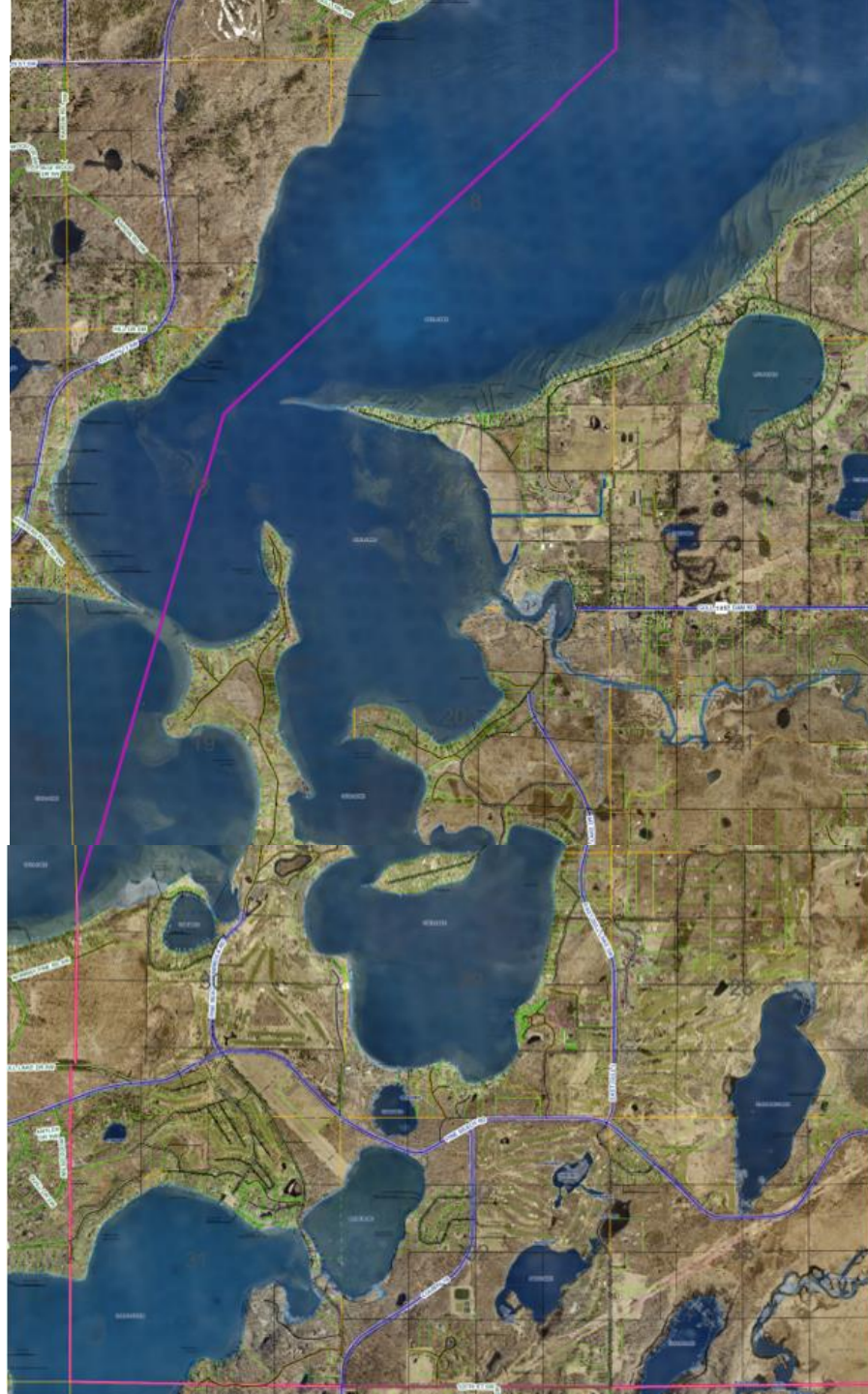




# City Of East Gull Lake

## Protecting our Lakes, Rivers & Wetlands

- Approximately **half** of the city's incorporated area is water
- City contains nearly **40 miles** of shoreline
- **97%** of lakeshore property in East Gull Lake serviced by our wastewater system



