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September 22, 2017

Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

**RE: Project No. 1598922
British Columbia Utilities Commission (BCUC or Commission)
Inquiry Respecting Site C
British Columbia Hydro and Power Authority (BC Hydro)
Response to BCUC Information Requests**

BC Hydro is writing to seek clarity on some aspects of the Deloitte LLP (“Deloitte”) report entitled “Site C - Alternative Resource Options and Load Forecast Assessment” (document A-8 or “Deloitte Report No. 2”). There are instances where, on the face of Deloitte Report No. 2, there seem to be either (a) internal inconsistencies between Deloitte’s stated assumptions and the calculations presented, or (b) costs missing from the calculations of alternative resource costs. These instances appear to materially affect Deloitte’s calculations of the cost of an alternative resource portfolio to Site C.

BC Hydro is identifying these issues early on in the comment period in the hope that it will be possible for Deloitte to provide some clarification about assumptions they used and how they performed their calculations. We believe this will be of assistance to the Commission in reconciling some of the differences between our Filing (F1-1) and Deloitte Report No. 2 and in the preparation of our reply to the Commission’s questions in their Preliminary Report. We intend to file (later in the comment period) a full response to the Commission’s Preliminary Report, which will include a critique of elements of Deloitte Report No. 2 and will identify the areas of agreement between BC Hydro and Deloitte on certain matters. It would be very useful, given the timelines, if Deloitte could provide clarification at the earliest possible date.

The specific instances about which we would appreciate clarification at this time are as follows:

1. The Deloitte report appears to overstate the upstream gas impacts in the event no LNG projects proceed. Specifically, some upstream gas production and processing facilities identified as LNG-dependent in BC Hydro’s load forecast have been in operation for a number of years already and are expected to continue regardless of

whether the downstream LNG export projects materialize. This results in an overstatement of the impact of a “no LNG” scenario by approximately 276 GWh/35 MW. We are wondering why Deloitte is assuming that the facilities would shut down after having been in operation independent of LNG development for some time, or whether this is an error?

2. We are unable to replicate both the capital and operating costs of alternative resources in Tables 1 and 2 of Appendix E of Deloitte Report No. 2 (pages 107-108) using Deloitte’s stated assumptions for all of the resources listed except for hydro (note that costs of hydro upgrades included are addressed in No. 4 below).

For example, Figure 3 of Appendix E to Deloitte Report No. 2 shows geothermal capacity additions of ~95MW in 2028. Table 1 of Appendix E shows capital additions of \$496 million. Based on Deloitte’s figures, BC Hydro calculates the capacity cost of this year’s additions to be \$5,200/kW, which is substantially below Deloitte’s stated assumptions of \$7,300/kW to \$8,800/kW.

Overall, Deloitte’s capital and operating and maintenance expenditure figures appear to be roughly 25 per cent or more lower for each of these resources than when we calculated them using Deloitte’s stated assumptions. The effect of this discrepancy to Deloitte’s overall calculations of the cost of alternative resources appears to significantly understate the cost of alternative resources that BC Hydro would have to obtain in the event of termination of Site C by almost 25 per cent.

3. The costs of alternative resources in Tables 1 and 2, Appendix E do not appear to include transmission, road and similar costs for capital costs (Table 1), and do not appear to include trade impacts or carbon tax in operations (Table 2). The significance of this issue is that, if these costs are omitted from the cost of alternative resources, the cost of alternative resources would be materially understated given these costs are reflected in the Site C project costs. This would materially affect the implications of termination of Site C, in terms of the additional resource costs BC Hydro would have to incur and makes for an apples-to-oranges comparison.
4. While we were able to replicate the costs in Table 1 of Deloitte’s Appendix E for hydro upgrades using Deloitte’s assumptions, when we looked at whether the attributed capacity (MW) and estimated costs were supported by the source documents, it appears Deloitte is relying on out-of-date or incorrect information. In essence, the use of this information resulted in Deloitte incorrectly concluding that (i) certain amounts of additional alternative capacity resources were available from existing facilities that are in fact not available based on more refined engineering work, and (ii) the cost of the capacity resources that are available being much cheaper than they actually are. In light of these issues, Deloitte’s alternative portfolio would only provide 60 per cent of the hydro capacity identified in the first ten years of the forecast period (to 2027), and the cost of replacing this capacity would be higher. Specifically:
 - GM Shrum upgrades are included at 220MW and \$71 million. Current studies put the potential output at 100MW and around \$105 million, equivalent to a unit

capacity cost of \$66/kW-year (see page 45 of Appendix L of our Filing, for more information). As noted in our Filing, there are significant reliability risks associated for the outages that would be needed for this project.

- Seven Mile upgrades are included at 32MW and \$100 million. This appears to utilize outdated information for capacity, and cost data for a different project. Our current studies put the potential output at 48MW for \$137 million (see page 499 Appendix L of our Filing).
- While not included in the list of BC Hydro upgrades, based on the total cost and capacity of hydro upgrades in Deloitte's portfolio, it appears that the Strathcona project has been included in Deloitte's portfolio of alternatives. There are dam safety concerns at Strathcona that are expected to require relocating the existing powerhouse, which would make the option of adding an extra unit to the existing powerhouse no longer feasible. As such, the inclusion of Strathcona and further, the use of Revelstoke 6 unit cost as a proxy for Strathcona unit additions, is inappropriate.
- The use of the \$/MW cost from Revelstoke 6 to estimate the cost of Ladore is also inappropriate. Hydro upgrades are site specific, and Revelstoke 6 is the cheapest non-Site C capacity option available (on a unit cost basis). Assuming this unit cost will apply to other projects would incorrectly understate costs of those other projects.
- Similarly, the use of the \$/MW cost from Ash River to estimate the cost of Shuswap is inappropriate. Hydro upgrades are site specific, and what applies at Ash River may not apply at Shuswap. In addition, Deloitte states in its report that costs at Ash River are, in-turn, based on the costs at Strathcona. As mentioned above, there are dam concerns about Strathcona project which would impact the resulting project costs.

The Commission's correspondence related to this proceeding should be directed to Fred James at 604-623-4046 or by email at bhydroregulatorygroup@bhydro.com.

Media or public inquiries should be directed to BC Hydro Media Relations at 604-928-6468.

Yours sincerely,



Fred James
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