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March 6, 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. 1598990  
British Columbia Utilities Commission (BCUC or Commission)  
British Columbia Hydro and Power Authority (BC Hydro)  
Fiscal 2020 to Fiscal 2021 Revenue Requirements Application**

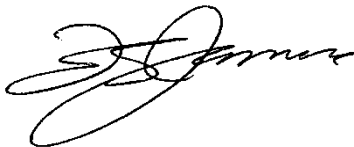
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BC Hydro writes to provide, as Exhibit B-56, its responses to the following undertakings resulting from the Oral Hearing of February 24 to March 4, 2020:

- Undertaking No. 41;
- Undertaking No. 45;
- Undertaking No. 49; and
- Undertaking No. 51.

For further information, please contact Chris Sandve at 604-974-4641 or by email at [bchydroregulatorygroup@bchydro.com](mailto:bchydroregulatorygroup@bchydro.com).

Yours sincerely,



Fred James  
Chief Regulatory Officer

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Enclosure

**BC Hydro Fiscal 2020 to Fiscal 2021 Revenue Requirements Application**

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BC HYDRO UNDERTAKING NO. 41

**HEARING DATE:** February 28, 2020

**REQUESTOR:** AMPC, Mr. M. Keen

**TRANSCRIPT REFERENCE:** Volume 12, Page 2212, line 9 to Page 2214, line 13

**TRANSCRIPT EXCERPT:**

MR. KEEN: Q Well, I think we've been around the mulberry bush a few times. I'll leave that there, but I will ask you to undertake to identify for the Campbell River Substation project what the cost was as a result of the incremental design. Was it strictly incremental or was there any redundancies as between the two designs? Was there demobilization and if so what was the cost of that? And demobilization resulting from the need to do a second design from the late identified geotech work. And then third, was there any idle time that was occasion by the need to do a second set of geotech work or just additional geotech work?

MS. HOLLAND: A We will prepare a response to that.

MR. KEEN: Q Thank you. Ms. Holland, I expect it's for you again. Can I take you to Exhibit B-5, this is the response to BCUC IR 1.107.2, and it's pdf page 1061. I'm looking for page 4 of 5.

MS. HOLLAND: A 1.107.2, correct?

MR. KEEN: Q Yes.

MS. HOLLAND: A Yes, I have that in front of me.

MR. KEEN: Q I'm looking for right at the end of the response, the Big Bend substation? It's on page 4.

MS. HOLLAND: A I have that in front of me.

MR. KEEN: Q So this is one of the other projects that I infer would have driven BC Hydro's change in geotechnical investigation practices, fair?

MS. HOLLAND: A This one is a little bit different. We did preliminary geotech as much as we were able to before we acquired this property. And we didn't find in that preliminary geotech what we subsequently found. Again, our preference is absolutely now to do it all. In this case, I'm not sure we still would have been able to do the detailed investigations in advance of the property acquisition. I'm not sure the property purchaser was in agreement, so we did what we were able to do.

THE CHAIRPERSON: Which project are we talking about here?

MR. KEEN: This is the Big Bend Substation cost.

THE CHAIRPERSON: Okay, there are two on the same page.

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MR. KEEN: Q And looking at the second last bullet on the page, Ms. Holland, again this is the cost of \$5 million attributed to "worse than anticipated geotechnical conditions," yes?

MS. HOLLAND: A Yes.

MR. KEEN: Q And I would ask you to roll this project's costs -- or this project into that same undertaking that you just gave in terms of incremental design costs, and idle time, and carrying costs, and the like. So you've given one undertaking for the Campbell River Substation, and I'd like you to do the same thing for the Big Bend Substation, unless you have those figures with you now, or you are familiar with them?

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**QUESTION:**

Please indicate the cost implications of design changes on the Campbell River Substation Capacity Upgrade Project and Big Bend Substation Project to address geotechnical issues identified in the Implementation phase. Further, please explain whether there were any costs related to design redundancy, demobilization or idle time, caused by those design changes.

**RESPONSE:**

**Big Bend Substation Project**

**For the Big Bend Substation Project, the Implementation phase began in May 2013 and construction started in April 2015. The cost to address the geotechnical issues identified in the Implementation phase was \$5 million. This included \$2.9 million for the cost increase related to changing the design from piling methodology to deep soil mixing methodology. This change occurred during the detailed design stage, prior to the tender and award of the construction contract. The practice at that time did not require substantial design work on the piles during the Definition phase. Piling costs were estimated using the typical piling capacity. Costs related to design redundancy for piling estimates are estimated to be less than \$50,000.**