- Gull Lake - 88,000 ft
- Sylvan Lake - 12,500 ft
- Dade Lake - 9,500 ft
- Bass Lake- 8,500 ft
- Lynch Lake - 5,500 ft
- Stephens Lake - 12,500 ft
- Ruth Lake – 8,500 ft
- Echo Lake - 3,500 ft
- Gull River - 40,000 ft
- Unnamed Lakes/Wetlands



## Sanitary Sewer Systems History

City Operates two Wastewater Treatment Facilities (WWTF)

**North Gull Point WWTF** and **South Pine Beach WWTF**

- 2 grants to construct facilities in 1991
- City funded collection and force-main infrastructure costs through local levy
- Local resorts provided upfront funds for a large portion of the project in exchange for future credits for private expansion/upgrade projects





## South Pine Beach WWTF

2005 - \$6.4 million investment in South WWTF

- Upgrade for phosphorus removal efficiencies
- 94% efficient phosphorus removal after improvements
- Current plant capacity for an additional 750 single family homes



South Pine Beach  
Wastewater  
Treatment Facility

## North Gull Point WWTF

### Aging Plant

- ~33 years old
- Structural and mechanical deterioration

### Limitations

- No significant investments for upgrades to plant due to substantial cost for necessary improvements
- New MPCA permit requirements are significantly more stringent than 1991 requirements
- Issues with remaining in compliance for water quality standards

### 2017 Facility Plan

- Studied alternatives for improvements to North WWTF or decommissioning North WWTF
- Project placed on MPCA Project Priority List (PPL)



# CRITICALITY

The North WWTF has significant structural, mechanical, operational and safety issues including:

Overall plant **deterioration**

- **Compliance issues** (15 mo. non-compliance TP)
- Aeration system (numerous **leaks** & mechanical issues)
- UV disinfection system **problematic** (controls & connections)
- Severe sand filtration system **degradation** (media needs replacement)
- No onsite water (**safety issue**)
- No influent or effluent metering infrastructure for daily monitoring
  - Flow monitoring performed offsite; no meters onsite **decreases accuracy** of measurements
- No chemical room (**safety and operational issue**)
- **Water quality concerns** at discharge (into Gull River)





Operational



Mechanical



Structural



Safety



**\*\*Non-Compliance with MPCA Permit Requirements**

The North Gull Point WWTF exceeded the 12-month moving total effluent phosphorus limit of 162 kg/yr for a 15-month period between November 2020 to January 2022

