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VIA ELECTRONIC MAIL

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**Attention: Patrick Wruck, Commission Secretary and Manager,
Regulatory Support**

Dear Sirs/Mesdames:

**Re: BC Hydro Salmon River Diversion Ceasing of Operations
Project No. 1598907**

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

If you have any questions regarding the foregoing, please do not hesitate to contact the undersigned.

Yours truly,

OWEN BIRD LAW CORPORATION



Christopher P. Weafer

CPW/jj
cc: CEC
cc: BC Hydro
cc: Registered Interveners

COMMERCIAL ENERGY CONSUMERS ASSOCIATION OF BRITISH COLUMBIA
FINAL SUBMISSIONS
BC Hydro Salmon River Diversion Ceasing of Operations
Project No. 1598907

1. The Commercial Energy Consumers Association of BC (CEC) represents the interests of ratepayers consuming energy under commercial tariffs in applications before the BC Utilities Commission (BCUC or Commission). The CEC has participated in the British Columbia Hydro and Power Authority (BC Hydro or the authority) Salmon River Diversion Ceasing of Operations Application proceeding (the “Application”), and provides the following Final Submissions for the Commission’s review and consideration. Subject to the comments below, the CEC generally supports approval of the Application.

2. BC Hydro applies pursuant to Section 41 of the *Utilities Commission Act* (UCA) for approval to permanently cease operation of the Salmon River Diversion located on eastern Vancouver Island. The Diversion is currently in use and supplements electricity generation at BC Hydro’s Ladore and John Hart Generation Stations by approximately 4%. The Diversion is operating below original design parameters, and several issues must be addressed if the Diversion is to remain in operation. These include:
 - Dam safety concerns related to the condition of the Salmon River Diversion dam;
 - The existence of an obstruction to the upstream migration of adult salmon in the Salmon River; and
 - Poor and inefficient operation of a fish screen.¹

Commission Determination

3. BC Hydro submits that a Section 41 process is effectively the converse of a Section 45 process which provides the Commission with authority to grant a Certificate of Public Convenience and Necessity (CPCN) except in this circumstance, it seeks the Commission’s permission to remove property from the utility service as opposed to seeking permission to add material assets to the utility service.² In BC Hydro’s view, the considerations articulated in the CPCN Guidelines inform the Section 41 process, with the result being that the cost-effectiveness test must be considered along with other important elements such as social and environmental considerations.³

4. Under section 41 of the *Utilities Commission Act* the Commission does not approve a proposed expenditure; it either permits the proposed cessation of operation, or not, on the basis of the

¹ Exhibit B-1, page 1 of 42

² BC Hydro Final Submissions page 3

³ BC Hydro Final Submissions pages 2-5

evidence put forward by the utility, including evidence of the cost of the proposed decommissioning project. The Commission is obliged to weigh all the relevant evidence, including cost evidence, but does not make a legally binding determination on what is the right or appropriate cost.

5. In the case of the Application, its evidence includes cost estimates of the proposed decommissioning, cost estimates of alternatives, evidence regarding the economic implications of the project, as well as evidence regarding social, environmental and First Nation implications of the proposed project and Alternatives.⁴
6. The CEC agrees with BC Hydro with respect to the concept of the required determination being essentially the converse of a CPCN determination. The CEC submits that the test for the current application should properly include a test of the ‘public interest’, which would include cost-effectiveness, environmental and social considerations along with any other issues the Commission deems relevant to the public interest.
7. BC Hydro provides evidence that the Salmon River Diversion is not a ‘heritage asset’ according to the *Clean Energy Act* because it does not include any transmission or distribution equipment, and is also not listed in Schedule 1 of the *Clean Energy Act* prohibiting sale or disposition of heritage generation and storage assets. Accordingly, BC Hydro argues that the section 14 *Clean Energy Act* prohibition against the sale or disposition of ‘heritage assets’ does not apply.⁵
8. The CEC accepts that there is no prohibition against the disposition of the Salmon River Diversion assets articulated in the *Clean Energy Act*.
9. However, the CEC notes that the Salmon River Diversion contributes 33GWh of energy to John Hart Generating Station and 33 GWh to Ladore Generating Station,⁶ and that Schedule 1 of the *Clean Energy Act* identifies both ‘John Hart’ and ‘Ladore’ as generating or storage assets with prohibitions for disposition.
10. The CEC submits that it could be appropriate for the Commission to take a broad view of the intent of the legislation in preserving the energy generation of the John Hart and Ladore Generating Stations.
11. The CEC recommends that the Commission factor this into its deliberations as part of its determination of the public interest and that the Commission could determine in favour of BC Hydro that the Salmon River Diversion is not a heritage asset.

⁴ Exhibit B-4, CEC 1.17.1

⁵ Exhibit B-3, BCUC 1.5.1

⁶ Exhibit B-1, page 22

Justification for the Application

12. BC Hydro outlines the justification for its proposal in Section 2 of the Application which includes the poor condition of the Diversion, Safety and Environmental risks, negative effects on Fish habitat⁷ and offset capability of energy contribution.⁸
13. BC Hydro describes its current approach (status quo) as being ‘piecemeal maintenance’ and believes an integrated approach is necessary to address the issues.⁹
14. The CEC agrees that an integrated approach is preferable for addressing the various issues.

