

November 19, 2015

Mr. Marc Rutten
Comox Valley Regional District
600 Comox Road
Courtenay, BC V9N 3P6

Dear Mr. Rutten:

Re: Hazard Abatement Order Report – Options Study

This letter is in follow up to the Oct 15, 2015 discussion with representatives from the CVRD, Village of Cumberland, TimberWest Forest Corporation and Island Health to review identified options to control or mitigate sediment introduction into Comox Lake from Perseverance Creek, specifically to document the outcome from that meeting and what can be expected going forward. It is hoped that this correspondence will provide clarification both for you as Water Supplier and for water consumers regarding the drinking water supply, in the wake of the two Boil Water Notices last Fall, the August 7, 2015 Hazard Abatement Orders, the Options Study and the fall and winter storm season that is now underway.

Options Study Outcome

A desired outcome from the Options Study was the identification of any short term interventions that could control or reduce the likelihood of increased sediment discharging from Perseverance Creek into Comox Lake as a result of recent erosion/slides, and in particular what has been described by a stakeholder as the “mass erosion event” occurring in Perseverance Creek last winter.

The Options Study identified potential mitigation options under three categories: Spillway Channel, Cumberland Creek and Perseverance Creek:

1. The three “Spillway Channel” options focus on controlling sediment at the eroding till slopes. My present assessment of this option, however, is that costs would be high (ranging from \$5.3 to \$8.2 million), construction would be major, access to the site would be challenging and significant maintenance would be required – all to achieve modest sediment reduction at best.
2. There were three “Perseverance Creek” options. While the cost estimates are considerably lower in respect of two of those options (construction of berms and a silt curtain in Comox

Lake), my present assessment is that the effectiveness of all three options at reducing sediment is too low (the Report references less than 20%). In addition, the potential for flooding resulting from these options is not known.

3. Five “Cumberland Creek” options were provided. The first two of these options would involve removal of the Cumberland No. 2 Dam, and potentially the construction of a small dam across the Spillway Channel. These options are stated in the Report as having up to 90% effectiveness in reducing sediment reduction into Comox Lake, but with a significant effect of reducing the current water supply for the Village of Cumberland. What this reveals, on my present assessment, is that we must work for a long term water supply strategy – a solution that addresses water quality and water storage needs for both communities. Before addressing that matter further below, I will note that “Cumberland Creek” (creek diversion and No. 2 Dam reconstruction) are also longer term options, but they are also expensive, they have been identified as having reduced effectiveness and they would require further detailed assessment, as too little is known about potential impacts. “Cumberland Creek” option 5 relates to managing water levels in Lake No. 2. Cumberland staff is already engaged in this operating procedure. Given the size of the reservoir it is doubtful this would have much, if any, impact on reducing turbidity-causing particulates resulting from larger precipitation/flow events. As well any rapid rise or fall in flow may affect structural integrity of the existing dam so again there is limited utility in this option.

The August 7, 2015 Hazard Abatement Orders were issued in recognition that with Fall 2015 fast approaching, any reasonable short term, supported and reasonable options that could be taken should be taken. Regrettably, having reviewed the September 2015 Options Study, there do not seem to be any current, effective, reasonable cost short term interventions.

I will reconvene a meeting with the CVRD, TimberWest Forest Corporation and the Village of Cumberland to review the status of this area of erosion and the documented options in the Options study and any possible new options or combination of options in the Spring of 2016.

Boil Water Notices

In the absence of a short term fix, what we are left with as storm season approaches year after year is the ongoing real risk of further bank failure, and for particulate matter from the site of the slide event continuing to increase turbidity into Comox Lake, a point that I make recognizing that there is no one single source of all particulate matter entering Comox Lake. The potential health impacts of such turbidity are increased where, as here, the CVRD water supply system only has one form of disinfection (chlorination), and the completion of a filtration plant which would add significant protection despite increased turbidity in the Lake is not expected until 2019.

What this means is that until the filtration system is constructed, and unless and until other feasible options are identified, future increased turbidity events beyond the threshold standards will, as a matter

of public health, necessarily require consideration of further boil water notices. This would be done in joint consultation with you as the water supplier utilizing the British Columbia Decision Tree for Responding to a Turbidity Event in Unfiltered Water, April 2013 as a guidance document, <http://www2.gov.bc.ca/assets/gov/environment/air-land-water/turbidity-decision-tree.pdf>.

In view of the discussion that sometimes arises in the wake of such notices, I want to confirm for the public that boil water notices due to increased turbidity in unfiltered water supplies are an important public health measure. To explain, “turbidity” is a laboratory measure of the relative clarity or cloudiness of water. It is an indirect but reliable indicator of the suspended particles in the water, measured by the scattering and absorbing effect that suspended particles have on light. These particles commonly arise from the weathering of rocks and soils during rainfall events or during rapid snow melt events, which are common during the fall and winter periods within Island Health. These particles can also be present in the summer due to the growth of biological organisms such as algae, cyanobacteria or zooplankton. From the health perspective, the problem with turbidity-causing particles is that they include pathogens. The greater the concentration of particulate matter in source water the greater the potential for that source water to contain increased pathogens and the greater the potential for that particulate matter to disrupt or overload drinking water disinfection processes. In addition, organic matter in water can react with chlorine to create by-products that may cause adverse health effects, especially over time.

While all water consumers of surface water are at risk as a result of increased turbidity where treatment consists of only one disinfectant and no filtration, the populations most impacted are those at the age extremes and with underlying health conditions. They represent some of the most vulnerable in our population and are often the first to be negatively affected. Boil water notices are issued in order to warn the public to take the necessary steps to protect themselves from the unacceptable risk of pathogens in their drinking water.

Beyond Boil Water Notices

The water supply system for the Comox Valley is a precious asset. Those responsible for protecting and managing the water supply are or should be aware that boil water notices are only a stop-gap measure to address health risks that are likely to continue into the future given the sensitive nature of this watershed. There are documented risks to Comox Lake’s drinking water (which provides drinking water to approximately 41,000 residents), which risks are posed both by natural events such as last year’s significant erosion event and by the use of landowners and recreational users who conduct activities upstream from on and into Comox Lake. There are also documented risks to Cumberland’s drinking water and supply, which risks are posed by some of the same factors, as well as the deterioration in Dam No. 2.

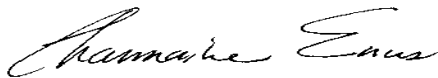
On the CVRD’s part, it is essential that the permit condition requirement a finalized and meaningful Watershed Protection Plan be completed. The filtration system, also a permit condition, is also essential. On Cumberland’s part, it must in my view proceed diligently to address the long recognized

issues set out in its 2007 *Water System Master Plan*, which solution may well include engaging in constructive dialogue with the CVRD to determine whether their a joint solution their respective water supply and water quality issues might be found.

While these steps are necessary, they are not sufficient given the disparate regulatory authorities that apply across this multi-use watershed. That is why the Provincial Health Officer has recently recommended to Government that it approve a process to create a Drinking Water Protection Plan for the watershed under Part 5 of the *Drinking Water Protection Act*, the ultimate purpose of which is to establish overarching legal standards that govern all decision-making in the watershed that impact on drinking water.

As Medical Health Officer, I am committed to working with stakeholders and exercising my regulatory authority as appropriate to ensure that drinking water and public health are protected.

Yours in Health,



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Medical Health Officer

c.c. Sundance Topham, CAO Village of Cumberland
Chris Cole, TimberWest Forest Corporation
Charlene MacKinnon, Senior EHO, Island Health
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