Fred James
Chief Regulatory Officer
Phone: 604-623-4046
Fax: 604-623-4407
bchydroregulatorygroup@bchydro.com

April 1, 2020

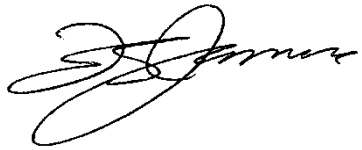
Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

RE: Project No. 1599053
British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Transmission Service Market Reference-Priced Rates Application – Freshet Rate Component
Written Final Argument

BC Hydro writes in compliance with BCUC Order No. G-49-20 to provide its Written Final Argument.

Yours sincerely,



Fred James
Chief Regulatory Officer

jc/ma

Enclosure

BC Hydro
Power smart

Transmission Service Market Reference-Priced Rates Application

Counsel's Final Written Submission on behalf of British Columbia Hydro and Power Authority

April 1, 2020

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1 Introduction

1. The British Columbia Hydro and Power Authority (**BC Hydro**) on October 31, 2019 submitted an Application to the British Columbia Utilities Commission (**BCUC**) requesting approval of:

    - The Freshet Rate (Rate Schedule 1892), and
    - The Incremental Energy Rate Pilot (Rate Schedule 1893).

2. Pursuant to Order No. G-300-19 the BCUC approved Rate Schedule (**RS**) 1893 effective January 1, 2020 on an interim and non-refundable basis, until further order of the BCUC.

3. Pursuant to Order Nos. G-327-19 and G-49-20, the BCUC determined that the RS 1892 component of the Application will be considered separately from any further consideration of RS 1893, and due to concerns regarding COVID-19 and in consideration of participants' safety, the RS 1892 component of the Application will be reviewed through a written process.

4. Accordingly, this Final Submission addresses BC Hydro's requests of the BCUC in relation to RS 1892 – the Freshet Rate only.

5. BC Hydro has been offering service under RS 1892 for the freshet periods of 2016 to 2019, on a pilot basis. BC Hydro has submitted an evaluation report for each year of the Pilot, together with a Final Evaluation Report.

6. BC Hydro has consulted extensively with its transmission service customers and the Association of Major Power Customers (**AMPC**), who support RS 1892 being offered on an ongoing basis.

7. In this Application, BC Hydro requests approval to make RS 1892 available on an ongoing basis, commencing April 1, 2020 and with no fixed termination date. The Freshet Rate proposed for approval on an ongoing basis is substantially

the same as the rate that was in place during the pilot period, the only exceptions being certain minor amendments (generally in the nature of house keeping), which are reviewed in sections 4.2 and 4.3 of the Application. A black-lined version of RS 1892 showing these amendments is provided in Appendix B of the Application.

8. BC Hydro has enrolled 24 customers for the 2020 freshet period on the assumption that the BCUC will issue its Order in regards to RS 1892 prior to May 1, 2020.

9. Pursuant to Directive 2 of Order No. G-49-20, the BCUC requested BC Hydro and interveners to also comment, in their written submissions, in relation to the scenario where the BCUC does not reach a decision on the Freshet Rate component of the Application before May 1, 2020. This item is addressed in section 5 of this submission.

2 Submission regarding the Freshet Rate

2.1 Impetus for the Freshet Rate

10. The Freshet Rate arose from the 2013 Industrial Electricity Policy Review (**2013 IEPR**) and BC Hydro's 2015 Rate Design Application (**2015 RDA**) to the BCUC:

    - In 2013 the Government of British Columbia appointed a task force to review the industrial electricity policy and regulatory framework in the province. The 2013 IEPR taskforce completed extensive consultation with stakeholders and made several recommendations, including:[1]

[1] Refer to: https://www2.gov.bc.ca/gov/content/industry/electricity--alternative--energy/electricity/electricity--business/industrial--electricity--policy--review.

