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Log No. 9355

**VIA E-MAIL**

regulatory.group@bchydro.com

July 21, 2005

**BCH – 2005 REAP  
Exhibit No. A-7**

Mr. Tony Morris  
Acting Chief Regulatory Officer  
British Columbia Hydro and Power Authority  
17<sup>th</sup> Floor 333 Dunsmuir Street  
Vancouver, B.C. V6B 5R3

Dear Mr. Morris:

Re: British Columbia Hydro and Power Authority (“BC Hydro”)  
Project No. – 3698388 / Letter No. L-28-05  
Resource Expenditure and Acquisition Plan (“REAP”)

Attached please find Commission Information Request No. 3 to BC Hydro. Please provide a hard copy and an e-mail file in response. Please include a fully functional Excel spreadsheet wherever there is a request for a numerical calculation. Pursuant to Commission Letter No. L-51-05, BC Hydro is requested to respond by Friday, August 12, 2005.

Yours truly,

*Original signed by:*

Robert J. Pellatt

JWF/yl

Enclosures

cc: Registered Intervenors

**BC Hydro March 2005 Resource Expenditure and Acquisition Plan**

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**100.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 3; Appendix A, p. 1**

The testimony states that the F2005 Call is targeting to procure a minimum of 800 GWh/year of firm and up to 800 GWh/year of associated non-firm electrical energy supply from large projects that are 10 MW or larger, and a minimum of 200 GWh/year of electrical energy supply from small projects of 1 MW to less than 10 MW.

100.1 Is BC Hydro also planning to impose a maximum project size? If not, why not?

100.2 Based on knowledge developed from BC Hydro's work on the 2004 IEP and the 2005 ROR, what is the likely average size of large projects that would be the most cost-effective?

**101.0 Reference B-11, Direct Testimony of Mary Hemmingsen, pp. 3 and 4**

Ms. Hemmingsen describes Environment Canada's Environmental Choice Program as a program to label qualifying products with an EcoLogo label. She also states that BC Hydro will pay prospective bidders \$3/MWh for their Green Attributes.

101.1 How does BC Hydro define "Green Attributes"?

101.2 How is the EcoLogo label presently being used?

101.3 Are there any examples of trades taking place which use this certification?

101.4 How does this certification differ from BC Hydro's definition of Green Attributes?

101.5 On page 4 Ms. Hemmingsen describes the market in Green Attributes to be relatively illiquid and describes several examples of Excel Energy's credit for "green rights" and a Canadian federal Government proposal for an incentive payment for renewable and wind projects.

Do any of these examples have a common definition for "green rights"?

101.6 Ms. Hemmingsen states that amount of the \$3/MWh credit for projects that assign their Green Attributes to BC Hydro is based on the current market value established by counterparties transacting in an open market.

Please describe the derivation of the BC Hydro estimate, including whether the \$3/MWh is the median, the mean or a boundary value of the range of values seen in the market and the specifics of the market from which BC Hydro drew its data. Specifics of the market would include the total number of transactions BC Hydro reviewed, the total volume and volumetric range of transactions reviewed and whether any transactions were discarded (for example, because such transactions might be considered untypical or 'outliers').

**102.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 5**

On page 5, Ms. Hemmingsen's testimony states: "...BC Hydro proposes to increase the size of the F2006 Call from a target maximum of 1,000 GWh/year to a target minimum of 1,000 GWh/year."

Please comment on any upper limit to the call. For example, how will BC Hydro decide where the upper limit to the amount of energy contracted from the responses to the call lies in terms of either energy volumes or prices, or combinations thereof?

**103.0 Reference B-11, Direct Testimony of Mary Hemmingsen, p. 5**

The 400 GWh/yr call in the 2005 REAP was justified on the basis of uncertainties in load growth and uncertainties for supply options meeting the in service deadlines.

Please describe if those uncertainties have changed and, if so, by how much and why.

**104.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 7**

Ms. Hemmingsen's testimony states: "The basis for the additional value provided by a project that provides firm energy on an hourly resolution is the levelized cost of Revelstoke Unit #5, inclusive of forgone system benefits to BC Hydro, a proxy for BC Hydro's cost of incremental intra-day system capacity."

