



**British Columbia Transmission  
CORPORATION™**

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**INTERIOR TO LOWER MAINLAND  
(ILM)  
TRANSMISSION REINFORCEMENT  
PROJECT**

**NICOLA to MERIDIAN TRANSMISSION LINE OPTION**

**Project Description**

**Submitted to:**

**British Columbia Environmental Assessment Office  
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**Canadian Environmental Assessment Agency  
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## List of Abbreviations

<b>Acronym</b>	<b>Definition</b>
AMC	American Creek Capacitor Station
AOA	Archaeological Overview Assessment
BC Hydro	British Columbia Hydro and Power Authority
BCEAA	British Columbia Environmental Assessment Act
BCEAO	British Columbia Environmental Assessment Office
BCTC	British Columbia Transmission Corporation
BCUC	British Columbia Utilities Commission
CEAA	Canadian Environmental Assessment Act
CEA Agency	Canadian Environmental Assessment Agency
CKY	Cheekye Substation
CPCN	Certificate of Public Convenience and Necessity
EAC	Environmental Assessment Certificate
EMF	Electromagnetic Fields
ILM	Interior to Lower Mainland
ING	Ingledow Substation
kAMP	Kilo Ampere
KLY	Kelly Lake Substation
kV	Kilo Volt
MDN	Meridian Substation
MoFR	Ministry of Forests and Range
MVA	Mega Volt Ampere
MVA <sub>r</sub>	Mega Vole Ampere reactive
MW	Mega Watt
NIC	Nicola Substation
NITS	Network Integrated Transmission Services
PU	per unit
RMR	Reliability-Must-Run
SARA	Species At Risk Act
SCST	Single Circuit Steel Tower
SI	Southern Interior
SVC	Static VAr Compensator
TOR	Terms of Reference
TTC	Total Transfer Capability

## Executive Summary

British Columbia Transmission Corporation (BCTC) is a provincial Crown corporation responsible for planning, managing, operating and maintaining most of the electrical power transmission system in British Columbia and its interconnections with the larger North American grid. The existing system has limited transfer capability, and is thermally limited during winter peak periods. As a result of the growing demand for electricity, firm export commitments, and the need for a reliable and efficient transmission system, the transfer capability of the Interior and the Lower Mainland transmission system requires reinforcement by 2014.

There are three alternatives for providing the required ILM transmission capacity:

1. Upgrade several existing transmission circuits;
2. Construct a new 500 kV alternating current (AC) transmission line; or
3. Construct a new High-Voltage Direct Current (HVDC) line and two converter stations.

There are also other potential “non-wires” solutions that could defer the need for additional ILM transmission capacity. These include:

1. Additional coastal generation;
2. Higher Demand Side Management (DSM) targets for load reduction; and
3. Additional imports from the US.

Generally, “non-wires” options would be the responsibility of BC Hydro to implement. These options represent key portions of BC Hydro’s power supply portfolio analysis and are currently being examined by the BC Utilities Commission through its review of BC Hydro’s Integrated Energy Plan and Long Term Acquisition Plan (IEP/LTAP) Application.

BCTC will complete its analysis of the transmission options by May 2007 and make a decision on the preferred option at that time. It is expected that the BCUC will have rendered its decision on BC Hydro’s IEP/LTAP Application before then.

In the interim, due to the long-lead time associated with permitting and constructing new transmission lines, BCTC is entering into the Environmental Assessment process for a

new transmission line option. If the new transmission line option is not selected as the preferred alternative, BCTC will withdraw this option from the Environmental Assessment process.

The new transmission line option to be considered would be a 500 kilovolt (kV) single circuit steel tower transmission (SCST) line from the Nicola Substation (NIC) near Merritt to the Meridian Substation (MDN) near Coquitlam.

This transmission line option would be approximately 240 km in length, and would parallel and adjoin existing transmission line right-of-way for the majority of the route. There are several sections along the existing transmission corridor that require widening of approximately 36 m adjacent to the existing right-of-way to accommodate an additional line. The total length of the sections requiring widening is approximately 70 km. There are a number of locations where the new line would need to be located on new right-of-way not adjacent to the existing corridor (i.e. the new line would depart the existing right-of-way and then return). The amount of new right-of-way not adjacent to the existing corridor is approximately 30 km. This new right-of-way would be on Crown land.

The transmission line and associated facilities would be operated and maintained by BCTC and owned by BC Hydro.

An HVDC solution would follow the same Nicola to Meridian path and have a similar environmental “footprint”. At this time, an HVDC solution is considered unlikely. However, if such an option were selected as the preferred alternative, BCTC will file an amended Project Description and draft Terms of Reference with the EAO.

