

**From:** skipsalty  
**Sent:** Monday, August 21, 2017 12:38 PM  
**To:** Commission Secretary BCUC:EX  
**Subject:** please correct table 3-8 , which BC Hydro ,due to rush,mistakenly slanted to show we need site C now.

Dear Mr. Wruck

Thank you for smaller pdf file in the SITE C terms of reference. But it has a material mistake which needs correcting, or it will mislead BCUC, ratepayers and the public.

Earlier, politicians of both NDP and Liberal politicians got the correct information, but it appears in the rush to get a quick review , BC Hydro overlooked to correct table 3-8 , which is **mistakenly slanted to show we need site C now.**

It is 4500 gwhrs (90% of Site C) too low for energy capacity because it is based on *minimum* flow for Peace River generation whereas it *should be average flow of Peace River.*

Earlier when he was NDP energy critic, John Horgan and I discussed the benefits of Lake Williston having world record storage.

BC Electric specially designed Williston to operate "**cyclically**" so average flow 17000 gwhrs can always be generated.

And any deficit in a 12500 low year can be supplemented with water carried over from a 22,700 high flow year.

I got these numbers from BC Hydro Sept 28-30 2012 (please see attached for verification) thanks to a Liberal MLA Ralph Sultan, who years ago was a young engineer doing surveys while I was BC Electric Director of Planning.

*You may wish to inform all interveners that table 3-8 needs a material correction?*

*Thank you*

*Sincerely,*

*Vern Ruskin*

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*PS Details*

*The mistake is due to wrongly assuming that the BC hydro system was designed, like all other hydro systems in North America, where system firm capacity was limited by the low flow year*

*BUT the BC hydro system is DELIBERATELY designed based on the AVERAGE flow year which is much greater. Please see exhibit from Doug Robinson (Secretary of the Canadian entity of the Columbia River Treaty).*

*That was requested by BC Electric CEO Dal Grauer and VP Tom Ingledow, who in 1956 asked me to write a paper to explained why BC Hydro (despite enough untapped hydro for many future years) was installing the Burrard Thermal plant ( ref 41 Ruskin, Vernon, "Thermal plants for firming up hydro" recommended by the American Institute of Electrical Engineers, Committee on Power generation, for presentation at the AIEE Winter General meeting in New York, Jan 21 ,1957).*

*BC Electric successfully minimized electricity rates, using around average 750 gwhr thermal, operated very little only in low years, firmed up and gained around 5,000 gwhrs firm hydro capacity at lowered cost to ratepayers.*

*Lake Williston, is an underused heritage from WAC Bennett, planned by BC Electric.*

*It took 20 years to fill and now stores 340,000 gwhrs energy.*

*It holds*

*5 times as much water as the Grand Coulee Dam, Washington State,*

*.11 times more water than Lake Shasta Dam, California,*

*3 times more water than Hoover Dam, Lake Mead on Colorado River (bordering Arizona and Nevada).*

***Lake Williston is like a world-record .... "giant rechargeable battery"***

*We planned to operate to achieve the same benefit of lowered rates for electricity to ratepayers, using the huge Lake Williston, by multi-year ("cyclic" ) carryovers of water stored over 20 years, thereby averaging low and high flows FOREVER .*

*Thus we don't need Burrard Thermal plant any longer, and the BC hydro grid is now 100% clean carbon-free energy fully, complying with the Paris climate change accord.*

*I also checked there was diversity between Peace River and Columbia River.*

*The low flow at each of these watersheds is not synchronized, so there is plenty of time for cyclic scheduling.*

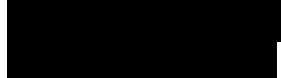
*Technically the flows on the Columbia are now set by Bonneville Power Administration. Lake Williston behind WAC Bennett Dam (Site A ) holds 20 years of Peace River flows, so it smoothes out any high and low flow years. The water from Lake Williston is used "cyclically" so the combined Columbia River and Peace River gwhr energy supply uses the same average 17,000 gwhrs Peace River flow level every year. That is 4,500 gwhrs greater than the low flow level of Peace and Columbia Rivers combined which BC Hydro now refers to as 'firm dependable'.*

*The average flow level is automatically updated by a moving average.*

***There is NO EXTRA COST for this extra 4500 gwhr energy, which now counts as firm dependable capacity. This no extra cost energy could halt the rate spiral for ratepayers.***

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Vern



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RALPH SULTAN, M.L.A.  
Member of the Legislative Assembly  
West Vancouver-Capilano

July 23, 2012

Vern Ruskin  
[REDACTED]  
[REDACTED]  
[REDACTED]

Dear Vern:

As requested by you, I am pleased to confirm that I have taken up a role as informal advisor to the province on the matter of the Columbia River Treaty which is up for renewal or cancellation. I also note that my colleague Bill Bennett, MLA, has been assigned a similar role in the government caucus. Bill's interests probably tend more with those matters of direct impact on his constituents living the southeastern corner of our province, whereas my interests lean more to the macro impact of this Treaty on our hydroelectricity balance and fiscal situation.

As you are aware, I am also pleased to confirm that many years ago I worked in a junior engineering capacity on hydroelectricity development for BC Electric Company, the predecessor to today's crown-owned BC Hydro. And as you are also aware, my formal education has been in engineering (UBC) as well as economics (Harvard), and prior to politics my work experience ranged from academia to banking to general management in the resource industries. A fuller description may be found on my website <http://www.ralphsultanmla.ca> as well as LinkedIn.

I understand that you are in contact with many parties in the United States who are also concerned about the future of this important treaty. If they



## Re: Moving Averages Peace +Columbia

[REDACTED]

Sun, Sep 30, 2012 at 3:19 PM

Dougstorage091212

Dear Bernie or Anita, pl pass on to Chris O'Reilly.

Dear Doug

Thank you for the info figures

They indicate BC could gain 4600 gwhrs and 1050 MW

by independent combined Peace and Columbia storage operations, using diversity and cyclic storage

The good news is, you could do it at extremely low heritage power cost—

- WITHOUT building any dam
- Fighting First Nations Indians,
- Sierra Club, lawyers,
- 

squeezing 7.9 billion from pockets of 1.5 million BC Hydro customers. (that's \$5266 per head and a rate spiral for angry voters)

and S&P won't downgrade BC's AAA rating and jack your interest cost

Backup details are below.

You will recall when I presented it to BC Hydro engineers in 2009, Tom Siu knew exactly what I meant by using diversity and cyclic carryover storage for Peace and Columbia combined

Yours sincerely

Vern

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#### DETAILS

Dougs list of figures prove

If peace and Columbia operated together independently to max power in BC, with Arrow(Keenleyside) as buffer

For the last 50 years shown, 1949-99

#### Diversity

the lowest Peace +Columbia generation was 28.1 twhrs,

The lowest 5 year moving average was 31.4 twhrs ,

So the benefit of peace-columbia diversity is 3.3twhr

Peace and Columbia Energy(Gwh) from CRT2014 Review Study 13SC

Water Year (Oct-Sep)	GMS	PCN	MCA	REV	ARD	Peace	Columbia
1998/99	12464	3016	8098	8405	1031	15480	17534
1996	17605	4168	8381	9300	708	21774	18388
1997	14728	3466	8307	8776	788	18194	17871
1998	14018	3373	8271	9126	668	17391	18065
1999/00	14365	3429	7687	8367	840	17794	16894
Maximum	18350	4384	9671	10436	1031	22734	20583
Average	13740	3305	7727	8494	742	17045	16962
Minimum	10066	2484	6066	7209	334	12550	14099