104.1 Please provide a detailed analysis showing the derivation of the levelized cost of Revelstoke Unit #5 as the underpinning for the additional value of hourly firm energy, with examination of the value attributable to forgone system benefits, and transportation to the Lower Mainland.

104.2 Are only Large Projects eligible for the evaluation credit adjuster of \$3/MWh? If so, why?

**105.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 7, Q11**

For clarity, is it a specific assumption underpinning the size of the F2006 call that Burrard Thermal can be relied on for dependable capacity? If not, what specific assumption with respect to the availability of Burrard Thermal was used?

**106.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, pp. 9-10, Figures 1 and 2**

106.1 Please supply Figures 1 and 2 showing the capability of BC Hydro storage/dispatchable generation to meet the monthly BC Hydro demand. Are GMS, PCN, REV and MCA the only facilities included in Discretionary Generation?

106.2 Please explain why Kootenay Canal Generating Station is not included in the storable/dispatchable category, particularly in 2008 and beyond.

106.3 Please explain how the Arrow Lakes Generating Station and its entitlement agreement are factored into the calculation of Discretionary Generation.

**107.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, pp. 8-10, Q13**

107.1 Does the “energy profile” described on p. 8 line 11 apply to Large Projects only? Is the “energy profile” limit for April through July applied on a project or on a bidder basis?

107.2 Does deleting ‘non-discretionary’ on p. 8 line 12 and “tendered” on p. 8 line 14 change the intended meaning of the sentence? Does the “energy purchased” cap of 120% of plant capacity on p. 8 line 21 apply to only Large Projects?

107.3 BC Hydro is proposing to apply a price premium/discount system to provide an incentive to suppliers to provide a larger proportion of their annual energy delivery in the high demand months and a lower proportion during the low demand months. Table 1 on page 10 is a sample table illustrating the price premiums or discounts. Please show or explain how Table 1 has been derived, and which price forecast it has been derived from.

107.4 The testimony states that the final price premium/discount table to be issued as part of the EPA will be derived from BC Hydro’s most current long-term market price forecast.

Will the final price premium/discount table be derived in the same manner and from the same forecast as the sample table? Will the price premium/discount table change during the term of the EPA?

107.5 Table 1 on page 10 shows that the LLH factor in October is valued at a discount of 89%. Please explain why the LLH value for October is significantly lower than the LLH values in August, September and November.

**108.0 Reference B-11, Direct Testimony of Mary Hemmingsen, pp. 19 and 32**

108.1 Ms. Hemmingsen states on page 19 that BC Hydro has conducted a review of other Utilities practices in procuring electrical energy. A recent article in Power Week Canada (Volume 4, Number 19) described a recent policy Hydro-Quebec adopted to disclose the details of long term power supply contracts to emphasize transparency in its dealings with electricity suppliers.

To what degree is the proposed BC Hydro policy similar to that recently announced by Hydro Quebec? (Press Release attached) Please comment on the pros and cons of adopting a policy similar to that adopted by Hydro Quebec.

108.2 The testimony states on page 32 that bid prices of all successful and unsuccessful tenders will be published on BC Hydro’s website after EPA awards(s), as well as any non-price factors that may have been used in determining the optimal portfolios.

Please describe how BC Hydro proposes to handle commercially sensitive information provided by potential bidders that may not be appropriate to be made public.

**109.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 13, Q17**

The testimony states that “With respect to projects under 1 MW, BC Hydro is currently exploring alternative processes that would accommodate such projects in a cost-effective manner”.

Please describe the alternative processes under consideration to accommodate projects under 1 MW and particularly those projects that are less than 1 MW but above the 50 kW eligibility limit for Net Metering projects.

**110.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 13, Mandatory Requirements**

Please comment on the practicality of relaxing the “proven” generation technology mandatory requirement for the “Small” category of generators given the unique opportunities that may be tied to the province’s geography.

**111.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 16, Term Flexibility**

Please comment on terms as short as 10 years not being included in this call. Is BC Hydro aware of any potential projects or respondents that do not meet the 15 year minimum term, but may have responded to a 10 year term?

**112.0 Reference: Exhibit B-11, Testimony of Mary Hemmingsen, p. 18**

The testimony states that the F2006 Call is an “open” CFT which means that all proven generation technologies, except nuclear technology, are eligible.

