



P.O. Box 1749
Halifax, Nova Scotia
B3J 3A5 Canada

Item No. 12.1.1
Environment & Sustainability Standing Committee
February 3, 2022

TO: Chair and Members of the Environment and Sustainability Standing Committee

-Original Signed-

SUBMITTED BY: _____
Jacques Dubé, Chief Administrative Officer

DATE: December 20, 2021

SUBJECT: **Declining Water Levels in Williams Lake**

ORIGIN

December 7, 2020 motion of the Environment and Sustainability Standing Committee:

MOVED by Councillor Cleary, seconded by Councillor Morse

THAT the Environment and Sustainability Standing Committee request a staff report that investigates the declining water levels in Williams Lake and makes recommendations on potential actions related to repairing and/or replacing the dam, as well as stopping the leakage around and under the dam. The report should investigate the influences of climate change, development, and other relevant factors on water levels and water quality in the Williams Lake watershed and if there are mitigating actions that might be beneficial, especially given the recent substantial investments made by the Halifax Regional Municipality and the Nature Conservancy of Canada in the new Shaw Wilderness Park.

MOTION PUT AND PASSED.

LEGISLATIVE AUTHORITY

Halifax Regional Municipality Charter

Section 79A (1) Subject to subsections (2) to (4), the Municipality may only spend money for municipal purposes if

- (a) the expenditure is included in the Municipality's operating budget or capital budget or is otherwise authorized by the Municipality;

Environment Act, Part X Water-Resource Management

Section 104 Lead Agency - The Department is designated as the lead agency of Government to

- (a) promote sustainable management of water resources;
- (d) promote the health and integrity of aquatic ecosystems, to protect habitats for animals and plants and to provide for continued recreation benefits;

[authorizes Nova Scotia Environment and Climate Change to regulate and enforce watercourse alterations]

Section 66 Regulations – Activities Designation Regulations

5A (1) Using or altering a watercourse or water resource, or the flow of water in a watercourse or water

RECOMMENDATION ON PAGE 2

resource, for any of the following purposes is designated as an activity that requires an approval, unless it requires a notification under Section 5B or is exempt under Section 5D:

- (a) withdrawing or diverting water in a volume greater than 23 000 L per day from a source of surface water or ground water;
- (b) storing water in a volume of 25 000m³ or greater;
- (c) constructing, modifying or maintaining a dam.

RECOMMENDATION

It is recommended that the Environment and Sustainability Standing Committee recommend that Halifax Regional Council request that the Mayor write a letter to the Province requesting that the Williams Lake Dam be assumed by a provincial body and repaired or replaced to address its impact on declining water levels in Williams Lake or that the Province revisit its position on granting permits or agreements for community group ownership or maintenance of dams.

BACKGROUND

Williams Lake is located in Spryfield and is surrounded by houses, a school, and municipal parks (Attachment A). The lake drains into Lawson's Brook through the Williams Lake Dam (the Dam). The Dam originates from as early as the 1700's and was installed to support industrial activities, which included sugar cane milling and ice production. Lawson's Brook extends under Purcell's Cove Road and drains into the North West Arm at the Royal Nova Scotia Yacht Squadron.

The Williams Lake Dam is now used to maintain lake water levels for recreation purposes, as the industrial uses in the area have disappeared. The Williams Lake Conservation Company (WLCC) is a non-profit volunteer organization established in 1968. The WLCC has assumed responsibility for maintaining and repairing the Dam in the past and had a water license agreement for the Dam between 1986 and 2006. The license was granted by the provincial Nova Scotia Water Resources Commission.

The WLCC has been recording annual water level measures and in the summer of 2020, the WLCC noted record low water levels of more than 4.5 feet below the top centre of the Dam. This information prompted media reports and the formation of the Williams Lake Dam Association (WLDA). The WLDA has compiled concerns with the lake levels ranging from impacts on private lakefront access to possible wildlife impacts. Through the WLDA, 904 residents have signed a petition, '*Save Williams Lake.*'

The low water levels have been attributed to the condition of the Dam and its inability to retain sufficient water. Local residents and the WLDA have advocated for a repair or replacement of the Dam by the Municipality or the Province. The Municipality acquired Shaw Wilderness Park in 2019, and this park is on either side of the Dam; which is one of the reasons it has been suggested that the Municipality repair the Dam. At acquisition of the parkland, the Municipality asserted that it was not responsible for the Dam and would not be taking over ownership or responsibility through the acquisition.

