Full Authority
20 June 2019
Agenda Item: 10

Allan Mills Safety Boom Report

Background

The Allan Mills Dam is owned by the Crowe Valley Conservation Authority (CVCA), and is operated by CVCA staff in the Marmora Office.

Allan Mills Dam is located in Lot 26, Concession 12 of Seymour Township (which is now part of the Municipality of Trent Hills), at the outlet of Rylstone Lake (on the Crowe River).

The concrete gravity dam was re-constructed in 1971. It consists of a north overflow weir, a centre control structure with 3 valved sluice openings and a south overflow weir. It maintains water levels on Rylstone Lake for recreation purposes.

In 1990, the dam was upgraded. The work scope included:

- The access walkway over the north overflow weir was raised by 300mm.
- The operation deck was extended in the upstream direction using steel grating.
- All 3 sluice gates were relocated from the downstream to the upstream side.
- Trash racks were installed in front of the sluice gates.
- A new concrete apron was installed at the control structure.
- Pressure foundation grouting of bedrock/concrete interface was performed at the north and south overflow weirs and control structure to eliminate observed leakage.

The crest elevation for both the north and south overflow weirs is 170.70m. The invert elevation of the valves is 168.58m.

Allan Mills Dam was inspected by William Grandy of EXP Services Inc. and the CVCA received the EXP Engineering Report 20th October 2017

The following are excerpts from the report.

Hydrotechnical Description

The surface area of Rylstone Lake is 1,320,000 m2 1.32km2 (132ha). The dam outlets into the Crowe River, which is a tributary of the Trent River. The Crowe River drainage area at the dam is approximately 2000 km2.

Dam Structure and Concrete Condition

The Allan Mills Dam appears to be founded on bedrock. The concrete structure extends to bedrock outcrops on both the north and south banks.

Dam Height (to deck): ~4m (control structure deck 171.93m, apron ~ 168m)

Dam length: 86m

The north overflow weir is 2.3m high, 10.7m long, a centre control structure which is 4.27m high, 8.69m long with 3 valved sluice openings. The valves are 0.91m x 0.91m each and the south overflow weir is 64.0m long with a varied height maximum of 3.04m.

Overall, the dam's concrete is currently in good condition.

A copy of the safety boom drawings is included in the report.

Operation Equipment

The dam's three valved sluice gates are opened by turning operating nuts on the valves using a power drill. However, the dam is rarely operated, since the overflow weirs provide sufficient flow capacity and water level control under most circumstances.

The valves were formerly opened in the fall (October) and remained open through the spring freshet, and were closed during the summer recreation season. The valves have not been operated in several years, they were operational during their most recent usage (which was around the year 2005, according to the CVCA operator). The valves appear to be in good condition.

The electrical connection at the dam was disconnected in the early 2000's.

Recommendations

Exp made the following recommendations for the Allan Mills Dam:
• Monitor all concrete cracks noted.
• Install safety boom upstream of dam (from Public Safety Measure Plan) - Priority Ranking 2

Priority	
1	Urgent – Unexpected repair/rehabilitation, corrective action required immediately
2	Now, Corrective action required within 1 year.
3	1-5 Years, Corrective action required within 1 to 5 years, monitor until corrected.
4	6-10 Years, Corrective action required with 6 to 10 years, monitor until corrected.
5	None, Corrective action not anticipated in the next 10 years, minor defect, take corrective action only when required.

Additional Considerations

The CVCA has purchased property on the southern bank of the river and pays taxes to the Municipality of Trent Hills.

The CVCA has a right-of-way from the northern bank of the river. The ROW is approximately 50' wide and 200' long. It encompasses the end of the dam, which gives access to the CVCA "its employees, servants and vehicles, successors and assigns, a free and uninterrupted right-of-way, in, over and upon Part of Lot 25, Concession 13, in the Township of Seymour, in the County of Northumberland, over the lands described in Schedule A".

The ROW was granted 22nd of August, 1979 by John and Mary Lisle, parents of Tim and Kathy Lisle. Kathy Lisle was part of the Jack Lakey delegation to the CVCA at the 16th May 2019 Board meeting.

The engineer was informed by Transport Canada that a new act (Navigable Protection Act) was officially legislated in April 2014. The Crowe River is not included in the waterways on its "Schedule to the Act", so a permit for the safety boom at Allan Mills Dam is not required.

Project Application

The CVCA Board approved capital funding to match provincial funding through the Ministry of Natural Resources and Forestry's Water and Erosion Control Infrastructure (WECI) program for the installation of a safety boom at Allan Mills in 2017/18.

The installation was not completed in 2018 primarily due to delays in obtaining the booms. In addition, the installation of the boom was delayed by weather constraints.

WECI funding was provided in 2018/19 to complete the installation.

