British Columbia Utilities Commission of Inquiry into BC Hydro’s Site C Project

Further Evaluation of the Need for the Site C Project

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1. Introduction and Recommendations


Since filing Eliesen 1, a number of documents have been tabled with the Commission which include, but are not limited to, BC Hydro’s submission dated August 30, 2017, the Commission’s independent consultant’s reports dated September 8, 2017, and BC Hydro’s answers to the Commission’s questions filed over the period leading up to October 6, 2017. These documents have been reviewed and assessed by the author.

When BC Hydro submitted its 866-page evidentiary information on August 30, 2017, it declared that, “BC Hydro expects to complete Site C on time and on budget, and we have the appropriate level of schedule and cost contingency.” Further, the document states that, “The expected total cost of the Project is $8.335 billion, and we do not expect to use the additional $440 million project reserve established and held by the B.C. Government.”

Section 4 of BC Hydro’s submission, titled ‘Site C is On Time and On Budget’, provides detailed material on the factors responsible for this belief and states, “The Project is on time and on budget, through proactive management of geotechnical and construction risks to schedule and budget.”

Five weeks later, on October 4, 2017, Chris O’Riley, president and chief operating officer of BC Hydro, informed the Commission that, “BC Hydro has encountered some geotechnical and construction challenges on the project and the risk to the river diversion timeline has now materialized…we have now determined that we will not be able to meet the current timeline for river diversion in 2019…Not meeting the current river diversion timeline has created new pressures on the project’s budget…expected to increase its cost by 7.3 per cent or $610 million, for a total forecast project cost of $8.945 billion.”

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1 Marc Eliesen, An Evaluation of the Need for the Site C Project, Submitted to BCUC, August 16, 2017, F13-1.


3 Ibid., page 2.

4 Ibid., page 24.

5 Letter to BCUC, Chris O’Riley, October 4, 2017.
It is hard to fathom how senior management at BC Hydro could be caught unaware. After providing assurances to the Commission on August 30th that the Project was on time and on budget, with no threat to the Treasury Board reserve, only thirty-five days later the Project is a year delayed and the Treasury Board reserve is not only tapped, it’s been exceeded by $170 million.

The purpose of this report, “Further Evaluation of the Need for Site C” (Eliesen 2), is to provide the Commission with additional research and analysis based on documents filed on the hearing record and recent Project related developments.

In particular Eliesen 2:

i) addresses the issues raised in the Commission’s Preliminary Report regarding whether Site C is on time and on budget;

ii) addresses the issues raised in the Commission’s Preliminary Report regarding the cost of completing the Project versus the cost of cancelling the Project;

iii) addresses Mr. O’Riley’s letter to the Commission and BC Hydro’s responses to Commission questions developed in its Preliminary Report; and

iv) presents findings and recommendations for the Commission to consider in the preparation of its Final Report.

It is appreciated that the Commission has been asked to evaluate the economics of Site C and the potential impact on ratepayers of three potential scenarios—continue the Project, postpone it, or terminate and remediate the site.

This report addresses the impact on ratepayers of continuing the Site C Project versus cancelling the Site C Project. This report does not address the second option—postpone Site C—since the cost to ratepayers of postponing, clearly outweighs any possible benefit.

Although Eliesen 2 addresses the impact on ratepayers of continuing versus cancelling Site C, it is necessary to mention that there are other, equally important, considerations than just those related to Site C’s impact on ratepayers. Although these issues are outside the scope of the Commission’s review, they must, at some point be properly addressed.

The important considerations outside the Commission’s scope of assessment, that must be addressed, are First Nations rights, environmental impacts and agricultural land use. It is expected that these significant issues will be appropriately considered by the Provincial Government when—subsequent to receiving the Commission’s Final Report—it determines the future of Site C.

By way of review, the findings in Eliesen 1 are summarized below:
Findings—Eliesen 1

1. BC Hydro’s load forecast suffers from systemic bias that exaggerates demand and does not incorporate price elasticity of demand that can be expected from higher rates related to BC Hydro’s debt burden, deferred accounts, Independent Power Producer (IPP) commitments and Site C.

2. To the degree that additional electricity supplies may be required, alternatives are available that are more responsive to market conditions and much more cost effective than Site C.

3. BC Hydro ratepayers do not need and cannot afford the electricity capacity associated with Site C even if the project is completed on time and on budget.

4. The notion that Site C will be completed on time and on budget is illusionary. The likely scenario is that costs will escalate significantly as has been the experience of Manitoba Hydro with the Keeyask Generating Station (34 percent increase) and Nalcor’s Muskrat Falls Generating Station (72 percent increase).

5. It is the author’s considered opinion, based on many years of experience at a number of Canadian utilities—including BC Hydro—that the cost of Site C has a high probability of increasing from $9 billion to $12 billion—by more than 30 percent.

Findings in Eliesen 1 are supported by documents filed with the inquiry since Eliesen 1 was prepared as well as recent Project related developments.

The findings in Eliesen 2 focus on more specific issues raised by the Commission in its Preliminary Report. These findings are summarized below:

Findings—Eliesen 2

1. Site C must be cancelled to ensure that the BC ratepayers are not left with an unconscionable burden of significant electricity rate increases that will cause major economic harm to families and businesses throughout the Province.

2. BC Hydro has been working to its own budget, schedule and in-service date of 2023, while the BC public has been led to believe it was working toward the Provincial Final Investment Decision budget with an in-service date of 2024. BC Hydro has not been transparent with British Columbians. Working toward an accelerated construction schedule is not based on prudent project management or cost reduction considerations. It is based on a politically motivated desire to reach the “point of no return” for this ill-conceived Project.
3. There are serious and on-going difficulties between BC Hydro and its Main Civil Works contractor Peace River Hydro Partners. These difficulties were, and continue to be, exacerbated by the accelerated construction schedule. The problematic relationship between BC Hydro and its main contractor has, and will continue, to significantly increase cost and delay of Site C.

4. BC Hydro’s contingency risk management and analysis has severely underestimated the uncertainties associated with constructing Site C. It is inappropriate to allocate alleged savings in Interest During Construction to Project work contingency. Not only does this put the Interest During Construction account at risk, it distorts budgets, frustrating effective assessment of management performance.

5. There is no practical public policy or business reason for excluding the Burrard Station and Columbia River Entitlement from future viable options assessment.

6. The factors responsible for the major cost overruns and schedule delays at Keeyask and Muskrat Falls can readily be applied to Site C and can assist in informing the Commission’s overall assessment of the likely impact on ratepayers of continuing or cancelling the Project.

Recommendations:

Recommendation #1: That the Commission undertake an assessment of the capacity and energy provided by the Burrard Generating Station and BC’s Entitlement under the Columbia River Treaty, in its final report on Site C.

Recommendation #2: That the Commission, in its evaluation of whether the Site C project is on budget, reallocate $315 million back from the Contingency Budget to the IDC account to return the IDC account to $1.407 billion as per the Provincial FID.

Recommendation #3: That the Commission recognize that the budget BC Hydro has been working toward is BC Hydro’s FID with a total cost (including PST) of $8.16 billion predicated on an in-service date of 2023.

Recommendation #4: That the Commission recognize that BC Hydro’s PMB has now increased to $8.945 billion—an increase of 9.6 per cent and its in-service date is delayed one year to 2024.

Recommendation #5: That the Commission recognize the factors responsible for high cost overrun and schedule delays associated with the Keeyask and Muskrat Falls Projects are similar to those experienced at Site C and therefore weight be given to the experience of other major Canadian
projects, particularly since Site C has just completed the second year of a nine-year construction schedule.

Recommendation #6: That the Commission rely upon an estimate of $12 billion for the capital cost of the Project in its evaluation of the impact on ratepayers of continuing or cancelling the Project.

Recommendation #7: That the Commission, in assessing the rate impact of Site C do so from an established rate base that recognizes BC Hydro’s current financial position, including its debt load, deferred accounts and IPP commitments.
2. **Constraint in the Commission’s Terms of Reference**

The Commission has been requested to advise the Provincial Government on three scenarios—completing the Site C project, suspending the Site C project; and terminating construction of the Site C Project.

The Commission has been requested by the Province to provide conclusions respecting not only the qualitative impact on ratepayers of these three options, but also the quantitative impact.

The Commission quite rightly concluded in its Preliminary Report that in a number of instances BC Hydro failed to provide sufficient information for it to quantitatively answer the questions identified in the Commission’s Terms of Reference.

It is important to address the quantitative and technical issues. However, before doing so there is a serious issue related to an inexplicable constraint in the Commission’s Terms of Reference that requires discussion. The constraint is that this Commission is required to adhere to the energy objectives set out in the Clean Energy Act. Question (iv) in the Commission’s Terms of Reference states that, “Given the energy objectives set out in the Clean Energy Act, what, if any, other portfolio of commercially feasible generating projects and demand-side management initiatives could provide similar benefits…to ratepayers at similar or lower unit energy cost as the Site C project?”

The constraint to the Commission’s work may have been unintended or it may have been intended. There is no evidence on the record that speaks to this issue. What is apparent, however, is that the constraint biases the Commission’s assessment toward the continuance of Site C.

The Terms of Reference requires that the Panel exclude from its portfolio of commercially feasible projects, the Burrard Generating Station and BC’s Entitlement under the Columbia River Treaty.

When in opposition, the current Provincial Government rightly argued against the principles of the Clean Energy Act. The Act removed significant powers from the Commission, it removed the Burrard Generating Station from BC Hydro’s Integrated Resource Planning, and it exempted Site C from review by BCUC.

The author’s considered opinion is that the Burrard Generating Station was explicitly removed from BC Hydro’s Integrated Resource Planning as a political decision—it was excluded in order to justify the construction of Site C. Then, having accomplished the

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exclusion of the energy and capacity at Burrard Station, the Act ensured that the absurdity of this decision would not be exposed through independent regulatory review. In an unprecedented move, the former government restricted the Commission from assessing the need for the Site C Project.

If the Burrard Generating Station had not been removed from BC Hydro’s Integrated Resource Plan there would be no need for the Commission’s Inquiry. There would have been no scenario upon which the construction of Site C could have been justified.

When Premier, John Horgan was the NDP energy critic, he stated there was no rationale for retiring the Burrard Station. The facility provided an important safety net to electrical energy users.

Mr. Horgan stated that, “It is the base load backup for the City of Vancouver and the Lower Mainland. When you have the bulk of your load centre distanced from generation by many hundreds of kilometres of transmission either from the Peace or the Interior (generating facilities) its nice to know if you need it you fire up the Burrard thermal generator.”