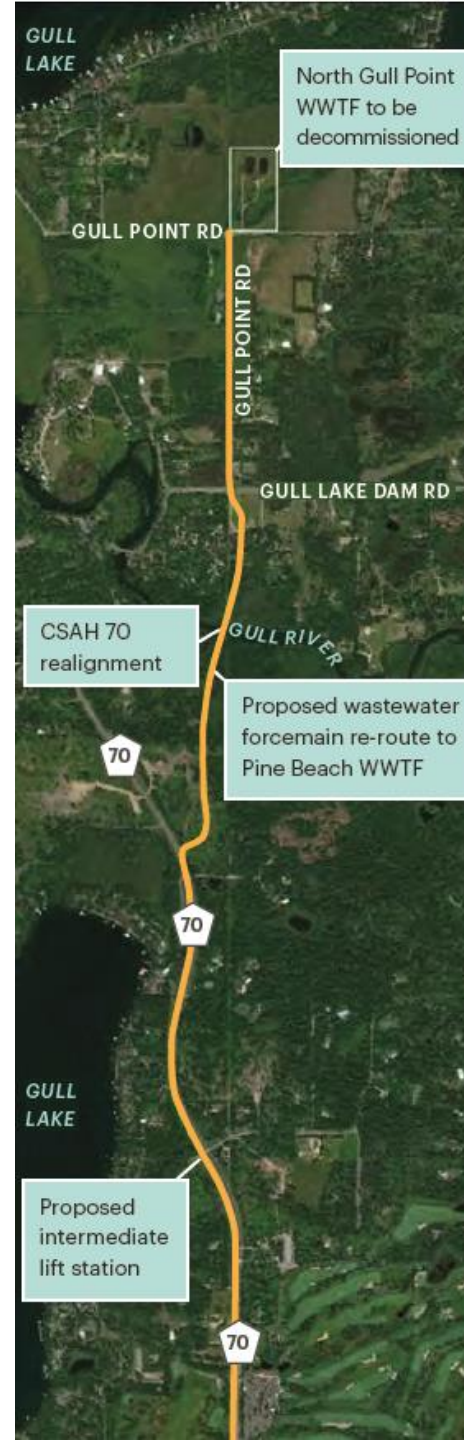




# City Of East Gull Lake

## Project Proposal

- Decommission North WWTF and reroute wastewater to South WWTF
- Main Project Components:
- Install force-main
  - Incorporate intermediate lift station
  - Improvements to existing lift stations
  - Improvements to South WWTF





## Project Benefits

Protecting the Environment while Looking Toward the Future

- Maintenance and operational costs at North WWTF **eliminated** after decommissioning
- Allows for **consolidation of flows**
- **Expansion** of municipal sewer services to new and existing developments including Gull Lake Resort
- South WWTF equipped for **phosphorous removal** and has sufficient **capacity** for current and future development
- Accommodates for future **growth** of rapidly developing lakeside community while **prioritizing environmental protections**
- **Protects surface and groundwater** especially at discharge point into the Gull River





## Cost Savings / ROI

### Total Cost Estimate for Improvements

- \$5.8 million (in 2023 dollars)
- Includes new force-main, improvements to existing lift stations, new intermediate lift station, and improvements at the South WWTF
- Facility Plan present worth considers electricity, labor, materials, and preventative maintenance

### Operational and Maintenance Savings

- **20-year Operations and Maintenance Cost at North WWTF**
  - 20-year present worth value cost – Approx. \$1,650,000
- **20-year Operations and Maintenance Cost for 2023/2024 Improvement Project**
  - 20-year present worth value cost – Approx. \$192,000
  - Facility Plan present worth considers electricity, labor, materials, and preventative maintenance

### 20-Year Operation and Maintenance Cost Estimate

Forcemain Alternative  
 City of East Gull Lake, MN  
 WSB Project No. 017015-000

#### Electrical Consumption

Lift Station No. 1 Pumps	4,578 kW-hr/yr
Intermediate LS Pumps	5,341 kW-hr/yr
Electricity Costs	0.085 \$/kW-hr
Annual Cost	<u>\$843.04 /yr</u>

#### Preventative Maintenance

Pump Grease	\$200.00 /yr	
Mechanical Seal	\$92.00 /yr	(replace twice over 20 years)
Misc. Maintenance	<u>\$4,000.00 /yr</u>	
	\$4,292.00 /yr	

### North WWTF Improvement Alternative- Operation and Maintenance Cost Estimate East Gull Lake, Minnesota 20-Jan-17

#### Electrical Consumption

3 x 25 HP Blowers (assumed size)	326,748.00 kW-hr/yr
Clarifier Mechanism	13,069.92 kW-hr/yr
UV Disinfection Equipment	3,650.00 kW-hr/yr
Chemical Feed Pumps	9,802.44 kW-hr/yr

Cost per kWhr \$ 0.05  
 \$ 17,783.52 per yr

#### Preventative Maintenance

Pump Grease	\$ 100.00 per yr
Mechanical Seal	\$ 46.00 per yr (replace twice over 20 years)
Misc. Maintenance Cleaning/ Repair	\$ 4,000.00 per yr
UV bulbs	\$ 2,000.00 per yr
Blower Filters	\$ 600.00 per yr



# City Of East Gull Lake



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