- BC Hydro should work with its industrial customers and the BCUC to develop options that take advantage of industrial power consumption flexibility; and
- Innovative rate options should be developed for industrial customers and to recover what BC Hydro would otherwise obtain on the export market, but with potential economic benefits to British Columbia.

- Following the recommendation of the 2013 IEPR task force and further extensive consultation with stakeholders, as part of its 2015 RDA BC Hydro requested the BCUC to approve RS 1892 – the Freshet Rate, on a pilot basis, for the freshet periods of 2016 and 2017.[2] The pilot was subsequently extended for the freshet periods of 2018 and 2019, with BCUC approval.

11. BC Hydro has been offering service under RS 1892 – the Freshet Rate on a pilot basis for the freshet periods (commencing May 1 and ending July 31) of 2016, 2017, 2018 and 2019. The rate terminated on December 31, 2019 in accordance with Directive 1 of Order No. G-106-19. Directive 4 of Order No. G-106-19 directed BC Hydro to submit an application for a permanent Freshet Rate, and by Order No. G-224-19 the BCUC directed that such application be filed by October 31, 2019.

12. This Application accordingly requests approval to make RS 1892 available on an ongoing basis, commencing April 1, 2020 and with no fixed termination date.

2.2 The Benefits of the Freshet Rate

13. The freshet is the annual period in the late spring/early summer when there are high inflows into the hydroelectric system due to snowmelt and rainfall. Roughly

[2] The BCUC conducted a streamlined review process into the Freshet Rate proposal, and approved the Freshet Rate for an initial two-year pilot period pursuant to Order No. G-17-16.

50 per cent of the total annual system inflow occurs during the freshet period.[3] Freshet inflows typically start in May, peak in June and recede in July.

14. BC Hydro has a recurring seasonal energy surplus during freshet periods caused by the high system inflows associated with snow melt and rain, must-take generation (e.g., from non-storage, run-of-river hydroelectric projects) and low domestic load. These conditions collectively limit BC Hydro's operational flexibility; that is, during freshet periods BC Hydro is limited in its ability to import electricity from the market, through purchases from Powerex, when prices are low (or negative). As a result of these limitations, BC Hydro may be forced to make Surplus Sales when market prices are very low, and BC Hydro may have to spill to avoid paying negative prices.[4]

15. Service under the Freshet Rate both supports the 2013 IEPR recommendations noted above, and assists in the management of the freshet energy surplus by encouraging incremental energy consumption during the freshet period.

2.2.1 Benefits to Participating Customers

16. The Freshet Rate is available to BC Hydro industrial customers taking service under RS 1823 – the Transmission Service Stepped Rate or RS 1828 – the Transmission Service Biomass Energy Program.

17. Approximately 30 per cent of eligible customers, across a broad range of industries and locations across the province, participated in the Freshet Rate pilot.[5] Participating customers took the following actions in response to the opportunity of lower unit electricity costs under the Freshet Rate:

    - Utilized idle production capacity (e.g., ran equipment harder, added an operating shift);

[3] Application, Appendix D, page 175 of 296

[4] Application, Appendix D, sections 3.1 and 3,2 of Preliminary Evaluation Report for Year 1, Appendix D (pages 180 to 182 of 296)

[5] Exhibit B-6, the response to BCUC Pre-filed Question 1.0 for SRP.

- Shifted production to B.C. plants from other jurisdictions;
- Optimized production (e.g., made more energy intensive, higher value product grades);[6] and
- Turned down on-site electricity self-generation (e.g., by reducing natural gas consumption for electricity generation).

18. Participant customers provided feedback that the rate was effective in providing a price signal to use more electricity. In short, participating customers ran harder, made more product and made higher value products. These actions benefit the individual customers, their employees and the province generally.