Diversion Condition

15. Both the Dam and the Canal are in poor condition and deteriorating, the downstream fish screen located in the Canal does not operate reliably, and the upstream fish passage at the Dam does not operate effectively.¹⁰ The views of the Director of Dam Safety have informed BC Hydro’s position¹¹ on this matter.
16. A review completed in 2014 by Associated Engineering (AE Report) indicates that substantive refurbishment of the Dam and Canal is required within five years (2019) and extensive reconstruction or replacement would continue beyond 20 years.¹² AE estimates ‘that \$2.38 M is immediately required to upgrade assets with poor ratings (Condition Rating 2 or CR 2) Failure to repair these assets could impact the operation, structural stability or limit the longevity of the SAR (Salmon River Diversion) facility’.¹³
17. The CEC submits that BC Hydro has provided reasonable evidence of significant deterioration of the Diversion condition requiring remediation, with the additional evidence of some urgency for the repairs as demonstrated by the AE report recommending changes within 5 years, or by 2019.
18. The CEC recommends that the Commission weight this evidence heavily in its assessment of the need for a project at this time.

Safety and Environmental Effects

19. The primary safety issue for the Diversion is the possibility of a failure under unusually high flows.¹⁴ The consequence category of a failure of the Diversion dam is assessed as ‘Low.’¹⁵ However, implications for failure of the dam include:

⁷ Exhibit B-1, pages 17 to 21

⁸ Exhibit B-1, pages 21 to 22

⁹ Exhibit B-1, page 6

¹⁰ Exhibit B-1, page 5

¹¹ Exhibit B-4, Bishop 1.3.2.1.2

¹² BC Hydro Final Submission pages 6-7

¹³ Exhibit B-1, Appendix E, Associated Engineer’s Report Executive Summary page 1-2

¹⁴ Exhibit B-1, page 15

¹⁵ Exhibit B-1, page 15

- Environmental consequences; a failure of the dam could lead to debris being washed downstream sending a flood wave and sediment pulse into the Salmon River Below. Additionally, depending on the mechanism of failure, fish passage at Salmon River may be impeded.
 - Reputational consequences including negative public response, negative media/opinion leaders' response, negative response of public officials, lack of regulatory compliance and Dam Safety incident resulting from a deferral of a project, leading to a loss of trust with the Comptroller of Water Rights.¹⁶
 - Financial consequences associated with the reputational and environmental issues noted above.¹⁷
20. The CEC submits that although there are legitimate issues with respect to Dam safety, they are of lower concern given the 'low' consequence category of a failure.
21. The CEC recommends that the Commission give limited weight to the likelihood of a dam failure in its assessment of the need for the project, particularly in that in the event the Commission does not approve the decommissioning, the dam will receive considerable investments in improvements and upgrading.

Fish Passage and Habitat

22. At the time of the Diversion's original construction a natural obstruction downstream prevented upstream fish migration. Over the years this obstruction was removed and efforts were undertaken by the government and others to increase the fish population using the Salmon River above the dam. These efforts included the addition of a fish diversion screen and a fish passage.
23. Significant concern has been expressed by stakeholders and agencies regarding the effectiveness of the fish screen in ensuring fish are not diverted to the Campbell River system and also regarding the success rates for salmon using the fish passage.¹⁸ The inherent design of the fish screen leads it to operate at a lower efficiency relative to modern fish screen designs.¹⁹ The Salmon River Diversion does have debris management measures in place. However, debris management measures such as debris booms and trash racks typically do not capture the small debris that plugs the fine-mesh fish screen such as leaves, pine needles, etc.²⁰
24. BC Hydro outlines the impact of the Diversion at pages 16 to 18 of the application.
25. A Water Use Plan (WUP) (accepted by the Comptroller of Water Rights (Comptroller) provides that the downstream fish screen must be operational from April 1 to December 31 each year. The

¹⁶ Exhibit B-1, page 15

¹⁷ Exhibit B-4, BCOAPO 1.1.1

¹⁸ Exhibit B-1, page 16

¹⁹ Exhibit B-4, Landale 1.1.3.1

²⁰ Exhibit B-3, BCUC 1.3.17

Comptroller has ordered BC Hydro to improve the fish screen to be operational at flows of up to 30 m³/s. Until these improvements are in place the diversion flow is restricted to 15m³/s.²¹ The fishway has also not met its design targets resulting in limits to fish migration and posing adverse impacts on the fish population in the river.²²

26. An upstream fish passage improvement was proposed to be completed in 2015.²³ However, BC Hydro states that as it analyzed the fish passage issues, together with We Wai Kai and Wei Wai Kum, it became apparent that water management for upstream fish passage, power diversion, and operation of the downstream fish screen are tightly linked, and that a successful upstream fish passage would require close integration with the other two elements. This increased the scope and complexity of addressing the upstream fish passage, and eventually culminated in the Rehabilitation Alternative as described in the application. The increased scope and complexity delayed the implementation of the upstream fish passage improvements, and BC Hydro is now two years late on that commitment.²⁴
27. It is not possible to determine the historical impact of the Salmon River Diversion on fish populations.²⁵
28. BC Hydro has responded to multiple information requests regarding the issue of the fish screen and the fish passageway. The CEC has reviewed the IR responses and submits that BC Hydro has outlined a need to address the fish screen and fish passageway issue at the present time.
29. The CEC recommends that the Commission apply moderate weight to the issue of fish passage in its assessment of project need.

Energy Replacement

30. The proposed decommissioning represents a net loss of approximately 46 GWh annually.²⁶ BC Hydro considers the ability of John Hart to ‘offset’ the lost energy under its project justification.
-
31. The CEC addresses the issue of Energy Replacement at the conclusion of this document.