In December of 2020, the Environment and Sustainability Standing Committee requested a staff report on the low water levels in Williams Lake.

DISCUSSION

Low Water Levels and Impacts

Water levels can fluctuate greatly in Williams Lake depending on the season and section of lake. The west end is shallower than the east and during the summer and fall these areas may have little water and vegetation is a prominent feature. Other areas of the lake can have gravel, sand, and mud exposed when

water is lower, which necessitates access be gained further from the shore. The fluctuating water levels have varying impacts on municipal and private recreation uses.

Municipal Parks

Cunard Junior High School Park is the primary location where the municipality provides water-based recreation in the area. Cunard Junior High School Park is located on Cunard Pond, which is connected to Williams Lake by two culverts. The park hosts the life-guarded Cunard Beach which is used for swimming lessons and public use. While water levels in the pond fluctuate and are lower in the summer, these changes have not had an adverse impact on swimming lesson or public use.

The municipality has three other parks directly on Williams Lake:

- Acorn Road Park - a small park with lake access for non-motorized watercraft;
- Pine Bluff Island Park - a small park with informal trails; and
- Shaw Wilderness Park - a 139-acre park with lake frontage and a trail flanking Lawson's Brook which leads to Williams Lake.

Water-based recreation from these parks is not organized or promoted by the municipality. Informal swimming and paddling from Pine Bluff Island Park and Shaw Wilderness Park are possible and may be impacted when water levels are low. Acorn Road Park has considerable vegetation and when lake water levels are low, there is insufficient water for water-based recreation to occur.

Property Owners on the Lake

Some residents who own private property on the lake have expressed concern over the negative impacts of low lake levels. These impacts are understood to include impaired access to the lake for recreation, poor aesthetics, and decreases in property value. The residents have cited situations where docks lay on the lakebed when water levels are low, and the lake cannot be readily accessed.

Causes of Low Water Levels and Changing Water Quality

Regional Council's motion cited that investigations into lower water levels should consider influences of climate change, development, the state of the Dam, and any other factors. Changing climate and development in the area were reviewed and were not found to have significant impact on water levels.

The WLCC has noted that the deteriorating condition of the Dam may be the primary reason for the lower water levels in the lake. The Dam has no sluice or other water level control mechanisms and is comprised of a variety of materials including concrete, grout bags, and gabion rock baskets. Observations by staff in the summer, when water levels are low, found that water is flowing through and likely underneath the dam.

There have only been limited instances where water quality issues have impacted recreational use:

- between 2010-2020 there were two closure days at Cunard Beach due to high E. coli counts, both occurring in 2019; and
- in summer 2021, there was a Blue-Green Algae bloom, which prevented use of the lake.

It is unclear if water level changes are impacting water quality, however water quality in William's Lake will be monitored through a new water quality monitoring program approved by Regional Council¹. The program includes 74 lakes and will involve local community organizations to collaboratively monitor municipal watersheds. Water sampling will establish a consistent set of baseline data and observational information on issues such as harmful algae blooms and invasive species.

¹[Water Quality Monitoring Policy Program Development Item No. 11.4.1, June 29, 2021 Regional Council](#)

Possible Solutions to the Leaking Williams Lake Dam

The Dam's condition has been a longstanding issue. The WLCC commissioned an engineering study in 2005 that was completed by YMCL Engineering Limited (YMCL). This study found that the earth/rock dam was in an advanced state of deterioration, does not satisfy the Canadian Dam Association safety guidelines, and that the Dam could not be repaired. YMCL identified that a new structure would be required at a cost of \$275,000.