2.2.2 Benefits to BC Hydro System Operations

19. In addition to the economic benefits to British Columbia of increased industrial production, domestic energy sales increased by a total of 569 GWh over the four freshet periods of the pilot. Increased domestic energy consumption during freshet periods reduces the volume of forced Surplus Sales, reduces the risk of spill at BC Hydro facilities and helps to optimize the value of system marginal resources.

20. Offering RS 1892 has therefore successfully assisted in the management of energy surplus during the freshet period by encouraging additional domestic load during freshet periods. This is not to say that RS 1892 service will consume the entire freshet energy surplus. In average water conditions, BC Hydro has a significant energy surplus that will not be significantly affected by the volumes of energy sales under the Freshet Rate. RS 1892 service has contributed positively by helping to absorb some of this surplus while also providing benefits for participant customers and ratepayers.

[6] Incremental load served under RS 1892 does not incur demand charges, allowing participating customers to further achieve higher uptime and optimization without setting a demand ratchet.

2.2.3 Benefits to Ratepayers

21. BC Hydro has evaluated the financial benefit to all ratepayers of offering RS 1892. The Final Evaluation Report dated December 2018 (covering 2016, 2017 and 2018) is provided in Appendix D of the Application, and the Evaluation Report for Year 4 (2019) is provided in Appendix E.

22. The ratepayer impact analysis is complex and involves the making of several key assumptions.

23. BC Hydro's analysis methodology[7] represents an after-the-fact, historical assessment of the marginal resource deemed to serve incremental RS 1892 energy volumes during the high load hour (**HLH**) and low load hour (**LLH**) periods each day of the freshet period. Importantly, in operations, service of RS 1892 load is not distinguished from service of all other customer load. That is, BC Hydro does not attribute imports, exports or use of its generation resources to serve any particular load or rate schedule service. BC Hydro only assessed the use of imports or exports with respect to the financial impacts of RS 1892 in its after-the-fact rate impact evaluation.[8] For the purpose of the evaluation, BC Hydro determined, for each day, the marginal resource condition deemed to serve incremental RS 1892 load. This condition was then paired with the net daily volume of RS 1892 load and the applicable daily pricing to calculate the corresponding economic impact, as follows:

- **Condition 1: Minimum Generation with forced export** – During periods when BC Hydro experienced a minimum generation constraint and net exports were forced to avoid spill, energy supplied under RS 1892 is deemed in the analysis to reduce forced exports. When Condition 1 is in effect, energy supplied under RS 1892 is deemed in the

[7] Refer to BC Hydro's Final Evaluation Report (Appendix D of the Application) for a more detailed description of the methodology.

[8] Exhibit B-6, the response to BCUC Pre-filed Question 4.0 for SRP.

analysis to provide an economic benefit to all ratepayers of approximately $10/MWh.

- **Condition 2: Minimum generation with economic import** – During periods when BC Hydro experienced a minimum generation constraint while importing on an economic basis, energy supplied under RS 1892 is deemed in the analysis to be served from market imports (Mid-C). When Condition 2 is in effect, energy supplied under RS 1892 is deemed in the analysis to result in economic loss to all ratepayers of approximately $4/MWh, if the market price is positive. On any day when the market price is negative, the deemed revenue loss is reduced by the difference between the actual market price and the $0/MWh floor price of RS 1892.[9] For example, if the market price was -$5/MWh during Condition 2, energy supplied under RS 1892 is deemed in the analysis to provide a benefit to all ratepayers of approximately $1/MWh.
- **Condition 3: Basin generation (system)** – During periods when BC Hydro is not on a minimum generation constraint, energy supplied under RS 1892 is deemed in the analysis to be served from BC Hydro's generation system resources. When Condition 3 is in effect, the difference between the value of actual RS 1892 energy sales and BC Hydro's System Marginal Value is used in the analysis to determine the deemed revenue gain or loss on that day.

24. The table below (Table 5 from page 16 of Appendix E of the Application) shows the deemed ratepayer impact by month for each of the three marginal resource conditions for each of the freshet periods of the pilot.