Alternatives Considered

32. BC Hydro considered 4 primary alternatives of which 2 were dismissed. These four included maintaining the status quo of periodic minor repairs (dismissed), ceasing operations without removal of the Dam or other component (dismissed), rehabilitation and decommissioning.²⁷

²¹ Exhibit B-1, pages 19 to 20

²² Exhibit B-1, page 20

²³ Exhibit B-1, page 20

²⁴ Exhibit B-4, CEC 1.3.1

²⁵ Exhibit B-4, CEC 1.10.3

²⁶ Exhibit B-1, page 22

²⁷ BC Hydro Final Submissions page 11

33. The CEC submits that neither the Status Quo nor the Decommission and Abandon represent appropriate alternatives and do not require further consideration.
34. BC Hydro also dismisses several approaches suggested in Information Requests as being not effective or viable solutions.²⁸ While it would be possible for BC Hydro to address only the downstream fish screen or the upstream fish passage issues at the Salmon River Diversion BC Hydro did not believe such an approach was prudent because it may have increased costs and led to integration and design issues.²⁹ BC Hydro did not specifically consider extending the dam downstream; extending the dam downstream would require additional infrastructure changes to the trimming weir, upstream fishway and sluiceway resulting in higher costs.³⁰
35. In CEC 1.9.1 the CEC inquired if BC Hydro considered rehabilitation and extending the dam's longevity, or rehabilitating and increasing the value of the energy provided. BC Hydro considered approaches that could provide a longer life for the dam which include:
- i) replacing the dam with a new concrete dam;
 - ii) improving the canal, flume and downstream fish screen to allow higher flows; and
 - iii) replacing the flume to provide a longer life.
36. In BC Hydro's view in each case, the extended life or improved capacity came at a significantly higher cost than the approach selected, which was not justified by the benefits gained. They consider the eventual Rehabilitation Alternative to be the most cost-effective alternative available to continue operation of the Salmon River Diversion.³¹
37. A life extension beyond 20 years for the dam was deemed to require a full replacement of the dam which was driven by the decay of timber crib materials in the interior of the dam.³²
38. BC Hydro considered alternatives for diversion dam replacement that would extend the life of the dam by a minimum of 50 years.³³ A report by Associated Engineering (Appendix E) provided two options including:
- i) 50 Year Operation – Optimal Replacement Scenario; and
 - ii) Complete Replacement in 20 Years.
39. The Optimal Replacement Scenario (scenario 1) assumes that all maintenance and replacements required are implemented, all elements are functional and all assets are at and continue to function at CR3 level among other assumptions outlined at page 26 of the report. Starting year 2038 the

²⁸ BC Hydro Final Submissions pages 11 to 12

²⁹ Exhibit B-4, CEC 1.3.1 and Bishop 1.2.2.1.3 and Landale 1.1.3.4

³⁰ Exhibit B-4, Bishop 1.5.2

³¹ Exhibit B-4, CEC 1.9.1

³² Exhibit B-4, CEC 1.13.1

³³ Exhibit B-4, CEC 1.13.1.1

canal concrete, drain system and gate systems will reach their expected life, and a replacement plan for these items will need to be developed at that time based on more precise condition assessments conducted during that period. The Scenario has a Total Whole Life Cost of about \$4 million (5 year period) to \$64 million (50 year period) and an average annual cost of about \$800,000 (about \$1.2 million assuming 2% inflation (50 year period).

40. The Complete Replacement in 20 Years scenario assumes that most assets are replaced immediately to create a fully functional diversion structure that meets or exceeds all fish passage and flow regulations with assets replaced once they reach CR2.³⁴ This scenario has a Total Whole Life Cost of about \$28 million (5 year period) to \$48 million (50 year period).
41. BC Hydro was not able to provide meaningful analysis of the alternatives presented in the AE Report in response to information requests.³⁵
42. The CEC considers that the two approaches suggested by AE could have potentially warranted further investigation by BC Hydro, and in particular the 50 year option could have been evaluated against a potential need for energy occurring after 2034.
43. However, the CEC accepts that given the results of the financial analysis of the 2 alternatives considered by BC Hydro it is likely these two options would not have been cost effective.
44. The CEC recommends that the Commission consider the two options presented by BC Hydro as the appropriate alternatives for review.

Cease Operation (Decommission) and Removal Alternative

45. The Cease Operation and Removal Alternative involves the removal of the Dam, the mechanical equipment at the canal headworks and downstream fish screen, and the Patterson Creek flume. The remainder of the canal, as well as the civil works at the canal headworks would remain in place since they do not affect fish passage or create dam safety concerns. BC Hydro would continue to manage access to the site and provide a means for wildlife movement. This alternative would result in the re-establishment of a natural river channel for fish passage, eliminating the entrainment of fish into the Campbell River system and reducing stress on adults migrating up river to spawn. Ceasing to operate the Diversion would not affect operation of the Ladore or John Hart Generating Stations, other than reducing inflows; reservoir elevations and operating practices will not be affected.³⁶
46. Drivers for the Decommissioning Alternative for Salmon River Diversion are Dam Safety concerns regarding the condition of the dam and the canal, as well as the environmental, fish management,

³⁴ Exhibit B-1, AE Report pages 26-29

³⁵ Exhibit B-3, BCUC 1.7.3 and 1.7.4

³⁶ Exhibit B-1, page 25

and stakeholder benefits derived from removing the dam and fish passage and returning the Salmon River to its natural state to facilitate fish passage to the upper reaches of the Salmon River.³⁷

