



**IN THE MATTER OF**

**BRITISH COLUMBIA TRANSMISSION CORPORATION**

CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY

CENTRAL VANCOUVER ISLAND TRANSMISSION PROJECT

**DECISION**

December 10, 2008

**Before:**

**A.W. Keith Anderson, Panel Chair & Commissioner  
Anthony J. Pullman, Commissioner  
Michael R. Harle, Commissioner**



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## OVERVIEW

This Decision is issued concurrently with Commission Order C-6-08.

On May 8, 2008 British Columbia Transmission Corporation (“BCTC”) filed an application (“Application”) with the British Columbia Utilities Commission (“Commission”, or “BCUC”) for a Certificate of Public Convenience and Necessity (“CPCN”) for its Central Vancouver Island (“CVI”) Transmission Project (“CVI Project”) (Exhibit B-1). BCTC filed Errata to the Application on July 15, 2008 (Exhibit B-1-1) and amendments to certain parts of the Application on September 15, 2008 (Exhibit B-1-2). Unless indicated otherwise, the use of the word Application in this Decision includes the Errata and amendments.

Section 1 describes the background of the Application, briefly describes the Applicant, the Application, the regulatory background to the Application, BCTC’s consultation with First Nations and the public as well as the process by which the Application was heard.

Section 2 describes BCTC’s transmission system on Vancouver Island, its need for reinforcement, and the alternatives considered by BCTC (including “non-wires” options) to address the need.

Section 3 addresses the process BCTC followed to select an Injection Routing Option, and then to select an alignment for its preferred Harewood South routing option.

Section 4 reviews the proposed CVI Project, its Schedule, the management team and the manner in which BCTC proposes to identify, manage, and mitigate its risks. It also sets out the Commission’s direction to BCTC concerning reporting requirements.

Section 5 discusses the socioeconomic and environmental impacts raised by intervenors and community members, particularly health concerns related to electro-magnetic fields (“EMF”). The impact on rates is also discussed.

Section 6 summarizes the Commission Panel’s key determinations.

## **1.0 BACKGROUND AND REGULATORY PROCESS**

Section 1 of this Decision sets out the background of the Application, briefly describes the Applicant, the Application, the regulatory background to the Application, BCTC's consultation with First Nations and the public, as well as the process by which the Application was heard.

### **1.1 The Applicant**

BCTC is a provincial Crown Corporation that began operations August 1, 2003. Under the *Transmission Corporation Act*, and a number of designated agreements between BCTC and BC Hydro and Power Authority ("BC Hydro"), BCTC has the responsibility to operate and manage the BC Hydro owned transmission system. BCTC is also responsible for planning, constructing and obtaining all regulatory approvals for enhancements, reinforcement, and sustaining and growth investments to the transmission system, and for entering into commitments and incurring expenditures for capital investments on the transmission system. BC Hydro continues to own the core transmission assets and is required to make capital expenditures to support these investments if such expenditures are approved by the Commission. Certain other capital assets, such as control centres, are funded and owned by BCTC.

### **1.2 Order Sought**

BCTC seeks an Order granting a CPCN for the CVI Project pursuant to sections 45 and 46 of the *Utilities Commission Act*, ("UCA" or the "Act") in the following terms:

1. "A Certificate of Public Convenience and Necessity is issued to BCTC for construction and operation of the CVI Project following the Harewood South route, with the transmission line in the vicinity of the community of South Forks aligned as follows:
  - a. through a part of Provincial crown Block 271 and through Provincial crown lands west and north of the DND Lands, subject to a ILMB [Integrated Land Management Bureau] tenure offer for the use of those Provincial crown lands being received by May 29, 2009; or



- b. if tenure for the Provincial crown land west and north of the DND Lands is not received by May 29, 2009, then through a part of Provincial crown land within Block 271 and through the Provincial crown land south and east of the DND Lands.
- 2. BCTC will advise the Commission by June 1, 2009 if a tenure offer from ILMB has been received for use of the Provincial crown land west and north of the DND Lands.
- 3. BCTC will file with the Commission quarterly progress reports on the CVI Project schedule and costs, followed by a final report on project completion”.

(BCTC Final Argument, Attachment 1)

### **1.3 Project Overview**

BCTC states that the CVI Project comprises the construction of a new transmission line that will connect the existing 230 kV transmission line between Dunsmuir substation (“DMR”) and Sahtlam substation (“SAT”) with the existing 138 kV transmission system in the vicinity of Nanaimo, and will terminate at a new Harewood West substation (“HWW”) to be located in close proximity to the existing 138 kV transmission line connecting Vancouver Island Terminal (“VIT”) and Jingle Pot substation (“JPT”) approximately 5 kilometres (“km”) south of JPT (Exhibit B-1, Appendix A, p. 16).

BCTC states that, in addition to the new 230 kV Injection transmission line and the new substation, it will carry out necessary modifications to the Lantzville substation (“LTZ”), and will also purchase sufficient land adjacent to the 230 kV (2L123/128) transmission lines for a future 500/230 kV transformation substation, the Nanaimo River substation (“NAR”), that will be required when the 230 kV transmission lines are converted to 500 kV operation.

BCTC states that HWW will be sized to accommodate the required transformers and related switchyard equipment and will occupy approximately 16.5 acres and that some additional right of way (“ROW”) will be required adjacent to HWW in order to terminate transmission lines into the station (Exhibit B-1, pp. 15-16).

## 1.4 Regulatory Background

BCTC states that the CVI Project, as proposed in this Application, is consistent with amendments to the Act that received royal assent in May 2008. The *Utilities Commission Amendment Act, 2008* amends section 46 of the Act as it relates to the procedures to be followed on an application for a CPCN and introduces a definition of “government’s energy objectives”. Amended subsection 46(3.1) requires the Commission to consider the government’s energy objectives in deciding whether or not to issue a CPCN (Exhibit B-1, p. 19).

Section 46(3.1) of the Act reads as follows:

“In deciding whether to issue a certificate under subsection (3), the commission must consider

- (a) the government’s energy objectives,
- (b) the most recent long-term resource plan filed by the utility under section 44.1, if any, and
- (c) whether the application for the certificate is consistent with the requirements imposed on the public utility under sections 64.01 and 64.02, if applicable.”

In the Act, the government’s energy objectives are defined as follows:

- (a) “to encourage public utilities to reduce green house gas emissions;
- (b) to encourage public utilities to take demand-side measures;
- (c) to encourage public utilities to produce, generate and acquire electricity from clean and renewable sources;
- (d) to encourage public utilities to develop adequate energy transmission infrastructure and capacity in the time required to serve persons who receive or may receive service from the public utility
- (e) to encourage public utilities to use innovative energy technologies
  - (i) that facilitate electricity self-sufficiency or the fulfillment of their long-term transmission requirements, or
  - (ii) that support energy conservation or efficiency or the use of clean or renewable sources of energy;

- (f) to encourage public utilities to take prescribed actions in support of any other goals prescribed by regulation.”

## **1.5 First Nations Consultation**

BCTC states that under the terms of the Asset Management and Maintenance Agreement between it and BC Hydro dated November 12, 2003 BC Hydro retains responsibility for the relationship between BC Hydro and First Nations with respect to the transmission system. It also states that a review of maps of the asserted traditional territories and/or maps of the Statement of Intent (“SOI”) areas submitted by First Nations in the treaty negotiation process and further research undertaken confirmed that the Nanoose and Snuneymuxw First Nations had a historical presence and use of the lands and resources in the areas that might be crossed by the potential routing options for the 230 kV Injection solution. The research indicated that the Nanoose First Nation had a historical presence in the vicinity of the Lantzville area and that the Snuneymuxw First Nation had a historical presence in the vicinity of the Lantzville and Nanaimo areas.

BCTC outlines the consultation that occurred up to the time of filing the Application with the Snuneymuxw First Nation in section 7.1.6 of the Application and with the Nanoose First Nation and the Te’ mexw Treaty Association (“TTA”) in section 7.1.7.

BCTC states that in April 2008 BC Hydro entered into a consultation and benefits agreement with the Snuneymuxw First Nation, and into a consultation and capacity funding agreement with the Nanoose First Nation and the TTA. By letter dated July 17, 2008, the Nanoose First Nation confirmed that it has been adequately consulted and accommodated with respect to its aboriginal rights and title in respect of the CVI Project and consents to the issuance of a CPCN.

BCTC states that the Snuneymuxw First Nation confirmed that it had been adequately consulted and accommodated with respect to its aboriginal rights and title in respect of the CVI Project and attaches a copy of a letter dated May 1, 2008 from the Snuneymuxw First Nation to the Commission confirming that the Snuneymuxw First Nation has been adequately consulted and

accommodated and that the Snuneymuxw First Nation supports the CVI Project and consents to the issuance of the CPCN and any other permits or authorizations to be issued by or on behalf of the Commission that pertain to the CVI Project.

BCTC states that it and BC Hydro will continue to consult with the Snuneymuxw First Nation, the Nanoose First Nation and the TTA with respect to the project, and that although the Harewood South routing option for which a CPCN is sought does not pass through the TTA's SOI area as submitted in the treaty negotiation process, it and BC Hydro will keep the TTA informed of major developments with respect to the CVI Project (Exhibit B-1, pp. 99-112).

## **1.6 Public Consultation**

BCTC describes its public consultation in section 7.2 of its Application, where it sets out an overview of its consultation plan, the stakeholders it identified, its consultation activities, its project website, its meetings with elected officials, and its community open houses.

The first of these was held on May 9, 2007 at the Coast Bastion Inn, Nanaimo, and BCTC states that the objectives of this open house were to:

- present preliminary information regarding the routing options being explored for the CVI Project through a series of display panels;
- answer questions regarding the Project; and
- solicit input on Project issues, opportunities and proposed areas of study.

BCTC states that 32 people attended the open house and that attendees included property owners and the general public, as well as representatives from the Regional District of Nanaimo, the District of Lantzville and the Nanaimo Chamber of Commerce.

BCTC states that the second open house was held on January 22, 2008 at the Loyal Order of Moose Hall, 1356 Cranberry Avenue, Nanaimo and that the objectives of this open house were to:

- present BCTC's preferred routing alignment for the proposed transmission line, and the preferred location for the proposed HWW;
- present details on how the preferred routing option was identified;
- solicit feedback on the preferred routing option; and
- answer questions regarding the Project.

BCTC states that approximately 50 people attended the open house, representing property owners residing in or near the Village of Extension and South Forks Road, as well as representatives from the Regional District of Nanaimo (Exhibit B-1, pp. 112-20).

In addition to these open house meetings, the Commission Panel determined that a Community Input Session would be held in Nanaimo on July 17, 2008 (Exhibit A-6).

## **1.7 The Regulatory Process**

By Order G-82-08 dated May 16, 2008 the Commission established a preliminary regulatory timetable and agenda. The timetable established a Procedural Conference in Nanaimo, on June 12, 2008, to seek input from the Applicant and interested parties on the process for the review of the Application. The Order required BCTC to publish, as soon as possible, in display-ad format, a Notice of Application and Procedural Conference, in a number of local publications, and to distribute copies of the Order and its Appendices, in a timely fashion, via registered mail, to all landowners potentially affected by the CVI Project (Exhibit A-1).

At the Procedural Conference BCTC and a number of Intervenor expressed a preference for a written process while two Intervenor expressed a desire for an Oral Public Hearing (T1:18 and T1:21). Following the Procedural Conference the Commission issued Order G-106-08 dated

June 26, 2008 that established a Community Input Session to be held in Nanaimo, on July 17, 2008 regarding the Application. It also directed BCTC to provide a written report on the status of its application to the Integrated Land Management Bureau (“ILMB”) to the Commission and other participants by Tuesday, July 29, 2008, to publish, as soon as possible, in display-ad format, a Notice of Community Input Session in a number of local publications, and to distribute copies of the Order and its Appendix, in a timely fashion, via registered mail, to all landowners potentially affected by the CVI Project.

The Commission also established a Regulatory Timetable for the issue of and response to Information Requests (“IR”) but did not determine whether the hearing would be written or oral stating that it had considered the input received at the Procedural Conference, and had concluded that further information regarding the status of the application by BCTC to the ILMB with respect to Block 271 would be helpful prior to making a determination on whether the review of the Application should proceed by a written or oral hearing process (Exhibit A-6).

By Order G-117-08, dated August 11, 2008 the Commission stated that it had considered the input received at the Community Input Session, and had concluded that even further information regarding the review of the Application was required, and that the receipt of Intervenor submissions on whether or not the review of the Application should proceed by a written or oral hearing process would be helpful. The Commission issued an amended regulatory timetable calling for a third round of IRs and for Intervenor Submissions on the Proposed Regulatory Timetable to be received by September 18, 2008 (Exhibit A-10).

Of the Intervenors, Ms. Pongratz-Doyle and Ms. Young responded that they would prefer an Oral Public Hearing (Exhibits C4-13 and C2-3). Ms. Young had previously stated during the Procedural Conference on June 12, 2008 that she preferred a written hearing (T1:12). BC Hydro submitted that that it considered a written review process appropriate (Exhibit C1-5). The Joint Industry Electricity Steering Committee (“JIESC”) did not provide a submission on the hearing process, but on June 8, 2008 had stated that it was not seeking an Oral Public Hearing (Exhibit C6-2). The British Columbia Old Age Pensioners’ Organization (“BCOAPO”) stated that it had no strong

preference for either a Written or Oral Hearing process and should the individuals registered as Intervenor in the CVI Project process express a desire for a written process or express no preference whatsoever, it would be content with the written process as proposed (Exhibit C7-8). BCTC submitted that the proceeding should continue on the proposed Written Regulatory Timetable and that it continued to be of the view that an Oral Public Hearing was not required for the Commission to decide whether or not the CVI Project meets the test of public convenience and necessity and is in the public interest (Exhibit B-10).

By letter dated September 24, 2008, BCTC filed further information regarding the status of its application to the ILMB, which is discussed in Section 4.4 of this Decision (Exhibit B-12).

By Order G-137-08, dated September 29, 2008 the Commission stated that following its review of the filed exhibits and the Transcripts of the Procedural Conference of June 12, 2008, it had noted that none of the Intervenor indicated a wish to file formal evidence and determined, after a review of these documents and the receipt of Intervenor submissions, that the review of the Application should proceed as a written hearing process (Exhibit A-13).

Accordingly the Commission established the following dates:

|  |                            |
|--|----------------------------|
| BCTC Written Final Submission          | Thursday, October 9, 2008  |
| Intervenor's Written Final Submissions | Thursday, October 16, 2008 |
| BCTC Written Reply Submission          | Thursday, October 23, 2008 |

By letter dated October 15, 2008 (Exhibit A-14) the Commission granted an extension to the deadlines as follows:

|  |                            |
|--|----------------------------|
| Intervenor's Written Final Submissions | Thursday, October 20, 2008 |
| BCTC Written Reply Submission          | Thursday, October 27, 2008 |

The following intervenors filed submissions: BC Hydro, BCOAPO, Ms. Young, Ms. Pongratz-Doyle, and Mr. M. Gogo.

By letter dated November 6, 2008, counsel for BCTC advised all parties that BCTC had not been aware that Ms. Pongratz-Doyle had filed a submission, but stated that a review of her submission indicated that all items she had addressed had been covered in BCTC's original submission and that no further reply was necessary.



## 2.0 NEED AND PROJECT JUSTIFICATION

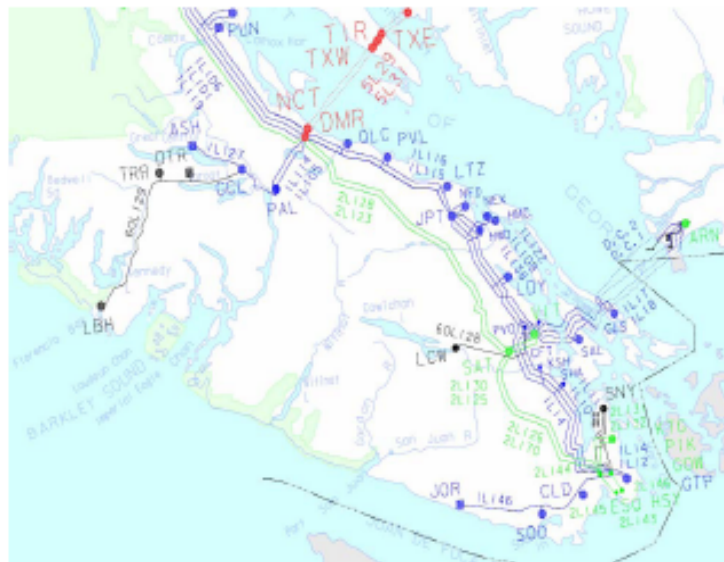
This Section describes BCTC's transmission system on Vancouver Island, its need for reinforcement and the alternatives considered by BCTC (including “non-wires” options) to address the need.

### 2.1 Background

BCTC provides the following map of the Vancouver Island transmission system:

**Figure 1**

**Figure 3-1. Map of Vancouver Island Transmission System**



Source: Exhibit B-1, p. 34

BCTC states that the electric transmission system supplying the CVI area runs from the DMR, located near Qualicum Beach, south to VIT, near Duncan. The CVI transmission system supplies the communities of Qualicum, Parksville, Lantzville, Nanaimo, Ladysmith, Chemainus, Crofton, Duncan, and surrounding areas, while the transmission system that supplies the South Vancouver Island (“SVI”) area runs south from VIT to Victoria, and supplies the Greater Victoria, Cowichan, and Sooke areas.