[9] As noted in Exhibit B-7, response to BCUC Staff IR 2.C, over the four years of the RS 1892 pilot, approximately 8 per cent of the price periods (where a price period refers to a period of heavy load hours or light load hours) had negative prices.

Table 5 RS 1892 Monthly Ratepayer Impact by Marginal Resource for Years 1 - 4

Year 1 (2016)	Forced Export	Market Import	System Basin	Revenue gain (loss)
May	$ 61	$ (6)	$ 481	$ 536
June	$ -	$ -	$ 806	$ 806
July	$ -	$ -	$ 917	$ 917
	$ 61	**$ (6)**	**$ 2,204**	**$ 2,259**
Year 2 (2017)	**Forced Export**	**Market Import**	**System Basin**	**Revenue gain (loss)**
May	$ 56	$ (93)	$ 424	$ 387
June	$ 117	$ (55)	$ 402	$ 464
July	$ 38	$ -	$ 1,305	$ 1,343
	$ 211	**$ (148)**	**$ 2,131**	**$ 2,194**
Year 3 (2018)	**Forced Export**	**Market Import**	**System Basin**	**Revenue gain (loss)**
May	$ 205	$ (78)	$ -	$ 127
June	$ 170	$ (77)	$ 50	$ 143
July	$ 65	$ (4)	$ 1,541	$ 1,602
	$ 440	**$ (159)**	**$ 1,591**	**$ 1,872**
Year 4 (2019)	**Forced Export**	**Market Import**	**System Basin**	**Revenue gain (loss)**
May	$ 45	$ (107)	$ (275)	$ (337)
June	$ 65	$ (91)	$ (55)	$ (81)
July	$ -	$ (94)	$ (31)	$ (125)
	$ 110	**$ (292)**	**$ (361)**	**$ (543)**
Totals	**$ 822**	**$ (605)**	**$ 5,565**	**$ 5,782**

25. As can be readily observed in the table above, when Condition 1 was in effect there was consistently net benefit to ratepayers across all freshet periods of the pilot; when Condition 2 was in effect there was consistently net loss to ratepayers across all freshets; and when Condition 3 was in effect there was net benefit to ratepayers in all freshets of the pilot except for 2019 in which there was net loss.[10]

[10] In Years 1 to 3, the System Marginal Value was on average lower than the Mid-C price plus the $3 adder, but in Year 4 the System Marginal Value was on average higher than the Mid-C price plus the adder. Exhibit B-8, response to CEABC IR 2.9.5.

26. A question therefore might be whether the ratepayer impact performance of RS 1892 across the four years of the pilot in aggregate, or in any one year of the pilot, is indicative of future results. Addressing this question involves consideration of whether the conditions in each year were within the range of 'typical' conditions while acknowledging that the historical range of conditions is quite broad.[11]

27. With respect to inflow conditions, BC Hydro's evidence confirms that,

    - Years 2016, 2017 and 2018 had annual inflows within +/- 10 per cent of average;[12]
    - Year 2019 had annual inflows at least 10 per cent lower (drier) than average;[13] and
    - Inflow conditions experienced in each of the four years of the pilot are likely to be within the range of inflow conditions observed going forward in the near and medium term.[14]

28. The weak freshet in 2019 resulted in lower must-run generation from non-storage hydro resources, reducing BC Hydro's freshet energy surplus and therefore, (i) reducing BC Hydro's Surplus Sales, and (ii) allowing BC Hydro to increase purchases from Powerex during the lowest and negative priced periods.[15] The impacts under Conditions 1 and 2 of the 2019 freshet are apparent in the table above.

29. In addition to 2019 being a significantly drier than average year, there were also abnormal conditions in energy markets. The Enbridge Gas Pipeline explosion and related gas pipeline constraints through 2019 reduced the availability of

[11] Exhibit B-5, the response to BCOAPO IR 1.29.2 and Exhibit B-6, the response to BCUC Pre filed Question 7.0 for SRP.