47. Additionally, completion of the decommissioning project would fulfil BC Hydro's commitments to First Nations related to the improvement of upstream fish passage at the site that were made as part of the agreements for the John Hart Replacement Project.³⁸ BC Hydro has not made any other commitments to First Nations with respect to changes in water diversions in the Campbell system watershed.³⁹
48. BC Hydro describes the scope of the Decommissioning Alternative as the minimum level of removal that would eliminate dam safety and environmental risks at the diversion dam and Patterson Creek flume, provide unimpeded fish movement, and ensure public and worker safety. BC Hydro is of the view that more extensive decommissioning, such as removing the portion of the canal that will remain under the Decommissioning Alternative or the civil works at the canal headworks, would significantly increase costs, but would not improve these results materially.⁴⁰ A pre-conceptual cost estimate for removing the canal was \$15 million, and BC Hydro has not estimated the cost of removing the civil works at the canal headworks.⁴¹
49. Under BC Hydro's proposed alternative BC Hydro will remain responsible for the structures that remain, and would continue to maintain them. This would require periodic inspection of the remaining portions of the canal, the headworks, the dam at the discharge pond, and the fencing adjacent to the canal. BC Hydro estimates that this will cost slightly less than \$20,000 annually or \$350,000 to \$400,000 in Net Present Value terms.⁴²
50. BC Hydro is unaware of any other potential legal restrictions regarding the proposed decommissioning of the Salmon River Diversion, except as otherwise noted.⁴³
51. The CEC submits that the decommissioning as proposed represents a viable alternative for consideration. The CEC submits it could also have been appropriate to consider the costs of complete removal of the canal and civil works as part of the public interest in decommissioning the Salmon River Diversion.
52. The CEC recommends that the Commission find the Cease operation and removal option to be appropriately scoped and a viable alternative for consideration.

³⁷ Exhibit B-3, BCUC 1.1.4

³⁸ Exhibit B-1, page 42

³⁹ Exhibit B-4, Bishop 1.9.0.1

⁴⁰ Exhibit B-4, CEC 1.11.1

⁴¹ Exhibit B-4, CEC 1.11.2

⁴² Exhibit B-4, CEC 1.11.3

⁴³ Exhibit B-3, BCUC 1.5.7

Rehabilitation Alternative

53. The rehabilitation alternative involves work to address the condition of the Dam and related dam safety risks, the design and possible relocation of the upstream fishway, the refurbishment or replacement of the downstream fish screen, rehabilitation of the Canal and Patterson Creek flume, and debris management and flow control at the Dam. Based on the condition of the Diversion, BC Hydro's Rehabilitation Alternative includes a Dam rebuild, replacement of upstream fishway, new downstream fish screen, canal improvements and new trashrack.⁴⁴
54. BC Hydro confirms that the Rehabilitation Alternative is feasible and viable to mitigate the concerns noted.⁴⁵ BC Hydro has responded to multiple information requests on the appropriateness of its considered designs.
55. As part of the Rehabilitation Alternative at the Salmon River facility, BC Hydro planned to replace the existing upstream fish passage with a new passage with automated gate operation and a redesign of the trash racks. This option was selected with input from FLNRO, DFO, and First Nations.⁴⁶
56. The new fish screen designs were vertically oriented with automated screen cleaning systems which are significantly different from the existing or modified existing screen. The Rehabilitation Alternative considered a variety of design flows for the Salmon River Diversion fish screen and canal, but improvements necessary to facilitate higher flows greater than 15 m³ /s were rejected due to the cost relative to incremental energy gains,⁴⁷ and uncertainty.⁴⁸ BC Hydro outlines these issues in several responses to information requests such as BCUC 1.3.11.⁴⁹
57. As part of the rehabilitation project, BC Hydro considered a variety of options for the fish screen. A new or modified fish screen capable of operating up to 30 m³ /s would satisfy the Comptroller's order. A new fish screen could be designed up to flows of 42.5 m³ /s (the maximum canal flow), but there was no certainty that a modified screen would meet current fish passage requirements even at 15 m³ /s.⁵⁰
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58. The scope of the rehabilitation alternative at the diversion dam could not be limited to simply replacing the surface timbers of the dam. The scope of this alternative was developed with the expectation that re-timbering would be required to a depth greater than 1 meter to achieve a 20-year life extension. A longer term life extension with a full replacement of the diversion dam was considered, but rejected due to cost.⁵¹

⁴⁴ Exhibit B-1, pages 27-28

⁴⁵ Exhibit B-4, Bishop 1.H.1,

⁴⁶ Exhibit B-3, BCUC 1.4.5

⁴⁷ Exhibit B-3, BCUC 1.3.8

⁴⁸ Exhibit B-3, BCUC 1.3.11

⁴⁹ Exhibit B-3, BCUC 1.3.8

⁵⁰ Exhibit B-3, BCUC 1.3.11

⁵¹ Exhibit B-3, BCUC 1.1.2.1

59. The CEC has reviewed the evidence with respect to the scope and appropriateness of the design elements of BC Hydro's Rehabilitation Alternative and finds it to be appropriate.
60. The CEC recommends that the Commission find the Rehabilitation alternative outlined by BC Hydro to represent a viable alternative and to be appropriately scoped.

Economic Assessment of the Alternatives

61. In BCUC 1.7.6 BC Hydro provides an economic assessment of each alternative with the conclusion being that there is limited cost differential between the two alternatives.
62. Under a 'With Rate Caps' scenario both the Decommissioning and Rehabilitation alternatives result in annual incremental increases over the fiscal 2020 to fiscal 2024 period of approximately 0.3%. Under a 'Without Rate Caps' scenario both the Decommissioning Alternative and the Rehabilitation Alternative are estimated to result in incremental annual rate increases for most years, through to F2024. The cumulative annual rate increase for the Decommissioning Alternative (0.03%) is estimated to be 0.02% lower than the Rehabilitation Alternative (0.05%).
63. The CEC has reviewed the analysis and submits it uses a reasonable set of assumptions. The CEC considers that the Updated Class 3 Alternatives provided in Exhibit B-3-2 would not have made a significant difference in these outcomes.