BCTC states that DMR is supplied by two 500 kV transmission circuits from Malaspina substation (“MSA”) on the Sunshine Coast, and VIT is currently supplied by a High Voltage Direct Current (“HVDC”) system from Arnott substation (“ARN”) in Delta. The HVDC system consists of two direct current circuits (pole 1, nominally rated at +260 k, which was installed in the 1960’s, and pole 2, nominally rated at -280 kV, which was installed in the 1970’s) that are at the end of their physical lives, and are no longer considered to be reliable from a planning perspective. The HVDC circuits are being replaced by the Vancouver Island Transmission Reinforcement (VITR) project, a 230 kV alternating current circuit, the first stage of which is expected to be in service in 2008. DMR and VIT are interconnected by two 230 kV circuits (2L123 and 2L128) between DMR and Sahtlam substation (SAT), approximately 97 km, and two 230 kV circuits (2L125 and 2L130) between VIT and SAT, approximately 7 km west of VIT. Circuits 2L123 and 2L128 between DMR and SAT were constructed to 500 kV specifications, but are being operated at 230 kV until such time that load growth on Vancouver Island warrants an upgrade to 500 kV operation.

BCTC states that the supply of electricity to the CVI area from DMR is provided by four 230/138 kV transformers at DMR and two 138 kV circuits (1L115 and 1L116) extending approximately 55 km south from DMR to JPT, in the vicinity of Nanaimo. CVI is also supplied from VIT through four 230/138 kV transformers and three 138 kV circuits (1L109, 1L122 and 1L138) extending from VIT to JPT, a distance of approximately 45 km (Exhibit B-1, pp. 31-32).

#### Maximum Rated Capacity

BCTC states that both CVI and SVI have experienced significant load growth over the last several years resulting in the transmission system supplying the CVI communities now operating at close to its maximum rated capacity under normal operating conditions. Under any one of several potential outage conditions during a peak load period, the transmission facilities in the CVI system could experience significant overloads. Consequently, it is necessary to upgrade the transmission system as soon as possible. BCTC identifies the elements in the transmission system serving the

CVI area that are experiencing overload conditions as transmission circuits 1L115 and 1L116 (between DMR and JPT) and the four 230/138 kV transformers at VIT (Exhibit B-1,p.31).

BCTC identified the date at which the critical component of the CVI system would be subject to its thermal limit rating as being the winter of 2010/11 when lines 1L115 or 1L116 would reach their thermal limit, and which coincides with the planned in-service date (“ISD”) of the CVI Project of October 2010 (Exhibit B-9, BCUC 3.119.1).

BCTC states that the transmission system is designed to an N-1 (single contingency) planning criterion to ensure that load will continue to be served during a single contingency outage, and during planned maintenance. A single contingency outage occurs when one element of the transmission system is forced out of service. BCTC states that it continually studies the transmission system to predict where and when congestion will occur and develops corrective plans by evaluating a number of feasible solutions to alleviate the areas of potential congestion, and summarizing the findings in an area Planning Report (Exhibit B-1, p.36), and attaches the Central Vancouver Island Area Study (Report No SPA2008-08 dated April 2008) (Exhibit B-1, Appendix A).

## **2.2 Peak Demand Forecast for CVI**

BCTC states that in preparing its 25 year demand forecast it used BC Hydro’s 10 year substation load forecast for the Vancouver Island region prepared in the summer of 2006 for the period from F2006 (viz the fiscal year ended on March 31, 2006) to F2017, after which the CVI and SVI substation loads were assumed to have a growth rate of 1.5 percent per year for the further 15 year period from F2017 to F2032. BCTC states that it based the rationale for using a 1.5 percent load growth rate after F2017 on the following factors:

- the average load growth rate for the CVI and SVI areas in BC Hydro’s 10 year substation load forecast was 1.53 percent per year over the eleven year period from F2006 to F2017;

- the average load growth rate for British Columbia in BC Hydro's summer 2006 20 year market load forecast was 1.4 percent per year for the ten year period from F2017 to F2027; and
- the average historical load growth rate for the Vancouver Island region for the 10 year period from F1997 to F2007 was 1.52 percent per year.

BCTC states that it reviewed the substation load forecast prepared by BC Hydro in summer 2007 for the CVI and SVI areas, which showed an increase of approximately 1.1 percent over the 2006 substation load forecast for all ten years. BCTC notes that this increase is lower than the 1.5 percent growth rate discussed above, but points out that the impact is less than one year's load growth, and considers that it does not change the timing or the need for a solution to alleviate transmission system conditions that lead to overloading in CVI.

BCTC states that it used BC Hydro's Market Load Forecast for bulk industrial load from F2006 to F2016 to forecast industrial customers' load supplied at the transmission level, and that for the purposes of the Application, it assumed that there would be no significant industrial load growth after F2016, and therefore, it held the industrial load constant from F2016 onwards.

In Table 1 below, BCTC summarizes the forecast customer demand on the 138 kV transmission system for selected years of the 25 year load forecast, and states that this table only considers the customer load forecast on the 138 kV transmission system and not the customer loads served from the 230 kV transmission system because it is the 138 kV system that is exceeding its capacity and overloading. The 230 kV transmission system serving CVI and SVI has available capacity, and can continue to serve those customers on the 230 kV transmission system for the foreseeable future (Exhibit B-1, pp. 37-8).

BCTC includes its 25 year annual load forecast as Appendix C to the Central Vancouver Island Area Study (Exhibit B-1, Appendix A).

**Table 1****Table 3-1. Vancouver Island 138 kV Load Forecast (MVA)**

|   |                        | F2008  | F2012  | F2016  | F2020  | F2024  | F2028  | F2032  |
|---|------------------------|--------|--------|--------|--------|--------|--------|--------|
| 1 | CVI 138 kV System      | 841.5  | 887.1  | 919.1  | 954.1  | 994.9  | 1038.3 | 1084.4 |
| 2 | SVI 138 kV System      | 513.1  | 465.6  | 481.4  | 507.6  | 538.8  | 571.8  | 606.9  |
| 3 | Total VI 138 kV System | 1354.6 | 1352.7 | 1400.5 | 1461.7 | 1533.7 | 1610.1 | 1691.3 |

Source: Exhibit B-1, p. 38

BCTC states that the firm capacity of the existing CVI and SVI 138 kV system is unable to meet peak demand. For example, the firm capacity of circuits 1L115/116 from DMR to JPT substation is approximately 195 MVA (based on one circuit out of service, an N-1 event). The peak demand served from circuits 1L115/116 (Qualicum, Parksville, Lantzville, and flow-through to JPT) for the winter of 2007/2008 was forecast to exceed available capacity, and the gap increases each year under the existing customer demand forecast (Exhibit B-1, p.38).

BCTC states that although it has a Remedial Action Scheme (“RAS”) in place that was designed to prevent damage to circuits 1L115/116 when an overload occurs, by opening the circuits 1L115/116 at JPT, the operation of the RAS is now causing other parts of the system (the VIT transformers) to overload and in the worst case will result in load shedding. In the past the RAS effectively removed the overload on circuits 1L115/116 without adversely affecting the rest of the system due to available capacity on the VIT transformers, deferring the need to upgrade the 138 kV transmission system in CVI. However, the RAS no longer provides this benefit now that the VIT transformers are also exceeding their firm capacity limits, resulting in an overload condition on the transformers during operation. It is possible to modify the RAS to operate at LTZ or Parksville (“PVL”) instead of at JPT, which would allow service from DMR to continue under single contingency outages on transmission lines 1L115/116. However, such a modification then forces the LTZ load to be served from VIT, placing even more load on its transformers that are already overloaded during a contingency outage.

BCTC states that it has been aware that customer demand was approaching the capacity limits of the CVI 138 kV system for some time and that up to 2005 it had expected that the proposed 250 MW gas fired generation project at Duke Point would have provided a new source of supply to the 138 kV system near Nanaimo and would have resolved the current system capacity constraints. BCTC states that Duke Point was cancelled by BC Hydro in 2005, requiring it to resolve the system constraints in another manner (Exhibit B-1, p. 39).

BCTC summarizes the need for the CVI Project and submits that the CVI and SVI areas have experienced significant load growth over the last several years. As a result of this load growth, the 138 kV transmission system is now operating close to its rated capacity under normal system operating conditions. Under an N-1 contingency event and heavy load conditions, load shedding will be required. By the winter of 2010/11 with loads at the level forecast circuits 1L115/116 could reach their thermal limits under normal (N-0) conditions. To resolve these conditions it is necessary to upgrade the transmission system serving the CVI area as soon as possible (BCTC Argument, para. 33).

BCOAPO submits that, “after a careful review of the evidence, [it] accepts BCTC’s assertion that there is a genuine and urgent need to address the transmission constraints that currently exist in the Central/Southern Vancouver Island region”..... and “BCOAPO recognizes that quick action must be taken to ensure the stability of a system many of its members rely upon for electricity delivery and that the maintaining the integrity of the transmission system is in the interests of all BC Hydro ratepayers” (BCOAPO Argument, p. 2).

BC Hydro submits that “the evidence demonstrates that there are currently transmission capacity challenges under N-1 (single contingency) conditions on the CVI system and the remedial measures used to address those challenges are not adequate, even after adjusting for the potential effects of demand side management measures including rate structures such as the Residential Inclining Block rate. The CVI Project is required by the earliest practical in service date of October 31, 2010, as proposed by BCTC” (BC Hydro Argument, para. 6).

On behalf of the residents of the South Forks/Nanaimo River Community, Ms. Young quotes BCTC's response to BCUC IR 1.16.2 and submits ... "to highlight our concerns that this 230 kV transmission line may not need to be built at this time - especially in light of the severe economic downturn throughout the world and especially in the US" (Ms. Young Argument, p. 3).

In Reply BCTC submits that Ms. Young's concern that the 230 kV transmission line may not be required at this time is based on a misunderstanding of its response to BCUC IR 1.16.2 where BCTC stated that the forecast load growth on Vancouver Island does not support the conversion of DMR-SAT to 500 kV in the 25 year planning horizon (BCTC Reply, para. 7).

### **Commission Determination**

The Commission Panel notes that BC Hydro's transmission system is planned in accordance with the North American Electric Reliability Council and Western Electricity Coordinating Council single contingency deterministic criterion for ensuring adequate system reliability referred to as the "N-1 criterion". This means that the transmission system should be able to withstand a severe short circuit and outage of any single element (such as a transmission line, cable circuit, generator or transformer) under any system condition. There should be no loss of customer load; furthermore, any resulting variations in voltage and frequency must be within acceptable limits.

The Commission Panel accepts BCTC's evidence that the load in CVI is growing and that the existing transmission system in the region is inadequate to meet the existing load when using the N-1 standard, and that the peak load growth is overloading the transmission system generally, and Lines 1L115 and 1L116 from DMR to JPT, in particular, and is placing 230/138kV transformers at risk. The Commission Panel further accepts that BCTC's current RAS at JPT is no longer capable of supporting operations during peak load periods, potentially risking damage to transformers.

In considering the Application the Commission Panel has taken into account the requirements of the UCA and the government's energy objectives including the need to "develop adequate energy transmission infrastructure and capacity in the time required to serve persons who receive or may

receive service from the public utility”, as well as Sections 64.01 and 64.02 for the achievement of electricity self-sufficiency.

The Commission Panel agrees with BCTC that the sole Intervenor who questioned the need for the Project may have misinterpreted BCTC’s response to BCUC 1.16.2, and notes that the Project received support from several Intervenors.

In the situation at hand the Commission Panel finds that BCTC’s use of the N-1 standard is an acceptable planning standard for system reliability. The Commission Panel determines that BCTC has established the need to reinforce the CVI transmission system by an ISD of October 2010 to provide adequate transmission infrastructure in order to reliably serve BC Hydro’s load in the region.

### **2.3 Potential “Non-wires” and Other Solutions**

BCTC states that as well as the alternatives discussed in Section 2.4 below it examined the following “non-wires” and other solutions:

- Demand Side Management (“DSM”);
- Local Generation;
- Remedial Action Schemes;
- Curtailment; and
- Juan de Fuca Cable Project (“JdF”).

#### **Demand Side Management**

BCTC states that one of the purposes of DSM initiatives is to defer the need to add infrastructure to meet growing demand, but, in the case of the CVI Project, existing customer demand already exceeds the firm capacity of the 138 kV transmission system with the result that DSM programs



have very little effect in managing the existing customer demand relative to the shortfall in capacity. BCTC also points out that the existing forecast of demand growth from the BC Hydro 2006 Substation Load Forecast includes the impacts of existing and planned DSM programs, so the forecast load growth in the CVI Area Study is the residual load growth after the effects of demand side programs have been taken into account (Exhibit B-1, p. 43).

#### Local Generation

BCTC states that a new generation supply source in the Nanaimo area at Duke Point would have resolved the capacity constraints on the 138 kV transmission system in CVI by alleviating the overloading on both circuits 1L115/116 and the transformers at VIT, by injecting a new supply source directly into the 138 kV transmission system near Nanaimo, the major load centre in CVI. However, since that project was cancelled, no other generation projects in the region have been proposed that would alleviate the need to upgrade the transmission system. In addition, any new generation project that may be announced would not likely be in service by October 2010, to meet the required ISD for the proposed solution to the capacity constraints in CVI (Exhibit B-1, p. 43).

#### Remedial Action Schemes

BCTC states that it will continue to employ RAS on its transmission systems, because they are an effective means of deferring the additions of infrastructure. In the case of the CVI transmission system, it notes that customer demand has exceeded the ability of the existing RAS to maintain the 138 kV transmission system during times of heavy usage, and is no longer effective. BCTC notes that redeploying the RAS to LTZ or PVL from JPT would not be an option, because it would increase the loading on the VIT transformers, and would not mitigate the need for additional firm transmission capacity in the CVI area to prevent load shedding during peak usage and a single contingency outage (Exhibit B-1, p. 44).

### Curtailment

BCTC does not address curtailment in its Application. However, BCTC addressed the Customer Capacity Curtailment Contracts entered into by BC Hydro and certain of its customers, and stated that two such curtailment contracts could result in load curtailment in the CVI area, and that the maximum load curtailment that might be available was 150 MW in the vicinity of VIT and 6 MW in the vicinity of JPT (Exhibit B-8, BCUC 3.117.4). BCTC stated that while these contracts can result in load curtailment, the nature of the contracts is such that they cannot be used to avoid or defer construction of the CVI Project, and that they were intended to serve as a resource option for supply to the BC Hydro system during periods of constraint in generating capacity. In particular, the Customer Capacity Curtailment Contracts were to serve as an alternative to the import of energy or the use of Burrard Thermal Generating Station for generation purposes when the cost of energy is high. Consequently, these contracts were designed to meet system generation deficiencies when other alternatives would likely still be available for system supply purposes, not constraints within the CVI regional transmission system.

BCTC stated that the Customer Capacity Curtailment Contracts were based on voluntary load curtailment of large customers that could facilitate an orderly shut down of their plant processes in a way that incurred minimal cost to them, including any disruption to their production process, with four hours notice, but that load curtailment in this manner was not sufficient to meet transmission system constraints since, in order to avoid system voltage collapses and excessive thermal overloads, a fast means of load shedding was required, rather than the planned and orderly curtailment of load over a period of four hours. BCTC concluded that the existing load curtailment contracts located in the CVI area were not practical options to resolve transmission system constraints (Exhibit B-9, BCUC 3.117.4.1).

In addition, BCTC stated that there was no guarantee that the customer would curtail the required load in the CVI area when load curtailment was requested, because the contract for 150 MW of curtailment covered more than one plant, and provided the customer with the latitude to determine which of its plant(s) would provide the requested load curtailment, and to what extent.

The extent of load curtailment at any one plant was at the sole discretion of the customer and could depend on the status of the plant itself or market conditions for the products produced by any specific plant, and that there was no requirement, and no certainty, that customers would curtail load in the CVI region.

BCTC stated that the Customer Capacity Curtailment Contracts do not avoid load shedding under N-1 conditions, and that they are not sufficient to ensure adequate capacity under an N-1 contingency condition for the remaining unshed load. In other words, load shedding at distribution substations will be required after customers with curtailment contracts have been curtailed (Exhibit B-9, IR 3.117.4.2).

#### Juan de Fuca Cable Project

In addition to potential “non-wires” solutions BCTC stated that it considered JdF, a proposed international transmission interconnection between Pike Lake Substation in the Victoria area, and Port Angeles, WA. JdF has reported that the first phase of this cable project using HVDC Light technology could be in-service in 2009 to provide up to 550 MW of capacity. BCTC states that neither JdF, nor any other bulk transmission supply source such as the Vancouver Island Transmission Reinforcement Project (“VITR”), will provide relief to the capacity constraints that exist on the CVI system, since the capacity constraints are the result of customer demand exceeding the capacity of the existing 138 kV transmission system in the CVI area, and that adding a new source of supply to the 230 kV transmission system up stream of VIT and DMR supply points does not help alleviate the constraints that result in overloading on the 138 kV transmission system (Exhibit B-1, pp. 42-43).

## 2.4 Alternatives Identified

Having determined that neither “non-wires” nor other solutions could resolve its excess loading conditions, BCTC states that it is necessary to reinforce the CVI regional transmission system as soon as possible and that it identified five alternatives as a means to offload 1L115/116 and the VIT transformers:

- 1) upgrade 1L115/116 to heavy-duty 138 kV circuits;
- 2) install phase-shifting transformers in 1L115/116 at DMR to control the flow over these circuits and upgrade the VIT transformers with higher capacity units;
- 3) install phase-shifting transformers in 1L115/116 at DMR to control the flow over these circuits and sectionalize the SVI and CVI 138 kV systems in the vicinity of VIT and establish a new 230/138 kV source in the SVI area to offload the VIT transformers. This can be achieved by establishing 230/138 kV transformation at SAT in the northern part of the SVI area and re-terminating the three SVI 138 kV circuits (1L14/10/11) supplied radially by VIT at SAT;
- 4) establish a new 230/138 kV source in the approximate center of the CVI area; and
- 5) convert the DMR-SAT 230 kV circuits (constructed to 500 kV standards) to 500 kV operation.