In 2021, the WLDA together with the WLCC procured an engineer's opinion of risk assessment from Meco Engineering. This assessment concluded that:

- the Dam leaks at a rate such that the lake level cannot be sustained during periods of low inflow, (typically the summer months);
- an updated version of the improvements proposed in the 2005 YMCL study would cost \$750,000 with an additional \$150,000 if fish passage allowances are required;
- in its current condition the Dam is unreliable and is at risk of failure with little warning which could be a danger to life safety and to property;
- if the Dam cannot be rehabilitated it should be breached/removed to mitigate the risk to downstream populations and infrastructure; and
- before making any formal decisions on a process, a comprehensive Dam safety inspection should be performed.

Both engineering reports recommend replacement of the Dam.

Dam Ownership and Responsibility

Historically, the Province has supported a role for community groups with respect to dams, as in the case of the water license agreement issued to WLCC. Based on discussions with the province, the Nova Scotia Department of Lands and Forestry (NSDLF) considers the Williams Lake Dam to be a non-essential water control structure of unknown ownership, which is one of several in the province. Nova Scotia Environment and Climate Change (NSECC) and Nova Scotia Lands Incorporated, in conjunction with an interdepartmental committee overseeing provincial dams, is working to determine ownership of dams that have unclear ownership. The purpose of this process is to ensure that the dams are subject to the appropriate oversight by NSECC. While an approved process is anticipated in 2022, the municipality is not party to the process or timelines. Based on HRM's understanding of the provincial assessment it is expected that dam ownership may be assigned to a provincial body but for some dams the question of ownership may remain unsettled. The province has also indicated that it no longer supports the granting of permits or agreements for community group ownership or maintenance of dams.

The province's review of ownership and status of the Williams Lake Dam is an initiative that may determine the next steps to address water levels in the lake. Assigning the dam to a provincial body could support the dam's repair or replacement.

Conclusion

Leakage from the Williams Lake Dam appears to be the most significant factor of the declining water levels being experienced in Williams Lake. Generally, low water levels are not impacting the swimming program at Cunard Beach, which is the primary location where the municipality provides water-based recreation. Lakefront property owners experience the main impacts of low water levels through diminished private recreational access and cited aesthetic impacts.

The condition of the Dam is an on-going issue that residents have expressed an interest in seeing resolved. The province is reviewing this matter which may include assigning responsibility to a provincial body. This might support the repair or replacement of the dam. To support this initiative, it is recommended that the Mayor write a letter to the Province requesting that the condition of the Williams Lake Dam and its impact on declining water levels in Williams Lake be addressed.

FINANCIAL IMPLICATIONS

No financial implications at this time.

RISK CONSIDERATION

This report has identified issues with the condition of the Williams Lake Dam. Responsibility over the Dam is being considered through a provincial review.

COMMUNITY ENGAGEMENT

Community engagement in the development of this report was limited to discussions with members of the WLCC and WLDA.

ENVIRONMENTAL IMPLICATIONS

No environmental implications were identified.

ALTERNATIVES

1. Environment & Sustainability Standing Committee could recommend that Regional Council direct the CAO to investigate the scope and costs of repairing or replacing the Dam, and the approvals that would be required from the province. Such an interest and possible expenditure of funds would need to be based on the Williams Lake Dam being for a municipal purpose and assessed against other municipal priorities.
2. Environment & Sustainability Standing Committee could recommend that Regional Council take no further action regarding the condition of the Williams Lake Dam.