This past summer, BC experienced the worst forest fires in the province’s history. Many have recognized these fires as linked to climate change conditions. It is not unreasonable to expect such unfortunate fire activity in the province in ensuing years, thus increasing the likelihood of impacting BC Hydro’s transmission infrastructure.

The Elephant Hill forest fire was not far from Clinton where one of BC Hydro’s main 500KV substations is located. If the wind had blown in a different direction the substation could have been destroyed and the Lower Mainland would have been severely impacted. Mr. Horgan’s concerns, in light of recent experience, hold even more weight than when they were initially spoken.

The Commission’s Terms of Reference require adherence to the Clean Energy Act and therefore does not allow the Commission to consider existing electricity supply possibilities from the Burrard Thermal Generating Station and it does not allow the Commission to consider supply from BC’s Entitlement under the Columbia River Treaty. This is unreasonable.

The Commission recognized in its Preliminary Report, “that the amount of energy and capacity available to the province in the treaty is approximately equal to the amount of energy and capacity that Site C will provide. In addition it is as clean as the energy that will be produced by Site C. Because of the possible temporary availability of this energy

7 Globe and Mail, Liberals insist aging gas-fired Burrard plant will be closed, Wendy Stueck, November 28, 2013.
it may not be appropriate as a long term supply. If it was appropriate to use as a short to medium term supply, there would be changes to the Clean Energy Act required.\textsuperscript{8}

Regrettably, the Panel has not addressed the exclusion of the Burrard Thermal Station in a fashion similar to its recognition of BC's Entitlement under the Columbia River Treaty.

The Commission historically has found that even partial exclusion of the Burrard Station is not in the public interest. In its ruling respecting BC Hydro's Application for Approval of the 2008 Long-Term Acquisition Plan submitted to the Provincial Government in 2009 the Commission found that, "BC Hydro's proposal to reduce its reliance on Burrard to 3,000 GWh/year for planning purposes was not supported by the evidence...the Commission Panel finds that BC Hydro's 2008 Long Term Acquisition Plan is not in the public interest and rejects it."\textsuperscript{9}

The Commission has undertaken analysis related to BC's Entitlement under the Columbia River Treaty and found that the supply is equivalent to Site C. The quantitative impact of including Treaty Entitlement supply in its assessment of alternatives should be undertaken for its Final Report.

With respect to the Burrard Generating Station, the Commission may find it useful to re-examine the information and analysis respecting the energy, capacity and related costs of the Burrard Station available to it from its own prior assessments as well as the material provided to the Commission in Eliesen 1.

The Burrard Station had a capacity and energy generation very similar to Site C, but was not operated by BC Hydro as a base load facility. The plant was a very cost-efficient back-up, on call for BC Hydro's system, as well as available to meet any peaking capacity requirements.

In response to the Commission's Question #2.69 regarding the purpose and objectives of BC Hydro's arrangement with Island Generation, BC Hydro replied that it "has a planned reliance upon Island Generation (IG) for 2170 GWh of firm energy and 275 MW of dependable capacity...is a valuable insurance policy...under the following circumstances:

\begin{itemize}
\item To support Vancouver Island reliability during periods of VI (sic) transmission line outages; and
\item To serve high domestic loads during cold snaps.\textsuperscript{10}
\end{itemize}

\textsuperscript{8} Preliminary Report, op. cit., Appendix B, page 5

\textsuperscript{9} BCUC, British Columbia Hydro and Power Authority and an Application for Approval of the 2008 Long Term Acquisition Plan, Decision, July 27, 2009, page 131.

The same argument should be applied to Burrard Station’s important purpose of providing dependable energy and capacity to the Lower Mainland on an as needed basis.

While Burrard Station is currently retired and is being utilized by BC Hydro for transmission support, it could be refurbished to operate again as an important strategic asset for BC Hydro.

An evaluation similar to that undertaken for BC’s Treaty Entitlement should be pursued and the quantitative implications of the Burrard Station on the need for Site C should be included as a viable scenario in the Commission’s Final Report. The need to cancel Site C can be established without regard to Burrard or the Columbia River Treaty, but there is no practical public policy or prudent business reason for excluding these viable options from the slate of alternatives to Site C.

**Recommendation #1: That the Commission undertake an assessment of the capacity and energy provided by the Burrard Generating Station and BC’s Entitlement under the Columbia River Treaty, in its final report on Site C.**

The Commission concluded in its Preliminary Report that:

i) “While the Panel has already found that the project is currently on schedule to deliver by November 2024, the Panel is not yet in a position to express a view on the probability that the project will remain on schedule as of June 30, 2017”\(^{11}\); and

ii) the Commission is not yet in a position to determine whether the Project was on budget as of June 30, 2017, although there is a very strong likelihood Site C is now over budget.\(^{12}\)

It is not surprising that the Commission is having difficulty nailing down BC Hydro’s budget and schedule performance. BC Hydro itself is having difficulty. There appears to be a deliberate attempt by BC Hydro to obfuscate budgets and schedules throughout this Commission’s inquiry.

To a large degree the confusion regarding whether BC Hydro is on time and on budget is related to the fact that BC Hydro has been working to a Final Investment Decision (FID) budget that is not consistent with the approved Provincial FID budget. BC Hydro’s FID budget is driven by different costs and a different in-service date than the Provincial FID.

BC Hydro’s FID budget has a capital cost of $8.160 billion and an in-service date of 2023. When BC Hydro’s current Project cost of $8.945 billion and 2024 in-service date schedule are compared to BC Hydro’s FID budget (the budget BC Hydro has been working toward) the Project is now 9.6 percent over budget and a year delayed.

There are two issues the Commission must address before it incorporates the recent figures provided by BC Hydro into its final evaluation of BC Hydro’s cost and schedule performance. These are:

1. Reconciling the Provincial FID Budget Versus Hydro’s FID and PMBs based upon Hydro’s FID; and

2. Hydro’s Treatment of Interest During Construction and Allocations to Contingency.

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\(^{11}\) Preliminary Report, op. cit., page i of viii.

\(^{12}\) Ibid., page iii of viii.
3.1 Two Sets of Budgets and Two Sets of Project Schedules

As has become clear from the evidence now available on the Inquiry record, there are two sets of budgets and two project schedules for Site C. These are:

i) BC Hydro’s Final Investment Decision (BC Hydro FID) budget with an in-service date of 2023, based on project costs, inflation and financing related to 2023. BC Hydro’s FID construction schedule is for an eight-year project (2015 - 2023); and

ii) Provincial Government’s FID (Provincial FID) budget with an in-service date of 2024 with project costs, inflation and financing related to 2024. The Provincial FID schedule is for a nine-year project (2015 - 2024).

We have learned from Deloitte’s report that BC Hydro’s Project Performance Measurement Baseline Budgets (PMBs) and Prior Month Forecast Baseline (PMFBs) budgets also exist.¹³ These performance measurement budgets have been developed subsequent to BC Hydro’s FID and the Provincial FID.

Ongoing performance measurement budgets are generally expected as part of any prudent project management procedure. BC Hydro relies upon its PMBs to measure its performance against budget during the course of the project.

The twist with the Site C Project, however—and why things have become more confusing than what would normally be expected—is that all of BC Hydro’s PMBs and its PMFBs assume a 2023 in-service date and are based on budget estimates related to BC Hydro’s FID of $8.160 billion (original BC Hydro’s FID budget of $7.96 billion plus $200 million for PST), predicated on a 2023 in-service date.

This means that there are distortions within BC Hydro’s PMBs and PMFBs. These distortions make it difficult to assess BC Hydro’s performance when the Provincial FID $8.335 billion budget and an in-service date of 2024, is relied upon as the reference point. The Provincial FID is relied upon as the reference point in BC Hydro’s, Deloitte’s and the Commission’s reports, but the Provincial FID is not relied upon internally by BC Hydro.

3.2 Evolution to the Provincial FID budget

In December 2014, BC Hydro presented a BC Hydro FID budget with a capital cost of $7.96 billion and a 2023 in-service date to the Provincial Government. The Provincial Government made changes in costs and timing to BC Hydro’s FID budget. The budget the Provincial Government approved (the Provincial FID) was for an amount of $8.355

billion and a 2024 in-service date. The Provincial Government introduced an additional $440 million reserve to account for events outside of BC Hydro’s control. This reserve is held and controlled by the Treasury Board.

The additional $375 million added to Project cost of $7.96 billion to bring it to $8.335 billion reflected an adjustment for PST of $200 million and inflation and interest cost components of $175 million related to a 2024 in-service date.

However—and what adds to the difficulty in assessing Hydro’s PMBs and PMFBs against the Provincial FID—is the fact that while BC Hydro kept to a 2023 in-service date, the company allocated to its PMBs and PMFBs inflation and interest expense amounts of $175 million predicated on a 2024 in-service date, as approved in the Provincial FID in December 2014.\textsuperscript{14}

Deloitte’s report did not recognize the inflation and interest expense component added to BC Hydro’s FID when the Project schedule was extended by a year as a result of the approval of the Provincial FID. Deloitte’s report states that the increase cost going from the Hydro FID to the Provincial FID was “to account for HST and PST changes in addition to an adjusted project completion date of 2024.”\textsuperscript{15} No mention of the increase to Project costs related to the addition of one year to the Project schedule was made.

The amounts approved in the Provincial FID were related to sales taxes and to inflation and interest expense for the one year extension in the in-service date from 2023 to 2024. Certainly the tax will be paid in any event. However, the inflation and interest rate adjustments that were accepted and incorporated by BC Hydro into the preparation of its PMBs and PMFBs would not be. The capital cost of the Hydro FID is $8.16 billion, not $8.335 billion as Hydro would have the Commission believe.

The PMB and PMFB schedules continue to be driven by an in-service date of 2023. BC Hydro—by adopting the one year inflation and interest amount afforded in the Provincial FID without also adjusting its schedule to reflect that one year extension—frustrates effective comparisons between the Provincial FID and BC Hydro PMBs and PMFB’s.

What BC Hydro has done is keep to the earlier schedule it developed in BC Hydro’s FID with an in-service date of 2023, while it increased its PMB budget to reflect the inflation and interest costs related to a one year delay. This inappropriate behaviour is readily confirmed by the fact that all of BC Hydro’s PMB’s aggregate to $8.335 billion, as is consistent with the aggregate amount in the Provincial FID budget.

BC Hydro accepted the increased budget allowance from the Provincial FID budget related to a 2024 in-service date, but then failed to adhere to the time horizon that gave

\begin{footnotesize}
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\textsuperscript{14} BC Hydro Overview of 2014 Site C Cost Estimate Methodology and Approval, \textit{Section 4}, Reviews and Approvals.

