



January 10, 2018

File: 76915-20/D720001-00

Ms. Tracy Samra
Chief Administrative Officer
City of Nanaimo
455 Wallace St
Nanaimo BC V9R 5J6

Dear Ms. Samra:

Re: Middle Chase River Dam – Outstanding Comptroller Order

Thank you for your letter dated March 21, 2017 proposing a plan to address the potential safety hazard of Middle Chase River Dam (Middle Dam).

Your proposed plan does not comply with the requirements of the Comptroller of Water Rights' February 23, 2016 letter which accepted a conceptual plan by Golder Associates and required a final plan, by September 30, 2016, to include the following five steps;

- 1) Identify conceptual remediation approaches
- 2) Risk assessment
- 3) Conceptual development of preferred options
- 4) Seek feedback from the Province
- 5) Selection of a dam remediation approach.

The proposed plan follows a different direction which includes a new hydrotechnical study by Urban Systems. Although this proposed plan uses a different approach than the accepted conceptual plan, the proposed plan was still reviewed by our office. Two reports completed by Urban Systems challenged the results of previous hydrotechnical studies completed for the Chase River. The Urban System reports included March 21, 2017 Memorandum to the City, Colliery Middle Dam Hydraulic Assessment – Final, and September 25, 2017 Memorandum to the City, Chase River Regional Analysis. I note there are several qualifiers within the Urban Systems reports indicating that additional work is required before conclusions can be drawn about the peak design flow for Middle Dam.

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**Ministry of Forests, Lands,
Natural Resource Operations
and Rural Development**

Resource Stewardship Division

Office of the Comptroller
of Water Rights

Water Management Branch

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Our review has found that the Urban Systems reports *do not* conform to hydrotechnical considerations outlined in the Canadian Dam Association guidelines which state, “high and extreme floods should be evaluated with a (realistic) degree of conservatism...” Additionally, the peak flow values determined by Urban Systems are much lower than several past and accepted hydrology studies on the Chase River, which were completed using common industry assumptions. The Urban Systems rainfall-runoff model was calibrated using a very common flood event and the regional analysis was completed utilizing some non-conservative judgements which affect the final calculated values. Given these factors, and the qualifiers noted in the Urban Systems reports, it is my office’s opinion that the overtopping risk to Middle Dam is high as concluded in previous studies completed for the City.

However, we note that your plan does propose a path to move forward that includes: reconfiguring and adding to the level sensor array so data is more suitable for a wider range of model calibration; collecting more rainfall and stream data to enable further modelling; and undertaking further hydrologic and hydraulic assessments prior to the next Dam Safety Review (DSR) scheduled for 2023.

Upon review of your proposed path forward our office is in agreement that this is a reasonable course of action. A key consideration in our assessment was the City’s completion of the labyrinth spillway on Lower Dam which reduces the risk of Lower Dam overtopping due to failure of Middle Dam. However, as identified in the 2014 dam breach modeling study completed by Associated Engineering, failure of Middle Dam will potentially result in incremental damage in the flood inundation zone during a large flood event.

Please note condition 2(b) of the Comptroller’s Order, dated April 29, 2015, has not been met and the City is considered out of compliance with that Order. By way of this letter we rescind the April 29, 2015 Order and replace the requirement of condition 2(b) as follows:

The City of Nanaimo are Ordered to undertake the following work to address the potential safety hazard of Middle Chase River Dam:

1. Submit to this office by February 28, 2018 the City’s timelines to reconfigure and add additional level sensor arrays to the Chase River,
2. Submit to this office by February 28, 2018 the City’s rainfall and streamflow data monitoring schedule,
3. Submit a summary report on the seismic withstand of Middle Chase River Dam (prepared by City engineers or a consultant) for acceptance by March 31, 2018,
4. Undertake an updated hydrotechnical assessment using prevailing dam safety industry best practices by December 31, 2022 to allow the study to be reviewed during the next scheduled DSR in 2023,
5. Submit a proposed engineering consultant and scope of work for the completion of the DSR to my office for acceptance prior to December 31, 2022,
6. Continue enhanced monitoring of Middle Chase River Dam especially during high rainfall events and after any seismic activities, and
7. Ensure the Dam Emergency Plan for Middle Dam is kept current and is followed, the local emergency authority has the correct emergency contacts for the dam, and all evacuation signs in the inundation zone are kept and maintained.

We also encourage the City to explore various options for Middle Dam to pass large floods and mitigate damage due to a seismic event.

Finally, we commend you and your staff for the work undertaken over the past several years to safeguard Lower Chase River Dam and work towards safeguarding Middle Chase River Dam.

Yours truly,

A handwritten signature in blue ink, appearing to read 'Ted White', with a large, stylized loop at the end.

Ted White, B.Sc.
Comptroller of Water Rights

pc: Poul Rosen, P.Eng., Senior Manager, Engineering, City of Nanaimo