Wahnapitae Lagoon Rehabilitation

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Recommended by:	General Manager of Growth and Infrastructure

Report Summary

This report provides a recommendation regarding the funding of the Wahnapitae Lagoon Rehabilitation project.

Resolution

THAT the City of Greater Sudbury approves a budget of $3 million for the Wahnapitae Lagoon project with funding from the Capital Financing Reserve Fund – Wastewater as outlined in the report entitled "Wahnapitae Lagoon Rehabilitation" from the General Manager of Growth and Infrastructure, presented at the City Council meeting on July 15, 2025.

Relationship to the Strategic Plan, Health Impact Assessment and Climate Action Plans

Rehabilitating the Wahnapitae Lagoon addresses a number of objectives within the strategic plan, including:

- *1.0 "Asset Management and Service Excellence"* by increasing the useful life of the Wahnapitae Lagoon by 15-20 years
- *2.2 "Seize the Momentum Resulting from Greater Sudbury Innovation Blueprint Process"* by aligning our needs with a local partner for mutual benefit
- *3.3 "Build Climate Resiliency into Existing Programs"* by increasing the capacity of the Wahnapitae Lagoon for additional inflow due to more rain events or faster spring snowmelts

Financial Implications

If approved, this capital project will proceed with funding of $3 million from the Capital Financing Reserve Fund – Wastewater.

Background

A wastewater lagoon is an engineered basin designed to treat wastewater using natural biological processes. As wastewater enters the lagoon, heavier solids settle to the bottom forming a sludge layer. Over time, aerobic and anaerobic bacteria, along with sunlight and oxygen, help break down organic matter and reduce pathogens. Lagoons often include multiple cells to increase treatment efficiency and retention time. Lagoons are relatively low-maintenance and cost-effective, with operational activities limited to weekly site inspections and sampling. Ultimately, lagoons produce cleaner water that can safely reenter the environment.

The sludge layer thickens over time as solids continuously settle to the bottom, which decreases the retention time of the lagoon. The loading rate of a lagoon varies based on the population it serves and the type of wastewater it receives. Over time, desludging is required to regain the lost capacity within the lagoon and involves dredging the bottom, drying and disposing the solids offsite. The Federation of Canadian Municipalities reported desludging cycles for Canadian lagoons generally occur every 5 to 20 years.

The nutrient-rich sludge creates an ideal environment for plant growth. Weeds, grasses, reeds, and even small trees may start to take root along the banks and in the shallow areas. This overgrowth can interfere with water flow and reduce treatment efficiency.

Figure 1 shows a lagoon with minimal vegetation and desludging that occurred within the last 5 years. Figure 2 shows a lagoon with significant vegetation and no desludging in the last 20 years.

Figure 1: Capreol Lagoon

Figure 2: Wahnapitae Lagoon

Analysis

The Wahnapitae Lagoon contains three cells and is located south of Wahnapitae (Figure 3). The cells discharge into an effluent ditch which discharges into the Wanapitei River. Figure 2 shows the current state of the lagoon's vegetation cover.

