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13 November, 2019

Mr. Chris O'Riley
CEO, BC Hydro

Mr. Ted White
Director and Comptroller of Water Rights
Water Management Branch
Province of British Columbia

Dr. Robert Schubak
Director of Dam Safety
BC Hydro

Ms. Rebecca Reid
Regional Director General—Pacific Region
Fisheries and Oceans Canada

Ms. Jennifer McGuire
ADM—Environment & Climate Change
Province of British Columbia

Dear BC Hydro and agency staff:

Re: Earthquake Upgrades on the Alouette Generating Station Intake and Dam

On September 13, 2019 BC Hydro made presentations to the Maple Ridge, Pitt Meadows City staff and Hon. MLA Lisa Beare and MLA Bob D'Eith regarding proposed upgrades to the BC Hydro facilities at Alouette Reservoir and other associated actions relating to the Corporation's activities on the ALU generating system. ARMS directors and staff were present at that meeting. At that time Dr. Schubak (BCH) described the plans to reduce the risk of Alouette Dam failure up to a 1:10,000-year probability earthquake, and generating-station intake rebuild, and gave a brief review on the proposed construction schedule. This was in addition to updates on fish passage and water licensing.

For the purposes of identifying the information to all the addressees, ARMS has attached the presentation to this letter.

Firstly, ARMS applauds BC Hydro's initiative to improve the safety for people and infrastructure downstream of the Alouette Dam. We recognize that BC Hydro is obligated to mitigate any risks to the surrounding residents and has the authority to act accordingly. However, the work plans as described to both City's staff and ARMS, raised several questions and concerns for the Alouette

River Management Society, which we feel BC Hydro had ample time and a responsibility to address. As much as ARMS agrees with the safety concern, we do not accept it as an excuse to disregard the following important environmental issues.

ARMS' concerns are in regard to environmental/fishery issues associated with the project and obligations under regulation, legislation and policy and fiduciary responsibilities to First Nations and rights and titles. Furthermore, during the presentation for this work there was no indication that the environmental and social impacts are going to be adequately assessed by BC Hydro nor proper redress (mitigation/compensation) put in place. Questions were asked of the presenters by people in attendance, but definitive answers were not provided.

Thus, in order to start to address the outstanding issues, our concerns are outlined below.

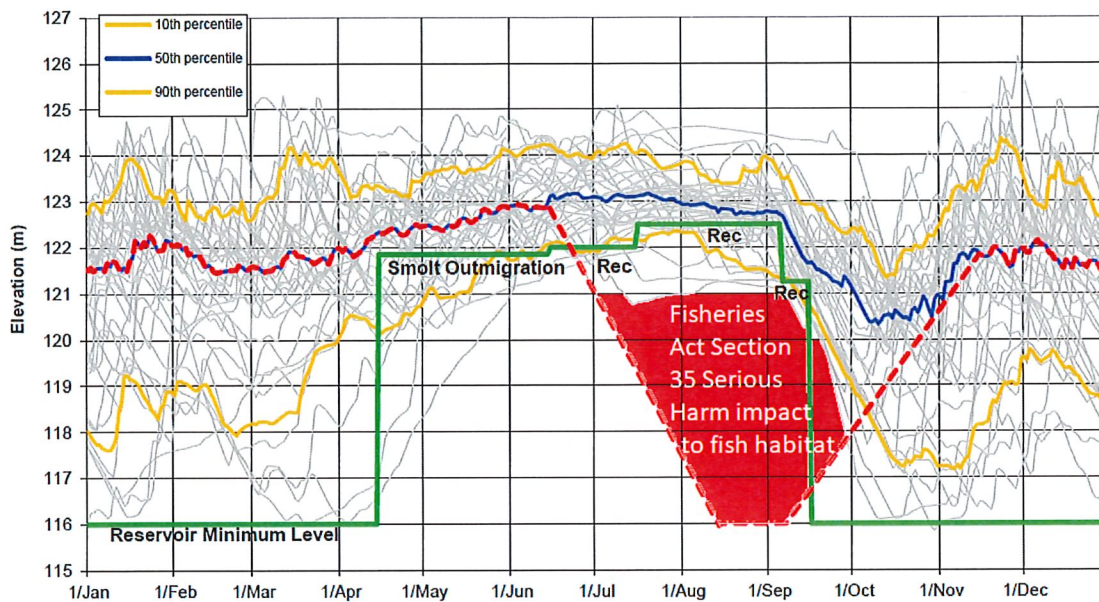
Rehabilitating the Diversion Tunnel/Adit Gates and Tunnel

As described in the Maple Ridge presentation of September 13, our concerns outlined in this letter are primarily in regards to the upgrading refurbishing the gates and diversion tunnel, LLO ("low-level outlet", minimum river flow pipe) through the Dam, in addition to the adit upgrades at the Alouette Generating Station. Of note, these projects will require drawing down the Alouette Reservoir commencing in July 2020 and into the autumn, and with subsequent recurring deep withdrawals in summers 2022 and 2023.