(Exhibit B-1, Appendix A, pp. iii-iv)

### 1. Upgrade 1L115/116

BCTC describes this alternative as consisting of upgrading of the two existing DMR-JPT 138 kV circuits to high capacity circuits, and states that it would increase the CVI supply capability out of the northern end of the CVI system at DMR, resulting in the need to increase the transformation capacity at DMR, while reducing the transformation upgrades required at VIT. BCTC observes that this alternative will avoid the need to acquire additional ROW along this corridor but that the existing towers on the ROW will need to be replaced with new structures (Exhibit B-1, Appendix A, p. 12).

## 2. Phase-shifting transformers in 1L115/116 at DMR

BCTC describes this alternative as consisting of using phase-shifting transformers at DMR to control the load flow over the two DMR-JPT 138 kV circuits within their existing ratings under both normal and single-contingency outage conditions. Consequently, this alternative also avoids the need for any additional ROW along this corridor. It also increases supply to the CVI area via DMR but not to the same extent as the previous alternative. As a result, a transformer upgrade will still be required at DMR but only towards the end of the long-range planning period.

Due to the reduced supply to the CVI area via DMR, BCTC calculates that the VIT transformer loading conditions will be increased relative to 1L115/116 Upgrade alternative and proposes to resolve VIT transformer constraints by developing 230/138 kV transformation facilities at SAT, sectionalizing the CVI and SVI 138 kV systems between VIT and SAT, and re-terminating the three VIT-GOW/GTP 138 kV circuits at SAT. BCTC notes that there is sufficient ROW for three 138 kV transmission lines from the junction of the VIT-SAT 230 kV ROW and the VIT-GOW/GTP ROW to SAT, a distance of approximately 4.7 km.

In addition to the above, BCTC states that additional reactive power support will be required in the VIT area to avoid low voltage conditions or a system voltage collapse during outages on the VITR circuit prior to the implementation of VITR #2, with the result that approximately 120 MVARs of support will be required, which in BCTC's view could be provided by the installation of a typical 242 kV, 122.4 MVAR capacitor bank at SAT (Exhibit B-1, Appendix A, p. 13).

## 3. Re-terminating SAT

BCTC states that this alternative essentially achieves everything from the alternative above; but that, instead of adding 230/138 kV transformation at SAT and sectionalizing the CVI and SVI system, transformation capacity is added at VIT and the two systems remain together (Exhibit B-1, Appendix A, p. 14).

#### 4. 230kV Injection

BCTC states that this alternative offloads both the DMR-JPT 138 kV transmission lines as well as the VIT transformers by creating a new source of supply in the center of the CVI area. It requires additional ROW for the new 230 kV transmission lines to be constructed from tap points on the DMR-SAT 230 kV circuits to HWW. The new transmission lines will be approximately 12 km long. Although construction of the NAR adjacent to the DMR-SAT ROW at the tap point for the circuits proceeding eastward to Nanaimo would be desirable as it would increase system reliability, BCTC considers that constructing only HWW in 2010 is adequate. Along with building HWW, property will need to be purchased for NAR to ensure that an adequate site is reserved for the future substation. The site will need to be suitable for a 500/230 kV substation since the DMR-SAT circuits are operated at 230 kV but were designed to 500 kV standards. They are critical for bulk supply purposes to Nanaimo and Victoria and their integrity should be preserved to the maximum extent possible (Exhibit B-1, Appendix A, pp. 15-16).

#### 5. Convert the DMR-SAT 230 kV circuits to 500 kV operation

BCTC states that these transmission lines were constructed to 500 kV standards and that their conversion to 500 kV operation would significantly offload the underlying DMR-JPT 138 kV transmission lines operating in parallel with these circuits; however, it would significantly increase the loading on the VIT transformers. To resolve the VIT transformer constraints, BCTC assumes that the 230/138 kV transformers at VIT would be upgraded as per the alternatives with the DMR phase shifting transformers (Exhibit B-1, Appendix A, pp.17-18).

### **2.5 Evaluation**

BCTC states that it evaluated the five alternatives using the following factors:

- technical feasibility and property and right-of-way requirements;
- financial impact;

- transmission losses; and
- reliability.

In the analysis BCTC used the Harewood South routing option as a proxy for the 230kV injection alternative. As can be seen below there was little variation in cost, transmission losses, or reliability among the various routing options and this did not vitiate the comparison.

#### Technical feasibility and property and right-of-way requirements

BCTC states that the 1L115/116 DMR-JPT Heavy-duty Upgrade alternative could be very difficult and expensive to implement without numerous and extensive outages to the load supplied by these transmission lines due to the upgrades required to strengthen the transmission line towers. In addition, it could be difficult to acquire the necessary ROW access as well as any temporary ROW requirements necessary to implement this alternative due the relatively well developed nature of the transmission route. BCTC concludes that this alternative may not be technically or economically feasible.

BCTC states that the main disadvantage with the DMR 1L115/116 Phase-shifting Transformers, CVI/SVI 138 kV system sectionalizing and SAT 230/138 kV development alternative is that the CVI regional transmission system will be more stressed than with the other alternatives. This is due to the higher load transfer required from DMR to VIT via the 230 kV circuits under this alternative. In particular, during outages on VITR's first circuit, all CVI and SVI supply is essentially provided by DMR at the north end of the CVI system and the CVI regional transmission system becomes increasingly stressed as load growth in the CVI and SVI area continues to develop. This requires additional VAR support in the vicinity of VIT up to the ISD of VITR's second circuit, currently forecast to be F2021.

BCTC states that the DMR 1L115/116 Phase-shifting Transformers with VIT transformer upgrades alternative has the same VAR support concerns as the previous alternative and is also sensitive to the ISD of VITR's second circuit.

BCTC states that the main disadvantage associated with the 230 kV Injection alternative is the need to acquire two new substation sites (although only one substation will be constructed initially) and a new transmission ROW.

BCTC states that the main disadvantage with the 2L123/128 DMR-SAT 500 kV Conversion alternative is that it may require phase-shifting transformers towards the end of the long-range planning period to extend the life of the CVI system in place at that time. At that point, the CVI system would essentially be the same as per the 1L115/116 phase-shifting transformer alternative. Consequently, if phase-shifting transformers are to be installed, it would likely be more economically feasible to install them in 2010 rather than convert the DMR-SAT 230 kV system to 500 kV. If so, this alternative would essentially be rendered redundant (Exhibit B-1, Appendix A, pp. 36-37).

## 2.6 Financial impact

BCTC estimates the capital cost of each of the alternatives as follows:

**Table 2**

**Table 5.11: Alternative Capital Cost Comparison**

| Alternative                                | Cost (\$M) |
|--|------------|
| 1L115/116 Thermal Upgrade                  | 168.4      |
| DMR Phase Shifters with SAT transformation | 92.3       |
| DMR Phase Shifters with VIT transformation | 134.0      |
| HWW 230 kV Injection                       | 77.4       |
| 500 kV Conversion                          | 188.4      |

Source: Exhibit B-1, Appendix A, p. 38



BCTC states that the estimated capital costs for these alternatives are in 2007 uninflated dollars (“\$2007”) with 20 percent contingency and do not include corporate overhead or interest during construction (“IDC”), and are considered to have an accuracy level of -15% to +35%.

BCTC stated that it did not include in its cost estimate of the 230 kV Injection alternative the cost of constructing the NAR substation as it had no plans to do so within the 25 year planning horizon. BCTC estimated the cost of the NAR substation to be \$62.3 million in \$2007 (Exhibit B-2, BCUC 1.16.5)

BCTC states that it performed a present value (“PV”) analysis to determine the alternative with the lowest overall PV cost, taking into consideration capital cost, O&M costs, property taxes, and transmission losses. The following parameters were used in the analysis:

- a) Capital costs in 2007 un-inflated dollars
- b) The ISD of first stage of all alternatives: October 2010
- c) Discount rate: 6.0 percent
- d) Duration of the PV analysis: 25 years
- e) O&M annual rate for steel towers: 1.10 percent
- f) O&M annual rate for substations: 1.01 percent
- g) Annual taxes for 230 kV heavy duty double circuit steel pole transmission lines: \$8159/km
- h) Annual taxes for 230 kV heavy duty double circuit steel tower transmission lines: \$7869/km
- i) Annual taxes for 138 kV transmission lines: \$800/ km
- j) Annual tax rate on physical plant: 1.47 percent
- k) Value of line losses: \$88.00/MWh

(Exhibit B-1, Appendix A, p. 38)

BCTC summarizes the results in the following table:

**Table 3**  
**Table 5.12: Alternative Present Value Analysis (\$Millions)**

| Alternative                                | Cost (\$M) |
|--|------------|
| 1L115/116 Thermal Upgrade                  | 105.3      |
| DMR Phase Shifters with SAT Transformation | 71.4       |
| DMR Phase Shifters with VIT Transformation | 107.3      |
| HWW 230 kV Injection                       | 28.5       |
| 500 kV Conversion                          | 95.2       |

Source: Exhibit B-1, Appendix A, p. 39 and Exhibit B-1-2, p. 45

BCTC stated that if it had assumed that the NAR substation would be constructed in the final year of the economic analysis the PV of the 230 kV Injection alternative would be \$14 million greater (Exhibit B-2, BCUC 1.16.4).

### Transmission Losses

BCTC calculates the line losses and produces the following table:

**Table 4**  
**Table 5.15: Annual Energy Loss Reduction Comparison**

| Year    | Reconductor<br>1L115/116 | Phase Shifters<br>with VIT<br>transformers | Phase Shifters<br>with SAT<br>transformers | 230kV<br>Injection | 500kV<br>Conversion |
|---------|--------------------------|--|--|--------------------|---------------------|
| 2010/11 | 43862 MWh                | 28061 MWh                                  | 30513 MWh                                  | 53942 MWh          | 78189 MWh           |
| 2016/17 | 34872 MWh                | 16619 MWh                                  | 18253 MWh                                  | 39231 MWh          | 74648 MWh           |
| 2031/32 | 52580 MWh                | 29151 MWh                                  | 25609 MWh                                  | 66474 MWh          | 60481 MWh           |

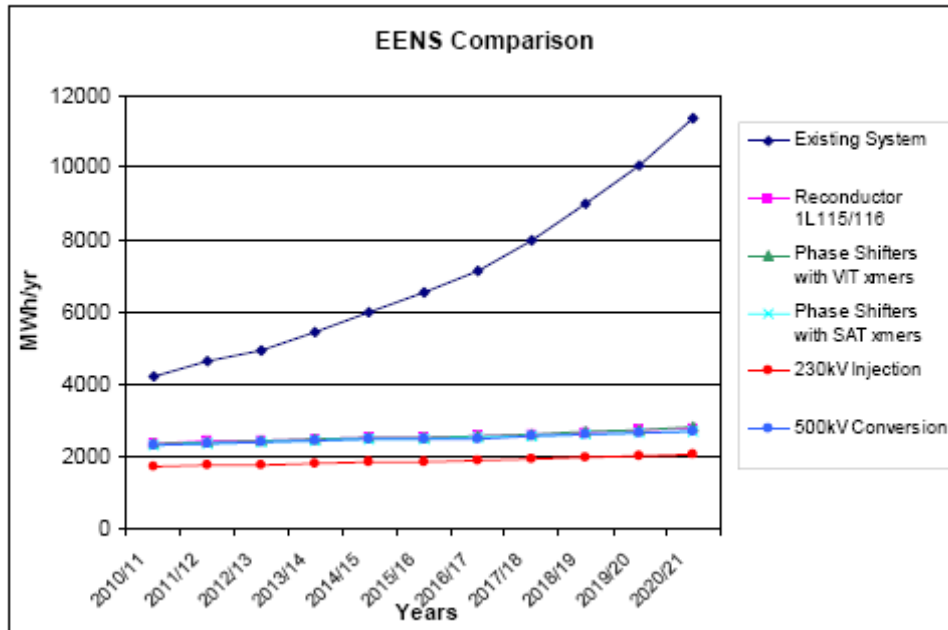
Source: Exhibit B-1, Appendix A, p. 40

## 5. Reliability

BCTC calculates the Expected Energy Not Served (“EENS”) of each alternative and produces the following chart:

**Figure 2**

**Figure 5.2: EENS Comparison**



Source: Exhibit B-1, Appendix A, p. 43

BCTC states that this table indicates that the status quo results in increasing likelihood of failing to meet demand due to the overloading of 138 kV circuits 1L115/116 and overloading of the transformers at VIT, and shows that the 230 kV Injection alternative provides the best reliability improvements over the existing system compared to the other alternatives. BCTC observes that providing a new supply source at Nanaimo, which is the approximate mid-point of the 138 kV transmission system and the major load centre in CVI, is the most reliable solution to mitigate the impacts of the various contingency situations in the CVI area that may occur (Exhibit B-1, p. 62).

## Sensitivity

BCTC performed sensitivity analyses around inflation, discount rates, and line loss escalation rates and demonstrated that its analysis was not affected by changes in any of those variables to any significant extent (Exhibit B-2, BCUC 1.20.1 & 1.23.6).

## **2.7 Summary**

BCTC summarizes the results of its analysis in the following table:

**Table 5**

**Table 5.17: Summary of Alternatives**

| <b>Alternative</b> | <b>Reconductor<br/>1L115/116</b> | <b>Phase Shifters<br/>with VIT<br/>Transformers</b> | <b>Phase Shifters<br/>with SAT<br/>Transformers</b> | <b>230kV<br/>Injection</b> | <b>500 kV<br/>Conversion</b> |
|--------------------|----------------------------------|---|---|----------------------------|------------------------------|
| NPV of Cost        | 105.3M                           | 107.3M  | 71.4M   | 28.5M                      | 95.2M                        |
| Power Losses       | Med                              | High  | High  | Low                        | Low                          |
| Reliability        | Med                              | Med   | Med   | High                       | Med                          |

Source: Exhibit B-1, Appendix A, p. 44; Exhibit B-1-2, p. 45

BCTC concludes that its recommended alternative is the 230 kV Injection alternative to resolve the transmission constraints of the CVI area, on the grounds that it has the lowest cost (in PV terms), it will meet the system needs for the long range planning period, reduce transmission losses, and decrease EENS (Exhibit B-1, Appendix A, p. 44).

BC Hydro submits that the evidence demonstrates that the 230 kV Injection proposal is preferable to any other alternative considered by BCTC in its application, based on a comparison of the present value of costs (net of reduced line losses), and that the 230 kV Injection proposal is even more favourable when other factors such as technical feasibility, reliability, environmental impacts, and First Nations interests are considered (BC Hydro Argument, para. 7).

**Commission Determination**

The Commission Panel accepts BCTC's assessment of the various alternatives for the CVI reinforcement and determines that the 230 kV Injection alternative is the most cost-effective and appropriate means of addressing the capacity constraints in the CVI region. The Commission Panel accepts that this solution provides the best balance of technical feasibility, financial impact, transmission losses, and reliability and that these factors are an appropriate basis for judging the alternatives proposed. The Commission Panel also notes that this alternative will help meet two of the government's energy objectives: i) developing adequate energy transmission infrastructure, and ii) self sufficiency by the reduction of line losses.

### 3.0 INJECTION ROUTING OPTIONS AND CHOICE OF ALIGNMENT

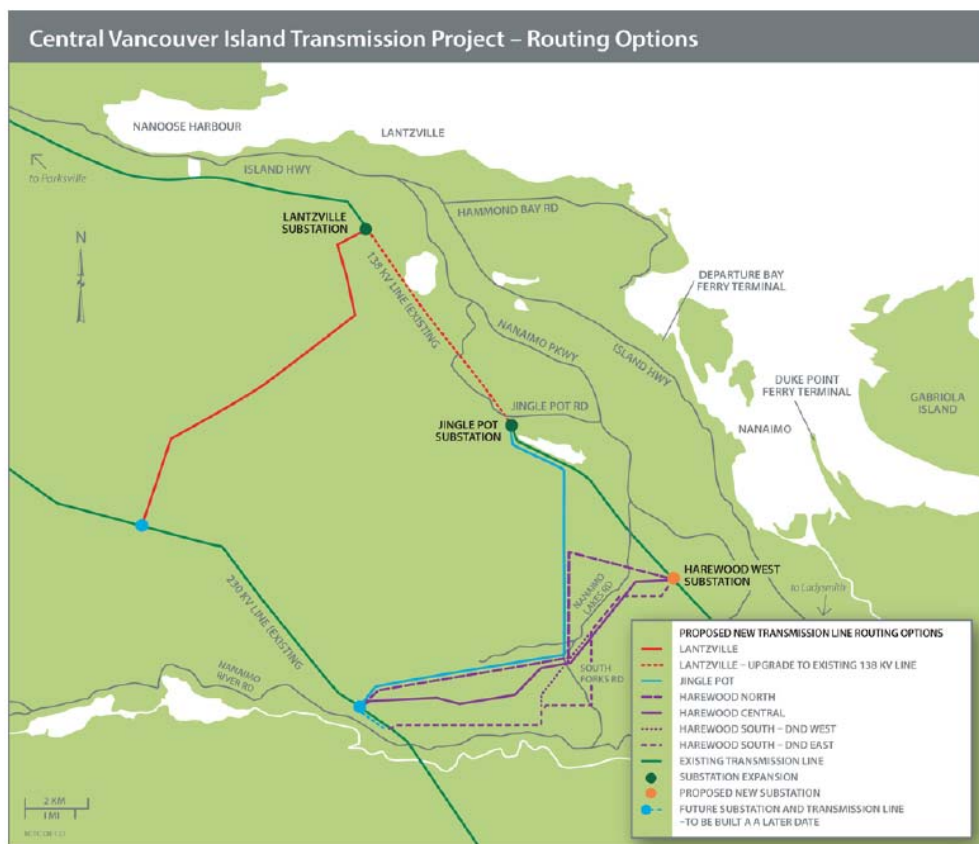
This Section addresses the process BCTC followed to select an Injection Routing Option, and then to select an alignment for its preferred Harewood South routing option.