\textsuperscript{15} \textit{Deloitte Report}, op. cit., page 19, footnote 19.
\end{footnotesize}
rise to this amount. This allows BC Hydro to give an appearance of budget control that is not reflective of the reality. It also makes it difficult for the Commission to achieve a clear evaluation as to BC Hydro’s performance to plan.

Simply put, BC Hydro’s FID budget delivered to the Provincial Government in 2014 assumed an in-service date of 2023. All BC Hydro’s PMBs prepared since the project was approved continued to work toward an in-service date of 2023, and yet the costs of BC Hydro’s PMBs reflected inflation and interest rate charges related to a 2024 in-service date. BC Hydro padded its PMBs.

If the Provincial FID and BC Hydro’s PMBs and PMFBs were internally consistent reflections of the same scope and schedule, the Commission should have been able to quantitatively determine whether BC Hydro was on time and on budget as at June 30, 2017 for the purposes of its Preliminary Report. The Provincial FID budget and BC Hydro’s budgets are not internally consistent, but at no time did BC Hydro feel it helpful to clarify this for the Commission.

3.3 Public Unaware of BC Hydro’s Aggressive In-Service Date of 2023

BC Hydro delivered to the Commission its report dated August 30, 2017 with 866 pages of information. In that report there is no reference to BC Hydro’s PMB process, let alone insight offered as to how the Provincial FID (what BC Hydro refers to as the ‘Project Budget’) differs in cost and timing to the construction schedule BC Hydro was actually following.

BC Hydro makes reference in its August 30, 2017 report to an “owner’s schedule float” as the only indication that it was working to a different time horizon than that which was approved by the Provincial Government. BC Hydro has adapted the notion of a schedule float to mask the fact that it has been working to BC Hydro’s FID, while the Commission, the new government and the public continued to believe it was working to the schedule and costs imbedded in the Provincial FID.

Of importance is the fact that since the Provincial FID was approved in 2014, the BC public has been completely unaware that BC Hydro was attempting to bring the Project in-service date forward by one year. Certainly, if the Province approved a budget with an in-service date of 2024, and added costs related to that extra year of construction, then that should have been both the project schedule and budget BC Hydro would work toward.

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16 Business Case for Investment Decision by BC Hydro Board of Directors, December 16, 2014, Project Milestones, page 9 of 40, footnote explains that the Provincial FID delays most components by approximately 12 months including the River Diversion and in-service date.
BC Hydro elected not to share this important information with the Commission. It was only when Deloitte uncovered and discussed the PMB in its report that the existence of, and BC Hydro’s reliance upon, the PMB became known.

As explained by Deloitte, “According to the Schedule Management Plan, the PMB is updated annually, or as required, to account for significant changes to the Project’s scope, schedule, and cost, as a result of contract awards, contract changes, contingency allocations, or unforeseen conditions.”

BC Hydro initially prepared a PMB in December 2015, updated it three months later in March 2016 and updated it again three months later in June 2016. The PMB evolution is detailed in Deloitte, Appendix C.

It appears that, not only did BC Hydro withhold the information that it was working to a different schedule than that provided in the Provincial FID, but it also appears that BC Hydro has not updated its internal PMB for fifteen months. The most recent PMB provided to Deloitte is dated June 2016. This violates the requirements of BC Hydro’s own Schedule Management Plan since, according to Deloitte, it says that a PMB will be prepared at least every year.

The failure to update the PMB compromises the company’s ability to monitor planned performance. There have been significant events related to the Project since June 2016 that should have precipitated a revised PMB even before June 2017. For example, BC Hydro’s Board decided on April 10, 2017, to increase the Main Civil Works contract and allocate contingency due to tension crack management measures. Certainly, an updated PMB to reflect this decision would have been prepared.

At the very least, the PMB should have been updated annually—that is, by at least June 2017. BC Hydro claims that its Schedule Management Plan has passed independent review, but, what good is a plan if BC Hydro does not follow it?

Either BC Hydro deliberately withheld information from Deloitte regarding the existence of a post June 2016 PMB, or it has been negligent by not preparing a more current PMB than that of June 2016.

BC Hydro provided responses to the Commission’s questions raised in its Preliminary Report, and yet no updated PMB has been provided. It would be expected that if BC Hydro was undertaking responsible budget management that an updated PMB as at September 30, 2017 would have been made available to the Commission. Should BC


18 Ibid., page 103.

19 BC Hydro, Minutes of a Special Joint Meeting, Site C Clean Energy Project Board, Monday April 10, 2017, FOI obtained by Bob Mackin.
Hydro submit an updated PMB in its October 11, 2017 report, it will be necessary for the Commission to evaluate the schedule based on BC Hydro’s FID as a reference point, not the Provincial FID.

What is also disturbing is how BC Hydro obfuscated the source of its “owner’s schedule float” referenced in its August 30, 2017 report. While BC Hydro mentions a one year contingency in its report, the company leaves the impression that this is related to the Provincial FID budget. The Provincial FID budget does not have a schedule contingency float of one year; the Provincial FID budget has an in-service date of 2024 and inflation and interest costs to support that date.

The real benchmark for evaluating BC Hydro’s project management capability is whether the project is on time and on budget related to BC Hydro’s FID. Should such a comparison be made, it would be evident that as at June 30, 2017, not only was Site C not on budget, it was also behind schedule.

3.4 Interest During Construction “Savings” and Contingency Accounting

The Commission requested in Question #2.9 that BC Hydro, “explain why it chose a contingency amounting to 9.5 percent of project costs, and what factors suggested this would be sufficient.”

In response BC Hydro admits that its contingency amount of $794 million does not include recognition of costs related to Project financing. However, in its August 30, 2017 report to the Commission, BC Hydro relied primarily upon IDC “savings” of $315 million it calculated and then reallocated to the work related contingency account. BC Hydro claimed that this is the primary reason that the project remained on budget as at June 17, 2017. This is an inappropriate reallocation of line items.

Further, BC Hydro knew that its contingency account was unrelated to IDC and yet led the Commission to believe that IDC “savings” could be relied upon to support Project work contingency.

BC Hydro should not have attempted in its August 30, 2017 report to mislead the Commission by suggesting that the IDC account, in any way, is related to Project construction cost. BC Hydro’s answer to Question #2.9 states that “In accordance with BC Hydro’s PPM practice, contingency is expressed as a percentage of the Total Construction Cost Without Contingency.”

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20 BC Hydro Response to BCUC Question #2.9, October, 4, 2017, F1-10.

21 Ibid.
There is no basis upon which BC Hydro could support its claim that IDC “savings” be allocated to Project contingency. It is not only poor budget management practice, it violates BC Hydro’s internal approach to contingency estimation.

Deloitte states that it is BC Hydro practice to update contingency up or down related to project work. It is only the line items that went into the estimation of the contingency account that should be considered, not line items such as IDC which had no role to play. The practice whereby “any savings identified in project budgets in insurance and IDC (Interest During Construction) are flagged and are formally returned to the unused balance of contingency” is inappropriate and unacceptable.

BC Hydro’s practice of allocating identified “savings” in IDC to increase the contingency budget related to the Project should not be allowed for purposes of the Commission’s review. The IDC account should remain as it was in the Provincial FID budget and any achieved or forecasted “savings” reflected in a performance comparison of the IDC line should be assessed against that line item only.

BC Hydro will not, and cannot, know whether its IDC account is sufficient until much closer to project completion and thus should not adjust the IDC account downwards. In this case, it appears that BC Hydro has done so in order to allocate the funds to work related contingency so as to camouflage Project cost management failings in its construction related activities.

The Commission’s Preliminary Report raised a number of questions related to IDC and contingency. BC Hydro’s answers only partially address them. However, as discussed in more detail in Section 3.6 below, BC Hydro’s response to Question #2.12 reveals that BC Hydro’s interest rate sensitivity is such that booking IDC savings and reallocating them to contingency is dangerously premature.

BC Hydro will likely find itself requiring a re-instatement into the IDC account of the $315 million it has taken from the IDC account. When it does, those funds will have been spent on Project related costs. The time to come to terms with BC Hydro’s Project related cost pressures is now.

In his letter of October 4, 2017 to the Commission, Mr. O’Riley states, “BC Hydro has encountered some geotechnical and construction challenges on the project and the risk to the river diversion timeline has now materialized…we have now determined that we will not be able to meet the current timeline for river diversion in 2019. While this will set some activities back a year, we had a oneyear (sic) float built into our schedule and are confident we can still deliver this project on time, by November 2024.”

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BC Hydro does not have a year float built into its budget. BC Hydro is now a year behind the schedule it has been working toward since 2015. BC Hydro estimates that the cost of its failure to remain on schedule is $610 million.\textsuperscript{24}

Mr. O’Riley goes on to explain that, “Not meeting the current river diversion timeline has created new pressures on the project’s budget. We estimate that this development in the project is expected to increase its cost by 7.3 per cent or $610 million, for a total forecast project cost of $8.945 billion.” BC Hydro’s response to Question #2.15 details the cost estimates of missing the river diversion 2019 date.

BC Hydro’s response to Question #2.15 includes amounts for inflation and interest expense. BC Hydro’s inflation amount is included in line items without specifying the aggregate amount. BC Hydro identifies financing carrying costs of $162 million for the one year delay.

However, BC Hydro already incorporated $175 million for inflation and finance carrying charges for a one year delay when the Provincial FID budget was approved, but BC Hydro did not adhere to that time horizon. Taking $175 million afforded by the Provincial FID, and then claiming inflation and financing as part of the $610 million increase cost estimate recently submitted to the Commission, means BC Hydro is double dipping on inflation and financing charges related to the one year delay.

In Response to Question #2.15, BC Hydro presents a breakdown of the components included in the $610 million cost increase estimate due to Project Delay.

\textbf{Table 1 — BC Hydro Increase Cost Estimate from One Year Project Delay}

<table>
<thead>
<tr>
<th>Description</th>
<th>Explanation</th>
<th>Amount ($ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing project costs</td>
<td>Incremental indirect costs</td>
<td></td>
</tr>
<tr>
<td>Site and environmental maintenance</td>
<td>Incremental site and environmental maintenance costs</td>
<td></td>
</tr>
<tr>
<td>Main Civil Works</td>
<td>Incremental costs</td>
<td></td>
</tr>
<tr>
<td>Turbines &amp; Generators</td>
<td>Storage of components and equipment</td>
<td></td>
</tr>
<tr>
<td>Generating Station &amp; Spillways</td>
<td>Incremental costs (primarily inflation)</td>
<td></td>
</tr>
<tr>
<td>Worker Accommodation</td>
<td>Fixed worker accommodation costs</td>
<td></td>
</tr>
<tr>
<td><strong>Total Direct Costs</strong></td>
<td></td>
<td>$397</td>
</tr>
</tbody>
</table>

Using the estimate of $610 million above, the Site C Project budget would be increased by 7.3 per cent from $8.935 billion to $8.945 billion. This revised budget remains within Deloitte “Low” scenario (0 per cent to 10 per cent) as presented above.