Decommissioning

64. BC Hydro originally provided an AACE Class 4 Cost Estimate for the Decommissioning Alternative⁵² and updated its estimate to a Class 3 estimate in Exhibit B-3-2. The CEC notes that the class 3 estimate is desired in a CPCN application and submits that this is the appropriate level of costing for this application.
65. BC Hydro identifies an expected cost of \$15.035 million in capital expenditures with an accuracy range of +20%/-15% (P50⁵³) (\$18 million to \$12.8 million).⁵⁴ Authorized costs are \$17.270 million.⁵⁵
66. For estimating purposes BC Hydro assumes annual inflation of 2 per cent.⁵⁶ In CEC 1.12.5 BC Hydro stated that feasibility-level estimate was prepared in early 2017, and the inflation line item is to reflect inflation from the time of the estimate to the time that the work is expected to be performed in summer and fall 2017.⁵⁷

⁵² Exhibit B-4, CEC 1.12.1.2

⁵³ Exhibit B-3-2, BCUC 1.9.1.1 page 10 of 58

⁵⁴ Exhibit B-3-2, BCUC 1.9.1.1

⁵⁵ Exhibit B-3-2, BCUC 1.9.1.1 page 15 of 58

⁵⁶ Exhibit B-4, CEC 1.12.5

⁵⁷ Exhibit B-4, CEC 1.12.5

67. The CEC submits that the inflation rate may be marginally high, but does not believe this would significantly impact the economic evaluation of the alternatives.

Rehabilitation Alternative

68. BC Hydro provides an estimated cost for the Rehabilitation Alternative of approximately \$35.361 million (expected, net of remissable portion) and \$39.070 (authorized, net of remissable portion).⁵⁸
69. BC Hydro also provides a PV analysis considering the value of diversion energy. BC Hydro's reference prices is based on market price forecasts for when BC Hydro is in surplus, and on the Long Run Marginal cost of firm, clean resources when BC Hydro is in energy deficit.⁵⁹
70. BC Hydro's Reference price for energy is \$72.4/MWh and is based on market price forecasts assuming BC Hydro remains in surplus until 2021 based on existing resources.⁶⁰ Under this scenario the levelized unit energy cost for the Rehabilitation Alternative is \$55.1/MWh (expected) and \$61.5/MWh (authorized).⁶¹ The Levelized Cost of Energy alternative includes operating costs in the order of about \$80,000 per year.⁶²
71. The energy has a PV of \$41.851 million. Adjusting for a Net Decommissioning Credit of \$9.262 million (the benefit of deferring decommissioning⁶³), there is a positive NPV of \$15.752 million (expected) and \$12.043 million (authorized).
72. BC Hydro also provides a Sensitivity Analysis using a Lower Comparator for the price of energy.
73. Under the Lower Comparator BC Hydro's Price for energy is \$45.2/MWh and is based on a longer period of energy surplus to fiscal 2033⁶⁴ based on existing and committed resources in its Load Resource Balance.
74. Under this scenario, the PV of the Salmon River Diversion energy is \$26.128 million. Adjusting for the Decommissioning Credit, there is a NPV of \$0.029 million (expected) and -\$3.680 million (authorized).

⁵⁸ Exhibit B-3-2 Attachment

⁵⁹ Exhibit B-1, page 22

⁶⁰ Exhibit B-1, page 22

⁶¹ Exhibit B-3-2 Attachment

⁶² Exhibit B-4, CEC 1.15.3.2

⁶³ Exhibit B-1, page 32

⁶⁴ Exhibit B-1, page 23

		Expected Costs		Authorized Costs	
a	Capital Cost of Rehabilitation ³³ (\$000s)	\$35,361		\$39,070	
b	Decommissioning Credit	(\$9,262)			
		Reference Price	Sensitivity Case	Reference Price	Sensitivity Case
c	Value of Energy (\$/MWh)	\$72	\$45	\$72	\$45
d	PV of Energy (\$000s)	\$41,851	\$26,128	\$41,851	\$26,128
e	NPV of Rehabilitation Project (\$000s) (d-(a+b))	\$15,752	\$29	\$12,043	(\$3,680)
f	Benefit Cost Ratio (d/(a+b))	1.60	1.00	1.40	0.88

65

75. The CEC inquired if BC Hydro would agree that the most likely comparison is to the longer period of surplus.⁶⁶ BC Hydro believes both the Reference Price and the Lower Price comparator should be considered.

76. BC Hydro confirms that it intends to fulfill its 'Planned Resources' as described in its current load resource balances.⁶⁷ BC Hydro provides its Load Resource Balance After Planned Resources in BCUC 1.7.5 Attachment.