#### 3.1 Injection Routing Options

Having concluded that the best solution was the 230 kV Injection alternative, BCTC reviews potential routing options for the injection of 230 kV power into the 138 kV transmission system in the vicinity of Nanaimo. BCTC states that it initially considered three routing options, Lantzville, Jingle Pot, and Harewood, and that due to ROW access concerns within provincial crown lands on the South side of Mount Benson, it reviewed a total of three Harewood Routing Options: Harewood North, Harewood Central, and Harewood South (Exhibit B-1, p. 68).

**Figure 3**

**Figure ES-2. Map of 230 kV Injection Routes for Central Vancouver Island**



Source: Exhibit B-1-2, p.12

### 3.1.1 Lantzville Routing Option

BCTC describes this routing option as approximately 12 km in length from a tap-off point on the existing 230 kV system near Black Jack Lake northwest of Mount Benson, traversing east, and terminating at LTZ, which is currently operated as a 138 kV substation on the 138 kV transmission system, but which was constructed to eventually become a 230 kV substation.

BCTC states that although BC Hydro purchased sufficient land to meet the design requirements of a 230 kV substation, additional land would be required to support an injection of 230 kV power from the west and to support the expansion of LTZ to accommodate the 230 kV to 138 kV transformation and related switchyard equipment needed to interconnect the new 230 kV transmission line with the 138 kV system. BCTC also states that sufficient private property exists around the substation to accommodate the required development.

In addition to the 12 km of new transmission line and ROW for the Lantzville routing option, the 138 kV circuits 1L115/116 from LTZ to JPT, a distance of approximately 7.5 km, would require upgrading to carry the heavier power flow from the 230 kV Injection and that upgrading would consist of either replacing the existing circuits with new support structures and higher capacity conductor, or adding a third transmission line between LTZ and JPT. A third transmission line would require acquisition of additional ROW to accommodate the additional circuit. Replacing the existing circuits with higher capacity circuits would also require the replacement of the existing towers with towers or steel poles that would be capable of carrying the heavier duty circuits. Planned outages of lengthy duration would also be required along the transmission line, as the old circuits are replaced.

BCTC notes that the Lantzville routing option would pass through an area of Lantzville known as the Foothills, where a development permit to construct a new subdivision and parkland area has been granted, comprising 900 acres of residential, commercial, institutional development, and 900 acres of parkland. To access LTZ the Lantzville routing option would pass through parts of the

Foothills development, which is adjacent to the substation. BCTC states that it became aware of the Foothills development through its public consultation process.

So far as environmental issues are concerned, BCTC states that the Lantzville routing option ROW would require significant clearing of second and third growth forest, as very little of the proposed routing option has been cleared recently, and that the environmental review it engaged Golder Associates (“Golder”) to conduct determined that the Lantzville routing option is more environmentally sensitive than the more southerly routing options due to the amount of existing forest cover along the route, providing better habitat for wildlife.

BCTC states that the Nanoose First Nations reviewed this routing option and concurred that the Lantzville routing option has higher environmental value, and the Nanoose First Nations submitted a letter dated 13 November 2007 stating that it did not support this routing option (Exhibit B-1, Appendix K).

BCTC concludes that, from a public, First Nations and environmental perspective, the Lantzville routing option is a more challenging routing option than the more southerly routing options, and as a result of having to upgrade the existing transmission 138 kV circuits 1L115/116 from LTZ to JPT, the Lantzville routing option is the most expensive 230 kV Injection option, with forecast capital costs of approximately \$112 million (Exhibit B-1, pp. 70-71).

### 3.1.2 Jingle Pot Routing Option

BCTC describes this routing option as approximately 15 km in length from a tap-off point on the existing 230 kV transmission system near NAR extending east and then north around the south side of Mount Benson, over both forested and cleared terrain and entering JPT from the south following the existing 138 kV transmission system ROW. This routing option crosses private forestry lands and crown land parcels until it reaches the 138 kV transmission system. The private forestry lands are partially cleared, and the routing tries to take advantage of cleared lands where possible. The portion of the routing option that crosses the provincial crown land parcels is second growth forest, and has not been cleared recently.



BCTC estimates that in order to accommodate the 230 kV circuits, the existing 138 kV ROW would need to be widened as it approaches JPT, and that the routing option would require expansion of JPT to accommodate the installation of two 230/138 kV transformers and related switchyard equipment, and to provide room for a future transformer. JPT is currently a 138 kV substation that provides distribution power to the local Nanaimo area, and expansion opportunity is limited by residential property on one side of the substation, difficult sloped terrain on another side, and a municipal road. In addition, there is also an eco-reserve (salmon bearing stream) on the western edge of the existing substation which limits site expansion in that direction. BCTC states that expansion of JPT would require the acquisition of adjacent residential/farm properties to accommodate the additional facilities necessary for 230/138 kV transformation and related switchyard equipment. BCTC states that access to JPT for the 230 kV transmission line to the substation is constrained due to Department of National Defense (“DND”) lands limiting widening of the existing 138 kV ROW on the west side of the ROW, south of JPT, and the Morrell nature sanctuary on the east side of the existing 138 kV ROW. Widening of the 138 kV ROW is also limited by Westwood Lake Nature Park, adjacent to the existing ROW.

BCTC states that it informed itself of the status of First Nations treaty negotiations and became aware that provincial treaty negotiators had offered the Snuneymuxw First Nations a large block of the crown lands on Mount Benson as part of an Agreement in Principle (“AIP Lands”) during treaty negotiations, and that this large block of crown lands encompasses lands that the proposed Jingle Pot, Harewood North and Harewood Central routing options pass through. Through consultation with the Snuneymuxw First Nation, it became clear that the Snuneymuxw did not support providing access to these lands for the purpose of constructing a new transmission line, in the absence of an overall land use plan for those lands.

BCTC states that it commissioned Golder to perform an environmental review of the Jingle Pot routing option which determined that the Jingle Pot routing option was also reasonably sensitive, due to the lack of clearing in the provincial crown lands, the proximity of the routing option to the

Morrell Nature Sanctuary and to Westwood Lake, and that both the local First Nations agreed with Golder's findings.

BCTC estimates that the capital cost of the Jingle Pot routing option is \$101 million (Exhibit B-1, pp. 71-73).

### 3.1.3 Harewood Routing Options

BCTC states that it identified three potential Harewood routing options and styles them the Harewood North, the Harewood Central and the Harewood South routing options. Each routing option consists of a new 230 kV transmission line approximately 12 km in length from a tap point on the existing 230 kV transmission lines, connecting to HWW, and would require the acquisition of ROW over private forestry land, crown land, and/or private residential property

BCTC states that HWW will be located along the 138 kV transmission circuits 1L109/122/138 in an area known as Harewood Plains, approximately 5 km south of JPT, within cleared private forestry land. HWW will be sized to accommodate two 230/138 kV, 400 MVA transformers, with room for the addition of two more transformers that may be required in the future, and related switchyard equipment and line terminations to interconnect with the existing 138 kV transmission system, and will be approximately 16.5 acres in size. BCTC states that by siting HWW on or near the existing 138 kV ROW minimal reconfiguration of the 138 kV transmission lines will be required (Exhibit B-1, p. 73).

### 3.1.4 Harewood North Routing Option

BCTC states that this routing option is 12.1 km in length from a tap off point near NAR on the existing 230 kV circuits 2L123/128, extending east over forested and cleared terrain on the south slopes of Mount Benson. The Harewood North routing option shares much of the same routing option as the Jingle Pot routing option; however, the Harewood North routing option branches off

approximately 5 km south of JPT to connect to HWW. The Harewood North routing option also crosses the provincial crown lands being offered to the Snuneymuxw First Nations, following the same routing option as the Jingle Pot routing option. Therefore, the Harewood North routing option shares the same First Nation and environmental issues as the Jingle Pot routing option discussed above.

BCTC estimates that the forecast capital cost of the Harewood North routing option is \$92 million (Exhibit B-1, p. 74).

### 3.1.5 Harewood Central Routing Option

BCTC states that this routing option is approximately 12.0 km in length from a tap off point near NAR on the existing 230 kV system, extending over forested and cleared terrain to connect to HWW. BCTC points out that the Harewood Central routing option takes greater advantage of previously cleared forest lands to minimize the amount of clearing of the new ROW, which makes this routing option more acceptable from an environmental perspective, and that this was borne out by the Golder review which found the Harewood Central routing option to be one of the least intrusive to the environment of the routing options reviewed.

BCTC states that as a result of consultation with the Snuneymuxw First Nation, it became clear that the Snuneymuxw did not support providing access to these lands for the purpose of constructing a new transmission line, in the absence of an overall land use plan for those lands.

BCTC estimates that the forecast capital cost of the Harewood Central routing option is \$93 million (Exhibit B-1, p. 75).

### 3.1.6 Harewood South Routing Option

This subsection describes BCTC's process of establishing an alignment for its Harewood South Routing Option, and how, in its original design it had proposed to cross private land, but now proposes to cross Block 271.

BCTC states that this routing option is approximately 11.7 to 12.2 km in length from a tap off point approximately 0.5 km north of Nanaimo River Road, at the point where the existing 230 kV transmission system crosses Nanaimo River Road, on the 230 kV system, extending eastward over forested and cleared terrain to connect to HWW. The routing is the most southerly transmission routing option investigated, and was originally designed to by-pass the provincial crown lands offered to the Snuneymuxw First Nation as part of ongoing treaty negotiations. By-passing the provincial crown land that is being offered to the Snuneymuxw First Nation resulted in approximately 500 metres of this routing alignment being on a private residential farm bordering those crown lands, identified as Lot 1, PL 50138.

In its Application BCTC states that discussion with the private landowner had indicated that he did not support the use of his lands for the new transmission line, and that some public support for the landowners had been established through the public consultation process undertaken to the date of the Application. BCTC states that, in order to minimize the impact to the private landowner, BC Hydro reached an agreement with the Snuneymuxw First Nation to allow the 230 kV transmission line to cross Block 271 immediately west of Lot 1, PL 50138, and that the alignment over Block 271 is BCTC's preferred routing option alignment for the Harewood South routing option. The existence of the two alternate alignments affects approximately 500 metres of the Harewood South routing option. In its original Application, BCTC states that it applied to the ILMB to secure a Licence of Occupation through Block 271 for the preferred routing alignment, and that if the ILMB declined the application, BCTC proposed to have the 230 kV transmission line follow the routing option alignment over Lot 1, PL 50138, that crossed the private landowner's property.

BCTC states that the Golder report confirms that the Harewood South routing option creates the least impact on the environment when compared to the Lantzville, Jingle Pot, and Harewood North routing options investigated, and that the Harewood Central routing option has similar environmental impacts as the Harewood South routing option. BCTC observes that the Harewood South routing option takes advantage of the most cleared land of any of the routing options reviewed, minimizing the need to clear additional trees, and disturbing the forest canopy the least.

BCTC estimates that the forecast capital cost of the Harewood South routing option is \$92 million (Exhibit B-1, pp. 75-76).

### **3.4 Selection of the Preferred Routing Option**

BCTC states it evaluated each routing option based on its forecast capital cost, environmental impact, community impact, First Nations impact, implementation risks, schedule risk, and regulatory risks, and that it assessed each routing option against the identified criteria, and assigned a score of between 1 and 10, with 1 being the best and 10 being worst, for each of the identified criteria. It then ranked the routing options based on their point totals, with each of the routing option measurement criteria having equal weight.

BCTC provides each routing option's ranking:

**Table 6**  
**Routing Option Ranking**

|                  |    |
|------------------|----|
| Lantzville       | 68 |
| Jingle Pot       | 57 |
| Harewood North   | 39 |
| Harewood Central | 34 |
| Harewood South   | 27 |

Source: Exhibit B-1, p. 78

BCTC states that it considers other factors in the selection of the preferred routing option, such as externalities including environmental and social considerations as well as the capital expenditures forecast for each of the routing options investigated, and that in its original Application its preferred routing option was the Harewood South routing option as described above (Exhibit B-1, p.78).

### **3.5 Choice of Alignment**

This subsection describes how BCTC amended its Harewood South routing option alignment to DND West.

On September 15, 2008 BCTC filed amendments to its Application to incorporate a change to its preferred route alignment (Exhibit B-1-2). The amendments include, in part, the original text in section 5.1.3.3. of the Application relating to the Harewood South Route Option, but also make some corrections to the text and expand the discussion on the Harewood South Option.

As part of the expanded discussion, BCTC states that it has also re-aligned the transmission line in the vicinity of South Forks so that the line would be a further 200 metres to the north and further from the residences in the community. BCTC believes this route alignment balances the interests of First Nations and the residents of the community of South Forks.

BCTC states that subsequent public input indicated that residents of the community of South Forks desired a route alignment that was a greater distance from their community, which caused BCTC to commission an environmental overview of provincial Crown land west and north of the DND Lands ("DND West alignment") and to engage in further discussions with the First Nations. The environmental overview (the September 2008 report of Golder) indicated that the environmental impact of an alignment west and north of the DND Lands is similar to that of an alignment south and east of the DND Lands ("DND East alignment"). BCTC has received letters from both the Snuneymuxw and Nanoose First Nations, with respect to the modified alignment. The letter from the Snuneymuxw First Nation, dated September 8, 2008 indicates that both the DND West and

DND East alignments are acceptable to them. The letter from the Nanoose First Nation, dated August 19, 2008 indicates a preference for the DND East alignment; however, the letter from the Nanoose First Nation does not indicate it would object to an alignment west and north of the DND Lands. Having considered the additional community input, the environmental assessment and the communications with First Nations, BCTC proposes, as its preferred alignment for the 230 kV transmission line in the vicinity of the community of South Forks, a route crossing Provincial Crown Block 271, currently offered to the Snuneymuxw First Nation, and crossing the Provincial Crown land west and north of the DND Lands (the DND West alignment). BCTC states that the use of this preferred alignment for the transmission line is dependent on, and subject to, tenure being received for the necessary Provincial Crown land in Block 271 and tenure being received for the lands west and north of the DND Lands.

BCTC proposes that, if tenure is received for Provincial Crown Block 271 but tenure is not received for the Provincial Crown land west and north of the DND Lands, the transmission line follow an alternate alignment that crosses Block 271 and then crosses the Provincial Crown land south and east of the DND Lands. BCTC has now received the necessary tenure a Tenure Offer from the ILMB to use of the Provincial Crown land south and east of the DND Lands (Exhibit B-1-2, pp. 76, 76a & 76b).

BCTC addresses its amended its CVI Project Application which proposed the Harewood South routing option with a preferred alignment in the vicinity of the community of South Forks that crosses Provincial crown Block 271 and crosses the Provincial crown land on the west and north sides of the DND Lands (the DND West alignment), and submits "This routing option on the north side of the DND Lands and on the west side of the DND Lands is a routing option as proposed in the compromise presented on behalf of the community by Ms. Young" (BCTC Argument, para. 119).

Further consideration of the route alignment after additional public input has resulted in the preferred alignment of the 230 kV transmission line crossing forested and cleared forestry lands of two private forestry companies and Provincial Crown land. In the vicinity of the community of

South Forks the preferred alignment has the transmission line crossing Provincial Crown land Block 271, currently being offered to the Snuneymuxw First Nation, and also crossing Provincial crown land west and north of Provincial Crown land occupied by the DND (“DND Lands”) (referred to as the “DND West alignment”). BCTC proposes, if tenure for the Provincial Crown land west and north of the DND Lands is not received, that the transmission line cross Provincial Crown Block 271 and also cross Provincial Crown land south and east of the DND Lands. BCTC submits that both alignments described above by-pass the private residential/farm property at 2100 Nanaimo River Road (District Lot 7, E&N). BC Hydro and the Snuneymuxw First Nation have been in negotiations on a benefits package, part of which includes agreement on the alignment of the transmission line over provincial crown lot Block 271, which is part of a larger block of Crown lands offered in treaty negotiations, and have reached agreement on the benefits package. BCTC states that it made an application to the ILMB to secure tenure over Provincial crown Block 271 and that a Tenure Offer (to perform a survey) was received on September 23, 2008 allowing for a DND East alignment (Exhibit B-12). BCTC states that an application to the ILMB to secure tenure over the Provincial Crown land west and north of the DND Lands was filed on 11 September 2008, and a decision on that application that would permit a DND West alignment is expected by approximately mid-January 2009 (Exhibit B-1-2, p. 18 (first revision)).