\textsuperscript{24} BC Hydro Response to BCUC Question #2.15, October, 4, 2017, F1-8.
Using the BC Hydro estimate for increased cost of $610 million, and BC Hydro’s FID budget of $8.16 billion (BC Hydro’s FID of $7.96 billion plus $200 million for PST) measured against the revised budget of $8.945 billion, the cost of Site C has increased by 9.6 per cent, not 7.3 per cent. This is because BC Hydro accepted the $175 million granted in the Provincial FID budget and allocated it throughout the BC Hydro FID budget to pad it, and now BC Hydro is attempting to add an additional unspecified amount for inflation from 2019 onward related to a one year delay and $162 million in finance carrying charges related for that same year delay.

BC Hydro is two years into what has now been confirmed as, unequivocally, a nine year project and for all intents and purposes, is now within Deloitte’s “Moderate” scenario (10 per cent to 20 per cent over budget).

Mr. O’Riley’s letter states that “Due to the project’s complexity, we expect to continue to face risks in other areas, including our second largest procurement (i.e. the Generating Station and Spillway) that remains open and the highway realignment.”25 However, Mr. O’Riley would have the Commission believe that BC Hydro will “mitigate” those challenges and avoid cost increase implications related to them.

Given BC Hydro’s performance to date, and that there are seven years left of construction activity, it is illusionary to believe that Site C will adhere to a 2024 in-service date and remain in the “moderate” scenario of a 10 - 20 per cent increase in cost. It is highly likely, based on BC Hydro’s performance, that Site C will reach a cost of $12 billion by the time the Project is complete.

3.5 BC Hydro’s FID Budget—Accelerated to Reach a “Point of No Return”

It is difficult to understand the rationale for BC’s Hydro’s FID and PMB budget’s accelerated schedule. It is also difficult to understand why BC Hydro kept knowledge of its accelerated schedule hidden from the public.

There certainly is no market or business need for Site C’s electrical output to be made available a year earlier than the Provincial FID budget in-service date of 2024. Accelerating in-service only adds unnecessary cost to ratepayers. Site C’s electrical output represents excess supply. Why bring it in a year earlier at greater cost to ratepayers?

It is inconceivable that the Provincial Cabinet—especially the former Minister of Energy —would not be aware of the construction schedule and padded budget that BC Hydro was actually working toward.

BC Hydro’s accelerated schedule was not motivated by reasons of prudent project management considerations related to electricity need. What is most likely is that the

schedule BC Hydro was working toward was deliberately accelerated in an attempt to achieve the “point of no return” by mid-2017 as the previous government promised it would.26

A politically motivated reason is the only reason that explains why the Provincial FID budget schedule—publicly announced by the Government of BC—would then be effectively ignored as BC Hydro rushed to work toward a 2023 in-service date. The costs of this ill- advised accelerated approach are becoming apparent as pressures related to the MCW contract admitted to by Mr. O’Riley and contraventions of the Environmental Certificate—not yet acknowledged by BC Hydro—attest. These issues, and their consequences on ratepayers, are discussed in more detail in Section 4.

If BC Hydro actually believed the Project could prudently be delivered a year earlier than officially announced, the company had a public interest responsibility to be transparent about it. The fact that BC Hydro was not transparent provides little comfort going forward.

It is certainly understood that producing a reliable project cost estimate and related construction schedule is a challenge for mega projects such as Site C. This is why the industry has developed well defined management protocols including well thought out risk management and risk analysis methodologies. These sophisticated approaches are used to determine contingencies required for expected, but unknown, costs and project delays during the design and construction process.

BC Hydro applied protocols to the development of Hydro’s FID budget. Hydro’s FID budget was subjected to external reviews.27 BC Hydro makes no reference to the protocols or reviews applied to any of its PMBs, nor does it reference any protocols or reviews applied to reallocation of line items to contingency budgets.

There should only be one construction schedule and that schedule should be the one upon which the Provincial FID budget is based. That construction schedule should then be utilized in the preparation of the PMBs and PMFBs over time. If schedule reconfigurations could be undertaken to achieve an earlier in-service date, such as 2023, then the Project comes in early. What we learn, however, is that the Provincial FID budget was not as rigorous or as detailed as BC Hydro’s FID budget. This lack of detail was explained in BC Hydro’s response to Preliminary Report Question #2.2 and #2.6.28

26 Vancouver Sun, Getting Site C to the point of no return, Vaughn Palmer, January 5, 2017.


28 BC Hydro Response to BCUC Question #2.2 and #2.6, October, 4, 2017, F1-8.
The author has numerous years of experience working in utilities when major projects were being constructed, such as Manitoba Hydro’s Limestone, but has never experienced a situation where there are two sets of budgets and two sets of schedules. It makes accurate evaluation—such as that required of this Commission—extremely difficult. It also allows BC Hydro to pick and choose which budget, costs and timing it will slide between to present itself in a favourable light while future costs and delays mount.

In its Preliminary Report the Commission noted that, “According to Deloitte, BC Hydro plans to implement earned value methodology (EVM) by December 2017 to assess the degree of completion of project activities. Deloitte adds that this is “common practice” for large projects, and “if developed and executed properly” provides an assessment of both current project status and future trends.” It may be common practice, but it is not a common practice that BC Hydro implemented.

The Commission should be aware that it was recommended to BC Hydro by Ernst & Young in September 2016 that BC Hydro implement EVM as a high priority (eg within three months). “The Main Civil Works contractors would benefit from a forward-looking capability and capacity review to help monitor contractor performance against schedule. The implementation of Earned Value Management and Unifier will also support contract management.” BC Hydro failed to implement EVM as recommended. This failure is an example of BC Hydro’s lack of management discipline and adherence to best practices.

The Commission recognized in its Preliminary Report that its work might be served by EVM. “The Panel understands that BC Hydro is planning to implement regular earned value reporting for the Site C project in December 2017. In advance of this development, the Panel asks BC Hydro to provide a point-in-time assessment of its progress to June 30, 2017 using the earned value method, including analysis of schedule variance, cost variance, schedule performance and cost performance as compared to both the FID and PMB plans.” (emphasis in original). The EVM request was item #2.6 of the Panel’s questions for BC Hydro.

In particular, BC Hydro’s response to Question #2.6 states, “Earned value methodology requires a project’s work packages to be broken down to a sufficient level of detail for analysis. While BC Hydro can prepare an earned value analysis compared to PMB for major work packages, BC Hydro has not performed an earned value analysis compared to the FID baseline as it lacks sufficient level of detail to assess (sic) using earned value methodology.”

31 BC Hydro Response to BCUC Question #2.6, October, 4, 2017, F1-8.
The admission by BC Hydro that it is unable to perform an EVM to the Provincial FID is disturbing. It also confirms that BC Hydro is not relying on the Provincial FID as its Project baseline. It is BC Hydro’s FID that is the Project baseline.

BC Hydro agreed with Ernst & Young that it would undertake EVM by December 2016. BC Hydro did not deliver. Then the company told Deloitte that EVM would be available by December 2017 after the Commission’s work is slated to be completed. Now we find that this is not possible.

It is only when the Commission explicitly asked BC Hydro for an EVM compared to the Provincial FID, that we learn that the Provincial FID is not of sufficient detail to warrant the application of EVM. BC Hydro has always known this to be the case but consistently pretended otherwise.

3.6 Treatment of Interest During Construction and Allocation to Contingency

BC Hydro’s submission states:

“At the time of the decision to construct Site C, BC Hydro had developed a Risk Management Plan and a risk register to identify potential risks associated with project construction and mitigation strategies should those risks occur…this risk framework was evaluated by Marsh Canada who concluded that BC Hydro had developed a strong foundation for risk management for Site C. This risk assessment forms the basis for ongoing risk and contingency monitoring.”32

When the Provincial Government announced its investment decision on December 16, 2014, the Site C Capital Cost Estimate “was reviewed and updated to $8.335 billion. Government also decided to establish a project reserve of an additional $440 million, to account for events outside of BC Hydro’s control that could occur over an eight-year (sic) construction period, such as higher than forecast inflation or interest rates, for a total of up to $8.775 billion. The reserve will be subject to provincial Treasury Board approval.”33

The Site C contingency account approved in the Provincial FID is $794 million, under authority and control of BC Hydro senior management and Board of Directors. The additional $440 million project reserve subject to the approval of the Provincial Government brings total project contingency is $1.234 billion.

In its submission, BC Hydro attempts to downplay the expenditure of nearly 45 per cent of the $794 million contingency reserve by suggesting that there are increased

32 BC Hydro Submission, op. cit., page 32.

33 BC, Backgrounder, Site C Capital Cost Estimate
contingencies available since 2014, primarily due to the “lower forecasted interest rates, which reduce the forecasted carrying costs (called Interest During Construction) on the debt incurred to finance the Project during construction.” This is presented in Table 4 of BC Hydro’s submission, reproduced below.

Table 2: Interest Saving Allocation to Contingency from BC Hydro Report

<table>
<thead>
<tr>
<th>Description</th>
<th>$ million (Nominal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Contingency Budget, at Final Investment Decision</td>
<td>794</td>
</tr>
<tr>
<td>Identified Savings on Forecast Interest-During-Construction:</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>89</td>
</tr>
<tr>
<td>2016</td>
<td>76</td>
</tr>
<tr>
<td>2017</td>
<td>150</td>
</tr>
<tr>
<td>Total identified Savings on Forecast Interest-During-Construction</td>
<td>315</td>
</tr>
<tr>
<td>Other Cost Savings identified, to June 30, 2017</td>
<td>86</td>
</tr>
<tr>
<td>Total identified Cost Savings</td>
<td>401</td>
</tr>
<tr>
<td>Total Contingency, June 30, 2017</td>
<td>1,195</td>
</tr>
</tbody>
</table>

BC Hydro’s report identifies $401 million in cost savings, of which almost 80 percent are related to “Savings on Forecast Interest-During-Construction”. BC Hydro takes these “savings” and adds them to the Provincial FID contingency budget of $794 million.

Upon what basis did BC Hydro determine it could lower its IDC account? Certainly, it has said it identified $315 million in savings, but that is not a justification for reducing the account and reallocating the funds to project contingency.

How did the company methodologically determine, unequivocally, that between now and fiscal 2025 (November 2024 in-service date) it will not require these funds to finance future construction related cost overruns for the project or meet requirements related to interest rates coming in higher than forecast?