The impacts to fisheries and their issues and to sockeye salmon will involve the following:

1. Sockeye fry, after first emerging from spawning redds, utilize the shallow littoral zone of large lake and reservoirs for the first stage of their lives, normally several weeks to a month-and-a-half. This has been extensively detailed in a current DFO draft report on the subject that has not yet been released to the public. For the Alouette Reservoir, this specific habitat is normally and consistently inundated during these critical early life-stage of sockeye due to recreation constraints. Other littoral rearing fish species will also be harmfully affected due to the deleterious effects to the shallow-zone as a result of this project. The deep drawdowns will harmfully alter these historical habitats (watered since at least 1984; see figure below) and cause **Serious Harm** Section 35 of the **Canada Fisheries Act** to these habitats. Because the 2020 (and the 2022 and 2023) drawdowns will dewater the littoral habitats in an highly non-normal fashion, notwithstanding the allowance to go down to 116 metres is "legal" under the their British Columbia water license, BC Hydro cannot simply assume that the "new littoral area" will be of the same quality, or quantity, as the quantum usually seen during its normal and regular spring/summer operations. This issue is important and is outstanding and needs to be addressed as per the legal requirements under Canadian law. There is no indication from the presentation that BC Hydro has dealt with, or intends on dealing with, this important issue. (also c.f., Downton Reservoir deep drawdown 1990's and the subsequent public issues associated with this deleterious action.)

Alouette Reservoir Levels (1984 - 2018, WUP Target, 2020 Drawdown)



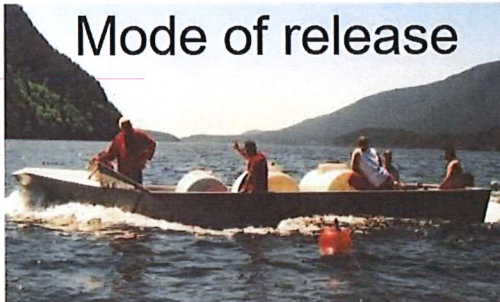
Serious Harm to littoral and pelagic fish habitats during proposed deep drawdown 2020, 2022, 2023

2. The deep drawdowns are potentially and likely to negatively change the plankton dynamics of the reservoir. This has the very real probability of affecting the productivity of the sockeye salmon production in the Alouette Reservoir. Note that the Maple Ridge presentation did not provide a quantum of the reduction of surface area of the reservoir during the critical rearing period for sockeye salmon rearing. This **Serious Harm** issue needs to be addressed as an impact associated with the re-development of both the adit and tunnel, low-level outlet pipe given that this is a requirement under Section 35 under the **Canada Fisheries Act**. Again, BC Hydro has shown no willingness to deal with this key Canadian legal requirement based on their public presentation.

3. There is currently a reservoir fertilization program, adding liquid nitrogen and phosphorus, that enhances sockeye juveniles that is being undertaken on Alouette Reservoir. This salmon restoration program is delivered by the BC Ministry of Environment and Climate Change Strategy UBC science staff. The deep drawdown proposed by BCH will disrupt this operation insofar as the current infrastructure of the fertilization storage (see figure below) is not capable of delivering the fertilizer to the low elevations that BC Hydro expects to achieve in 2020, 2022, and 2023. BC Hydro and the agencies need to deal with this appropriately.