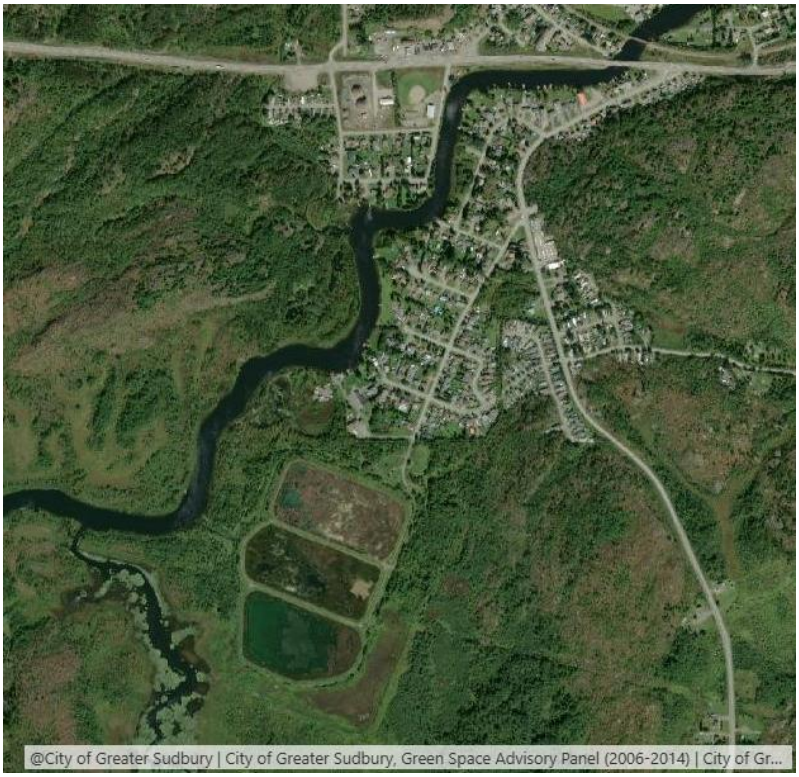

Figure 3: Location of Wahnapitae Lagoon

The Environmental Compliance Approval (ECA) is our licence for operating the lagoon. It states the conditions that must be followed to stay within compliance. These conditions include sampling frequency, effluent concentration limits and discharge windows. Per the ECA, the lagoon discharges semi-annually: spring and fall. The spring discharge is to commence after the lagoon has become free of ice cover.

As the sludge accumulation and vegetation growth are causing the cells to become shallower, this spring saw the snowmelt overwhelm the remaining capacity and start discharging before all the ice was gone. This event is a contravention of our ECA. Our local partners at the Ministry of the Environment, Conservation and Parks (MECP) were notified as we sought approval to commence discharge with remaining ice cover. The overflow occurred at the normal discharge location and did not breach the berms.

Staff increased sampling and testing frequency and found all parameters to be within the effluent concentration limits.

A similar operation problem was encountered last year. As stated in the City of Greater Sudbury Wastewater Lagoons Annual Report 2024, last year's fall discharge was impeded when vegetation created a blockage in the discharge pipe. A second cell's discharge pipe has since been impeded.

In 2022, staff issued a Request for Tender (ISD22-23) to rehabilitate the lagoon. Sixteen companies took the plan, but only one placed a bid for $11 million. As this was greater than budgeted, the tender was not awarded. Discussions were held about phasing the work over many years for budgetary reasons, but the high mobilization/demobilization costs, and years-long disturbance to local residents made this approach unfeasible.

The specific challenge with rehabilitating the Wahnapitae Lagoon is the need to first remove the vegetation which requires specialized equipment such as floating excavators. Once the vegetation is removed and disposed, additional equipment is brought to site to begin dredging operations.

This spring's discharge reinforced the need to address the lagoon's condition in the short term. The City has not undertaken sewage lagoon cleaning in over a decade, and the process is inherently complex, requiring specialized equipment. Given these challenges, staff conducted a market sounding to assess contractor availability and the anticipated scope of work. These discussions revealed a time limited local disposal option for the dredged material, which will result in significant cost savings. It is anticipate that the same scope of work can be completed this summer for $3 million as opposed to the $11 million bid in 2022.

Conclusion

Staff recommend advancing the rehabilitation of the Wahnapitae Lagoon in 2025 with funding being allocated from the Capital Financing Reserve Fund – Wastewater. This takes advantage of a unique opportunity to reduce overall costs and have the work done within one season, therefore reducing the impact to the residents in Wahnapitae.

Resources Cited

Optimization of Lagoon Operation, Federation of Canadian Municipalities and National Research Council (2004), Accessed online: https://fcm.ca/sites/default/files/documents/resources/guide/infraguide-optimization-lagoon-operations-mamp.pdf

City of Greater Sudbury Wastewater Lagoons Annual Report 2024, Accessed online: https://www.greatersudbury.ca/live/water-and-wastewater-services/projects-plans-reports-and-presentations/wastewater-annual-reports/2024-lagoons-annual-report-pdf/