[12] Exhibit B-6, the response to BCUC Pre-filed Question 7.0 for SRP.

[13] *Ibid*.

[14] Exhibit B-6, the response to BCUC Pre-filed Question 8.0 for SRP.

[15] Application, Appendix C, Evaluation Report for Year 4, section 1.8.4, pages 17 to 18.

gas (and increased its price) for gas-fired electricity generation reducing power market depth and increasing market prices, all of which resulted in BC Hydro relying more on its generation system resources, putting strong downward pressure on BC Hydro system storage.[16] The combination of the low storage levels prior to, and low inflows during, the freshet contributed to System Marginal Values for the 2019 freshet period being significantly higher (e.g., approximately double) relative to the 2018 freshet period.[17] The impact under Condition 3 of the 2019 freshet is also apparent in the table above.

30. BC Hydro considers the design elements and special conditions of RS 1892 as applied-for to be sufficient for the freshet energy service to provide benefits to ratepayers and manage the risk of deemed economic losses over the entire freshet period and over multiple freshet periods:[18]

    - The firm service rates (RS 1823 or RS 1828) applicable to the baseline level of service in the absence of RS 1892 recover the fixed and variable costs of the firm service provided to these customers;[19]
    - RS 1892 is a non-firm service meaning that BC Hydro may refuse service in circumstances where BC Hydro does not have sufficient energy or capacity. Further, BC Hydro is not obliged to construct a System Reinforcement to serve this incremental load, nor is the load included in BC Hydro's load forecasts;[20]
    - The $3/MWh energy charge adder and $0/MWh energy price floor mean that the service provides an economic benefit to ratepayers under

16 Application, Appendix E, page 17. Exhibit B-7, response to BCUC Staff IR 2.K.

17 Application, Appendix E, page 20 of 21.

18 Exhibit B-6, the response to BCUC Pre-filed Question 4.0 for SRP.

19 Application, Table 5 Freshet Rate Bonbright Assessment, page 56, indicates under 6. Recovery of the Revenue Requirement, for RS 1823 and RS 1828 baseline load, there is stable recovery of the revenue requirement.

20 Exhibit B-8, the response to BCOAPO IR 2.42.1.

Condition 1, manages the deemed economic loss under Condition 2 and provides a benefit under Condition 3 in most expected scenarios;[21]

- Special Condition 2 of RS 1892 provides BC Hydro with the basis to deny service if the customer is not able to describe the operational and/or production changes that will result in incremental energy consumption which mitigates load shifting risk;[22] and
- Any adjustments to customer baselines for the purposes of RS 1892 are subject to BCUC review and approval.[23]

31. The result is that RS 1892 service is expected to provide ratepayer benefit across most individual freshet periods, and over multiple years.[24] BC Hydro has clearly demonstrated that RS 1892 has provided ratepayer benefits over the Pilot period. BC Hydro's view is that RS 1892 should not be changed solely because for a specific hour or day the provision of RS 1892 might result in a deemed economic loss.

32. For the reasons set out in the responses to BCUC Pre-filed Questions 2.0 and 5.0 for SRP,[25] BC Hydro does not support adding a requirement to curtail RS 1892 service on a short term basis or to suspend service for an entire freshet period for economic reasons. Modeling, analysis and consultation has not been conducted regarding the potential benefits, costs and risk of such requirements, and there is no evidence demonstrating that such requirements would provide a net benefit overall.