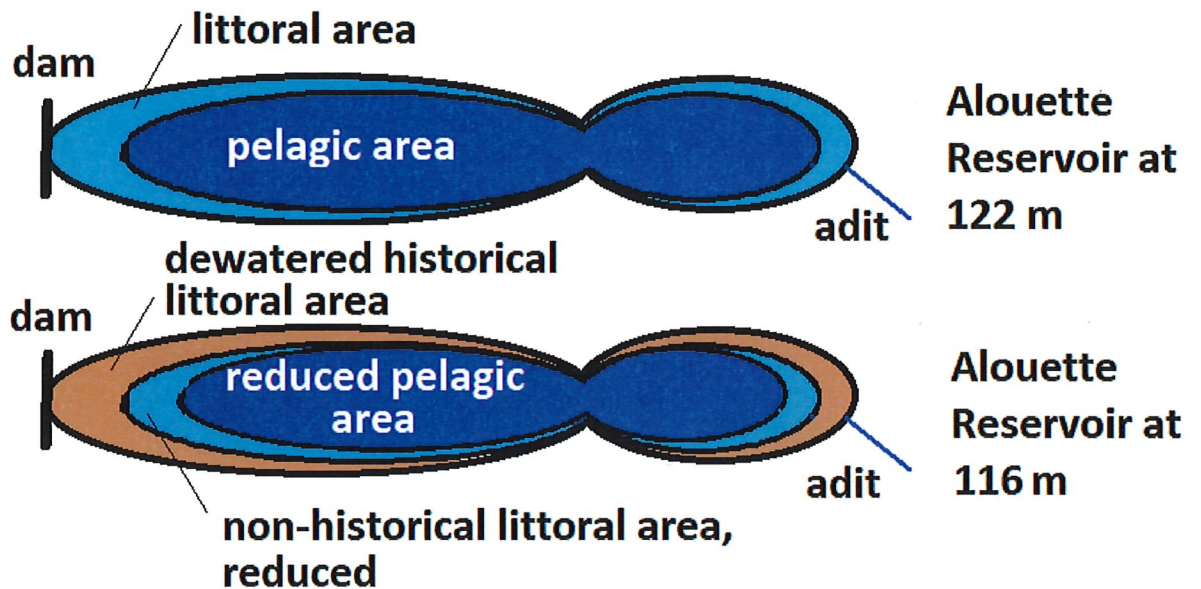


↓ tank-to-water surface
to increase by
↑ additional 6 m



Tank farm and spring-summer reservoir elevations. Deep drawdown will increase this by 6 m.

4. In its September 13 presentation, BC Hydro asserted that there would be no change to entrainment of fish as a function of the deep drawdowns. ARMS submits that, given that BC Hydro currently has absolutely no idea as to the current level of entrainment of fishes through the adit into Stave Reservoir and, in particular, age 0+ and pre-smolt 1+ sockeye juveniles, it is making a deliberately false statement that the passage of fishes through the adit will not change during deep drawdown. An empirical understanding of the entrainment of nerkids, at the various life stages is absolutely imperative to properly protect this resource in the face of effects by hydro-electric production, both now and during the project, and post-construction. Currently, BCH has an authorization with DFO to allow entrainment (subject to a WUP review which is pending); given that the parameters under the construction scenario will radically change, ARMS submits that this agreement is probably legally null-and-void during the tenure of the project.
5. What was not clarified by BC Hydro in the September 13 Maple Ridge presentation is whether or not the upgrades to the low-level outlet pipe, tunnel or the adit will result in post-project changes to flow regimes (e.g., discharge amounts), or reservoir levels. For example, in the redevelopment of the low-level outlet pipe, will the diameter of the intake or the pipe be reduced? And, thus, affect the river flow capacity? In the context of the fact that if the system operations of the Alouette Reservoir or tunnel/adit change as a function of these upgrades, then there is the potential for increased impacts to fish and fish habitat. And this needs to be both assessed and addressed under Canada **Fisheries Act** habitat legislation. Such a scenario was seen to occur as a result of the Stave Falls redevelopment project, as an example. BC Hydro did not enlighten the attendees at the Maple Ridge meeting as to what would happen post-construction in these regards.



Effects on pelagic and littoral areas to spring/summer sockeye littoral and pelagic habitats in Alouette Reservoir.

Legislative and Regulatory Obligations

In the context of BC Hydro's obligations under provincial and federal legislation, there are several issues that need to be considered. Notwithstanding that these upgrades are important and need to be done, they will still require Section 11 authorizations under the British Columbia **Water Sustainability Act** in order to work in and about a stream. Under the process of a Section 11 Authorization of the BC *WSA* the public can appeal to the **Environmental Appeal Board** if it feels that BCH has been negligent or not undertaken due diligence in respect to the Project.

At this time there is no indication that BC Hydro has obtained these authorizations.

Historical Obligations Under Legislation

Given that BC Hydro is currently diverting and using unlicensed water through the adit into Stave Reservoir (and that it does not have a valid license to use this water), is applying for a renewal of a license that is about to expire, and is undergoing major revisions to its infrastructure, ARMS submits that this is the time to address these outstanding historical issues. ARMS points out that just south of the Canadian border, the US requires such upgrades via FERC (Federal Energy Regulatory Commission) to address historical impacts during the relicensing process. The Baker Lake (reservoir) facility is a good example of how the proponent was required to address

outstanding fisheries issues in order to continue to operate with a renewed license. Thus, ARMS opposes any renewal of diversion licenses on the Alouette watershed until the salient environmental and fiduciary First Nations issues are addressed. They include:

1. Fish passage for all migratory fishes at the Alouette Dam. This will involve a commitment to provide resources to construct a fishway so that all species of migratory salmon and trout have a reasonable chance of accessing their historical spawning and rearing areas.
2. Commitment and resources to quantify and address entrainment of salmon smolts and other life-history stages of fishes at the adit must be obtained prior to the authorization of any construction.