The Commission requested in Question #2.13 that BC Hydro provide “a quantification of the budget impact for each risk (identified in table D-4 of appendix D)…should the risk come to pass.” In the item discussing the risk of “Interest Rate Variability” BC Hydro acknowledges that the cost of interest rate variability could reach $1 billion, meanwhile, BC Hydro wishes to transfer $315 million out of the IDC account to accommodate cost overruns in work related activity. This makes little sense. BC Hydro should have

34 **BC Hydro Submission**, op. cit., page 31.

understood their interest rate exposure and reflected this in its August 30, 2017 report. Instead, BC Hydro stated they would transfer out $315 million in alleged financing cost “savings”.

BC Hydro would have the Commission believe it is appropriate to increase its contingency reserve with IDC amounts to reach $1.195 billion—an amount $401 million greater than when the Provincial FID budget was determined. This increase in contingency is not a result of sophisticated modelling techniques but was determined by an alleged windfall gain related, primarily to interest rate expectations and a belief that interest rates will be lower between now and 2025 than they are currently.

In BC Hydro Response #2.12 to the Commission’s questions, BC Hydro provided a graph of its interest rate projections. That graph is provided below. It is clear that BC Hydro expects that interest rates will continue to fall into 2018 and remain low until the Provincial FID in-service date. BC Hydro could have assisted the Commission in identifying how it arrived at a possible impact of $1 billion charge to the IDC when it answered Question #2.12, but did not do so.

**Graph 1 — BC Hydro Forecast of Interest Rates During Construction**

![Graph 1](image)

The Commission requested BC Hydro provide an analysis of the impact on IDC of various interest rate increases on BC Hydro interest costs. BC Hydro has indicated that if interest rates rise by 2 percent above those projected (not a 2 percent increase from where rates are today), $136 million of the anticipated savings would be eroded.
This is worrisome since Site C is only two years into a nine year project. Interest rates may be lower than BC Hydro originally forecasted now, but with seven years of construction activity still to take place they may be much higher than forecasted over the period.

Further, there is no indication as to why BC Hydro has predicted declining rates when recent Bank of Canada actions suggest an upward trend may be forthcoming sooner rather than later, particularly since the Bank of Canada raised its benchmark a quarter of a point in early September.\(^{36}\)

If BC Hydro has been overly aggressive in predicting a decline in interest rates such that, for example, rates rise to roughly 5.5 percent instead of decline to 3.5 percent, there will be a need for increased IDC of more than $100 million.

There are other reasons why there may be a draw on the IDC account not currently foreseen by BC Hydro such as Project cost increases beyond budget and/or if the project is delayed. We have already learned that the one year delay in Project in-service date to 2024 results in a financing cost of $162 million as per BC Hydro’s answer to Question #2.8.

Since the entire project cost is not protected by the hedging program, if interest rates rise in the future, IDC requirements will rise. Further, BC Hydro is presenting the hedging program as if it is risk free when it is not.\(^{37}\) It is not clear if BC Hydro has allocated the cost associated with its hedging program to Site C in the same pro rata share as it has claimed the cost reduction benefits from it, but it should have. Hedging programs are not free.

Even if BC Hydro’s aggressively positive interest rate forecast is correct, BC Hydro faces the prospect of increased interest rate charges related to its credit risk during this Inquiry. BC Hydro has avoided discussion of its financial weakness, including its huge debt load, $6 billion in deferral accounts and almost $60 billion in IPP contract commitments, and how the liabilities may impact the cost of borrowing on a go forward basis. BC Hydro’s financial position is the weakest among Canadian utilities.

There have been signals from credit rating agencies that a downgrade is possible. This would increase BC Hydro’s overall financing costs, likely irrespective of its hedge program.\(^{38}\)


A one-tier credit downgrade brings with it roughly a 25 basis points increase in interest expense. For Site C’s unhedged debt, this represents about $11 million per year on $4.4 billion. However, it would not be unreasonable to expect that BC Hydro’s hedging program has some relationship to BC Hydro’s credit status, and therefore, it is probable that the annual cost of a credit rating downgrade would come in closer to $20 million on an annual basis.

This means that the so called “savings” BC Hydro claims to have garnered from its hedging program and lower interest rate forecast are at risk because of the debt burden Site C places on an already vulnerable corporate financial position. The credit rating BC Hydro expected to maintain when it developed its IDC account, is not likely to be the credit rating that persists.

BC Hydro also stated in its response to Question #2.12 that the savings reflect not only a reduction in forecast rates of interest but also “changes in the expected timing of expenditures.”39 BC Hydro does not assist the Commission by identifying how much of the $315 million is related to project timing issues, or is there any reference to how those timing impacts have been affected by the announced Project delay on October 4, 2017. The interest rate sensitivity analysis only provides partial insight into the sources of BC Hydro’s IDC “savings”. Regardless, the IDC line should not be adjusted by virtue of the “savings” BC Hydro has calculated.

Not only is it inadvisable to reduce the IDC line item, it is also inadvisable to increase the Project work contingency account with the proceeds. Contingency accounting adjusts for expected budget pressures that cannot be identified directly at the time the FID is developed.

Contingencies provide room for the ‘known unknowns’. Contingencies are calculated to accommodate such pressures on costs and schedules as material price escalation, contractual disputes, poorly designed scope, design creep, lack of approvals, weather, geotechnical conditions, and labour relations issues. If contingencies as originally established are drawn, then the Project is over budget.

There is more than sufficient evidence that BC Hydro’s contingency risk management and risk analysis has severely underestimated the uncertainties associated with the Project. In what appears to be a desperate attempt to find additional contingency monies to accommodate the serious and ongoing challenges related to the MCW contract, it should be noted that there are still large contracts to be awarded. Based on BC Hydro’s experience with the MCW contract, the transmission and spillway contracts will likely come in much higher than anticipated with insufficient Project work related contingency amounts.

The practice of identifying realized and potential savings in IDC, removing them from the line item and then allocating those amounts to work contingency is inappropriate

39 BC Hydro, Response to Round 2 Information Requests, 2.12, September 29, 2017, F-14
when estimating budget risk. It not only puts the IDC line item at risk, it allows budget inaccuracies on construction related Project line items to appear less inaccurate than they are. What should be a useful project management feedback mechanism becomes unplugged.

BC Hydro would have the Commission believe that because it got lucky on interest rates, that windfall gain can be reallocated to cover up just how poor the company is at forecasting construction contingency.

Certainly there is the Treasury Board reserve of $440 million for contingencies related to inflation and interest rates, but it is very doubtful that the Provincial Government provided this reserve so BC Hydro could draw from its IDC account to prop up project related contingency, and then when that action proves ill-conceived, turn to the Treasury Reserve for a bail out. As we learn from BC Hydro’s response #2.8, the budget overruns have now used that reserve amount in any event.

How BC Hydro deals with contingencies associated with Site C is unsettling. The Commission is correct when it points out concern in its Preliminary Report that, “the $356 million contingency that has been allocated and committed to date represents 45 percent of the planned $794 million contingency, two years into an eight-year (sic) project…”

The Panel is correct to be concerned when it states, “BC Hydro is already forecasting to use $1 billion of contingency, two years into an eight-year (sic) project. This is twenty-six percent over the original cost contingency of $794 million, and is eighty four percent of the revised cost contingency of $1.195 billion.”

The Panel seems to accept BC Hydro’s increase in contingency from $794 million to $1.195 billion based on “historically low interest rates.” The Panel requested that BC Hydro provide an analysis of the $315 million identified as savings, which BC Hydro did in answer to Question #2.12. The sensitivity information provided by BC Hydro confirms that a reduction in IDC is imprudent.

The $315 million IDC component of the revised contingency should not be considered as Project work related contingency for the reasons discussed in this section and for the reasons provided in Section 3.4.

When IDC is excluded from Project contingency, BC Hydro’s forecast that it will use $1 billion of contingency two years into a nine-year project is twenty-six percent over the original contingency cost of $794 million, and is fourteen percent over a revised cost contingency of $880 million. ($1,195 - $315 = $880 for revised contingency). As at June 2017, BC Hydro was over budget.

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40 Preliminary Report, op. cit., page iii of viii.

41 Ibid., page 33.
In summary:

i) if the Commission is tied to an evaluation of BC Hydro based on a 2024 in-service date, then the budget and time schedule upon which BC Hydro should be evaluated is the Provincial FID against a PMB system predicated on the same budget and time schedule. The PMB reports the Commission has received to date result in a comparison of apples to oranges when evaluated against the Provincial FID;

ii) it is inappropriate for BC Hydro to estimate an unexpected interest expense windfall gain, reduce the IDC account and reallocate the amount to the work related contingency account. The Commission should not accept such an approach;

iii) BC Hydro has stated that $162 million in financing carrying charges have been added to its budget because of Project delay. This utilizes more than 50 per cent of BC Hydro’s so called “savings”. There is good reason to believe that the remaining interest “savings” BC Hydro has identified will be required as the project progresses; and

iv) manipulation of the IDC and contingency accounts as BC Hydro has attempted to do in Part 4 of its report masks project related cost pressures and contingency reliance.

Recommendation #2: That the Commission, in its evaluation of whether the Site C project is on budget, reallocate $315 million back from the Contingency Budget to the IDC account to return the IDC account to $1.407 billion as per the Provincial FID.

Recommendation #3: That the Commission recognize that the budget BC Hydro has been working toward is BC Hydro’s FID with a total cost (including PST) of $8.16 billion predicated on an in-service date of 2023.

Recommendation #4: That the Commission recognize that BC Hydro’s PMB has now increased to $8.945 billion—an increase of 9.6 per cent and its in-service date is delayed one year to 2024.
4. Main Civil Works

The Main Civil Works (MCW) contract is the largest contract to be tendered for the construction of Site C. The BC Hydro FID budget cost estimate BC Hydro prepared for this contract was based on services provided by one general contractor. KPMG’s review of Hydro’s budget modelling in 2014 noted that, “BC Hydro has not allowed for any Joint Venture costs in its 2014 estimate for Main Civil Works.”

The Commission’s Preliminary Report states, “Deloitte is also concerned about the risks that BC Hydro has under-estimated the cost of its major contracts. BC Hydro under-estimated the cost of the main civil works contract, which caused cost contingency to be committed when the contract was awarded.”

The four qualified bids for the MCW contract that BC Hydro received were all joint venture partner bids. Hydro accepted the lowest bid, but even this exceeded BC Hydro’s estimate.

The MCW contract was awarded to Peace River Hydro Partners (PRHP), a consortium of Alberta based Petrowest Corporation (now in receivership), Spain’s Acciona Infrastructure, and Korea’s Samsung. The MCW contract award in excess of Hydro’s estimate—partly due to its failure to anticipate a joint venture—is an early indication of BC Hydro’s mismanagement of the MCW budget process.