112.1 Please provide the dates of the two most recent system-wide open CFT calls conducted by BC Hydro.

112.2 How would BC Hydro propose to maintain a balanced mix of resource options or project location in the event that competitive bids resulted in cost-effective energy supplies that form clusters in regions or that are heavily weighted towards certain energy sources?

**113.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 20, Non-Firm Energy Price**

Please comment on any amounts above the contracted firm energy amount being treated as non-firm, and any amounts below addressed through liquidated damages. Was a “tolerance” of delivered firm energy (for instance, a range of 100% to 105% of contracted firm energy) considered? If so, why is such a term not considered in this call?

**114.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, pp. 21 -22 and Exhibit C, p. 9, Price Escalation**

114.1 Please explain the effects of the asymmetry introduced by 0 to 50% of the bid price eligible for escalation with the CPI, while the liquidated damages market price cap escalates with the full CPI.

114.2 The EPA terms include an escalation provision to address the risk that the revenue stream for the energy does not match the bidder’s cost. The escalation is based on a percentage (between 0 and 50%) of the bid price that escalates with CPI.

114.2.1 Please clarify if the CPI is nation-wide or province-wide.

114.2.2 Please provide the historical escalation indices in BC for (i) residential, commercial and industrial electricity price and (ii) residential natural gas burner tip price and compare them to the BC CPI in the last

(a) 15 years

(b) 20 years

(c) 25 years

(d) 30 years

(e) 35 years

(f) 40 years

114.2.3 Have any other indices been considered to check if they could better match the cost streams of electricity supply? If not, why not? If yes, please describe those indices.

**115.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 21, Change in Law/Flow Throughs**

Please comment on whether a flow through of water rental fees has been considered, and if so, why this is not considered a flow through cost since the majority of BC Hydro's generation portfolio is exposed to the same risk and eligible for being recovered in rates.

**116.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 29 of 35**

The testimony states that BC Hydro will have a four-step evaluation process. The first step will reject materially non-conforming tenders.

Please define and provide examples of "materially non-conforming".

**117.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 30**

The testimony states that in Step 3, BC Hydro will carry out a project risk assessment for each tender. Please provide any guidelines used by the evaluation team on project risk assessment.

**118.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, p. 33, Q38 and 39**

118.1 If available, please provide a document or documents summarizing the feedback from stakeholders during BC Hydro's consultation process.

118.2 Please discuss whether, in BC Hydro's view, its current CFT methodology is supported or not by the stakeholders, and provide BC Hydro's reasons for its assessment of that degree of support.

**119.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, Exhibit A, p. 2**

According to the testimony, Load Displacement projects are not eligible for the CFT process. The rationale is that these projects do not add any additional energy to the system and therefore should not be permitted to trade up.

119.1 Please explain the treatment of surplus energy if the LD project displaces more than 100% of the customer requirement and the excess energy can be added to the system.

119.2 Can the LD customer's surplus energy be treated as "incremental generation"? If so, under what conditions?

**120.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, Exhibit A, p. 6, Interconnection and Metering Issues**

For bidder-built transmission facilities between the bidder's generating station and the Point of Interconnection, what is BC Hydro's policy regarding payment for, ownership of, and cost recovery of those facilities?

**121.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, Exhibit A, p. 6**

Exhibit A states that "BC Hydro will not take the transmission risk prior to delivery into the integrated BC Hydro transmission system as BC Hydro is in no better position than the bidders to manage this risk."

Please describe the transparency and knowledge of system operations that affords bidders the same opportunity as BC Hydro to manage transmission risk.

**122.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, Exhibit B, p. 2 Determination of Optimal Portfolio**

Please describe more fully the criteria associated with the target aggregate portfolio of 50 MW.

**123.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, Appendix B, pp. 2 and 3**

The testimony states that BC Hydro will select cost-effective supply from all sources by applying price and non-price criteria such as low-cost and meeting its 50% BC Clean Electricity target. It also states that the relative weighting of criteria will not otherwise be predetermined.

123.1 Does BC Hydro propose to monetize non-price criteria in the evaluation? If yes, please describe the monetization process. If not, please explain how the non-price criteria will be applied.