**Due to further soil issues discovered during construction, the cost estimate increased by an additional \$2.1 million. These soil issues resulted in greater depth of the deep soil mixing panels than originally designed, and required removal of large boulders below five meters to avoid damage to the deep soil mixing equipment. There were no additional costs related to demobilization or idle time caused by design changes from piling methodology to deep soil mixing methodology. However, the deep soil mixing required additional time to evaluate the tenders and an additional three months to address the removal of large boulders. Due to these geotechnical issues the overall schedule impact was in the order of six months.**

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**Campbell River Substation Capacity Upgrade Project**

For the Campbell River Substation Capacity Upgrade Project, the Implementation phase began in July 2015 and construction began in 2016 as planned. The cost to address the geotechnical issues identified in the Implementation phase was \$3.4 million. The geotechnical issues were discovered early during Implementation Phase, while starting the detailed engineering. These geotechnical issues required design additions such as the design of piles, a new retaining wall, new seismic keys, new drainage, and additional soil replacements. There was no design redundancy, and there was no additional costs related to demobilization or idle time caused by design changes.

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BC HYDRO UNDERTAKING NO. 45

**HEARING DATE:** February 28, 2020

**REQUESTOR:** David Ince,

**TRANSCRIPT REFERENCE:** Volume 12, Page 2319, line 8 to Page 2322, line 16

**TRANSCRIPT EXCERPT:**

MR. INCE: Q And then subsequently in Exhibit B-13, Ince 2.33 BC Hydro provided a calculation of the gap between the 98 percent, approximately, and the 93 percent. So there is some headroom, so to speak. And the number that was provided was 2500 GWh per year, so again, that is the gap in the requirement and what BC Hydro is actually producing, and at an 80 percent load factor, that works out to be 360 MW. So it would appear that BC Hydro has 360 MW of headroom in terms of gas fire generation. Would you accept those numbers, subject to check?

MS. DASCHUK: A Yes.

MS. DASCHUK: A I think the other factor that we have to consider is I don't have a copy of the service plan with me, but the service plan does state that all new generation that comes on to BC Hydro's system has to be 100 percent clean. 100 percent clean. So, notwithstanding that we're already at 98 percent, we don't actually have headroom between 93 and 98 because of the mandate that all new generation must be clean.

MR. KUMAR: A I think the other thing to keep in mind is that we do have federal funding that has been put towards this project. And I'm not sure if he we ended up having a solution that would have gas generation as part of it, would we qualify for federal funding for this project.

MS. DASCHUK: A We would not.

MR. INCE: Q That was a precondition of the federal funding, that it be a clean solution?

MS. DASCHUK: A Yes.

MR. INCE: Q When making these difficult decisions in terms of let's say a gas-based solution or an electricity or a clean solution, does BC Hydro have internal economics in terms of what is the value of dollar per tonne for GHGs? So when you have to do the economics of putting in let's say a diesel fire generator versus a clean generator, does BC Hydro use an internal number? I mean the carbon tax is \$35 a tonne, so presumably that should be the metric?

MS. DASCHUK: A Well, as I mentioned, we don't have an option not bring on non-clean sources. So we don't put in a cost for that, because that wouldn't be an option that would be feasible for us. Certainly, the concept of having a cost for carbon and GHG gas emissions is something that we are having conversations about, and how

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do we factor those into our business decisions on a go-forward basis. But historically that would not have been the case.

MR. INCE: Q Okay. Could I get a reference in terms of this 100 percent requirement, could that be an undertaking in terms of provide what is that requirement, when did it come to pass? That is somewhat of a surprise to me.

MS. DASCHUK: A I think it is in the service plan, subject to check. So what I would do is I would say we would submit the service plan, and it would say that would be a requirement.

MR. INCE: Q Thank you. Is that legislation?

MS. DASCHUK: A It is not legislation, it is the mandate -- every year BC Hydro receives a mandate letter from the government and we have our service plan which is approved by our board of directors. And that service plan has, just referring to it, if you will excuse me for a moment.

MS. DASCHUK: A I'll do it as an undertaking to check for the -- where my recollection of that number of 100 percent of new generation is to come from clean. I can't see it at the moment.

MR. INCE: Q These often comes as letters of expectation from the Minister to BC Hydro and then it gets embedded in the service plan. Is that the correct order?

MS. DASCHUK: A That's how I understand it, but I will doublecheck that.

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### **QUESTION:**

Where did the requirement that 100 per cent of new generation be from clean or renewable resources come from, and what are the specific details of this requirement?

### **RESPONSE:**

**The Government of B.C.'s 2016 Climate Leadership Plan mandated that 100 per cent of the supply of electricity acquired by BC Hydro for the integrated grid must be from clean or renewable sources. To reflect this mandate, the New Clean Supply performance measure was introduced in BC Hydro's 2017/18 – 2019/20 Service Plan.**

**In December 2018 the Government of B.C. introduced the CleanBC Plan, replacing the Climate Leadership Plan. The New Clean Supply performance measure was not included in BC Hydro's 2019/20 – 2021/22 Service Plan, pending completion of Phase 2 of the Comprehensive Review.**

**BC Hydro would also like to take this opportunity to make a clarification. In the transcript, David Ince quotes BC Hydro's generation headroom as "2500 gigawatt**

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per year”.<sup>1</sup> As per BC Hydro’s response to INCE IR 2.33.0, the 2500 GWh figure only applies to actual generation from fiscal 2019 and is not an ongoing yearly expectation.