BC Hydro was not prepared for the cost estimate implications of a joint venture for the MCW. BC Hydro did not anticipate the more difficult management realities a joint venture partnership represents because it did not build such an arrangement into its plans.

An Ernst & Young report on Site C Infrastructure Risk and Cost Management noted a year ago that, “given that the parties contracted have not had extensive experience working together on major projects, additional oversight and reporting to ensure cost and schedule targets are met should be considered.” This means that BC Hydro still had not adapted to the cost and schedule pressures that a joint venture implies as recently as a year ago.

The Deloitte report states that, “PRHP may have significantly underbid the Project, by [redacted] to [redacted]. This may explain the claims that PRHP has submitted to the


43 Preliminary Report, op. cit., page 29

Project to date to recuperate some of its losses. Deloitte believes that PRHP may continue this trend as long as it cannot recover its losses.”

4.1 Petrowest Receivership

In Eliesen 1, it was noted that Petrowest Corporation, one of the joint venture partners of PRHP, had gone into receivership. The question was raised in that report as to how BC Hydro qualified Petrowest, since a month after the contract was awarded the media reported that Petrowest was operating on borrowed time from its lenders.

BC Hydro’s approach to qualifying its contractors has not been answered by BC Hydro, nor did Deloitte make any reference to the contract vetting approach in its report. BC Hydro’s approach to qualifying contractors is an important issue particularly since corporate non-performance can have significant consequences for a major project, the implications of which cascade throughout the project time line and cost.

Further, BC Hydro has significant contracts it has not yet let. The negative experience with Petrowest—and its effect on project costs and schedules—is evidence the Commission now has before it. This evidence shows that BC Hydro is derelict in its due diligence duties with respect to contractor vetting.

According to BC Hydro the termination of Petrowest will not have a “significant impact.” This claim is highly suspect. There has not been credible evidence provided by BC Hydro to back up this claim. In fact, in its responses to the Commission’s questions BC Hydro has not addressed the impact of Petrowest’s financial failure on Project cost and schedule. The Commission should be concerned about BC Hydro’s silence on the issue and how future contractors will be qualified by BC Hydro.

In contrast to BC Hydro’s characterization of the situation, in its report, Deloitte expressed concern. “Deloitte is of the view that this termination will create a period of instability that may impact PRHP’s ability to meet its planned work schedule in the short to medium term.” Inability to meet the planned work schedule is both expensive and foreshadows further schedule delays.

Deloitte asked a number of questions of BC Hydro as part of its research for its report. One of these related to high staff turnover. “Question: Have (sic) there been a lot of turnover in staff with PRHP? An answer was provided verbally as being high.”

“Response: Yes, BC Hydro has observed that PRHP has experienced a significant


46 Ibid.

47 Ibid.
amount of staff turnover over the past few months. Some recent examples of senior positions/Key Individuals who have left or been replaced in the last few months are: [redacted]. BC Hydro is noting these changes and ensuring that contractually-required Key Individuals continue to be in place.\textsuperscript{48} From a project management perspective, high staff turnover, especially at the senior level, is an indication of a serious situation of non-performance.

Further evidence on the impact of Petrowest’s termination from then joint venture is reflected in Deloitte’s Question \#146 to BC Hydro, “We would like to know about the potential cost and schedule implications related to the termination of Petrowest from the Peace River Hydro Partners consortium. We understand that Petrowest provides most of the labour and equipment required under the Main Civil Works contract. We are wondering if PRHP has provided any contingency plans to address the situation.\textsuperscript{49} BC Hydro’s reply referenced attachments—all of which were redacted. Request for access to these redacted attachments was refused to the author, notwithstanding the delivery of a confidentiality agreement to BC Hydro having been undertaken.

There is serious and ongoing difficulty between BC Hydro management and the remaining PRHP management. On September 26, 2017, PRHP laid off 200 workers due to work stoppage on both sides of the Peace River.\textsuperscript{50} BC Hydro publicly objected to this action stating that, “in this case we believe this work can continue into the late fall and early winter, and we are encouraging PRHP to re-examine their decision to layoff these workers.”\textsuperscript{51}

When disagreements on MCW activities are being debated in the public arena, this confirms the existence of serious problems that can be expected to further impact the construction schedule and Project costs. This has now been acknowledged by BC Hydro in their answer to the Commission’s Question \#2.3. The Commission has been informed that the joint constructibility review undertaken by BC Hydro and PRHP, to develop options to recover schedule and maintain the 2019 river diversion milestone, was not successful, and that, “the parties are in dispute over the causes of the delay.”\textsuperscript{52}

BC Hydro correctly states that, “it is not uncommon for contractors to seek additional compensation for alleged changes to the work, found conditions or in relation to construction delays.”\textsuperscript{53} However, the number and severity of these claims and the stark

\textsuperscript{48} Site C Review, Responses to Questions Raised by Deloitte, Question 6, August 14, 2017
\textsuperscript{49} Responses to Questions Raised by Deloitte, Question 146, August 21, 2017.
\textsuperscript{50} Alaska Highway News, September 26, 2017, Site C layoffs mount; 200 workers laid off.
\textsuperscript{51} Ibid.
\textsuperscript{52} BC Hydro Response to BCUC Question \#2.3, October, 4, 2017, F1-8.
\textsuperscript{53} BC Hydro Response to BCUC Question \#2.7, October 5, 2017, F1-10.
differences in views between BC Hydro and the MCW contractor reflect disfunction that is not conducive to constructing a large hydro dam. As an example of the disfunction, BC Hydro explains in its response to Question #2.7:

“Left Bank

…The contractor has alleged that its work has been delayed as a result and that there is a global instability within the left bank works that it anticipates has caused a delay of approximately 1 year to its operations on the left bank. The contractor has alleged that the geotechnical conditions observed on the left bank differ from those disclosed by BC Hydro.

BC Hydro disputes the Contractor’s allegations and has directed the Contractor to take all required steps to recover schedule pending the resolution of the dispute and on account of the Contractor’s Delay (sic). BC Hydro has notified the Contractor that it considers the Contractor to have failed to apply appropriate factors of safety and appropriately sequence and monitor its work when operating on the left bank, including when constructing its temporary haul roads.”  

These allegations on both sides are serious and suggest significantly increased cost for developments to date over and above the $610 million disclosed by BC Hydro.

The Commission should be aware of contract dispute developments that took place at Muskrat Falls between Nalcor and its MCW contractor Asaldi. The outcome of those disagreements resulted in the MCW contract price being increased from $1.26 billion to $1.83 billion before work recommenced—a 45 percent increase.

BC Hydro’s single contractor assumption, failure to anticipate and adjust for joint venture complexities and costs, and failure to properly vet its contractors, has resulted in a significant underestimation of MCW costs, only some of which are evident in current figures. Further efforts to deal with these disputes will likely add to Project costs, and possibly contribute to further project delay.

In summary, the Commission documented many serious risks impacting schedule and costs associated with the MCW contract in its Preliminary Report. These are:

- two tension cracks on the left bank creating significant challenges with the MCW contract;

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54 Ibid., page 5 of 6.

55 CBC, Nalcor, Astaldi reach $1.83B contract to complete Muskrat Falls powerhouse, December 21, 2016.

56 Preliminary Report, op. cit., page ii of viii
• two years into an eight year (sic) project 45 per cent of the planned contingency of $794 million (Provincial FID budget) has been committed\textsuperscript{57};

• if the river diversion is not achieved by September 2019 then the project will not remain within budget and would likely require a draw on the Treasury Board reserve\textsuperscript{58};

• PRHP’s latest schedule revisions mean the start of the River Diversion milestone will not be achieved in 2019 as planned. Hydro is not accepting this revision. However, if there is a negotiated achievement of the 2019 deadline, cost increases are likely in order to achieve it\textsuperscript{59};

• there is no clear method by which BC Hydro measures percent of complete\textsuperscript{60}; and

• PRHP has made slow progress in its evaluation of the left bank and has consistently excavated lower volumes compared to its own prior month’s forecasts\textsuperscript{61}.

In the answers to the Commission’s Round Two Questions, BC Hydro has acknowledged that all of the above concerns were valid.

4.2 Environmental Non-Compliance

The immediate serious risks to the Project’s cost and schedule are not limited to those identified in the Commission’s Preliminary Report. In addition, there are serious risks related to environmental non-compliance which have not been disclosed by BC Hydro in a transparent manner.

Ongoing violations of environmental non-compliance associated with the MCW have, and will continue to, impact cost and schedule. Environmental compliance at Site C has been so poor that repeated violations related to sediment control have harmed water quality and fish habitat.\textsuperscript{62}

\begin{footnotes}
\item [57] Ibid., page iii of viii.
\item [58] Ibid.
\item [59] Ibid., page 16.
\item [60] Ibid., page 14.
\item [61] Ibid., page 16.
\item [62] Vancouver Sun, Larry Pynn, B.C. Hydro faces more environmental rebuke over sediment flows at Site C dam, April 16, 2017.
\end{footnotes}
In addition there has been environmental non-compliance with the requirement to implement measures to control and clean up leaks and spills of hydrocarbon material in order to minimize effects on amphibians, and to monitor water quality in potentially affected wells.63

The Canadian Environmental Assessment Agency also released an order in January 2017 requiring that BC Hydro comply with conditions related to fish and fish habitat harmed as a result of sediment laden water.64

An August 31, 2017 inspection report from the BC Environmental Assessment Office (EAO) detailed how BC Hydro violated rules respecting indigenous burial sites and a sweat lodge, and therefore BC Hydro cannot legally proceed with a bridge over Cache Creek related to Site C highway relocation. BC Hydro must apply for an amendment to its EAO certificate because it changed the location and length of the bridge from the design originally approved by EAO.65 This involves at least a 90 day period of consultation with affected First Nations.

In June 2017, BC Hydro was requested to delay the expropriation of houses along the proposed highway route. BC Hydro claimed that a slight delay in re-routing the highway would add an additional $630 million to construction costs and delay the Project a year.66 BC Hydro knew at that time that there were formal complaints of certificate violations before the EAO and also knew that delaying the proposed highway route (and expropriation of housing) would not likely result in a one year delay to the Project.67

BC Hydro advanced a false narrative respecting a delay in the expropriation of houses along the highway route. It continues to be unclear as to the cost related to the need to respect the EAO certificate and First Nation’s heritage sites.

BC Hydro, in response to the Commission’s Question #2.7, acknowledges increased, “direct costs arising from additional incremental effort required by revisions to the Construction Environmental Management Plan. The main changes are as follows:

- As a result of an order issued by the Comptroller of Water Rights on June 24, 2016, the requirements for the project’s water management regime changed.