**124.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, Exhibit B, pp. 3 and 6**

The testimony states that the portfolio determined by BC Hydro's evaluation team to be optimal will be recommended to BC Hydro senior management for EPA awards.

124.1 Please describe the deliberation process by senior management regarding the award of the EPA.

124.2 Under what circumstances, if any, would senior management reject the optimal portfolio recommended by the evaluation team?

**125.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, Exhibit B, p. 9, Interconnection/Transmission Adjustment**

125.1 When will the full evaluation of the BCTC OATT be completed?

125.2 How will generators on Vancouver Island be evaluated given that their supply will reduce the load on the existing and future transmission systems between Vancouver Island and the Lower Mainland? Will bids that are sited on Vancouver Island still be evaluated on delivery to the Lower Mainland?

125.3 Will generators be evaluated on their site specific ability to relieve transmission or distribution constraints, and will bids be given credit for delaying capital improvements in the transmission or distribution system?

125.4 Is BC Hydro able to identify any areas of constraint where specifically-sited generation can defer the need for transmission or distribution investments?

**126.0 Reference: Exhibit B-11, Direct Testimony of Mary Hemmingsen, Exhibit C, p. 12**

Exhibit C states that the \$/MWh discount is based on the levelized cost of Mica Unit #5, inclusive of forgone system benefits to BC Hydro, and that the eventual \$/MWh discount to be applied will be determined based on further evaluations for the levelized cost of Mica Unit #5.

126.1 Please provide a detailed analysis showing the derivation of the levelized cost of Mica Unit #5 as the underpinning for the additional value of non-firm energy.

126.2 Please provide the monthly capacity and energy expected from Mica Unit #5.

**127.0 Reference: Exhibit B-11, Direct Testimony of Richard Rosenzweig, pp. 9 – 11**

Please provide copies of the relevant sections or pages of the documents used as the basis for the statements about GHG adders by the utilities cited on pages 9 to 11.

**128.0 Reference: Exhibit B-11, Direct Testimony of Richard Rosenzweig, Exhibit B**

Please provide the full citations for the studies and models cited in Exhibit B.

**129.0 Reference: Exhibit B-11, Direct Testimony of Richard Rosenzweig, Exhibit B, p. 6**

The report states, with reference to Scenario 1 that “In light of these considerations, we estimate that prices in this scenario would increase to \$19 - \$31 in 2015.”

Please clarify if this statement is intended to mean that the low range of estimates (Bernard et al #1 and Nordhaus) are intended to increase to \$19 - \$31 and, if so, which specific considerations drive the expected increase.

If the consideration driving the increase is potential monopolistic or oligopolistic behaviour by Russia and or other sellers, then does that not simply lead to the Bernard et al estimate #2 (high estimate of \$41.05)? If not, why not?

**130.0 Reference: Exhibit B-11, Direct Testimony of Richard Rosenzweig, Exhibit B, pp. 9-10**

At the bottom of page 9, the Exhibit states that MIT economic modeling produces an estimate for 2015 of \$13.68 and that U.S. Energy Information Agency analysis produces an estimate for 2015 of \$27.37. The Exhibit then states that “The average of these two estimates, rounded to the nearest dollar, is \$19.90. Without further information available, we estimate that prices in the U.S. system in 2015 will be approximately \$12 - \$25.”

- 130.1 Should the average be rounded to the nearest dollar or cent? Please confirm that the average, rounded to the nearest dollar, is \$20.00.
- 130.2 Please expand on the reasons for estimating a range that is lower (\$12 - \$25), at both the high and low ends of the estimated range, than the range suggested by two studies cited (i.e. \$13.68 and \$27.37).
- 130.3 Please confirm that the \$25-\$37 range estimated on page 10 refers to the estimated price range for countries that remain under the Kyoto Protocol and that the price range for Canada would be the lower range (\$12 - \$25). If not, please explain why the price range for Canada would be different than the price range for the U.S.
- 130.4 Please confirm that if the Table Summarizing Price Expectations for Canada for 2015 should read as follows:

Scenario 1:	\$19 - \$31
Scenario 2:	\$37 - \$50
Scenario 3:	\$12 - \$25

If not, please explain why not.