Table 3-8 Energy Load Resource Balance after Planned Resources

Category	F2017	F2018	F2019	F2020	F2021	F2022	F2023	F2024	F2025	F2026	F2027	F2028	F2029	F2030	F2031	F2032	F2033	F2034	F2035	F2036
Existing and Committed Major Resources																				
Hydro Resources (including SBC)	30	45,445	45,806	46,014	46,201	46,411	46,411	46,411	46,657	52,365	53,777	53,777	53,777	53,777	53,777	53,777	53,777	53,777	53,777	53,777
Existing and Committed PV Resources	35	13,252	14,061	14,457	14,856	14,756	13,424	13,620	13,400	12,506	12,300	12,075	11,500	10,913	10,351	10,256	10,256	10,106	9,568	8,201
Future Availability Resources																				
PV Renewals	51	254	369	647	775	936	1,114	1,349	1,626	1,961	2,352	2,229	2,417	3,325	3,798	3,525	3,865	4,011	4,549	5,615
Operating Off-System Resources	52	57	173	284	304	505	578	726	857	948	1,028	1,109	1,280	1,300	1,507	1,512	1,722	1,833	1,934	2,045
Residuals	53	129	321	742	937	1,172	1,441	1,730	2,015	2,406	2,809	2,117	3,416	3,323	4,745	6,315	6,406	5,512	5,970	6,500
Total Supply (Operational View)**	138	61,825	61,927	63,215	63,919	65,063	68,806	70,826	72,754	80,185	82,244	82,271	89,493	92,334	93,444	99,136	99,444	99,136	99,136	99,136
Operational System Total Demand Requirements																				
2019 May Mid Load Forecast Before DSM*	48,534	49,013	49,473	49,973	50,303	49,615	48,836	48,008	47,110	46,213	45,267	43,256	41,222	37,236	33,174	29,425	25,462	22,399	22,215	18,081
Operating INU Load	45	148	149	252	31,226	22,220	22,221	22,248	22,248	22,248	22,248	22,248	22,248	22,248	22,248	22,248	22,248	22,248	22,248	22,248
Total Demand	48,579	49,161	49,622	50,225	51,529	51,835	51,064	50,256	49,358	48,463	47,515	45,504	43,470	39,484	35,422	31,673	27,710	24,643	24,463	20,162
Capacity and Committed Demand Side Management & Other Resources																				
SM Therapeutic	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53
Voltage and VAR Optimization	57	152	171	185	210	240	254	250	253	268	280	293	293	296	300	310	315	320	325	331
2019 DSM Pilot PV Savings	85	910	933	940	935	925	923	917	912	885	853	855	848	844	827	770	760	756	757	731
Operational Demand Side Management Resources																				
2019 DSM Pilot PV Savings	85	910	933	940	935	925	923	917	912	885	853	855	848	844	827	770	760	756	757	731
2019 DSM Pilot PV Savings	5	0	0	252	304	4,554	4,967	2,312	2,827	2,346	2,222	2,540	2,736	4,306	4,348	4,475	4,620	4,656	5,110	4,976
2019 DSM Pilot PV Savings	5	0	0	252	304	4,554	4,967	2,312	2,827	2,346	2,222	2,540	2,736	4,306	4,348	4,475	4,620	4,656	5,110	4,976
Total Demand	138	61,825	61,927	63,215	63,919	65,063	68,806	70,826	72,754	80,185	82,244	82,271	89,493	92,334	93,444	99,136	99,444	99,136	99,136	
Surplus (Deficit as % of Net Load (Operational View)**	0%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Surplus (Deficit as % of Net Load (Planning View)**	0%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Small Gas Supply (GWh) (Operational View)**	2,298	1,457	1,536	1,544	1,572	1,600	1,628	1,656	1,684	1,712	1,740	1,768	1,796	1,824	1,852	1,880	1,908	1,936	1,964	1,992
Operating Reserves (GWh) (Operational View)**	2,550	2,035	1,917	1,750	1,591	1,432	1,273	1,114	955	796	637	478	319	160	0	0	0	0	0	0

BC Hydro Salmon River Division
Ceasing of Operations Applications

BCUC IR 1.7.5

⁶⁵ BC Hydro Final Submission page 13
⁶⁶ Exhibit B-4, CEC 1.7.5.1
⁶⁷ Exhibit B-4, CEC 1.7.5

77. The CEC submits that at a minimum the appropriate reference price should consider all the resources that BC Hydro intends to fulfil, meaning that BC Hydro will stay in surplus until well into the 2030s.
78. The CEC submits that indeed the Load Resource Balance After Planned Resources may well be overly optimistic as BC Hydro's forecasting has been shown to be consistently high, and LNG load may not materialize as anticipated.
79. The CEC considers that it is likely that BC Hydro will continue in a long period of surplus, which could extend beyond 2034.
80. The CEC submits that the appropriate reference price for the Alternative is the sensitivity price of \$45.2/MWh, or even lower, and that the Rehabilitation Alternative should be considered as having a marginal NPV.
81. The CEC recommends that the Commission weigh heavily the economic evidence based on the lower price comparator of \$45.2 when making its economic assessment of the options.
82. In addition to its PV analysis, BC Hydro points out that the benefit to cost ratio illustrates a minor benefit relative to overall costs. They argue that when considering the scale of the NPV results, the sensitivity to prevailing market conditions and the range of capital estimates for substantive rehabilitation works, the economic comparison of alternatives on an NPV basis is a relatively weak factor in determining the preferred alternative.
83. The CEC agrees that there could be a significant range in the capital estimates and submits that it is also reasonable to consider the direct need for increased expenditures to retain supply when BC Hydro is facing the possibility of an extended period of surpluses.
84. The CEC recommends that the Commission find that the Decommissioning Alternative has an expected cost of -\$15.035 million. The Rehabilitation has an expected NPV of -\$35,361 million NPV plus the NPV of the energy provided of \$26,128 giving a net NPV of -\$9,233 million for the rehabilitation itself minus, \$5,773 million for the future cost of decommissioning, making the total NPV of this alternative -\$15,006. This makes a cost difference between the two alternatives nil.