In response to a Commission IR, BCTC expanded its ranking to include the two additional variants on the Harewood South routing option and a number of other criteria and produced the following table:



**Table 7**

Table 3.109.1. Expanded Route Selection Matrix

|    | Route   | LTZ Option | JPT Option | HWW North | HWW Central | HWW South (DND East) w/out Block 271 | HWW South (DND East) with Block 271 | HWW South (DND West) |
|----|---|------------|------------|-----------|-------------|--------------------------------------|-------------------------------------|----------------------|
| 1  | Capital Cost (\$million)                                | \$112      | \$101      | \$89      | \$90        | \$92                                 | \$92                                | \$89                 |
|    | Score   |            |            |           |             |                                      |                                     |                      |
| 2  | Capital Cost  | 10         | 7          | 1         | 2           | 4                                    | 4                                   | 1                    |
| 3  | Environmental Impact                                    | 8          | 9          | 5         | 2           | 3                                    | 3                                   | 3                    |
| 4  | Community Impact  | 10         | 8          | 2         | 2           | 5                                    | 2                                   | 2                    |
| 5  | First Nations Impact                                    | 10         | 10         | 10        | 8           | 2                                    | 3                                   | 3                    |
| 6  | Implementation Risks                                    | 10         | 7          | 7         | 7           | 5                                    | 5                                   | 5                    |
| 7  | Schedule Risk   | 10         | 8          | 8         | 8           | 5                                    | 7                                   | 7                    |
| 8  | Regulatory Risk   | 10         | 8          | 6         | 5           | 3                                    | 3                                   | 3                    |
| 9  | Pole Numbers  | 10         | 8          | 5         | 5           | 5                                    | 5                                   | 5                    |
| 10 | Conductor Configuration                                 | 7          | 5          | 5         | 5           | 5                                    | 5                                   | 5                    |
| 11 | Aesthetics  | 10         | 9          | 5         | 5           | 5                                    | 5                                   | 5                    |
| 12 | EMF Levels  | 7          | 5          | 5         | 5           | 5                                    | 5                                   | 5                    |
| 13 | Line Losses   | 10         | 7          | 5         | 5           | 5                                    | 5                                   | 5                    |
| 14 | Reliability   | 7          | 5          | 3         | 3           | 3                                    | 3                                   | 3                    |
| 15 | Operation & Safety                                      | 5          | 5          | 5         | 5           | 5                                    | 5                                   | 5                    |
| 16 | Noise   | 5          | 5          | 5         | 5           | 5                                    | 5                                   | 5                    |
| 17 | Residential Structures within 0.5 km of the Edge of ROW | 10         | 8          | 1         | 1           | 4                                    | 3                                   | 2                    |
| 18 | Natural Screening                                       | 10         | 8          | 5         | 5           | 5                                    | 5                                   | 5                    |
| 19 | Property Value  | 10         | 8          | 2         | 2           | 3                                    | 2                                   | 2                    |
| 20 | Effects during Construction                             | 10         | 9          | 2         | 2           | 3                                    | 2                                   | 2                    |
| 21 | Overall Score   | 169        | 139        | 87        | 82          | 80                                   | 77                                  | 73                   |
| 22 | Overall Ranking   | 7          | 6          | 5         | 4           | 3                                    | 2                                   | 1                    |

Source: Exhibit B-9, BCUC 3.109.1

BCTC added the following commentary to this table:

- BCTC addressed capital costs and noted that, while a benefits agreement for the Harewood South route alignments that cross Block 271 had been negotiated, Both the Harewood North and Central routes would require a benefits agreement, which would increase the cost risk associated with those routes, would increase the costs for those routes relative to the Harewood South DND East and West alignments over Block 271, and would potentially change the capital cost rankings in the table above;
- BCTC stated that it rated First Nations Impact 1 point higher for the Harewood South DND East and West alignments with approval to cross Block 271 compared to the Harewood South alignments without approval to cross Block 271, due to requirement for tenure over Block 271;
- BCTC opined that Schedule Risk was higher for the DND West and DND East alignments due to the uncertainty over BCTC's ability to cross Block 271, and the added time to accommodate the ILMB application for the DND West alignment that will potentially take until February 2009 i.e. a delay of about 5 months;
- BCTC stated that the LTZ Option had the highest number of residential structures within 0.5 km of the edge of the right-of-way as it will pass through Foothills development and also due to upgrade requirements of 1L115/116 which are along a residential corridor. The JPT Option had the second highest score as the JPT substation was surrounded by

residential property. The least number of residential structures within 0.5 km of the edge of the right-of-way were for Harewood North Central routes, and that HWW South route with DND West alignment was the best among the three HWW South alignments;

- BCTC stated that natural Screening would be the least for the LTZ Option and best for the Harewood routes around the residential areas;
- BCTC stated that the impact on property value would be highest for the LTZ Option as it will pass through the Foothills development. The next highest impact on property values will be for the JPT Option, as the JPT substation expansion will impact the neighbouring properties. The Harewood North, Central and South alignments (DND West and DND East) are expected to have the least impact on property values. The Harewood South route without approval to cross Block 271 will impact a residential property, and therefore its property value; and
- BCTC considered that the effects during construction would be highest for the LTZ Option due to extensive outages required to upgrade 1L115/116, followed by the JPT Option due to relative closeness to the residential community. The impact during construction for the Harewood North, Central and South (DND East and DND West alignments) were expected to be the least, which would be limited to traffic management during construction and construction noise.

(Exhibit B-9, BCUC 3.109.1)

BCTC submits that use of the DND West alignment would increase the distance between the transmission line and most of the residences along South Forks Road to more than a kilometre. One residence is approximately 700 metres from the transmission line as it crosses Block 271, and that would not change with the DND West alignment. The DND West alignment also does not change the distance from the residence at 2100 Nanaimo River Road, which is approximately 430 metres from the transmission line as it crosses Block 271 (BCTC Argument, para 118).

BC Hydro submits that BCTC has made considerable efforts to accommodate the interests of South Forks property owners and residents by re-aligning the proposed Harewood South routing option at least twice, and concludes “BC Hydro is of the view that the Harewood South route is the preferred route, even if the ILMB does not approve the outstanding application that would allow BCTC to re-align the transmission line west of the DND lands” (BC Hydro Argument, paras. 12, 15).

BCOAPO submits that the Harewood DND West routing option does not address all public concerns but it does seem to indicate BCTC is attempting to mitigate all risks to whatever extent is practicable given their limited timeline and other project constraints, and concludes “BCOAPO is prepared to recommend to this Commission Panel that BCTC’s application for a CPCN for the CVI Project based on the Harewood DND West route be approved” (BCOAPO Argument, pp. 3, 5).

In her Argument Ms. Young submits “we would like to ask you to advocate for the South Forks/Nanaimo River Community by directing the British Columbia Transmission Corporation to place the 230 kV transmission lines along the Harewood North Route or the Harewood Central Route”(Young Argument, p. 3).

Similarly Ms. Pongratz-Doyle submits that “Our Communities stand is that we (our Community) want this 230 kV High Voltage Power Line built on the HWW North Route or HWW Central Route or at the very least 1 km way from all property lines” (Pongratz-Doyle Argument, p. 7).

In Reply, BCTC addresses the Submission of Ms. Young, and the Letters of Comment of Ms. Pongratz- Doyle, Mr. Ford and Ms. Abbott, which suggest the transmission line should be constructed at a distance further from the community of South Forks, and in particular further from the property of Dan and Shirley Gogo. BCTC points out that the petition of residents in the South Forks area indicated opposition to the transmission line going through Dan and Shirley Gogo’s property, and submits that it responded to this concern by negotiating an agreement with the Snuneymuxw First Nation to cross Block 271, and that it responded to subsequent expressions of concern by investigating the DND West alignment and by putting that alignment forward as its preferred alignment. BCTC submits that it has been reasonable and responsive in its actions relating to the route of the transmission line (BCTC Reply, para. 16).

BCTC addresses the Submission of Ms. Young requesting that the Commission Panel ask BCTC to place the 230 kV transmission line on the Harewood North or Harewood Central route, and submits that it considered both routes in paragraphs 108 to 113 of its Final Argument. BCTC notes that none of the Intervenor took issue with the factors considered by BCTC or with the conclusions

BCTC reached, namely that both the Harewood North and the Harewood Central routes cross Provincial crown lands that have been offered to the Snuneymuxw First Nation as part of an Agreement in Principle during treaty negotiations and that this fact increases implementation and schedule risk considerably due to the complexity of having to deal with the provincial crown and with First Nations (neither of whom support either the Harewood Central or the Harewood North route option) to secure a significant corridor through the middle of the crown lands (BCTC Reply, para. 21).

### **Commission Determination**

The Commission Panel agrees with BCTC's assessment that both the Lantzville and Jingle Pot routing options are sub-optimal from perspectives of cost, environment, public and First Nations impacts. The Commission Panel agrees that the Harewood South routing option is superior to the Harewood North and Central routing options from an environmental and First Nations perspective, but that the Harewood South routing option will affect more landowners than the Harewood North and Central routing options. The Commission Panel agrees that while BCTC's proposed alignment does not address all the public concerns it nevertheless represents an acceptable compromise and an effort to accommodate the needs and concerns of the South Forks community.

## **4.0 PROJECT DESCRIPTION, COSTS AND RISKS**

This Section reviews the proposed CVI Project, its Schedule, the management team and the manner in which BCTC proposes to identify, manage and mitigate its risks. It also sets out the Commission's direction to BCTC concerning reporting requirements.

### **4.1 Description of the Project**

BCTC describes the CVI Project as a new 230 kV double circuit transmission line tapping off the existing DMR to SAT 230 kV circuits (2L123 and 2L128). The new transmission line will be suspended on steel pole support structures, and will require a new ROW 34 metres in width. BCTC states that its proposed route is the Harewood South route, whereby the proposed transmission line will connect to the existing 230 kV circuits approximately 0.5 km north of the point where the 230 kV transmission lines cross Nanaimo Lakes Road, and run to a new substation (HWW) to be located on cleared forestry land in close proximity to the existing 138 kV transmission line, approximately 1.8 km south of the point where the existing SAT to JPT 138 kV circuits cross Harewood Mines Road. In addition to the new 230 kV Injection transmission line and the new substation, modifications at the LTZ will be required. BCTC will also purchase sufficient land adjacent to the 230 kV (2L123/128) transmission lines for a future 500/230 kV transformation substation, the NAR, which will be required when the 230 kV transmission lines are converted to 500 kV operation. The Application includes the cost of the NAR land (approximately 25.3 acres) but not the equipment, which is expected to be required after the end of the 25 year planning period. HWW will be sized to accommodate the required transformers and related switchyard equipment and will be approximately 16.5 acres to accommodate the station, and some additional property (10 metres on each side) for civil improvements such as screening and drainage containment. Some additional ROW will be required adjacent to HWW to terminate transmission lines into the station (Exhibit B-1, pp. 15-16).

## 4.2 Project Timetable

BCTC states that the planned ISD for the project is October 31, 2010 and provides the following table setting out the preliminary major project milestones:

**Table 8**

**Table 5-3. Major Project Milestones**

|   | Milestone                          | Date           |
|---|------------------------------------|----------------|
| 1 | File CPCN Application              | May 2008       |
| 2 | Project Approval                   | August 2008    |
| 3 | Engineering Design (start)         | September 2008 |
| 4 | Route Staking and Clearing (start) | October 2008   |
| 5 | Construction start                 | March 2009     |
| 6 | In service                         | October 2010   |

Source: Exhibit B-1, p. 81

## 4.3 Project Team

BCTC states that the knowledge, experience and expertise of BC Hydro's Engineering Services unit are available to BCTC under the terms of Support Services Agreements between BCTC and BC Hydro. BCTC has also retained the services of specialized consultants to advise it on various aspects of the CVI Project as required. The CVI Transmission Project Team structure, members and roles are identified in Exhibit B-1, pp. 26-27.

## 4.4 Other Permits and Approvals

### Environmental

BCTC states that infrastructure projects may be subject to review under the Canadian Environmental Assessment Act ("CEAA") and/or the British Columbia Environmental Assessment Act ("BCEAA"). CEAA applies when a federal department or agency is required to make a decision on a project. A Screening Level environmental assessment under CEAA is required if federal

permits, approvals, or authorizations included in the *Law List Regulations* are required (Law List trigger) and/or if part of the project right-of-way is on federally-owned land (land trigger). BCTC does not expect the CVI Project to meet either of these requirements for a CEEA review.

Projects that trigger a review under BCEAA include those projects that are an electric transmission line of 500 kV or higher, with 40 km or more of new ROW, as specified in the Reviewable Projects Regulation (*BC Reg. 370/2002, Part 4*). BCTC states that the CVI Project does not trigger an automatic review under BCEAA as it does not meet the threshold criteria as set out above (Exhibit B-1, p. 83).

#### Integrated Land Management Bureau

BCTC states that, since the Harewood South route crosses provincial Crown land, BC Hydro is required to obtain a statutory right-of-way from the Minister of Agriculture and Lands by application to the ILMB which coordinates and adjudicates applications.

BCTC states that BC Hydro made an application to the ILMB for a statutory right-of-way on November 30, 2007, in which it also applied for an interim licence of occupation to allow entry, occupation and construction of the utility pending completion of a legal survey to define the tenured area and the issue of the requested statutory right-of-way.

BCTC states that ILMB requires a utility to include in its application for a Crown tenure a description of the consultation activities it has undertaken with First Nations and that BC Hydro had included in its application a summary of its consultation with First Nations.

In addition, BCTC attaches to its Application the Ministry of Agriculture and Lands' Land Use Operation Policy that applies to all Crown land used for linear public and private utilities, section 8.1.7 of which provides for consideration of First Nations' interests in the disposition of Crown land (Exhibit B-1, pp. 96-97).

BCTC stated that its DND West alignment follows a route that is over provincial crown land, which will require an application to the ILMB for a Licence of Occupation, leading to a statutory ROW over these lands, and that the application to the ILMB would take up to 120 days for processing after acceptance by the ILMB Front Desk (Exhibit B-9, BCUC 3.110.1).

On September 24, 2008 BCTC filed Exhibit B-12 to which it attached the ILMB's September 23, 2008 Tenure Offer for those parts of District Lot 1 E&N, Block 271, together with unsurveyed Crown foreshore or land covered by water being part of the bed of Boulder Creek, all within the Douglas District, indicating that the application is accepted. BCTC stated that the attached Tenure Offer relates to the application submitted to the ILMB on 13 May, 2008 (ILMB File #1413165), and that with the attached ILMB Tenure Offer, relating to the Crown Block 271 application, BCTC is now in a position to secure an interim Licence of Occupation over these crown lands described above. BCTC advised that on September 11, 2008, it made a third application to the ILMB for crown land tenure relating to those crown parcels west and north of DND Lands identified as Block A, DND Reserve, Land Act Plan 29TR2, that make up the DND West route alignment (Exhibit B-12). BCTC submits that the issuance of the Tenure Offer to cross crown Block 271 represents an important step towards the preferred alignment (BCTC Argument, para. 124).

#### Minor permits

BCTC states that it will apply for approval for works in-and-about a watercourse, if required, during the construction period.

BCTC addresses the required permit under the *Heritage Conservation Act* and states that in May 2008 Millennia Research Limited submitted an application to obtain a permit under this Act to conduct an Archaeological Impact Assessment for this Project, and that, if any cultural resource or artifact is identified and needs to be relocated, an application for an Heritage Alteration Permit will be submitted to the Provincial Archaeological Branch (Exhibit B-1, p. 81).



### Municipal Approvals

BCTC states that, as a provincial Crown corporation, it is not subject to local area government bylaws and zoning when determining the route for a new transmission line. When siting a new transmission line, it is BCTC's intent to minimize the amount of land required for ROW and to minimize the visual impacts, regardless of whether the land is public or private. In establishing the preferred routing alignment, BCTC states that it undertook a thorough public consultation process that included consultation with the Regional District of Nanaimo (Exhibit B-2, BCUC 1.45.1).

### Project Costs

BCTC provides a detailed summary of the cost (based on the accuracy of the planning level estimates produced of from -15% to +35%) of the Harewood South Route (DND West alignment) as follows:

**Table 9  
Cost Summary**

| <b>Description</b>                | <b>Estimate (\$000)</b> |
|-----------------------------------|-------------------------|
| 230kV Injection Transmission Line | 18,475                  |
| New Harewood West Substation      | 30,572                  |
| Work at Other Substations         | 4,372                   |
| Telecommunications                | 2,182                   |
| Other Project Costs               | 5,141                   |
| Contingency                       | 12,148                  |
| Escalation and Inflation          | 7,409                   |
| Corporate Overhead                | 2,625                   |
| Interest during Construction      | 5,964                   |
| <b>Project Total</b>              | <b>88,888</b>           |

Source: Exhibit B-9, BCUC 3.113

BCTC stated that its cost estimate of the Harewood South route following the DND West alignment was approximately \$2.5 million lower than the Harewood South route following the DND East alignment, which it ascribed to the DND West alignment requiring fewer dead-end structures compared to the DND East alignment, and to the DND West alignment being approximately 0.5 km shorter than the DND East alignment.

BCTC also noted the reduction in direct costs also results in lower contingency, escalation and inflation, lower BCTC overheads and IDC, saving an additional \$1.0 million (Exhibit B-9, BCUC 3.113.2).

BCTC states that the cost estimate was prepared by BC Hydro Engineering Services and includes implementation phase capital costs only, commencing in August 2008 through to implementation at October 31, 2010. Definition phase expenditures totaling \$2.5 million were approved in the Commission's June 2007 Decision pertaining to BCTC's F2008 to F2017 Capital Plan.

BCTC describes BC Hydro's cost estimating methodology and states that the cost estimate is based on an ISD of October 31, 2010, and includes all engineering, procurement and construction costs, regulatory and environmental costs, property acquisition costs, contingency, overheads, IDC, and inflation.

BCTC states that it provided BC Hydro with estimates for public consultation, regulatory, and environmental, while all other costs were developed by BC Hydro, including First Nations capacity funding engagement costs. The cost estimate is considered fully loaded but does not include any potential First Nations benefits agreement costs, which are confidential in nature.

The estimate was completed at a planning level and has an accuracy of between -15% to + 35%. BCTC states that upon receipt of a CPCN, it and BC Hydro Engineering will undertake more detailed engineering and routing studies to help refine the accuracy of the estimate. In addition, BCTC will be able to commence the procurement process, which will help refine the accuracy of the

estimate. It is expected that procurement will be carried out by a series of contracts for both site and ROW preparation, and for substation and line construction (Exhibit B-1, Appendix D, pp. 1-2).