ATTACHMENTS

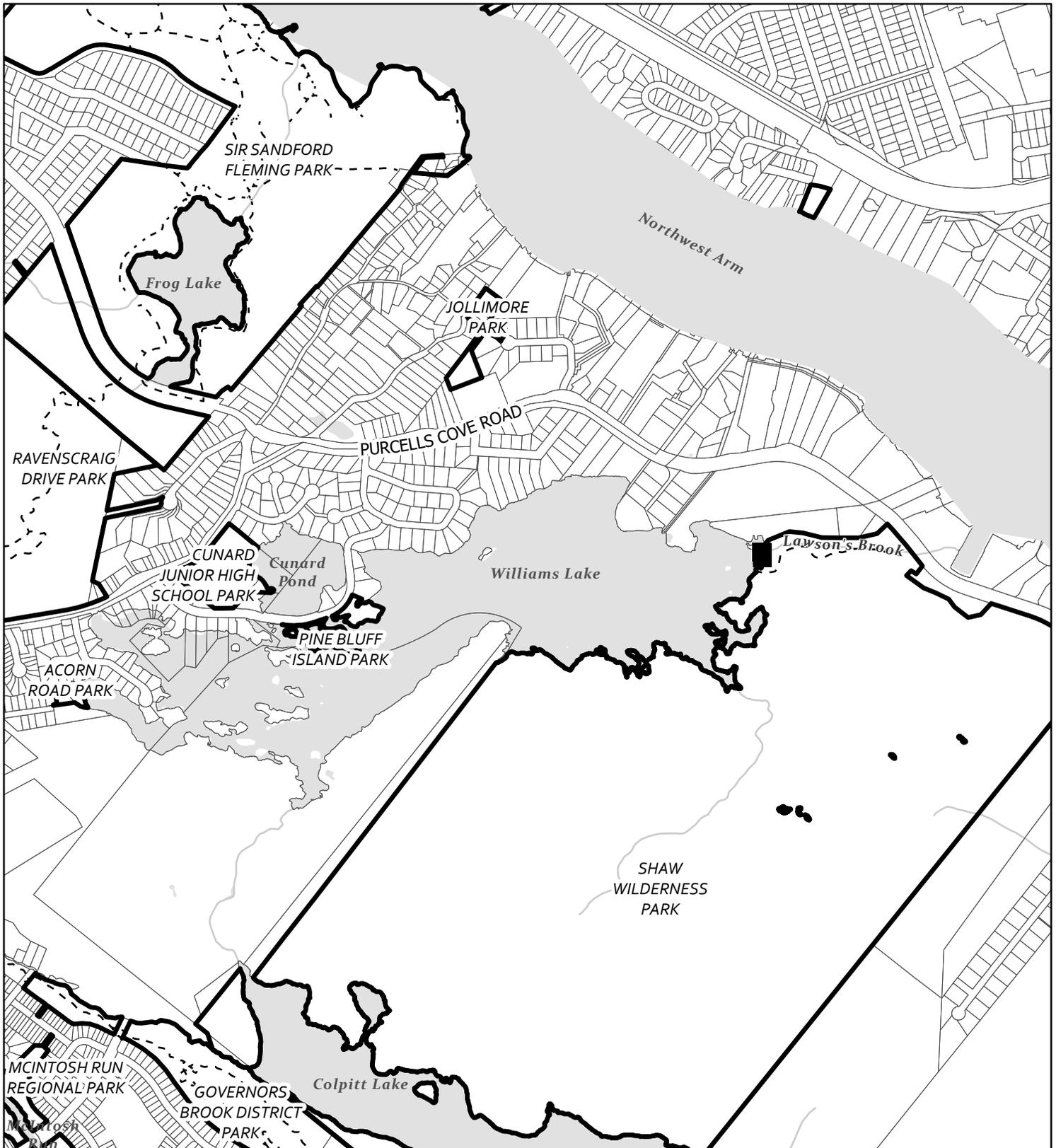
Attachment A Williams Lake Location Map

A copy of this report can be obtained online at halifax.ca or by contacting the Office of the Municipal Clerk at 902.490.4210.

Report Prepared by: Penelope Kuhn, Real Property Policy Coordinator, Policy and Planning, Parks and Recreation, 902.240.2647

Richard Harvey, Manager of Policy and Planning, Parks and Recreation, 902.476.5822

Nalini Naidoo, Director of Strategic Planning & Design, Parks and Recreation, 902.476.7587



WILLIAMS LAKE - LOCATION MAP

- Dam
- - - Trail
- ▭ HRM Park
- Parcel
- Hydrography

HALIFAX
 Parks & Recreation
 Business & Technical Services

N 0 200 400
 Meters