Non-Economic Assessment of the Alternatives

85. BC Hydro has also considered a number of non-economic factors in assessing the alternatives, including safety, environmental impacts, social impacts, stakeholder and First Nation interests.⁶⁸ BC Hydro does normally consider the social and ecological benefits of the alternatives under consideration,⁶⁹ however, BC Hydro does not quantify or "score" ecological and social impacts for

⁶⁸ BC Hydro Final Submissions page 15

⁶⁹ Exhibit B-4, CEC 1.2.1

its projects.⁷⁰ BC Hydro believes that given that the Rehabilitation Alternative is only marginally economic, and may be uneconomic depending on assumptions of the value of energy, the ecological and social differences between it and Decommissioning Alternative factor more heavily in the decision-making process.⁷¹

86. The CEC agrees that given the marginal economic differences between the two alternatives it may be reasonable for the Commission to weight the ecological and social differences more heavily than might otherwise be appropriate.
87. BC Hydro considers the Decommissioning Alternative as the most environmentally friendly option available to BC Hydro for the Salmon River Diversion. Removal will provide a naturalized stream bed for both upstream and downstream fish movement, improve fish access to high quality spawning and rearing habitat, restore the natural river processes for gravel recruitment, and eliminate an inter-basin water diversion. BC Hydro states that none of these objectives would be as fully realized in the Rehabilitation Alternative.⁷² Removal of the diversion dam is not expected to have any adverse fish impacts. Decommissioning work will be taking place during the instream window and a mechanism for fish passage will be maintained during decommissioning.⁷³
88. Roy Bishop states in his Information Request that under the Decommissioning Alternative less water will be available for salmon rearing in the Campbell River downstream of John Hart. BC Hydro acknowledges that diversion from Salmon River contributes to water storage on the Campbell River system and, therefore, provides an incremental benefit to flow management on the Campbell River system. BC Hydro states that the benefit is difficult to quantify and given that the Salmon River Basin and the Campbell River Basin have similar climatic conditions the benefit in low flow years, when it would be most valuable, will be minimal.⁷⁴
89. It is not possible to determine the historical impact of the Salmon River Diversion on fish populations.⁷⁵ The estimated impact on fish populations of removing the Diversion, and a comparison to fish populations in other nearby rivers on Vancouver Island, is included in BC Hydro's response to BCUC IR 1.15.3.1.
90. Additionally, the Rehabilitation Alternative does not meet some stakeholders' and First Nations' preference to return the Salmon River to its natural state.⁷⁶ Rehabilitation of the Diversion would perpetuate a physical obstruction to fish passage in the Salmon River.⁷⁷

⁷⁰ Exhibit B-4, CEC 1.2.2

⁷¹ Exhibit B-4, CEC 1.2.1

⁷² Exhibit B-4, CEC 1.5.1

⁷³ Exhibit B-4, CEC 1.10.2

⁷⁴ Exhibit B-4, Bishop 1.H.5,

⁷⁵ Exhibit B-4, CEC 1.10.3

⁷⁶ Exhibit B-4, CEC 1.2.1

⁷⁷ BC Hydro Final Submissions page 16

91. The CEC submits that the evidence is that the Rehabilitation Alternative does not provide any relatively better environmental or other considerations for the Commission to weigh in its assessment.

Stakeholder Considerations

92. BC Hydro states that ‘interested parties, government agencies, community stakeholders and First Nations, all recognize that fish passage and protection are best facilitated by removing of the Dam and allowing the river its natural channel. Letters of support from governmental agencies, community groups and First Nations evidence this view. The broad support for the Project enhances BC Hydro reputation and social licence to operate facilities throughout the Campbell River System’.⁷⁸ The CEC notes however that the support does not appear to be unanimous in that interveners in this proceeding such as Roy Bishop would appear to be opposed to the Decommissioning.
93. The CEC acknowledges that there appears to be broad public support from several stakeholders for the decommissioning of the dam and submits that this is an important consideration, particularly given the relatively minor economic difference between the two options.
94. The CEC recommends that the Commission apply moderate weight to the stakeholder support.

Energy Replacement

95. Of the 835 GWh/year of energy attributed to the John Hart Facility⁷⁹ the Salmon River Diversion Dam contributes 46 GWh energy⁸⁰ and no capacity.⁸¹ In BCUC 1.13.1 Attachment 1, BC Hydro provides its response to Clean Energy Association of BC in the Revenue Requirements Application, which states that the diversion represents annual revenues of \$3.9 million.⁸²
96. BC Hydro argues that the anticipated energy lost by the Project is substantially ‘offset’ by efficiency improvements being implemented at the John Hart Generating Station. BC Hydro has obtained higher efficiency at the redeveloped John Hart Generating station than previously anticipated for the John Hart Generating Station Replacement Project.⁸³ BC Hydro however confirms that the efficiency upgrades will be implemented and are unrelated to the cessation of operations at the Salmon River Diversion.⁸⁴ They confirm that, accordingly, that the Salmon River Diversion energy decommissioning represents a net loss of 46GWh.⁸⁵

⁷⁸ BC Hydro Final Submission, page 16

⁷⁹ Exhibit B-4, Bishop, 1.40.5

⁸⁰ Exhibit B-3, BCUC 1.7.6

⁸¹ Exhibit B-1, page 22

⁸² Exhibit B-3, BCUC 1.13.1 Attachment 1, BC Hydro Revenue Requirements Response to Clean Energy Association IR 1.16.4