#### Transmission Line Direct Costs

BCTC states that BC Hydro Engineering developed planning level cost estimates for the transmission line and ROW based on preliminary routing design and determined site access, ROW preparation requirements, structure types and structure locations. Based on the preferred 230 kV transmission routing alignments the BC Hydro estimators made assumptions on terrain and geotechnical information to come up with estimates for access roads, poles, conductor and foundations, which are based on recent construction tender experience of BCTC and BC Hydro, and market escalation factors (Exhibit B-1, Appendix D, p. 2).

#### Substation Costs

BCTC states that single line diagrams were produced along with layout and civil design for HWW and NAR. The cost to construct NAR is not included in the estimate provided in this Application because it will not be required until operation of the existing 230 kV transmission system is converted to 500 kV operation, which is not expected within BCTC's 25 year planning horizon. In addition BCTC includes the layout for the LTZ to accommodate the modified RAS.

BCTC states that the substations' sizes were planned to accommodate the ultimate build-out over the 25 year planning horizon and that construction and installation costs were based on recent tender experiences at BCTC and BC Hydro (Exhibit B-1, Appendix D, p. 2).

#### Other Capital Costs

BCTC states that in addition to the direct costs of construction and implementation it also must incur other capital related costs in support of the direct construction and design costs. These include regulatory costs, environmental review costs, First Nations consultation costs, lands and

ROW costs, construction contingency, corporate overheads and IDC (Exhibit B-1, Appendix D, p. 3). BC Hydro filed details on a confidential basis of the costs of First Nations accommodation (Exhibits C1-2 and C1-3).

### Costs Excluded

BCTC confirmed that there were no specific cost allowances in its estimate for grounding the gas pipeline or potential bridge load upgrades, and stated that it presently does not expect any costs for additional grounding of the pipeline, and that, since a transportation plan has not been created, information on potentially impacted bridges was unknown (Exhibit B-8, BCUC 2.76.1).

### Contingency

BCTC states that the capital cost estimate provided in the Application includes a contingency amount of 20 percent of all forecast costs. The contingency amount is to cover potential unknown cost changes and risks that cannot be specifically identified at the time the estimate was prepared, but which can be foreseen with varying degrees of probability throughout the life of the Project.

### Escalation and Inflation

BCTC states that Project costs were developed using constant 2007 cost estimates for the various project components and that inflation rates of 5 percent, 5 percent, 4 percent, and 3 percent were applied to fiscal years F2008 to F2011 respectively to develop an inflation adjusted cost estimate as at time of implementation, October 31, 2010. The rates are based on the September 2007 MMK Consulting inflation report titled "Cost Trends in British Columbia's Non-Residential Construction Industry". BCTC states that the allowance for inflation is consistent with the escalation used in the F2009 to F2018 Transmission System Capital Plan, filed December 21, 2007 with the Commission (Exhibit B-1, p. 82).

### Corporate Overhead

BCTC states that it has included in its capital cost estimate an amount for construction overheads, which are applied to the Project to account for those indirect costs associated with the Project that are necessary for its successful implementation, and which typically include, but are not limited to, services such as management, planning, accounting services, payroll and benefits administration, procurement and warehousing, and communications.

Estimates of overhead charges included in the capital cost forecasts are based on BCTC overhead rates from 2008-2011 as follows:

**Table 10**  
**Estimated Overhead Charges included in Capital Cost Forecasts**

| <b>Fiscal Year</b> | <b>Overhead Rate</b> |
|--------------------|----------------------|
| 2008               | 3.42%                |
| 2009               | 2.44%                |
| 2010               | 3.32%                |
| 2011               | 3.39%                |

Source: Exhibit B-1, Appendix D, pp. 4-5

### Interest during Construction

BCTC states that the forecast capital costs includes an amount for IDC, which ensures that the cost of financing the project by the utility, prior to the project being put into service, is recovered in rates. Due to the nature of utility facilities, there are often long lead times for equipment and construction activities, required for the construction and implementation of the facilities, which has to be financed by the utility. Allowing IDC ensures that the utility is not out of pocket for the costs associated with financing large utility projects that are for the benefit of rate payers that use the utility facilities. BCTC applies a forecast rate for IDC of 6.88 percent per annum from 2006-

2011, which is established by BC Hydro (Exhibit B-1, Appendix D, p. 5).

### Monte Carlo Analysis

BCTC includes a Monte Carlo Analysis of the CVI Project as Appendix E of its Application, and states that, in order to better understand the risk associated with the project estimate, BC Hydro Engineering Services carried out a Monte Carlo type simulation for the CVI Project cost estimate, showing the frequency and the financial consequences of the identified risks. BCTC states that the Monte Carlo Analysis breaks down the Project costs into distinct tasks (e.g. Project Management, Civil Design, etc.), with each task being assumed to be independent of each other. Each of these tasks is given a best estimate value (estimated cost without contingency, inflation, or IDC), and then range estimates are developed by assigning high and low estimated values to each task. Each task has its own distribution and shape as determined by the minimum, maximum and best estimated values provided by BC Hydro Engineering. The minimum value has a 1 in 40 chance of being lower and the maximum value has a 1 in 40 chance of being higher. Using this input, a triangular probability distribution is developed. The data is then analyzed for minimum, maximum, standard deviation, and P50 and P90 values. P50 is the value or estimated cost where probability not to exceed is 50 percent and P90 is the value or estimated cost where the probability not to exceed is 90 percent. The estimated cost, P50 and P90 values for CVI Project are as follows:

**Table 11**  
**Project Estimated Cost, P50 and P90**

| <b>\$millions</b> | <b>Estimated Cost</b> | <b>P50</b> | <b>P90</b> |
|-------------------|-----------------------|------------|------------|
|                   | 64.947                | 74.130     | 79.531     |

Source: Exhibit B-1, Appendix E

BCTC notes that all costs are un-inflated and do not include IDC or corporate overhead.

BCTC states that the Monte Carlo analysis on the construction direct costs resulted in a P50 estimate with 20 percent in contingency, which is consistent with the contingency included in its cost estimate for the Project (Exhibit B-1, Appendix E).

BCTC stated that the P50 and P90 contingency amounts used in the cost estimate on page 132 of its Application differ from the Monte Carlo analysis that was shown in Appendix E for two reasons:

- the Monte Carlo model treated all cost elements as being independent of each other. However, most cost elements exhibit some degree of correlation with other cost elements. Correlating the cost elements will result in a change of the calculated contingencies, especially the P90; and
- all project risks likely have not all been identified at this early phase (planning level) of the project.

BCTC pointed out that the Monte Carlo simulation provided is only a mathematical model for obtaining cost outcomes with a probability attached, and that, based on this model and estimating judgment, 20 percent contingency was chosen for the P50 (Exhibit B-9, BCUC 3.112.1).

### Risk Management

BCTC addresses risk management in section 8 of its Application. BCTC states that it has identified, assessed, and developed mitigation plans for managing the Project's risks. Risk identification and mitigation is an ongoing process and the Project team will continue to identify risks and mitigation measures as the Project proceeds through its definition and implementation phases.

BCTC states that its Project team identified risks affecting a number of project disciplines and activities including engineering, design, procurement, stakeholder consultation, First Nations consultation, and environmental assessment, following which it evaluated the likelihood and impact of each risk, produced a relative ranking of the identified risks, and developed mitigation plans for each risk (Exhibit B-1, pp. 128-29).

BCTC states that the CVI Project risks identified to date mainly relate to acquisition of new ROW for the transmission line and fee-simple land for the substations, and to the availability of engineering resources, both of which risks are expected to have a direct impact on meeting the scheduled ISD and cost of the Project.

BCTC addresses construction risks and notes that there are significant active and planned construction projects in BC from 2008 to 2010, and a potential risk is the availability of sufficient resources for construction contractors and support services, especially in western Canada.

BCTC states that it plans to issue the construction contracts for the CVI Project on a Design Bid Build (“DBB”) basis. The benefits of the DBB contracting methodology is that this methodology will be more attractive to potential construction contractors, making the bid process more competitive, and thereby lowering costs to the rate-payers, all else being equal. The design work required for this project is standard. BCTC’s blanket order procurement, with the benefit of large purchasing bargaining power, will be used for some material requirements. All major material will be directly purchased by BCTC and delivered to the installation contractor. The contractors will be responsible for procuring other material required for the construction (Exhibit B-1, pp. 129-31).

#### Schedule Risk

BCTC states that the CVI Project schedule allows for approximately four months of regulatory review, with a decision by the end of August 2008, and that any delay in the approval process could result in a delay in the procurement of some long-lead time materials, which might result in an overall schedule delay. To mitigate the potential risk of missing the in-service date of October 2010, BCTC states that it may have to order the HWW transformers in advance of Commission approval. To reduce cost risk, cancellation provisions would be included in any contract with transformer suppliers such that the order could be cancelled if the CVI Project is not approved by the Commission. There is sufficient time in the schedule to have the other major equipment delivered by the spring of 2010.



BCTC states that it plans the first site work on CVI Project to start in September 2008 with survey, staking and forestry engineering. Clearing of the ROW and substations will commence after August 31 when the bird nesting restriction is no longer in effect. Performing the clearing a year in advance will allow construction of the transmission line in the summer of 2009. The construction of the substation is also scheduled to start in the summer of 2009, with delivery of major equipment in the spring to summer of 2010 (Exhibit B-1, p. 132).

BCOAPO addresses risk at several points in its Argument, and points out that BCTC's original preference for the Harewood South route was based on a perception that it had the lowest risks and impacts associated with it, and that the modified route, the Harewood DND West, does not address all public concerns but it does seem to indicate BCTC is attempting to mitigate all risks to whatever extent is practicable given its limited timeline and other project constraints.

BCOAPO addresses the risks identified to date for the CVI project as mainly relating to acquisition of the new ROW and the land for the Substations and engineering resources, and submits that opposition from individual landowners could impact both scheduling and project costs but BCTC does not anticipate these factors will impact scheduling and these cost risks are reflected in the project costs. Unfortunately, this application is made without ILMB approval so there is a possibility, however minimal, that the new Harewood DND West route will not be viable. As a result, there is a risk to ratepayers that BCTC could be forced to revert to the original Harewood South route and that the affected landowners could seek to block construction by challenging the CPCN as was the case in the VITR. In the absence of a Commission decision it is impossible to assess the quantum of that risk, but given the need for this project and the facts of this particular case, BCOAPO submits that the risk is manageable and necessary.

BCOAPO expresses concerns about the unquantified cost and scheduling risks posed by the Nanoose First Nation failing to give clear support for the Harewood DND West route, and submits that "it is regrettable that the filing date of this application modification precluded an examination of how this might impact project costs and scheduling, if at all. Again, taking into account the

urgent need for a CVI transmission reinforcement and the deadline for such a project, BCOAPO finds the risk to ratepayers is necessary” (BCOAPO Argument, p. 4).

#### Reporting on the CVI Project

For reporting purposes on the CVI Project, BCTC states that it intends to follow the same reporting format and methodology as the Commission approved for the VITR Project. BCTC addressed the possible use of earned value reporting for the CVI Project and states that it does not intend to use earned value reporting for this Project, submitting that implementing earned value reporting would require BCTC to incur additional costs for staff and would create “considerable administrative burden”. BCTC submits that it performs almost all of its work on major projects through contracts that are typically fixed price lump sum contracts or fixed construction unit price contracts; rather than through cost reimbursable or cost plus contracts, and that consequently, it is not of material importance to BCTC to know what the costs of a contractor are. BCTC points out that earned value reporting would also have the potential to increase bid prices from contractors and service providers, as they would be required to provide additional information. BCTC submits that there is no value, and only added cost, in an earned value reporting requirement for the CVI Project (BCTC Argument, paras. 140-41).

#### **Commission Determination**

The Commission Panel accepts BCTC’s cost estimate of \$88.888 million for the Project. The Commission Panel has considered BCTC’s analysis of its risks and agrees that it has taken all appropriate steps to identify and mitigate these risks.

The Commission Panel agrees that BCTC should continue to prepare its progress reports using the same methodology as it currently uses on the VITR project.

Accordingly, the Commission Panel directs that:

- BCTC shall file with the Commission Quarterly Progress Reports on the Project showing planned versus actual schedule, planned versus actual costs, and any variance or difficulties that the Project may be encountering. The Quarterly Progress Reports will be filed within 30 days of the end of each reporting period;
- in the event that the ILMB does not grant BCTC tenure over the Provincial Block 271 and the Provincial crown lands necessary for the DND west alignment by May 29, 2009, BCTC shall in its next Quarterly Progress Report indicate the status of its application with the ILMB and any decision made and actions initiated with respect alternative routing to the DND West alignment; and
- BCTC shall file with the Commission within six months of the end or substantial completion of the Project, a Final Report that provides a complete breakdown of the final costs of the Project, compares these costs to the updated cost estimate, and provides a detailed explanation and justification of material cost differences.

## **5.0 SOCIOECONOMIC, ENVIRONMENTAL, AND RATE IMPACTS**

This Section of the Decision discusses the socioeconomic and environmental impacts raised by intervenors and community members, particularly health concerns related to EMF. The impact on rates is also discussed.

### **5.1 Management of Impacts**

BCTC identifies the process undertaken for environmental review related to fisheries and aquatic resources, vegetation, wildlife, land use and aesthetics (Exhibit B-1, section 6.0). It also includes a report on Electromagnetic Fields (EMF) (Exhibit B-1, section 6.6 & Appendix R).

BCTC describes the processes undertaken with regards to public and First Nations consultation, stating that these activities reflected the manner it had identified issues and concerns with the Project and the related responses, as well as its commitment to ongoing future consultations to attempt to identify impacts and to discuss and develop accommodation options as the regulatory, detailed design, construction, and restoration stages of the Project proceed (Exhibit B-1, section 7.0).

The Commission Panel also ordered the Community Input Session held on July 17, 2008 to provide the opportunity for the public and interested parties to further present views on the CVI Project and its impacts that may not have been identified through other activities.

### **5.2 Electric and Magnetic Fields**

BCTC cites Commission Order C-4-06 of the VITR Decision regarding EMF and their impacts on health. As directed, BCTC states that it engaged Exponent Inc. to report on new developments in the science and further multi-disciplined scientific reviews completed since the VITR proceeding. It includes an updated report in its Application as Appendix R, which BCTC summarizes as concluding that “a review of the relevant peer-reviewed research and reviews by scientific panels on the

subject of health impacts of power line EMF indicates that, using the accepted weight and evidence approach, the body of research does not suggest the magnetic fields are the cause of cancer or any other adverse health outcome” BCTC calculates the expected EMF for the proposed transmission line and shows that these levels are very low when compared to the accepted recommended International Committee for Non-Ionizing Radiation Protection (ICNIRP) limit of 833 mG (Exhibit B-1, pp. 91-94).

BCTC provides the following Table which sets out the calculated values as follows:

**Table 12**

**Table 6-1. Calculated Electromagnetic Field Levels**

| Distance (m)<br>from Centre<br>Line        | 1m above Ground      |                      | Ground Level (E)     |                      |
|--|----------------------|----------------------|----------------------|----------------------|
|  | Double Circuit (D/C) | Single Circuit (S/C) | Double Circuit (D/C) | Single Circuit (S/C) |
|  | milli-Guass (mG)     | (mG)                 | (mG)                 | (mG)                 |
| -100                                       | 0.21                 | 2.82                 | 0.21                 | 2.81                 |
| -75  | 0.49                 | 5.01                 | 0.49                 | 4.98                 |
| -50  | 1.52                 | 11.04                | 1.49                 | 10.89                |
| -25  | 8.15                 | 36.58                | 7.71                 | 35.02                |
| -17  | 16.42                | 60.30                | 15.04                | 56.18                |
| 0  | 49.19                | 103.80               | 41.16                | 91.72                |
| 17   | 16.42                | 37.98                | 15.04                | 36.31                |
| 25   | 8.15                 | 24.21                | 7.71                 | 23.51                |
| 50   | 1.52                 | 8.47                 | 1.49                 | 8.38                 |
| 75   | 0.49                 | 4.15                 | 0.49                 | 4.13                 |
| 100  | 0.21                 | 2.44                 | 0.21                 | 2.43                 |
| <b>Maximum field levels within the ROW</b> |                      |                      |                      |                      |
| On ROW                                     | 49.19                | 110.36               | 41.16                | 96.72                |

Source: Exhibit B-1, p. 93

BCTC stated that it has relied heavily on the updated 2007 Exponent Report, the World Health Organization (WHO) and Health Canada’s conclusions, and ICNIRP limits for its assessment of health risks, and that, in order to mitigate EMF risks, it has proposed a double circuit, low reactance phase-shifting solution with optimized transmission and pole design with respect to EMF, and routing intended to limit public exposure. It stated that it will also incorporate other low cost measures to lower EMF readings including conductor clearances, phase spacing, and conductor types (Exhibit B-9, BCUC 3.111.1).

Ms. Pongratz-Doyle raised several concerns and IRs related to health impacts of EMF. In her Argument she raises the potential for application of the “Precautionary Principle” due to “the associated uncertainty ... because not many seem to understand what exactly is going on with the diagnosed illnesses with proximity to High Voltage Power Lines” (Pongratz-Doyle Argument, p. 4).

In her Argument, Ms. Young raised concerns related to “health impacts to the residents to the electric and magnetic fields, if the lines are placed only 410 metres from Dan and Shirley Gogo’s home” (Young Argument, p. 1).

BCTC submits that “the expected magnetic field 100 metres from its proposed transmission line is lower than typical magnetic field levels found in most homes due to electrical appliances and lighting in the home” (BCTC Argument, para. 133).

### **Commission Determination**

The Commission has addressed EMF in several previous decisions, notably the VITR Decision in 2006 and the Okanagan Transmission Reinforcement Decision in October 2008. In the VITR Decision, the Commission provided its rationale for not adopting the term “precautionary principle”.