**131.0 Reference: Exhibit B-11, Direct Testimony of Richard Rosenzweig, Exhibit B, pp. 11-12**

The table on page 11 and 12 summarizes the results of models analyzing the level of carbon tax needed to reach a stabilized 550 ppmv concentration by the end of the century. Footnote 9 states that the source is a “Review of Post 2020 Modeling Insights for BC Hydro” by Trexler Climate and Energy Services.

Please provide a copy of the report.

**132.0 Reference: Exhibit B-11, Direct Testimony of Richard Rosenzweig, Exhibit B, p. 12**

Exhibit B states that one approach to price forecasting for GHG compliance instruments from 2020 to 2040 would be to inflate 2015 price forecasts by 5% annually.

Please explain the basis for choosing 5% as a price inflator rather than, for example, 2% or 10%?

**133.0 Reference: Exhibit B-11, Direct Testimony of Doug Russell, pp. 5 and 8 and Direct Testimony of Tim Lesiuk, p. 6**

Mr. Russell's testimony states on page 5 (lines 11-13) that, for planning purposes, the average price used by the Government of Canada in determining the number of tonnes the Climate Fund might purchase is \$10 per tonne. On page 8, Mr. Russell notes that \$15 per tonne has been presented as a cap or upper limit by the Government of Canada.

Why is it more appropriate for BC Hydro to use the upper limit of \$15 per tonne for 2010 rather than the \$10 per tonne used by the Government of Canada as an average price for its planning purposes?

**134.0 Reference: Exhibit B-11, Direct Testimony of Tim Lesiuk, p. 8**

134.1 Please describe how the emission profile of a project is defined.

134.2 Must a generation project using a specific fuel type fall within the boundaries described on page 8 (e.g. 0.8 to 1.2 t CO<sub>2</sub>e/MWh for a coal-fired facility) or are those ranges purely illustrative of expected values?



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## Press Release

### ***For immediate release***

Montréal, May 13, 2005

### **Hydro-Québec Distribution wants to make its long-term supply contracts public**

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As part of its mandate to ensure supply of electricity for the Québec market, Hydro-Québec Distribution wishes to make public information on the costs related to each of the long-term supply contracts it has signed.

Hydro-Québec Distribution takes the position that this information is important to its customers and should be put on record. It concerns long-term electricity supply contracts, approved by the Régie de l'énergie (energy board) to meet Québec requirements, and whose costs and risks are assumed by customers. This information is also significant in terms of energy security.

To that effect, Hydro-Québec Distribution has asked each of its suppliers today to agree that all information related to their long-term contracts with Hydro-Québec Distribution be made public as soon as possible. The Régie de l'énergie has been duly informed of the requests submitted to each supplier.

The contracts referred to are as follows:

#### Call for tenders 2002-01

TransCanada Energy Ltd. – 507 MW of electricity generated from a natural gas facility, signed on June 10, 2003

Hydro-Québec Production – 350 MW from hydropower originating at the Robert-Bourassa generating facility, signed on December 10, 2002

Hydro-Québec Production – 250 MW generated from hydropower originating at La Grande-1 generating station, signed on December 10, 2002

#### Call for tenders 2003-01

Kruger Inc. – 19 MW generated from a cogeneration facility, signed on March 15, 2004

Bowater Canadian Forest Products Inc. – 20.4 MW generated from a cogeneration facility, signed on March 15, 2004

## Call for tenders 2003-02

Cartier Wind Energy (6 contracts) – 739.5 MW generated at 6 wind farms, signed on February 25, 2005

Northland Power Inc. / Northland Power Income Fund (2 contracts) – 250.5 MW generated at 2 wind farms, signed on February 25, 2005

Hydro-Québec Production has already indicated that it concurs with the publication of information related to its contracts with Hydro-Québec Distribution. This information will soon be made available on Hydro-Québec Distribution's Web site:

(<http://www.hydroquebec.com/distribution/en/marchequebecois/index.html>).

Furthermore, Hydro-Québec Distribution will submit a proposal to the Régie de l'énergie that the publication of contractual information be incorporated into the future terms and conditions of long-term calls for tenders. The division will work within the framework to be established by the Régie in this respect.