63 BC, Quarterly Environmental Enforcement Summary, 3rd Quarter 2016.


65 BC Environmental Assessment Office Inspection Record, August 31, 2017.

66 Globe and Mail, BC Hydro denies NDP’s request to delay Site C construction, Justine Hunter and Ian Bailey, June 7, 2017.

67 Letter from Nun wa dee Stewardship Society to Premier Christy Clark, June 7, 2017.
This change requires the purchase of new water treatment plants, incremental monitoring, and additional reporting; and

- Additional environmental management changes were required following the Environmental Assessment Office order on April 7, 2016 related to incremental site-wide erosion and sediment controls.  

Numerous environmental certificate violations have not been addressed by the Commission, perhaps because neither Deloitte or BC Hydro raised them. The environmental certificate violations need to be added to the Commission’s list of concerns along with the quantification of the cost and schedule implications related to them.

It appears that the only quantitative mention BC Hydro has made to the serious environmental infraction risk is included in BC Hydro’s response to Question #2.5 and #2.13. BC Hydro states that there have been difficulties in adapting to the Project’s environmental commitment, not that there are serious defaults in meeting certificate requirements. BC Hydro is misrepresenting the current situation and understating the risk and cost related to it.

BC Hydro’s response to Question #2.13 regarding Environmental Requirements states, “The Project must comply with the requirements of the Environmental Assessment Certificate (Provincial) and the Federal Decision Statement as well as conditions in licenses, permits and authorizations. All Contractors on the Project have experienced difficulties in adapting their construction methodologies to achieve the Project’s environmental commitments. To address this, BC Hydro has added additional environmental specialists and is working with the Contractors to implement solutions that meet regulators’ expectations.”

BC Hydro places a severity impact range of $10 - $100 million and a probability of risk occurring of 30 per cent. BC Hydro has 100 per cent probability of default on environmental compliance since it has already occurred, not 30 per cent as BC Hydro suggests. Regulators are in a position to levy fines and penalties related to them. As well, the cost of compliance is likely to be significant and yet BC Hydro pretends the situation is much less serious than it is.

The misrepresentation of environmental requirement risk brings into question the reliability of BC Hydro’s Probability of Risk Occurring for all risks identified in the updated Table D-4. Putting this in context, on October 4, 2017 the Commission was told that the probability of geotechnical risks was 10 per cent with a cost range of $10 - $100 million. That same day the Commission is informed by Mr. O’Riley that BC Hydro has

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68 Question #2.7, F1-10, op. cit., page 4 of 6.
69 Question #2.13, F1-10, op. cit., page 2 of 7.
encountered geotechnical and construction challenges—geotechnical risk is no longer probable it has occurred—and the total cost related to this is $610 million.
5. Other Large Canadian Hydro Projects

The Commission’s Preliminary Report states that, “we do not find other project comparisons are sufficiently relevant to draw specific conclusions about the Site C project.”

This is unfortunate. The evidence presented in Eliesen 1, along with evidence supplied by other participants, clearly illustrates the direct parallels of cost overruns and project delays of Manitoba Hydro’s Keeyask Generating Station and Newfoundland and Labrador’s Muskrat Falls projects to Site C.

The Panel commented in its Preliminary Report that there appears to be a contradiction between Eliesen and Deloitte respecting the construction delay at Muskrat Falls. The Panel stated, “Eliesen…cites the examples of … Keeyask Generating Station and Muskrat Falls which are both currently two years behind schedule. Deloitte notes that … Muskrat Falls is at “61% actual completion versus a plan of 63%”. The Panel notes that Deloitte’s submission on Muskrat Falls appears to be in contradiction to Eliesen’s observation that the in-service date is “delayed to 2020 from the in-service date of 2018 when the project commenced in 2013.”

It is important to inform the Commission that there is no contradiction. At project sanction Muskrat Falls was expected to be in-service in May 2018. The schedule was revised in June 2016 with a new in-service date of May 2020. This is the 2 year delay cited in Eliesen 1. Since Eliesen 1 was prepared, a new revised schedule has been publicly released that places the in-service date for Muskrat Falls at August 2020—representing a project delay of 2 years and 3 months.

Deloitte erred in its project schedule reference. The reference Deloitte selected does not compare actual construction completion to an original plan. It is unclear what the base reference is in the quote that Deloitte chose, but it certainly is not one that allows for a meaningful assessment of project delay.

To assist the Commission, Table 3 below, has been provided to illustrate the schedule plan at Muskrat Falls project sanction and each revised schedule plan since.

As Table 3 shows, when the project was sanctioned, Nalcor expected full power by May 2018, whereas the June 2016 revision put full power by May 2020 (2 year delay) and the June 2017 revision puts full power at August 2020 (2 years and 3 months delay).

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70 Preliminary Report, op. cit., page ii of viii.

71 Ibid., Page 19. Deloitte’s reference comes from page 6 of the Muskrat Falls Quarterly Report. The statement in the Quarterly Report is, “Muskrat Falls Generation construction progress was 61.4% vs. planned of 63.2%-cumulative progress continues to trend behind plan;”
Table 3 — Muskrat Falls Forecast to Complete

Current forecast to complete - schedule

<table>
<thead>
<tr>
<th>Milestone description</th>
<th>Date at project sanction (DG3)</th>
<th>Re-baseline planned June 2016 (Generation AFE4/Transmission AFE3)</th>
<th>Re-baseline planned June 2017 (Generation AFES/Transmission AFE4)</th>
<th>Forecast June 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st power transfer (Poe 1)</td>
<td>N/A</td>
<td>N/A</td>
<td>01 Jul 2018</td>
<td>21 Mar 2018</td>
</tr>
<tr>
<td>First power from Muskrat Falls</td>
<td>30 Dec 2017</td>
<td>02 Aug 2019</td>
<td>02 Nov 2019</td>
<td>To be confirmed</td>
</tr>
<tr>
<td>Full power from Muskrat Falls</td>
<td>22 May 2018</td>
<td>14 May 2020</td>
<td>14 Aug 2020</td>
<td>To be confirmed</td>
</tr>
</tbody>
</table>


Source: E&Y Muskrat Falls Project, August 31, 2017.

In Eliesen 1, it was stated that, “...construction (of Muskrat Falls) commenced in 2013 at an estimated cost of $7.4 billion with an in-service date of 2018. The current cost estimate is $12.7 billion (an increase of 72 percent) with inservice delayed to 2020.”

However, the Commission’s Preliminary Report states that, “By comparison, Deloitte quotes a current estimate of $5.5 billion (without interest during construction or capitalized financing costs) versus an original estimate of $2.9 billion.”

It is important for the Panel to understand that the cost figures in Eliesen 1 and the cost figures in Deloitte cannot be compared because Deloitte’s figures are a subset of those referenced in Eliesen 1.

Eliesen 1, referenced total project costs including transmission related costs and financing while Deloitte referenced costs related to generating construction only (Deloitte excludes costs related to transmission assets of $894 million and transmission

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72 Eliesen 1, op. cit., Page 7.

73 Preliminary Report, op. cit., Page 34
lines of $3.72 billion). As well Deloitte excludes financing costs. Thus it may appear that there is a contradiction in the figures relied on in Eliesen 1 and Deloitte, but there is not.

For example, current project cost of $12.7 billion (Eliesen 1 figures) includes $2.58 billion in financing costs leaving $10.12 billion in project capital costs. Of this $10.12 billion in project capital costs, $5.5 billion (Deloitte’s figure) consist of Muskrat Falls Hydroelectric Generating Facility costs.

In order to serve the Panel in removing the confusion regarding Muskrat Falls capital cost overruns, Graph 2 below, provides original and revised cost estimates.

Graph 2 — Muskrat Falls Capital Cost Comparisons

Muskrat Falls Projected In-service Capital Cost

Source: Nalcor

While the Commission may have determined that it will “give more weight to the evidence specific to the Site C project,” it is hoped that this conclusion was not partially based on apparent contradictions that do not exist.

Eliesen 1 identified factors that were responsible for major cost overruns and schedule delays at Keeyask and Muskrat Falls. These factors can readily be applied to Site C and can assist the Commission. Certainly the evidence specific to Site C reveals that the

project is experiencing significant cost overruns and delays, but since the relatively limited construction history of Site C does not give the Commission much history to work with, drawing on major projects in Canada with similar circumstances can assist the Commission in determining what the future most likely holds for Site C.

By way of review, the factors are:

a) the utility has not constructed a large generating station for decades;

b) internal professional staff experience in the planning and construction of large mega projects built by the utility have retired or moved on;

c) there is a lack of construction contractor experience with large hydro projects being built in the northern regions of Canada;

d) unexpected or unforeseen major geotechnical problems and challenges exist; and

e) the utilities have a history of exaggerating further electricity requirements for their province and rely on recent forecasts to justify the need for new generating stations.

It is not an uncommon practice in assessing likely future events to assess pre-existing conditions. The pre-existing conditions with BC Hydro are such that they send off warning signals that material delay and cost overruns for the remaining seven years of construction activity are not only very likely, but almost certain.

Even without the similar experience of Muskrat Falls and Keeyask, the factors outlined above are indicative of “evidence related to Site C” that should give the Commission concern. The experience of Muskrat Falls and Keeyask provide the Commission with some useful benchmarks as to the quantitative impact of the above five factors when applied to a major project such as Site C.

It should also be pointed out that the budget overruns and project delays for both Muskrat Falls and Keeyask were not publicly acknowledged until after three to four years of construction activity. Senior management for both projects—which are further along than Site C—have warned that more cost increases and schedule delays could take place before the projects are complete.

The Panel correctly concludes that BC Hydro’s recent overall project performance is not relevant “since the size and scale of the Site C project is so much larger than anything BC Hydro has recently undertaken.”

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However, it is relevant to examine the evidence related to BC Hydro’s management of recent large transmission projects. In this regard, a selection of the larger projects provided in Table 10 of the Commissions Preliminary Report, the following major BC Hydro transmission projects all experienced significant cost increases.

**Table 4 — Recent BC Hydro Major Transmission Projects**

<table>
<thead>
<tr>
<th>Transmission Line</th>
<th>Budget (Millions $)</th>
<th>Final Cost (Millions $)</th>
<th>Percent Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northwest</td>
<td>$561</td>
<td>$705</td>
<td>26%</td>
</tr>
<tr>
<td>Interior to Lower Mainland</td>
<td>$657</td>
<td>$741</td>
<td>13%</td>
</tr>
<tr>
<td>Dawson Creek/Chetwynd</td>
<td>$254</td>
<td>$296</td>
<td>17%</td>
</tr>
</tbody>
</table>

BC Hydro has confirmed significant delays on its recent generation and transmission projects. “Generation placed 32 projects into service in fiscal 2015 and fiscal 2016…On average Generation projects were placed into service 8 months after the original approved in-service date.”…“Transmission and Distribution placed 151 projects into service in fiscal 2015 and fiscal 2016…On average Transmission and Distribution projects were placed into service 9 months after the original approved inservice date.”

