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Our File: 23841/0135

March 17, 2016

**VIA ELECTRONIC MAIL**

British Columbia Utilities Commission  
Sixth Floor, 900 Howe Street  
Vancouver, BC  
V6Z 2N3

**Attention: Ms. Laurel Ross, Acting Commission Secretary and Director**

Dear Sirs/Mesdames:

**Re: British Columbia Hydro and Power Authority ("BC Hydro") W.A.C. Bennett  
Riprap Upgrade Project Application, Project No. 3698854**

We are counsel for the Commercial Energy Consumers Association of British Columbia ("CEC"). Attached please find the CEC's second set of Information Requests with respect to the above-noted matter.

A copy of this letter and attached Information Requests have also been forwarded to BC Hydro and registered interveners by e-mail.

Should you have any questions regarding the foregoing, please do not hesitate to contact the writer.

Yours truly,

**OWEN BIRD LAW CORPORATION**

Christopher P. Weafer  
CPW/jlb  
Encl.  
cc: CEC  
cc: BC Hydro  
cc: Registered Intervenors

**COMMERCIAL ENERGY CONSUMERS ASSOCIATION OF BRITISH COLUMBIA**  
**INFORMATION REQUEST #2**

**British Columbia Hydro and Power Authority**  
**W.A.C. Bennett Riprap Upgrade Project Application**  
**Project No. 3698854**

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**33. Reference: Exhibit B-3, CEC 1.3.7**

**RESPONSE:**

BC Hydro's cost estimate for the Project is based on an accuracy range of +25 per cent/-20 per cent, not the +25 per cent/-10 per cent shown on page 1-18, line 8 of Exhibit B-1. Of the nine projects in Table 1-1, the range for individual projects varies from +14 per cent to -19 per cent. Based on the complexity associated with this Project, BC Hydro has deemed the appropriate accuracy range to be the +25 per cent/-20 per cent, which is consistent with the AACE Class 3 guideline.

As per AACE Class 3 the range with 80 per cent confidence can be as high as +30 per cent and as low as -20 per cent.

- 33.1. Please contrast the complexity of this project with the other projects in the sample provided indicating past performance, as justification for the +25% side of the cost estimating accuracy.

**34. Reference: Exhibit B-3, CEC 1.4.2**

**RESPONSE:**

The interlocking (or knitting) quality is mainly a property of the rock (size, shape, and durability) and its placement method. Construction of a test panel at the beginning of riprap placement will provide a reference standard of knitting quality for the remaining work. Construction quality inspection (QA/QC) is essential to ensure knitting quality.

- 34.1. Please discuss the test panel acting as a reference standard, particularly with respect to any aspect of the knitting which would evolve over a long period of time and or whether or not the knitting quality is known to be observable within the timeframe of the project.
- 34.2. Please discuss the construction quality inspection, how it is conducted and whether or not it will have a means of quantitative assessment of the knitting quality.

**35. Reference: Exhibit B-3, 1.11.2 and Exhibit B-1, Table 2**

**Table 7.2 Aggregate Number of Occurrences of High NW and NE Wind Events at the Dam Crest**

Annual Maximum Hourly Wind Speed (km/hr)	Number of Occurrences in Past 17 Years (NW)	Number of Occurrences in Past 17 Years (NE)
30 to 40	3	0
40 to 50	3	10
50 to 60	10	6
60 to 66	1	1
>66	0	0

**Table 2: Design Wind Speed (Northwest Direction)**

Annual Exceedance Probability	Estimated Over-water Wind Speed (km/hr) at Standard 10 m Height for Different Wind Durations		
	1 hour	2 hour	3 hour
1/100	78	73	69
1/1,000	89	81	74
1/10,000	96	87	78

- 35.1. Please relate this measured wind occurrence data to the design probability information in Section 4, Table 2 of the application, with respect to the degree to which the data confirms the probability risk and likely to which level the risk is confirmed.
- 35.2. Please discuss whether or not BC Hydro views this data and the related regional analysis data referenced in CEC 1.11.1 as confirming the design decisions for the project relative to informing the risk assessment and design decisions made for the project and therefore, consequently the costs of the project.

**36. Reference: Exhibit B-3, CEC 1.8.1**

The EEP was recently re-convened in November 2015, and the new design, construction plans, and construction schedule from 2017 to 2019 were presented. While its report is still in draft, the EEP continues to support the need for the riprap upgrade and did not provide any comments regarding the construction schedule.

- 36.1. Can BC Hydro confirm that the EEP agrees with the BC Hydro decisions regarding the more comprehensive plan for the upgrading and agrees with the

timeframe, so that the absence of comment on the schedule is resolved relative to the earlier comments of much quicker response being desirable?

**37. Reference: Exhibit B-3, CEC 1.28.2**

**RESPONSE:**

Between the stockpile and the Dam, BC Hydro has estimated that it requires approximately four to five trucks per hour.

- 37.1. Please discuss the degree to which traffic congestion may occur with a 4 to 5 truck per hour schedule and whether or not this may present a cost and/or schedule risk to the project, the degree to which this has been anticipated, the management and control capabilities which will be used to deal with the risk potential, and any quantitative assessment of the potential for this to be a risk factor.

**38. Reference: Exhibit B-3, BCUC 1.2.1**

The Dam Safety surveillance has not noted any specific erosional events since 1998, with the exception of a heavy rainfall event in 2011 which caused fill erosion to the upper slope of the dam due to rapid runoff. Cross section surveys conducted in 1999, 2005, 2007, 2010, and 2014 to monitor erosion occurring over time also did not indicate specific erosion events since 1998.

- 38.1. To what extent does heavy rainfall represent a risk for the new design and if significant, discuss how this has been factored into the design criteria and whether or not the design is sufficiently robust that heavy rainfall will not be expected to be a significant risk factor.
- 38.2. Please provide any quantitative analysis of this risk factor to support the BC Hydro conclusions discussed in answer to the above question.

**39. Reference: Exhibit B-3, BCUC 1.26.1**

**RESPONSE:**

The modeled Project costs in the following table take into account the overall yield losses, including but not limited to losses at the quarry, material transport, and stockpiling.

Nominal Yield at Dam Face (Placed) (%)	Cost Upper Bound (\$ million)	Cost Lower Bound (\$ million)
10	175	112
13	171	110
15	169	108

- 39.1. Please extend this table to cover the contract ranges of 17% and 19% as well.
- 39.2. Please provide a discussion of the potential for a contractor to respond to the incentives and deliver a 17% or 19% plus yield.
- 39.3. Please confirm that this is a significant factor affecting the potential costs of the project.
- 39.4. Please provide a list of any other significant factors which may affect the cost of the project, the range of potential cost performance as well as any contractor incentives being used to ensure cost-effective performance.