The Commission Panel concludes that the EMF exposure guidelines established by WHO, INCIRP, and Health Canada are appropriate guidelines for considering the safety of EMF levels. The Commission accepts BCTC’s evidence that magnetic fields from the proposed lines will be well below the existing guidelines for the proposed routing, both under the lines and at the edge of the ROW, as well as being virtually negligible at any residence in the area.

While the Commission acknowledges the concerns of the residents in the South Fork area regarding EMF, it concludes that there has been no evidence provided to justify these concerns that would outweigh the use of the WHO, INCIRP, and Health Canada guidelines for EMF exposure.

### **5.3 Environmental Impacts**

BCTC states that while the Project was not required to undertake an Environmental Assessment under the CEAA or the BCEAA, it nevertheless commissioned Golder to undertake a preliminary resource assessment related to the various solutions. It retained Golder to conduct a more comprehensive environmental assessment on the preferred solution's potential routes, with the view of identifying the option with the least potential for environmental effects. The assessment considered:

- existing riparian forests;
- value and sensitivity of existing aquatic habitats;
- potential interactions with rare plant species and plant communities;
- potential wildlife fragmentation and loss;
- potential loss of breeding and foraging habitat;
- visual quality impacts; and
- potential effects on recreation uses.

(Exhibit B-1, pp. 83-84)

BCTC includes the Golder report in Appendix L to the Application. Its objectives were to identify environmental resource attributes for the various routing options, describe the potential for environmental impacts or interactions, and identify general environmental design, mitigation measures, and management strategies for the Project.

BCTC states that the Golder report drew on available information and government data bases, field surveys, and input from First Nations. The Harewood South route was determined to have the least potential for project-environment interactions, and would contribute least to potential effects associated with habitat fragmentation and loss, population isolation, and loss of breeding

and foraging habitat. BCTC has committed to adopt the recommendations of the Golder report (Exhibit B-1, pp. 90-91).

BCTC stated that while it was considering modifying the routing of the Harewood South route initially proposed, to become the Harewood South route west and north of the DND Lands (DND West alignment), it instructed Golder to carry out an environmental overview assessment of the DND West Alignment, as well as the alignment that is south and east of DND Lands (DND East alignment). Based on the findings BCTC concluded that both alignments were materially the same from an environmental perspective. BCTC stated that using standard mitigation techniques during construction, environmental interaction would be minimized, and that mitigation methods would be captured in its Environmental Management Plan (Exhibit B-9, BCUC 3.110.1).

Both Ms Pongratz-Doyle (Exhibit E-5) and Ms Young (Argument, p. 2) raised general concerns regarding the environment. In Reply, BCTC cited the conclusions found in the Golder report that “...potential environmental effects of the construction and operation of the CVI Project can be managed through proper planning and design, implementation of appropriate Best Management Practices, open and transparent communication and consultation with First Nations, the public, and other affected stakeholders” (BCTC Reply, para 12).

#### **5.4 First Nations Impacts**

BCTC states that BC Hydro has responsibility for the relationship between BC Hydro and First Nations with respect to the transmission system and that BC Hydro has undertaken this role with respect to the CVI Project. It was determined that the Snuneymuxw and Nanoose First Nations have an interest in the lands affected by the Project. The related consultations with these First Nations are described in Section 7.0 of the Application.



BCTC stated that, in exercising their Douglas Treaty and Aboriginal rights, representatives of the Snuneymuxw First Nation expressed concerns regarding the clearing of forests and a preference for an option that resulted in the least disturbance to mature forest. They have also expressed a preference for use of existing roads to be used where possible during construction. BCTC stated that it believes that the Harewood South routing will result in the lowest potential impact on the Snuneymuxw First Nation's Douglas Treaty and Aboriginal rights (Exhibit B-9, BCUC 3.128.1).

BCTC stated that both First Nations have provided letters indicating that they have been adequately consulted and accommodated with respect to the Project. As refinement of the routing of the Harwood South route evolved and the Application modified for the Harewood South route, consultations with the First Nations continued. Concerns were raised regarding sensitive high elevation vegetation and ecosystems and the distribution and habitat use of larger species. However, the Snuneymuxw First Nation has indicated that both the DND West and DND East alignments are acceptable to it. The Nanoose First Nation has indicated a preference for the DND East route, depending on future logging plans for the area; however, that would be less of an issue if the area is going to be logged. BCTC understands that this preference "is based on the belief that the forest and wildlife values on the west side of the DND Lands are of higher value, and therefore have a higher impact on their asserted Aboriginal and Douglas Treaty rights" (Exhibit B-9, BCUC 3.110.1).

BCTC and BC Hydro have indicated that they will continue to consult with the Snuneymuxw and Nanoose First Nations as the Project proceeds and to develop accommodation options as issues arise.

The Commission Panel notes the requirements of the ILMB for utilities to include in their application for Crown tenure a description of the consultation activities they have undertaken with First Nations, and that BC Hydro appears to have complied with the ILMB's requirements. The Commission Panel finds that the necessary consultation and accommodation with affected First Nations has been carried out.

## 5.5 Private Property Impacts

Considerable community opposition arose with the Harewood South route described in the original Application, largely because of its potential for crossing residential property at 2100 Nanaimo Road. BCTC responded to these concerns by modifying its Application to indicate that it preference was to route the Harewood South routing, firstly, along the DND West alignment, or, alternatively, along the DND East alignment.

Island Timberlands LP expressed reservations regarding the proposed location of HWW on Island Timberlands' land, and stated that the substation should be accommodated in the lands of the existing Harewood distribution substation (T2:46). BCTC indicated that the vacant land around HWD is not sufficient to accommodate HWW and that the substation land at HWD is limited and attempts to acquire more in proximity would have a negative impact on both project cost and schedule (Exhibit B-9, BCUC 3.115.1, 3.115.2).

Mr. Ford expressed concerns that his property would be visually impacted by the Harewood South alignment (Exhibit C5-2), while Ms. Young also expressed concerns in relation to noise pollution, both from the transmission lines and from people who will use the transmission corridor for recreational purposes (Young Argument, p. 2). BCTC submits that proposed screening by trees will mitigate these concerns (BCTC Reply, p. 39).

Both Ms. Pongratz-Doyle and Ms. Young express concerns about the potential for forest fires (Pongratz-Doyle Argument, p. 8; Young Argument, p. 2). In Reply, BCTC notes that many of the fires in the area appear to have been deliberately set and that there is "no suggestion of any connection between the deliberately set fires and the proposed CVI Project" (BCTC Reply, p. 17). .

In her Argument, Ms Young also expresses concerns related to the devaluation of property along the Nanaimo River Road and its future development potential (Young Argument, p. 2). BCTC states that no development plans have been presented to the Commission suggesting prevention of the

transmission line on the Harewood South route, nor is there any evidence of projects that will be brought by the transmission line that will bring an “industrial corridor” as suggested by Ms. Young (BCTC Reply Submission, p. 5).

### **Commission Determination**

The Commission Panel recognizes that BCTC has taken measures to accommodate the concerns of local landowners and accepts that proposed screening by trees on the Harewood South alignment should adequately mitigate noise pollution concerns. The Commission Panel does not believe that the risk of deliberately set fires will be affected by the selection of a particular alignment or that the Project will create an “industrial corridor”. Nevertheless, the Commission Panel directs BCTC to provide adequate security measures to the transmission ROW; to that end it directs BCTC to file with the Commission a plan of how it intends to provide the ROW security in its Final Completion Report.

The Commission Panel accepts that there is not sufficient land around HWD to accommodate a new substation and that attempts to acquire more land in proximity would have negative impacts on project costs and schedules.

## **5.6 Rate Impacts**

BCTC provided the financial assumptions and the impact on annual revenue requirement from 2009 through 2032, including the average impact to customers over the 25 year study period. This identifies a 2.19 percent gross impact on transmission revenue requirement and a 0.4 percent gross impact on BC Hydro revenue requirement for 2012 (Exhibit B-2, BCUC 1.14.0). BCOAPO submits that while it has made some observations regarding BCTC’s method of calculating the revenue requirement, particularly in relation to cost of capital factors, it does not take exception to what has been provided by BCTC (BCOAPO Final Submission, p. 3).

## **6.0 SUMMARY OF KEY COMMISSION DETERMINATIONS**

The Commission Panel has carefully considered and weighed the evidence and arguments of all parties participating in this proceeding and has considered the various alternatives assessed by BCTC. The Commission Panel concludes that the CVI Project is needed as soon as possible in order to reliably serve BCTC's load in the CVI region. It also concludes that the 230 kV Injection alternative is the most appropriate means of addressing the capacity constraints in the region. The Commission Panel, therefore, for the reasons given in this Decision, finds the CVI Project to be necessary and in the public interest. Subject to the Directions contained in this Decision, the Commission Panel grants BCTC a CPCN for the CVI Project in the terms of Order C-6-08.

**DATED** at the City of Vancouver, in the Province of British Columbia, this 10<sup>th</sup> day of December 2008.

*Original signed by:*

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A.W.K. ANDERSON  
PANEL CHAIR

*Original signed by:*

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A.J. PULLMAN  
COMMISSIONER

*Original signed by:*

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M.R. HARLE  
COMMISSIONER

SIXTH FLOOR, 900 HOWE STREET, BOX 250  
VANCOUVER, B.C. V6Z 2N3 CANADA  
web site: <http://www.bcuc.com>



**BRITISH COLUMBIA  
UTILITIES COMMISSION**

**ORDER  
NUMBER C-6-08**

TELEPHONE: (604) 660-4700  
BC TOLL FREE: 1-800-663-1385  
FACSIMILE: (604) 660-1102

**IN THE MATTER OF  
the Utilities Commission Act, R.S.B.C. 1996, Chapter 473**

**and**

**An Application by the British Columbia Transmission Corporation  
for a Certificate of Public Convenience and Necessity  
for the Central Vancouver Island Transmission Project**

**BEFORE:** A.W.K. Anderson, Commissioner  
and Panel Chair  
A.J. Pullman, Commissioner  
M.R. Harle, Commissioner

December 10, 2008

**O R D E R**

**WHEREAS:**

- A. On May 8, 2008, pursuant to the Utilities Commission Act, the British Columbia Transmission Corporation ("BCTC") filed an Application ("Application") for a Certificate of Public Convenience and Necessity ("CPCN") to construct and operate the Central Vancouver Island Transmission Project (the "CVI Project"); and
- B. BCTC proposes the CVI Project as the preferred solution to alleviate capacity constraints in the Central Vancouver Island area; and
- C. The CVI Project has an estimated capital cost of approximately \$100 million, which includes the construction of a new Harewood West substation, and the construction of a new transmission line, approximately 12 km in length, following a route described as the Harewood South route; and
- D. By Order G-82-08 dated May 16, 2008, the Commission established a Procedural Conference in Nanaimo, BC on June 12, 2008 to seek input on the regulatory process for the review of the Application; and
- E. The Commission considered the input received at the Procedural Conference, and concluded that further information regarding the status of the application by BCTC to the Integrated Land Management Bureau ("ILMB") with respect to Block 271 would be helpful prior to making a determination on whether the review of the Application should proceed by a written or oral hearing process; and
- F. By Order G-106-08 dated June 26, 2008, the Commission established a Community Input Session in Nanaimo, BC on July 17, 2008 to seek input on the regulatory process for the review of the Application; and

- G. The Commission considered the information received at the Community Input Session, and concluded that further information regarding the review of the Application was required; and
- H. By Order G-117-08 dated August 11, 2008, the Commission established an amended Regulatory Timetable and sought Intervenor submissions on whether or not the Application should proceed by a Written or Oral hearing process; and
- I. The Commission received responses from Jeanette Pongratz-Doyle, Maureen Young, British Columbia Hydro and Power Authority ("BC Hydro"), the BC Old Age Pensioners Organization *et al.* and BCTC; and
- J. In the responses to information requests filed September 11, 2008 and in amendments to its Application filed September 15, 2008 BCTC modified its preferred alignment for the Harewood South route from an alignment through a part of Block 271 and through Provincial crown land south and east of lands occupied by the Department of National Defence ("DND Lands") to an alignment through Block 271 and through Provincial crown land west and north of the DND Lands, subject to tenure being received for the use of those Provincial crown lands; and
- K. On September 24, 2008 BCTC confirmed that the ILMB issued a Tenure Offer to BC Hydro for Crown Land for parts of District Lot 1 E&N and Block 271; and
- L. By Order G-137-08 dated September 24, 2008 the Commission established an Regulatory Timetable for the review of the Application by a Written hearing process; and
- M. Submissions in the proceeding concluded with BCTC's Reply Submission on October 24, 2008; and
- N. The Commission Panel has considered the Application and the evidence and submissions in the proceeding and has determined that the CVI Project is in the public interest and that a CPCN be issued to BCTC for the CVI Project for the reasons set out in the Reasons for Decision that accompany this Order.

**NOW THEREFORE** pursuant to Sections 45 and 46 of the Utilities Commission Act the Commission orders as follows:

- 1. A Certificate of Public Convenience and Necessity is granted to BCTC for construction and operation of the CVI Project following the Harewood South route, with the transmission line in the vicinity of the community of South Forks aligned as follows:
  - a. through a part of Block 271 and through Provincial crown lands west and north of the DND Lands, subject to a ILMB tenure offer for the use of those Provincial crown lands being received by May 29, 2009; or

**BRITISH COLUMBIA  
UTILITIES COMMISSION**

**ORDER  
NUMBER** C-6-08

3

- b. if tenure for the Provincial crown land west and north of the DND Lands is not received by May 29, 2009, then through a part of Provincial crown land within Block 271 and through the Provincial crown land south and east of the DND Lands.
2. BCTC will advise the Commission by June 1, 2009 if a tenure offer from ILMB has been received for use of the Provincial crown land west and north of the DND Lands.
3. BCTC shall comply with directions of the Commission Panel in the Decision that accompanies this Order.
4. BCTC shall file with the Commission Quarterly Progress Reports on the CVI Project showing planned versus actual schedule, planned versus actual costs, and any variances or difficulties that the CVI Project may be encountering. The Quarterly Progress Reports will be filed within 30 days of the end of each reporting period and will be generally as set out in Appendix A to this Order.
5. BCTC shall file with the Commission a Final Report, within six months of the end or substantial completion of the CVI Project, that provides a complete breakdown of the final costs of the CVI Project, compares these costs to the updated cost estimate, and provides a detailed explanation and justification of all material cost variances.
6. Subject to paragraphs 4 and 5 of this Order, the format and content of the Progress Reports and the Final Report will be determined by BCTC in consultation with Commission staff, or by determination of the Commission.

**DATED** at the City of Vancouver, in the Province of British Columbia, this 10<sup>th</sup> day of December 2008.

BY ORDER

*Original signed by:*

A.W.K. Anderson  
Commissioner and Panel Chair

Attachments



An Application by the British Columbia Transmission Corporation  
for a Certificate of Public Convenience and Necessity  
for the Central Vancouver Island Transmission Project

**Table of Contents**

**1. Project Status**

- 1.1.1 General Project Status
- 1.1.2 Major Accomplishments, Work Completed and Key Decisions Made
- 1.1.3 Project Challenges and Issues; Issues Currently Open, Date Opened, Dated Closed, Those Issues that are Past Due
- 1.1.4 Plans for Next Period
- 1.1.5 Site Photographs

**2. Project Schedule and Cost**

- 2.1.1 Project “S” Curve and schedule showing the budget at completion, actual cost to date, estimate to completion, estimate at completion, cost variance between estimated and budgeted cost at completion, schedule variance, percent budget spent, and percent complete. All values are to be shown in each report throughout the duration of the project.

**3. Project Schedule**

- 3.1.1 Milestone Summary with the planned finish date, actual finish date, variance in days, status
- 3.1.2 Procurement Summary with the planned finish date, actual finish date, variance in days, status
- 3.1.3 Contract Summary with the planned finish date, actual finish date, variance in days, status
- 3.1.4 Current Schedule
- 3.1.5 Schedule Summary
  - 3.1.5.1 Schedule Performance to Date
  - 3.1.5.2 Schedule Projection Going Forward
  - 3.1.5.3 Schedule Difficulties and Variances
- 3.1.6 Design Scope Change Summary with Description of Request, Explanation for Request, Request Amount, Approved Amount, Deferred Amount, Reject Amount, Under Investigation Amount.
- 3.1.7 Construction Scope Change Summary with Description of Request, Explanation for Request, Request Amount, Approved Amount, Deferred Amount, Reject Amount, Under Investigation Amount.

**4. Project Costs**

- 4.1.1 Project Cost Summary including explanation of variances using the format in Exhibit B-9, BCTC IR 3.113.2 response.
- 4.1.2 Financial Summary including explanation of variances
- 4.1.3 Summary of Individual Contracts (Construction and Procurement) Exceeding \$3M with Budget Amount, Award Amount, Approved Change Orders

**5. Project Resource Management**

- 5.1.1 Engineering Resources (Man-hours, Planned vs. Actual – non- cumulative) both in chart and table format. Provide explanation for variance and corrective action taken.
- 5.1.2 Construction Resources (Man-hours, Planned vs. Actual – non-cumulative) both in chart and table format. Provide explanation for variance and corrective action taken.

**6. Project Risks**

- 6.1.1 Current Project Risks
- 6.1.2 Risks Going Forward

**7. Stakeholder or First Nations Issues**

- 7.1.1 An ongoing cost report of all existing and new issues using the updated cost estimate as a budget. For each issue, the report should show “amount in capital budget”, “spent to date”, “estimate to complete”, “forecast total to complete”, and “variance”.
- 7.1.2 An Explanation of new issues and variances will be provided.