⁸³ Exhibit B-1, page 22

⁸⁴ Exhibit B-4, CEC 1.1.1

⁸⁵ Exhibit B-4, CEC 1.1.1.1

97. The CEC notes that the levelized cost of energy of the Salmon River Diversion is \$55.1/MWh (expected) and \$61.5/MWh (authorized)⁸⁶ which is significantly below that anticipated in the John Hart Dam Seismic Upgrade.⁸⁷ However, a proper evaluation of the Salmon River Diversion energy would be its cost (\$55.1/MWh) less its value in the market (\$35) because it is surplus, leaving a value of \$-20/MWh. This can be compared to the value of this energy in the future when it might be needed, of a Long Run Marginal cost of \$85/MWh discounted to a PV of approximately \$20/MWh. Consequently retaining the Salmon River Diversion energy is of no value to BC Hydro for future requirements.
98. The 2013 Integrated Resource Plan sets out BC Hydro's acquisition plan which assumes that the energy contribution of 46 GWh from the Salmon River Diversion is available over the planning horizon.⁸⁸ BC Hydro however affirms that no energy would be acquired to offset the energy loss from ceasing operations.⁸⁹
99. BC Hydro points out that removing the Salmon River's 46 GWh energy contribution from the system Load Resource Balance does not affect BC Hydro's plans for energy procurement prior to F2034 so until that time there is no need to 'replace' that energy. In F2034 and after, BC Hydro will need to acquire additional resources. When those resources are needed, the energy no longer contributed by the Salmon River Diversion will not be directly replaced, in the sense that BC Hydro will not procure a specific 46 GWh resource in its place; instead, BC Hydro will assess the Load Resource Balance at the time and acquire energy and capacity as required.
100. BC Hydro also notes that it is constantly maintaining its facilities and improving them where it is cost-effective to do so. When improvements are made to generating equipment they often allow increases in energy or capacity over time, as is seen by the efficiency improvements at the John Hart Replacement Project. None of these will be direct 'replacements' for the foregone Salmon River Diversion energy, but they will occur all the same.⁹⁰
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101. In this application the evidence is that no incremental energy will be acquired to replace the energy from the Salmon River Diversion. The CEC notes that new energy is not anticipated until F2034, and that indeed this could be considerably extended if BC Hydro's forecast is lower than anticipated. The Salmon River Rehabilitation Alternative would only provide another 20 years of energy before it requires decommissioning. Finally, the CEC recognizes that there is an additional capital cost to rehabilitate the Salmon River Diversion which the CEC submits should not be spent under the considerable surplus circumstances experienced in the BC Hydro system.
102. The CEC recommends that the Commission give very little weight to the issue of replacing the Salmon River Diversion energy.

⁸⁶ Exhibit B-3-2 Attachment

⁸⁷ Exhibit B-3, BCUC 1.13.1 Attachment 1, Clean Energy Association 2.40.1

⁸⁸ Exhibit B-3, BCUC 1. 7.5

⁸⁹ BC Hydro Final Submission page 14, SEE also CEC 1.1.1.2

⁹⁰ Exhibit B-4, CEC 1.1.1.2

Recommendation

103. Given the marginal difference in the economics of the two options, the CEC agrees with BC Hydro that the Commission should give considerable weight to the non-economic factors of the two options. The CEC agrees that Decommissioning with Removal Alternative provides more of these benefits than the Rehabilitation Alternative.
104. The CEC recommends that the Commission approve the application for decommissioning as filed by the authority.

Regulatory Account Treatment

105. BC Hydro proposes that the costs from project would be eligible for, and appropriately placed, in a 'Dismantling Cost Regulatory Account' (DCRA) deferral account.⁹¹ The forecast account balance at the end of the test period would be recovered over the next test period. Interest would be applied to balances in the account consistent with the application of interest to other variance accounts, based on BC Hydro's current weighted average cost of debt.⁹²
106. The CEC has no objection to establishing a Dismantling Cost Regulatory Account and is satisfied that costs from this project are appropriately recovered over the next test period.
107. In the event that the account is denied, BC Hydro proposes to place the costs into the Heritage Deferral Account. BC Hydro outlines benefits of utilizing an existing account in BCUC 1.19.6. BC Hydro expects that its ability to meet the objectives of the 2013 10 Year Rates Plan would not be different if the cease operations and removal costs are recorded in the Dismantling Cost Regulatory Account as opposed to the Heritage Deferral Account⁹³ as outlined in BCOAPO 1.14.2.
108. The CEC notes that the Salmon River Diversion is not a 'heritage asset'. This definition influences the prohibitions on ceasing operations as outlined in the *Clean Energy Act* and discussed above.⁹⁴ The CEC submits that accordingly, the Heritage Deferral Account may not be the appropriate deferral account.
109. BC Hydro would not be opposed to a directive from the Commission to defer the costs incurred for the Decommissioning Alternative to the Non-Heritage Deferral Account or to a separate regulatory account for this purpose.⁹⁵

⁹¹ Exhibit B-1, page 37

⁹² Exhibit B-3, BCUC 1.19.6

⁹³ Exhibit B-4, BCOAPO 1.14.2

⁹⁴ BC Hydro Final Submissions page 18

⁹⁵ Exhibit B-3, BCUC 1.19.6

110. The CEC recommends that the Commission apply the costs to the DCRA if the DCRA is approved, and to the Non-Heritage Deferral Account if the DCRA is not approved.

ALL OF WHICH IS RESPECTFULLY SUBMITTED.

David Craig

David Craig, Consultant for the Commercial Energy Consumers Association of British Columbia



Christopher P. Weafer, Counsel for the Commercial Energy Consumers Association of British Columbia