The Installation

28 boom units
6 buoys
Galvanized steel chain, shackles and pins
6 2 meter x 2 meter concrete anchors
1 Anchor Plate
1 Eye Bolt Anchor

Safety boom anchored to dam as per engineered drawings and to allow recreational access to the river for the homeowners. (See attached photos)

The installation of the booms was completed in late winter/early spring 2019. The barge to complete the work was removed on the 30th of May after road restrictions were lifted.

During the installation, the Lawson family approached CVCA staff to determine if the anchor bolt on the south side of the river could be moved downstream to ensure the boom would not interfere with an existing building (currently vacant and owned by the Lawsons) and its future inhabitants. The request was vetted with the CVCA engineer and he approved the relocation of the anchor bolt and slight location changes for concrete anchors #5 and #6. The alteration would have no impact on the functionality of the safety boom system.

The CVCA received a letter from the Lawsons confirming the action taken.

Post Installation

In addition, CVCA General Manager received a phone call and an e-mail on the 9th of April from Mr. Jack Lakey (renter of the Lisle cottage) indicating his displeasure of the safety boom and the threat of legal action. A subsequent e-mail was received from Mr. Lakey requesting a deputation to the CVCA Board.

Due to the nature of the complaint received from Mr. Lakey, staff informed the EXP engineer, Bill Grandy of the concerns.

Mr. Grandy advised the CVCA of the following:

The Ministry of Natural Resources and Forestry has installed safety booms on the upstream side of all of their dams (or least the vast majority). There were issues at other dams where fatalities could have been avoided if safety booms had been in place, so they installed booms as part of safety due diligence and to reduce their liability. A precedent has been set in the province regarding these booms.

Dams are dangerous structures, the normal layperson may not be aware of the suction force of these dams and could easily be drawn through or over the dam if they or their watercraft are in close proximity. Staff also confirmed serious injury or death could occur on the upstream side of the weir.

In addition, Mr. Grandy advised that Mr. Norm Dallard of EXP (a former MNRF dam project manager) would be able to offer additional information.

Mr. Dallard was contacted by phone and advised the CVCA of the following:

Mr. Dallard stated booms are a "Best Management Practice" for MNRF, Parks Canada and are strongly endorsed by the Canadian Dam Association.

He again confirmed safety booms are installed (or being installed) at all MNRF dams.

He used the example of the MNRF owned Pevensy dam, which is one of the smallest and "innocent looking dam" had a fatality and the recommendation that came with a Coroners Inquest was a safety boom. The Allan Mills dam (which he is familiar with) has a far greater risk assessment.

Mr. Dallard also commented, "if the public is swimming in the area", as a dam owner this alone would cause concern.

He also confirmed in this litigious society, it is not worth the liability risk to make changes to the boom's anchor point on the dam.

With regard to the comment by Mr. Lakey that the CVCA is being overly cautious, Mr. Dallard stated the CVCA should not rely on past history to be indicative that Allan Mills will always be a safe site. There is no way to predict that it will always remain accident/incident free. If the installation of the safety boom prevents just one death or injury, much less personal property damage to a watercraft, then Mr. Dallard stated it would be well worthwhile for the public. As well, the safety booms reduce the CVCA to liability exposure.

Additional Information

During the spring flood of 2019, an incident occurred at Belmont Dam. A family had rented a cottage upstream of the Belmont Dam, used a small aluminum boat during the high flows and headed toward the dam. Details are scarce, but the boat was overturned, caught in the dam and the family had to be rescued by other residents. Confirmation of injuries has not taken place, but I was advised by the cottage owner the family was distraught and badly shaken up with minor injuries. Considering the force of the water and the overturned boat, it appears they were fortunate to escape serious injuries or worse.

The property owner called and spoke with myself but did not disclose any personal information. She was not even interested in getting the boat back in her possession. Staff were able to dislodge the boat but due to the force of the water, they were unable to retrieve it. Pictures of the boat caught in the dam are provided for your information.

Options

1. Move the anchor point as requested by Mr. Lakey and the Lisles.

2. Retain the anchor point in its current location.

Recommendation

The safety boom, as it is currently installed, follows:
1) recommendations from the Allan Mills Dam Safety Assessment,
2) guidelines as set forth by the Canada Dam Safety Association and Ministry of Natural Resources Best Management Practices,
3) advice from the CVCA's EXP engineer and former MNRF engineer
4) reduces CVCA liability,
5) and most importantly it will help to ensure public safety.

Therefore, staff recommend retaining the anchor point in its current location.

Board Decision
TP

Appendix

Pictures
1) the safety boom as installed, 2) the anchor point on the dam and 3) the boat lodged in Belmont Dam, 4) Pevensey Dam

Engineered Drawing of the Allan Mills Structure

Supporting Documentation
Newspaper Articles – links to articles
Allan Mills Structural Drawing
Survey of Right-of-Way, Part 2 on the plan. Part 1 is the Lisle property
Orthophotography – Dam, Lisle Property and CVCA Property
Mr. Lakey's e-mails, 9 April,6 June and 11 June 2019