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<sup>1</sup> BC Hydro RRA Proceedings, Volume 12, Page 2329, line 12 to 13.

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**BC HYDRO UNDERTAKING NO. 49**

**HEARING DATE:** March 2, 2020

**REQUESTOR:** BCUC, Mr. P. Miller

**TRANSCRIPT REFERENCE:** Volume 13, Page 2467, line 9 to Page 2468, line 17

**TRANSCRIPT EXCERPT:**

MR. MILLER: Q I wasn't really interested in the types of work, but just the number there. And I have a question about the number. So you indicate in that same document that you will initiate a new project and you will file an application with BCUC at a later date when the need arises.

So, how are you going to handle the amount spent to date? Is it going to be expensed in the current period? Or is there some other method?

MS. DASCHUK: A I believe that's written off to the account of the shareholder.

MR. MILLER: Q To the account of the shareholder? Okay, same question with respect to Seven Mile. You say that that project had been cancelled I believe. What was the amount spent to date on that project?

THE CHAIRPERSON: Sorry, what was the project?

MR. MILLER: Seven Mile.

MR. DARBY: A I believe the write-off for Seven Mile is 1.5 million.

MR. MILLER: Q Okay, and how was that amount being handled? Is it going to be expensed in the current test period? Or are you going to carry it forward until the project is reinitiated?

MS. DASCHUK: A What I think we need to do is take an undertaking to take a look at the amount that was budgeted for write-offs in this fiscal year.

And my understanding is that that budget amount was handled on a first come/first serve basis until we used up the amount, and anything that was written off over and above that is going to the account of the shareholder. But what I can't say is which specific elements made up the base amount, so I'll work with our finance team to provide that list of the amounts in the projects that use that initial budget amount.

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**QUESTION:**

Please provide a schedule of project write-offs during fiscal 2020 compared to the fiscal 2020 project write-off budget.



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**RESPONSE:**

As stated in section 8.21, Chapter 8 of the Application, the fiscal 2020 to fiscal 2021 forecast for project write-offs was developed based on an evaluation of historical trends for capital project write offs as a percentage of capital spend between fiscal 2016 to fiscal 2018. The average of the three-year historical actuals was approximately 0.9 per cent of capital expenditures. This was considered as a starting point for future year forecasts, with a decrease of 0.1 per cent per fiscal year in the Test Period as an estimated impact of our process improvement efforts to decrease project write offs by identifying risks to capital expenditure write offs earlier in the project lifecycle. Please also refer to BC Hydro’s response to BCUC IR 1.161.1 for further information about this approach.

The actual project write-offs in fiscal 2020 as at December 31, 2019 were \$14.1 million and are provided in the table below by project. The fiscal 2020 annual project write-off budget is \$9.9 million which has been exceeded by \$4.2 million as of December 31, 2019.

(\$ million)		YTD Actual (December 2019)	F2020 RRA Plan	Variance
IPID	Name of Project			
93845	Metro North Transmission (MNT)	6.5		
93690	Stn Service Transfer & AC panels - WSN	2.8		
900452	DUG Extension Along Highway 1 East (SI-KAM-008)	1.0		
90957	Peace to Kelly Lake Capacitors	0.9		
92517	Prince George to Terrace Capacitors (PGTC)	0.8		
G000657	Comox - Puntledge Flow Control Improvements	0.7		
93670	SI-OKA-210 VNT 25F66 Rebuild and Relocate Undersized Conductors	0.5		
92183	Vancouver Island Radio System	0.5		
92166	SC Excitation Systems Upgrade - VIT/KLY	0.3		
900715	60L285,60L288 &60L292 Rating Restoration and Refurbishment	0.3		
92618	VIT & KLY Hydrogen Gas Sys - Safety Upg	0.2		
901642	NI-NEW-104 CWD 25F61 U/G Heavily Treed (reversal)	(0.2)		
901643	NI-NEW-116r DAW 25F53 Relocate MVA (reversal)	(0.2)		
900247	BR1 T3 & BRT T4A Replacement (reversal)	(0.2)		
	11 Projects with Write-offs under \$200K	0.3		
	<b>Total Project Write-offs</b>	<b>14.1</b>	<b>9.9</b>	<b>4.2</b>

**If actual project write-offs are higher than planned project write-offs in a given fiscal year, the variance is to the account of the shareholder, all else being equal.**

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BC HYDRO UNDERTAKING NO. 51

**HEARING DATE:** March 2, 2020

**REQUESTOR:** BCUC, Mr. Miller

**TRANSCRIPT REFERENCE:** Volume 13, Page 2482, lines 6 to 18

**TRANSCRIPT EXCERPT:**

MR. MILLER: Q Now, the graph that you provided on the last page of the handout that graph doesn't include customers in the non-integrated areas, does it? Or does it? You can take this as an undertaking if you need to.