33. BC Hydro considers that the proposed RS 1892 reflects a balanced approach to risk as between ratepayers and participant customers. BC Hydro considers

21 Exhibit B-6, the response to BCUC Pre-filed Questions 4.0 and 7.0 for SRP.

22 Exhibit B--8, the response to BCOAPO IR 2.49.1.

23 Application, Appendix B, RS 1892 – Transmission Service – Freshet Energy, Special Condition No. 4, page 6 of 18.

24 Exhibit B-6, the response to BCUC Pre-filed Question 7.0 for SRP.

25 Exhibit B-6.

that the transfer of additional risk to participant customers, such as through the inclusion of economic interruption or suspension criteria, will reduce the attractiveness of RS 1892. This in turn, may lead to reduced participation which would diminish the proven effectiveness of RS 1892 to help manage the freshet period surplus and provide participant and ratepayer benefits.[26]

3 Further Evaluation of RS 1892

34. An area of interest in the proceeding was when BC Hydro should next re-evaluate the performance of RS 1892.

35. BC Hydro's position is stated in its response to BCUC Pre-filed Question 8.0 for the Streamlined Review Process (SRP). BC Hydro submits that a review in ten years time is a reasonable approach considering regulatory efficiency, ratepayer risk, and customer experience.

36. Undertaking more frequent reviews of the Freshet Rate will result in costs that will have to be recovered from ratepayers.[27] A review in ten years is a reasonable period of time, given that BC Hydro's energy surplus in a planning view is expected to last at least ten years.

37. Additionally, BC Hydro's expectation is that conditions over the near to medium term are likely to fall within the range of conditions that were observed and evaluated over the past four years. As such, conducting ongoing analysis of the economic impacts of RS 1892 in the coming years is not expected to meaningfully expand the evidence and information on ratepayer economic impacts of RS 1892.[28]

[26] Exhibit B-6, the response to BCUC Pre-filed Question 2.0 for SRP.
[27] Roughly estimated at $100,000. Exhibit B-7, the response to BCUC Staff IR 2.O.
[28] Exhibit B-7, the response to BCUC Staff IR 2.N.

4 Conclusion

38. BC Hydro submits that making RS 1892 available on an ongoing basis, will benefit participating customers, the province generally, and also provide benefits to ratepayers across most individual freshet periods and over multiple years.

39. The evidentiary record for RS 1892 is both fulsome and robust. BC Hydro has submitted comprehensive evidence, including five evaluation reports for RS 1892 in addition to the Application, which demonstrate the success of the rate in encouraging broad customer participation, achieving incremental energy use and providing participant and ratepayer benefits. BC Hydro has also consulted extensively with customers and industry, who have advised their support for RS 1892 to continue.

40. Attempting to reduce risk and/or increase the benefit to ratepayers by transferring additional risk to participant customers, such as through the inclusion of economic interruption criteria, suspension criteria, or by increasing the price of the energy charge adder, will serve to reduce the attractiveness of RS 1892 which, in turn, may lead to reduced participation and diminish the proven effectiveness of RS 1892.

5 Other Business

41. The BCUC requested BC Hydro and interveners to address in written submissions the scenario where the BCUC does not reach a decision on the Freshet Rate component of the Application before May 1, 2020.

42. BC Hydro submits that, if the Panel decides to approve RS 1892 on the terms applied for by BC Hydro before May 1, 2020, but is unable to issue reasons by then, the Panel could issue its Order approving RS 1892 with reasons and any additional directions to follow in due course.

43. Alternatively, if the Panel is unable to decide whether to approve RS 1892, or on what terms RS 1892 will be approved, by May 1, 2020, BC Hydro submits that the BCUC should approve RS 1892 on the terms applied for by BC Hydro on an interim and non-refundable basis until further order of the BCUC.
BC Hydro submits that the interim rate should be approved on a non-refundable basis, because enrolled customers will be making operating decisions based on the interim rate and they require certainty that the rate will not be changed retroactively.

44. BC Hydro notes that the BCUC similarly approved the Incremental Energy Rate on an interim and non-refundable basis pursuant to Order No. G-300-19.

ALL OF WHICH IS RESPECTFULLY SUBMITTED APRIL 1, 2020

Per: _____

Ian Webb
Counsel for BC Hydro
Lawson Lundell LLP