Conclusion

This letter reiterates and expands upon those questions that were outstanding as part of the presentation at Maple Ridge Library on September 13, 2019. ARMS also sees a requirement by the environmental agencies to use this project to address long standing (90+ years) impacts caused by the original construction and ongoing operation of the dam, generating station and diversion facilities. And for BC Hydro and senior governments to meet their legislative requirements and fiduciary obligations to First Nations, and to the environment and fisheries. In the context of these serious outstanding issues, because BC Hydro sends power to the US under the USMCA trilateral agreement, it is selling “environmentally dirty power” to the United States. Given that BC Hydro derives an estimated \$65 million additional annual revenue from the Alouette watershed water flows in its downstream projects on the Stave watershed, it is not economically unreasonable for it to address these longstanding fisheries issues forthwith.

ARMS has been working in good faith with BC Hydro and the other stakeholders (ENV, DFO, Katzie First Nation, LGL) at the Alouette River Sockeye Re-anadromization Program table, which is fulfilling the steps defined within the Fish Passage Feasibility Framework. We believe that the proof we have been asked to provide for feasibility of a fish passage has been addressed and that it is more than reasonable to consider it within this project. We further assert that the intentions of ARMS and Katzie First Nation is to restore all historic fish populations to the Alouette watershed. Although the comments in our letter have been sockeye-centric, the fish passage is intended for all species. Moreover, we affirm that our concerns relating to the dam upgrade project be addressed, so that any further setbacks on our efforts on restoring fish are avoided.

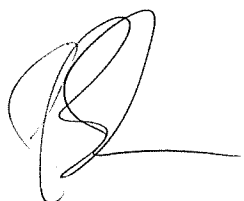
As a final key note and tied directly to the upgrades of the low-level tunnel and the adit, the application by BC Hydro to now renew one of its diversion licenses on the Alouette Reservoir is critically important vis a vis the intent of the original decision-makers of to not provide it to the applicant in perpetuity. Clearly, the water authority of the time implicitly understood, in the early part of the 20th century, that social, First Nations and environmental standards change over time. And they wrote this license in such a way that it would expire so that future generations could resolve any outstanding issues before being re-issued. Further, it is our firm opinion, based in law, that the purpose of an open public licence review period, prior to a water licence being renewed, or potentially cancelled, is to open a public window to gather a fuller understanding of the following potential impacts in the continuation and renewal of said water licence: These may

include, but are not limited to the following: social-economic, environmental, fisheries, health, First Nations, recreational, riparian holders below the Alouette Dam, provincial and municipal Parks that border the Alouette Lake/ Reservoir watershed, other water licences on the watershed that may be impacted. The time to resolve those issues is now.

And, until these issues are dealt with, ARMS, with all the resources that are available to it, will strongly oppose BC Hydro moving forward with the proposed upgrades and re-licensing efforts.

Sincerely,

Per:

A handwritten signature in dark ink, appearing to be 'G. Borick-Cunningham', with a stylized, looped initial 'G' and a long horizontal stroke extending to the right.

Greta Borick-Cunningham, Executive Director
For Cheryl Ashlie, President
Alouette River Management Society

cc.

Katzie First Nation, Chief Grace George, Councillor Rick Bailey
Kwantlen First Nation, Chief Marilyn Gabriel, Councillor Tumia Knott
Hon. Premier John Horgan
Hon. Minister Energy, Mines, and Petroleum Resources, Michelle Mungall
Hon. Minister for Tourism, Arts and Culture, MLA Maple Ridge-Pitt Meadows Lisa Beare
Hon. Minister for Fisheries, Oceans and the Canadian Coast Guard, Jonathan Wilkinson
City of Maple Ridge Mayor and Councillors
City of Pitt Meadows Mayor and Councillors
MLA Maple Ridge-Mission, Bob D'Eith
Opposition Critic for Energy, Mines and Petroleum Resources, MLA Tom Shypitka
Leader of the Official Opposition, MLA Andrew Wilkinson Q.C.
Leader of the Third Party, MLA Dr. Andrew Weaver