**LIST OF TABLES**

|         |   |
|---------|---|
| Table 1 | Project Milestones  |
| Table 2 | Project Expenditure Summary, Table & Chart of CAPEX Cumulative Distribution Function showing an Updated Cost Estimate, Upper Bound (Cost Estimate), Current Forecast to Complete, Spent to Date (Escalation and Contingency are to be identified separately).   |
| Table 3 | Summary of Variances Greater than \$3M  |
| Table 4 | Summary of Contracts exceeding \$3M   |
| Table 5 | Summary of Outstanding Claims greater than \$3M   |
| Table 6 | Table of Project Risks including Risk Description & Explanation, Date Risk Originated, Date Risk Last Reviewed, Level/Severity of Risk, Mitigation Plan, Contingency Plan, Mitigation Cost Amount (including schedule delay), Contingency Reserve Amount Required, Total Contingency Reserve Required to Date, Contingency Reserve Remaining. |

**LIST OF ACRONYMS**

|                    |   |
|--------------------|---|
| \$2007             | 2007 uninflated dollars   |
| AIP Lands          | Agreement in Principle  |
| Application        | May 8, 2008 Certificate of Public Convenience and Necessity Application for its Central Vancouver Island Transmission Project |
| ARN                | Arnott substation   |
| BC Hydro           | British Columbia Hydro and Power Authority  |
| BCEAA              | British Columbia Environmental Assessment Act   |
| BCOAPO             | The BC Old Age Pensioners Organization <i>et al.</i>  |
| BCTC               | British Columbia Transmission Corporation   |
| CEAA               | Canadian Environmental Assessment Act   |
| Commission or BCUC | British Columbia Utilities Commission   |
| CPCN               | Certificate of Public Convenience and Necessity   |
| CVI, CVI Project   | Central Vancouver Island Transmission Project   |
| DBB                | Design Bid Build  |
| DMR                | Dunsmuir substation   |
| DND                | Department of National Defense  |
| DSM                | Demand Side Management  |
| EENS               | Expected Energy Not Served  |
| EMF                | Electric and Magnetic Fields  |
| HVDC               | High Voltage Direct Current   |
| HWW                | Harewood West substation  |
| IDC                | interest during construction  |
| ILMB               | Integrated Land Management Bureau   |
| IR                 | Information Requests  |
| ISD                | in-service date   |
| JdF                | Juan de Fuca Cable Project  |
| JIESC              | Joint Industry Electricity Steering Committee   |
| JPT                | Jingle Pot substation   |
| LTZ                | Lantzville substation   |
| MSA                | Malaspina substation  |

**APPENDIX A**

Page 2 of 2

|                |   |
|----------------|---|
| NAR            | Nanaimo River substation                            |
| PV             | present value                                       |
| PVL            | Parksville substation                               |
| RAS            | Remedial Action Scheme                              |
| ROW            | right of way  |
| SAT            | Sahtlam substation                                  |
| SOI            | Statement of Intent                                 |
| SVI            | South Vancouver Island                              |
| TTA            | Te'mexw Treaty Association                          |
| UCA or the Act | Utilities Commission Act                            |
| VIT            | Vancouver Island Terminal                           |
| VITR           | Vancouver Island Transmission Reinforcement Project |

**LIST OF APPEARANCES**

|                              |   |
|------------------------------|---|
| G.A. FULTON, QC<br>P. MILLER | Commission Counsel                                    |
| C. JOHNSON, QC               | British Columbia Transmission Corporation             |
| K. DUKE                      | British Columbia Hydro and Power Authority            |
| L. WORTH<br>E. KUNG          | The BC Old Age Pensioners Organization <i>et al.</i>  |
| M. YOUNG                     | Regional Director Area C Regional District of Nanaimo |
| J. PONGRATZ-DOYLE            | Landowner   |
| K. FORD                      | Landowner   |
| M. GOGO                      | Landowner   |

The following made presentations at the Community Input Session:

- S. Henderson (Island Timberlands LP)
- M. Young
- J. Pongratz-Doyle
- M. Abbott
- W. Calvert
- K. Gogo
- K. Blackstaffe
- D. Gogo
- B. Campbell
- L. Krog, MLA

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|   |                  |
|---|------------------|
| D.J. Flintoff<br>J.B. Williston<br>T. Roberts | Commission Staff |
| G. Isherwood<br>E. Switlishoff                | Contract Staff   |
| Allwest Court Reporting Ltd.                  | Court Reporters  |

IN THE MATTER OF  
the Utilities Commission Act, R.S.B.C. 1996, Chapter 473

and

British Columbia Transmission Corporation  
Certificate of Public Convenience and Necessity for  
Central Vancouver Island Transmission Project

**EXHIBIT LIST**

**Exhibit No.**

**Description**

*COMMISSION DOCUMENTS*

- |      |   |
|------|---|
| A-1  | Letter dated May 16, 2008 issuing Order No. G-82-08 establishing a Procedural Conference and Preliminary Regulatory Agenda and Timetable  |
| A-2  | Letter dated May 27, 2008, issuing clarification on material submitted prior to the filing of the Application and confirmation to resubmit correspondence relevant to the review of the Application |
| A-3  | Letter dated May 29, 2008 issuing Information Request No. 1 to BCTC   |
| A-4  | Letter dated June 4, 2008 issuing two Proposed Regulatory Timetables for discussion at the June 12, 2008 Procedural Conference  |
| A-5  | Letter dated June 10, 2008 issuing notice of appointment of Commissioner, Michael Harle   |
| A-6  | Letter dated June 26, 2008 and Order No. G-106-08 establishing a Community Input Session for Nanaimo and issuing the Regulatory Timetable for the proceeding  |
| A-7  | Letter dated July 10, 2008 issuing Information Request No. 2 to BCTC  |
| A-8  | Letter dated July 11, 2008 providing Participants with procedural information on the Community Input Session  |
| A-9  | Letter dated July 30, 2008, issuing a response to Exhibit C4-11   |
| A-10 | Letter dated August 11, 2008 and Commission Order G-117-08 with amended Regulatory Timetable  |
| A-11 | Letter dated August 21, 2008 issuing Information Request No. 3 to BCTC  |

| <b>Exhibit No.</b> | <b>Description</b>  |
|--------------------|---|
| A-12               | Letter dated September 10, 2008 issuing clarification on procedural matters when filing evidence    |
| A-13               | Letter dated September 29, 2008 issuing Commission Order G-137-08 with Amended Regulatory Timetable |
| A-14               | Letter dated October 15, 2008 granting an extension to the filing dates for Submissions             |

*APPLICANT DOCUMENTS*

|       |  |
|-------|--|
| B-1   | Letter dated May 8, 2008 filing Application for a Certificate of Public Convenience and Necessity for the Central Vancouver Island Transmission Project                      |
| B-1-1 | Letter dated July 15, 2008 filing Errata to amended pages and appendices   |
| B-1-2 | Letter dated September 15, 2008 filing an amendment to incorporate change to its preferred route alignment   |
| B-2   | Letter dated June 19, 2008 filing responses to Commission Information Request No. 1 and BCOAPO Information Request No. 1   |
| B-2-1 | <b>CONFIDENTIAL</b> - Letter dated June 19, 2008 filing confidential responses to Commission Information Requests No. 1.8.1 and 1.8.3  |
| B-2-2 | Letter dated June 19, 2008 filing replacement copy of responses to Commission Information Request No. 1 and BCOAPO Information Request No. 1 (Exhibit B-2)                   |
| B-3   | Letter dated July 8, 2008 filing the Integrated Land Management Bureau Reasons for Decision for an application for an electric powerline crossing with Schedule A plans      |
| B-4   | Letter dated July 10, 2008 filing response to Intervenor Information Request (Exhibit C2-2)  |
| B-5   | Letter dated July 10, 2008 responding to Exhibit C7-3 request for the disclosure of confidential information requested in BCOAPO's Information Request No. 1.11.a and 1.13.a |
| B-6-1 | Letter dated July 24, 2008 filing responses to Commission Information Request No. 2, BCOAPO Information Request No. 2, and Jeanette Pongratz-Doyle Information Request No. 2 |

| Exhibit No. | Description   |
|-------------|---|
| B-6-2       | <b>CONFIDENTIAL</b> – Letter dated July 24, 2008 filing responses to Commission Information Request No. 2.107.3   |
| B-7         | Letter dated July 29, 2008 filing status update on the Integrated Land Management Bureau Application for a License of Occupation over Crown Land Parcel |
| B-8         | Letter dated August 5, 2008 filing response to supplemental Information Request (Exhibit C4-9)  |
| B-9         | Letter dated September 12, 2008 responses to Information Requests from Commission, BCOAPO and Jeanette Pongratz-Doyle                                   |
| B-9-1       | Letter dated October 9, 2008 filing revised response to the Commission's Information Request No. 3  |
| B-10        | Letter dated September 18, 2008 submission regarding Regulatory Timetable   |
| B-11        | Letter dated September 19, 2008 with responses to Late Information Request from Jeanette Pongratz-Doyle (Exhibit C4-17)                                 |
| B-12        | Letter dated September 24, 2008 filing a copy of the Integrated Land Management Bureau Tenure Offer (To Obtain Survey)                                  |

#### *INTERVENOR DOCUMENTS*

|      |  |
|------|--|
| C1-1 | <b>BRITISH COLUMBIA HYDRO AND POWER AUTHORITY</b> – Web registration dated May 22, 2008 requesting Intervenor Status                                 |
| C1-2 | <b>CONFIDENTIAL</b> - Letter dated June 19, 2008 filing response to Commission Information Request No. 1.27.1 and BCOAPO Information Request 1.13(a) |
| C1-3 | <b>CONFIDENTIAL</b> – Letter dated July 24, 2008 filing response to Commission Information Request No. 2.102.2                                       |
| C1-4 | Letter dated July 31, 2008 filing response to BCOAPO Information Request No. 2.25.0 (Exhibit C7-6)   |
| C1-5 | Letter dated September 18, 2008 response to Commission Letter dated September 10, 2008 (Exhibit A-12)  |



| <b>Exhibit No.</b> | <b>Description</b>   |
|--------------------|--|
| C2-1               | <b>REGIONAL DISTRICT OF NANAIMO</b> – Email dated May 23, 2008 requesting Intervenor Status  |
| C2-2               | Letter dated June 23, 2008 from Maureen Young, Regional Director, filing Evidence of visual impact on proposed route   |
| C2-3               | Email dated August 27, 2008, filing comments on the proposed procedural process  |
| C3-1               | <b>GOGO, DAN AND SHIRLEY</b> – Email dated May 26, 2008, filing request for Registered Intervenor status made by Maureen Young, Regional District of Nanaimo     |
| C3-2               | Email dated June 9, 2008 from Maureen Young, Regional District of Nanaimo, filing request to change from Registered Intervenor status to Interested Party status |
| C4-1               | <b>PONGRATZ-DOYLE, JEANETTE</b> – Online web registration filing request for Registered Intervenor status  |
| C4-2               | Letter dated May 30, 2008 filing evidence of support   |
| C4-3               | Letter dated May 30, 2008 filing petition of opposition support  |
| C4-4               | Letter dated July 8, 2008 filing Information Request No. 2 to BCTC   |
| C4-5               | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> - Presentation dated June 12, 2008   |
| C4-6               | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> – Submission showing three photographs   |
| C4-7               | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> – Copy of the Central Vancouver Island Transmission Project  |
| C4-8               | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> – Health impacts of the proposed beauty to Denny Power Line dated October 17 <sup>th</sup>                           |
| C4-9               | Letter dated July 22, 2008 filing Information Request No. 3 to BCTC  |
| C4-10              | Letter dated July 26, 2008 filing evidence submission from Health Canada, the World Health Organization and a copy of the ongoing petition                       |
| C4-11              | Email dated July 29, 2008 filing Information Request No. 4 to BCTC   |
| C4-12              | Letter dated August 4, 2008 filing an additional Information Request No. 4 to BCTC   |
| C4-13              | Letter dated August 22, 2008 filing comments on the procedural process   |

| <b>Exhibit No.</b> | <b>Description</b>   |
|--------------------|--|
| C4-14              | Letter dated August 26, 2008 filing an additional Information Request No. 4 to BCTC  |
| C4-15              | Fax dated August 28, 2008 filing article in Microwave News as evidence   |
| C4-16              | Letter dated August 22, 2008 filing letter of comment  |
| C4-17              | Letter dated September 11, 2008 filing Information Request No. 5 to BCTC   |
| C5-1               | <b>FORD, KEVIN</b> – Email dated May 27, 2008, filing request for Registered Intervenor status   |
| C5-2               | Email dated June 20, 2008 stating concerns regarding the BCTC Central Vancouver Island CPCN Application  |
| C5-3               | Letter of Comment received October 15, 2008 regarding the preferred route of the transmission line   |
| C6-1               | <b>JOINT INDUSTRY ELECTRICITY STEERING COMMITTEE (JIESC)</b> – Letter dated May 27, 2008 from R. Brian Wallace, Bull Housser & Tupper, filing request for Intervenor Status                                  |
| C6-2               | Email dated June 8, 2008 from R. Brian Wallace, filing comments and notice that the JIESC will not be attending the Procedural Conference  |
| C7-1               | <b>BRITISH COLUMBIA OLD AGE PENSIONERS ORGANIZATION (BCOAPO)</b> - Letter dated May 27, 2008 request for Registered Intervenor status for Leigha Worth, Eugene Kung and Bill Harper of Econalysis Consulting |
| C7-2               | Letter dated June 5, 2008, filing Information Request No. 1 to BCTC  |
| C7-3               | Letter dated July 9, 2008, filing request for confidential disclosure of information requested in BCOAPO's Information Request No. 1.11.a and 1.13.a   |
| C7-4               | Letter dated July 10, 2008, filing Information Request No. 2 to BCTC   |
| C7-5               | Undertakings dated July 9, 2008 from Eugene Kung and Leigha Worth requesting access to Confidential material filed by BCTC in this proceeding  |
| C7-6               | Letter dated July 25, 2008 filing BCOAPO Information Request No. 2   |
| C7-7               | Letter dated August 28, 2008 filing Information Request No. 3 to BCTC  |
| C7-8               | Letter dated September 15, 2008 filing comments on the proposed regulatory timetables  |

| <b>Exhibit No.</b> | <b>Description</b>   |
|--------------------|--|
| C8-1               | <b>GOGO, MIKE</b> - Submission dated June 12, 2008 requesting Intervenor Status  |
| C9-1               | <b>ISLAND TIMBERLANDS</b> – Email dated August 25, 2008 filing request for late Registered Intervenor status and filing comments |

*INTERESTED PARTY DOCUMENTS*

|     |  |
|-----|--|
| D-1 | <b>GOGO, DAN AND SHIRLEY</b> – Request for Interested Party status made by Maureen Young, Regional District of Nanaimo, dated May 23, 2008 |
|-----|--|

**INTERESTED PARTY STATUS WITHDRAWN  
REFER TO EXHIBIT C3-1**

|       |  |
|-------|--|
| D-1-1 | Email dated June 9, 2008, from Maureen Young, Regional District of Nanaimo, filing request to change from Registered Intervenor status to Interested Party status                  |
| D-1-2 | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> - M. Young's Presentation dated July 17, 2008  |
| D-1-3 | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> - Copy of the Arrowsmith Benson – Cranberry Bright Official Community Plan, Bylaw Number 1148, Consolidated Version dated January 2007 |
| D-1-4 | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> – Booklet entitled Regional Growth Strategy from the Regional District of Nanaimo, undated   |
| D-1-5 | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> – Series of Photographs of the Vancouver Island Equestrian Trail Ride, BC, Provincial dated June 28 <sup>th</sup> and 29 <sup>th</sup> |
| D-1-6 | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> – Map entitled “Sensitive Ecosystem Inventory”   |
| D-1-7 | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> – Map entitled “Sensitive Ecosystem Inventory” dated June/July 2005  |
| D-1-8 | Filing the Arrowsmith Benson – Cranberry Bright Map  |

| Exhibit No. | Description   |
|-------------|---|
| D-1-9       | Letter dated July 18, 2008, filing evidence between Geoff Garbutt, Manager of Current Planning of the Regional District of Nanaimo and Gordon Smaill, Ministry of Agriculture & Lands Integrated Land Management Bureau |
| D-2         | <b>TIMBERWEST FOREST CORP.</b> - Letter dated May 26, 2008, from John Hendry, Vice President, filing request for Interested Party status and comments   |
| D-3-1       | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> – Presentation of Ms. Abbott  |
| D-4-1       | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> - Presentation of Ms. Blackstaffe   |
| D-4-2       | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> – Document entitled BCTC Application for Certificate of Public Convenience and Necessity for the Interior to Lower Mainland Transmission Project dated May 26, 2008         |
| D-5         | <b>GREENWING ENERGY</b> – Online web registration dated August 27, 2008 from Jake Gray requesting Interested Party status   |

#### *LETTERS OF COMMENT*

|       |   |
|-------|---|
| E-1   | <b>ISLAND TIMBERLANDS GP LTD.</b> - Letter of Comment dated July 7, 2008, from Stephen Henderson , Senior Land Manager                            |
| E-2   | <b>NANOOSE FIRST NATION</b> - Letter of Comment dated July 17, 2008 from an authorized representative   |
| E-3   | <b>SUBMITTED AT COMMUNITY INPUT SESSION</b> - Presentation from Bill Calvert, dated July 17, 2008 titled “South Forks Power Transmission Line”    |
| E-4   | <b>ABBOTT, MARY</b> - Letter of Comment dated October 20, 2008 from Mary Abbott, Nanaimo, BC  |
| E-5   | <b>PONGRATZ-DOYLE, JEANETTE</b> - Letter of Comment dated September 26, 2008 filing newspaper article from Jeanette Pongratz-Doyle of Nanaimo, BC |
| E-5-1 | <b>PONGRATZ-DOYLE, JEANETTE</b> - Letter of Comment dated September 27, 2008 filing newspaper article from Jeanette Pongratz-Doyle of Nanaimo, BC |