BC Hydro’s recent experience illustrates project delays and cost overruns even with smaller projects and more predictable management activity. This does not provide a sense of confidence in BC Hydro’s major project management ability. If Hydro has trouble getting the small projects in on time and on budget this should give the Commission concern about its ability to manage a major project like Site C.

**Recommendation #5:** That the Commission recognize the factors responsible for high cost overruns and schedule delays associated with the Keeyask and Muskrat Falls Projects are similar to those experienced at Site C and therefore weight be given to the experience of other major Canadian projects, particularly since Site C has just completed the second year of a nine-year construction schedule.

**Recommendation #6:** That the Commission rely upon an estimate of $12 billion for the capital cost of the Project in its evaluation of the impact on ratepayers of continuing or cancelling the Project.

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76 Ibid., page 18
6. Future Rate Increases and BC Hydro’s Financial Situation

The impact of Site C on BC Hydro ratepayers cannot be looked at in isolation from BC Hydro’s current financial position. In its Preliminary Report the Commission was silent on this issue.

The price impact on ratepayers of continuing, postponing or cancelling the project is sensitive to the relative position of BC Hydro’s overall financial reality because of how relative financial position impacts credit ratings and cost of debt. Any increase in debt costs—even if market interest rates stay unchanged—increases the cost of service to ratepayers.

The impact on ratepayers of continuing, postponing or cancelling the project would be less if BC Hydro was in a strong financial position with a lower debt load, low or no deferral accounts and low or no contingent liabilities related to IPPs.

Given the weak financial position of BC Hydro, there is a cost of continuing the project because Site C exacerbates an already precarious financial situation. There is reason to believe that continuing Site C will bring with it higher debt financing charges. Higher financing costs related to credit worthiness concerns, not only increases the debt financing costs for Site C, but for all BC Hydro and provincial government debt. The cost to ratepayers of a downgrade(s) because of Site C would need to be applied to all debt BC Hydro intends to incur, not simply debt related to Site C.

As mentioned in Section 3.6, a credit downgrade brings with it a roughly 25 basis points increase in interest expense. It would not be unreasonable to expect that BC Hydro’s hedging program has some relationship to BC Hydro’s credit status, and therefore, it is probable that the annual cost of a credit rating downgrade because of Site C would affect all debt to be incurred, not just the unhedged portion.

BC Hydro’s precarious financial situation has been extensively documented in Eliesen 1 and in other submissions. 77 BC Hydro’s weakened condition affects its ability to cover its cost of service without significant rate increases even without the cost burden from Site C. In particular, BC Hydro’s deferral accounts, debt level and contingent liabilities related to IPPs will place a significant burden on residential, commercial and industrial ratepayers.

Avoiding a downgrade(s) in BC’s credit rating by cancelling Site C is a benefit to BC Hydro ratepayers in the amount of interest expense related to Site C financing that would otherwise be payable if the continuation of the project triggers such a downgrade.

77 F17-1 McCandless, R., F18-3 CEABC, F35-1 Peace Valley Landowners Association, F36-1 Swain H., and F44-1 Finn E.
Further, the recent qualified opinion by BC’s Auditor General in the Financial Accounts for 2016/17, in part related to the deferral accounts, increases concern. A qualified report is a serious issue, and in this case suggests there has been political manipulation in financial reporting. When the Commission examine’s BC Hydro’s claim that there will be no real rate increases for ratepayers (since they will be tied to a 2 percent inflation rate) it must be done so in light of the implications on rates from an appropriate approach to deferral accounting as per Canadian Public Sector Accounting Standards.

In effect, the Auditor General has stated that unless an independent third party regulator establishes BC Hydro rates, BC Hydro cannot use rate-regulated accounting approved by the Government because it is not independent from BC Hydro.\textsuperscript{78} The Auditor is urging the Provincial Government to rescind its government regulation on deferral accounts and have them reviewed and determined by BCUC. Such a review would lead to higher rates than BC Hydro represents at this inquiry.

In addition to the relative rate increase that can be expected (rather than Hydro’s predicted rate increase) there is also the issue of elasticity of demand for electricity. Elasticity of demand is not linear, but increases as prices rise. Regardless of the elasticity of demand coefficient that the Commission elects, what must be recognized is that with the looming significant rate increases expected as a result of debt, contingent liabilities and deferral accounting, is that the elasticity response will be greater the higher the base. The impact of Site C must be considered from the perspective of what rates will be when the Project comes on stream, not what BC Hydro would like the Commission to believe they will be (which is a much lower number).

In Commission Question #2.19, BC Hydro was asked about the “appropriateness of BC Hydro’s assumptions related to price elasticity and future rate increases.”\textsuperscript{79} Other parties were invited to make submissions related to the question to assist the Commission.

BC Hydro claims in its response to Question #2.19 that, “Government and BC Hydro have shown that they have taken actions to keep rates among the lowest in North America, including recent actions taken to do so despite lower forecast revenues of over $3.5 billion. While there are many risks over the very long term impacting the ability to keep rates low, BC Hydro considers that actions will be taken to do so.”\textsuperscript{80}

When Site C was announced in December 2014, press materials promoted BC’s residential rate ranking as the third lowest in North America, as illustrated in Graph 3.


\textsuperscript{79} BC Hydro Response to BCUC Question #2.19, October 5, 2017, F1-6.

\textsuperscript{80} Ibid.
Within two years, Vancouver had fallen to fifth place among North American cities.

Source: Site C Final Investment Decision—Technical Briefing, December 16, 2014

Source: Quebec Hydro
Residential customers have not been charged rates that are reflective of their cost of service and as such claims that actions are being taken to keep them ‘low’ ring hollow. Significant rate increases have been postponed, not avoided. Significant rate increases are required in the near future because of irresponsible planning, imprudent financial management and political interference.

It is not possible to undertake a rigorous estimation of what rates should be to cover cost of service as there is insufficient publicly available information to do so. However, it is clear that as of 2014, rate increases should have been much higher than they have been.81

The need for significant rate increases has compounded, suggesting that there is about a 15 - 20 per cent rate increase required to reflect cost of service for current users. Much needed revenue to pay for services provided have been swept into deferral accounts that now total $5.9 billion.

The Provincial Auditor has now officially stated that the reliance on deferral accounting, without independent regulatory review, is not in accordance with proper accounting standards. There is an urgent need for the Provincial Government to address this situation. Review and approval of BC Hydro rates needs to return to the independent regulator.

It must be recognized that the burden on ratepayers from the construction of Site C has not been included in current cost of service requirements. The burden of Site C will be layered on the backs of BC ratepayers in addition to the need for much higher rates that have not been contemplated in BC Hydro’s Rate Plan.

It is clear that the short term political meddling in BC Hydro rates has postponed a financial reckoning. Had the necessary rates been imposed to cover BC Hydro’s cost of service, BC electricity rates would have soared. BCUC is disadvantaged, since the former government circumvented its role as an independent rate regulator.

The Panel has put forward a number of questions related to BC Hydro’s industrial load demand, especially the LNG future load—Question #2.16. In summary, BC Hydro states that, “BC Hydro believes the market’s view, on balance, remains largely unchanged from when the Current Load Forecast was developed; while there remains significant uncertainty, global LNG demand will continue to growth (sic) and there is opportunity for B.C. LNG.”82

81 Leaked Rates Working Group Document, BC Hydro Session 1, August 23, 2013.

82 BC Hydro Response to BCUC Question #2.16, October 3, 2017, F1-6.
Deloitte’s report, and a number of other submissions, have a more pessimistic viewpoint and provide evidence that BC Hydro is overestimating the future requirements associated with both LNG and related oil and natural gas processing loads.\textsuperscript{83}

While, “BC Hydro recognizes there is considerable uncertainty associated with LNG and associated upstream oil/gas loads” the utility is silent on the extensive BC Hydro and BC Government subsidies required to promote these industries in BC. LNG subsidies were raised in Eliesen 1. Efforts to enhance electricity usage in the province through subsidization of transmission lines puts the burden on other BC Hydro ratepayers. The previous provincial government refused to have the proposed transmission lines subject to review by BCUC.

On November 4, 2014, to encourage LNG plants to establish in BC, BC Hydro announced its policy on electricity rates for LNG plants to connect to its electrical grid. These were:

- The combined energy and demand charge for LNG facilities in 2014 will be $83.02 per megawatt hour (MWh), before applicable taxes.
- By comparison, the average rate paid in 2014 by other industrial customers in the province is $54.34/MWh (before taxes).

This rate ensures that LNG customers will cover the full cost of new energy required to serve their power needs. LNG customers will also be required to contribute the full cost of connecting to the BC Hydro system, as well as transmission system upgrades required to serve their facilities.”\textsuperscript{84}

The Minister of Energy and Mines and Minister of Natural Gas Development said these rates would ensure that the full cost of power that LNG plants require is covered and that existing ratepayers do not pay.

Two years later, on November 4, 2016, BC Hydro offered potential LNG developers a reduced electrical rate. The Provincial Government stated that this subsidized ‘eDrive rate’ would be exempt from any review by BCUC.\textsuperscript{85}

For the proposed wood fibre plant in Squamish, this subsidy has been estimated to represent $34 million per year for a total of $860 million over its 25 year life span.\textsuperscript{86}

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\textsuperscript{83} Deloitte Report, op. cit., page 5 and page 74.
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\begin{flushright}
\textsuperscript{84} BC Information Bulletin, \textit{Terms finalized for LNG customers using BC Hydro system}, November 4, 2014, 2014MEM0028-001668
\end{flushright}
\begin{flushright}
\textsuperscript{85} BC Government, \textit{New eDrive electricity rate for LNG facilities}, Nov 4, 2016
\end{flushright}
\begin{flushright}
\textsuperscript{86} Tyee, \textit{BC’s LNG Fraud}, Andrew Nikiforuk, November 10, 2016, E. Finn.
\end{flushright}
Whether there will be any LNG plants established in BC is uncertain. What is clear though, is that under BC Hydro policy, non-industrial ratepayers will bear the burden. The subsidy will be borne by residential and commercial ratepayers and if the Commission accepts BC Hydro’s market view of industrial demand, this impact would needs to be incorporated.

Recommendation #7: That the Commission, in assessing the rate impact of Site C on ratepayers do so from an established rate base that recognizes BC Hydro’s current financial position, including its debt load, deferred accounts and IPP commitments.