MR. KUMAR: A We could do that.

MR. MILLER: Q And then if there is -- if the non-integrated areas aren't reflected in the graph, maybe you could also undertake to let us know if you have any information about customer satisfaction with regard to reliability in the non-integrated areas.

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**QUESTION:**

Does the graph BC Hydro's response to BCUC IR 2.244.1, included in Exhibit B-12, include customers from the non-integrated areas. Please elaborate with any further information on customer satisfaction levels from customers in non-integrated areas.

**RESPONSE:**

**The graph in BC Hydro's response to BCUC IR 2.244.1 does not include customers from the non-integrated areas (NIA).**

**BC Hydro does not conduct a formal customer satisfaction survey in the NIA, however we discuss elements of service quality in regularly scheduled meetings we have with NIA communities and on an as-needed basis. Examples of regularly scheduled meetings are our Final Agreement Steering Committee meetings with Tsay Keh Dene and Kwadacha, where we provide information on electricity outages and receive feedback on service quality within the community.**

**BC Hydro's non-integrated area operations and planning teams are also in regular contact with First Nations and address power quality and reliability issues as they arise. We work closely with the NIA communities to schedule planned outages at times that accommodate their needs and minimize outage impacts.**

**Our efforts in working with the NIA communities to improve reliability is also reflected in Zone II Ratepayer Group's response to BCUC IR 4.1/4.1.1 on their**

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intervener evidence (extracted from Exhibit C5-12, a copy of which is attached). We continue to work with individual NIA communities to address their specific concerns.

#### 4.0 Reference: Non-Integrated Areas

**Exhibit C5-9, Zone II Ratepayers Group Evidence, PDF p. 13;  
BC Hydro F2017-F2019 RRA proceeding, Exhibit C17-9, BCUC  
IR 4.2, 6.1  
Quality of service**

In response to BCUC IR 4.2 in the Previous RRA, Zone II RPG stated:

In Fort Ware, electricity reliability has improved since BC Hydro took over service. However, there have been some problems with the smart meters and some meters had to be replaced. These issues have now been resolved.

In Tsay Keh Dene, the level of service has not met the needs of the community. There have been delays in service connections, an unanswered need for upgrades, and multiple generator failures. Delays in restoring operations have caused damage to housing and computers, and negatively effected the community's communications network.

In Zone II RPG's evidence, it states:

The community's [Tsay Keh Dene] electricity demand is exceeding BC Hydro's projections, with blackouts and flickering lights occurring on a weekly basis. The community needs additional electricity supply to provide reliability, to provide much needed housing for a growing community, to grow the economy and to provide services. Cooperation is needed from BC Hydro to develop renewable energy projects at fair prices, offset diesel needs and achieve broader community objectives.

4.1 Please elaborate on the frequency and duration of blackouts in Tsay Keh Dene. How many times during a week does a blackout occur, how long does it take for power to be restored and at what time of day and year do these blackouts occur?

4.1.1 Please explain whether the quality of service has changed since the Previous RRA. If so, please elaborate.

**Response:** Tsay Keh Dene would like to clarify that blackouts have improved considerably since BC Hydro replaced its diesel generators in 2018. We still have blackouts occasionally as well as brownouts. Tsay Keh Dene has not tracked the frequency of these events since the installation of the new generators, so cannot provide more specifics.

Tsay Keh Dene has found BC Hydro to be more responsive to its concerns since the previous RRA. Tsay Keh Dene also has invested considerable time and effort into improving the relationship.

In response to BCUC IR 6.1 in the Previous RRA, Zone II RPG stated:

BC Hydro is in the process of consulting with Tsay Keh Dene to determine:

1. The extent of the current and future load growth;
2. How this growth can be minimized through comprehensive energy efficiency and conservation efforts; and
3. How the shortfall can be addressed by upgrading the diesel generating station and the distribution system while considering potential future renewable energy installations by the community.

Zone II RPG's response also stated:

Distribution system upgrades will also be required to service a planned residential development. This new residential development area is adjacent to an area currently serviced by a single phase line. This line requires upgrading to a three phase line in order to service the planned addition of 50 new residences to ensure:

1. Sufficient line load capacity; and
2. Load is shared equally between the three phases (required for generating unit operation).

Tsay Keh Dene representatives are currently submitting a customer connection request for the planned residential, which will initiate the distribution cycle.