There is some uncertainty whether the Project would be automatically reviewable under the *Reviewable Projects Regulation* of the *British Columbia Environmental Assessment Act (BCEAA)*. If the Project is not reviewable, BCTC will ask the British Columbia Environmental Assessment Office (BCEAO) to designate the Project as a reviewable project under *BCEAA*.

The NIC-MDN transmission line option would also need to go through an environmental assessment process under the *Canadian Environmental Assessment Act (CEAA)* due to the requirement for federal approvals and authorization from under the *Fisheries Act* and *Navigable Waters Act*. Once the project is designated a reviewable project, the Project would undergo a harmonized federal-provincial environmental review led by the BCEAO in accordance with *BCEAA* and *CEAA*. The Canadian Environmental Assessment Agency (CEA Agency) will determine whether the federal government requires an environmental screening assessment or a comprehensive study.

The NIC-MDN transmission line option, if selected as the preferred alternative, will also require a Certificate of Public Convenience and Necessity (CPCN) from the BCUC. It is expected that the BCUC process would review the need and justification for the Project, the alternatives, capital and operating costs, and a broad range of socio-economic and non-financial factors. The BCUC may choose to hold public hearings on the CPCN application.

### **Potential Benefits**

The benefits of upgrading the ILM transmission network include:

1. Alleviating transmission constraints that will continue to worsen as load in the Lower Mainland grows and remote electricity generation resources continue to be developed in the BC interior;
2. Supporting system reliability and efficient resource utilization by ensuring that there is adequate transmission capacity to link generation with load;
3. Improving energy efficiency by reducing transmission system energy losses;
4. Ensuring BC's trade benefits are retained;
5. Reducing costs and enhancing flexibility for transmission line maintenance;
6. Reducing exposure to load and generation shedding requirements; and
7. Reducing reliance on gas-fired coastal generation.

### **Project Components**

A new transmission line would involve:

1. A 240 km 500 kV transmission line between NIC substation near Merritt and MDN Substation in Coquitlam;

2. 500 kV circuit terminations and related equipment at NIC and MDN within the existing substation boundaries; and
3. A 500 kV series compensation station near the mid-point of the transmission line.

## Consultation

First Nations engagement and public consultation will be undertaken throughout all stages of project planning, regulatory review, and construction. This will include meetings and working sessions with First Nations, meetings with stakeholder groups, and public open houses and information sessions. Consultations will be supported by a variety of information materials and feedback mechanisms to ensure that stakeholders have the opportunity to be fully informed about the project and have convenient means to provide input.

## Environmental Assessment

The scope of the environmental assessment will include a range of potential effects to physical, biological, and cultural resources including:

1. Aquatic species and habitat;
2. Terrestrial ecosystems, vegetation and wildlife;
3. Land use and socioeconomic/socio-community conditions;
4. Visual landscape and recreational resources;
5. First Nations traditional use;
6. Heritage and archaeological resources; and
7. Public health issues.

BCTC will prepare and submit a draft Terms of Reference (TOR) for regulatory review and approval that will outline the proposed scope of the technical studies, assessment methodologies, public and First Nations consultation programs, and the general format and organization to be implemented during preparation of the Application for an Environmental Assessment Certificate (EAC) under *BCEAA*. The EAC Application will also satisfy the requirements for either a screening level environmental assessment or a comprehensive study under *CEAA*.

## **1.0 PROPONENT INFORMATION**

### **1.1 Proponent Identification**

BCTC is a provincial Crown corporation that began operations on August 1, 2003. BCTC's head office is located at Suite 1100 - 1055 Dunsmuir Street in Vancouver.

Under the *Transmission Corporation Act* and a number of designated agreements between BCTC and BC Hydro, BCTC has the responsibility to manage, maintain and operate BC Hydro's transmission assets. BCTC is also responsible for directing new investment in transmission infrastructure upon approval of the BCUC. This responsibility includes planning, constructing and obtaining all regulatory approvals for enhancements, reinforcements and sustaining growth investments of BC Hydro's transmission assets, 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.

### **1.2 Key Proponent Contacts**

#### **Proponent: B.C. Transmission Corporation (BCTC)**

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## 2.0 PROJECT JUSTIFICATION

This Project Description provides an overview of the NIC-MDN transmission line option to reinforce the Interior to Lower Mainland transmission grid.

The existing ILM transmission network is thermally and voltage stability limited during winter peak power transfer. The ILM network has a total transfer capacity of 5,800 MW and a thermal limit of 6,300 MW. During peak load hours in 2006/07, the sum of Lower Mainland and Vancouver Island load, firm transmission commitments on circuits connecting the BC system to the US, and transmission losses from the ILM system are projected to reach approximately 7600 MW and continue to grow after that. Until an ILM transmission system reinforcement is made, the difference between the demand and the existing ILM capacity, 1300 to 1800 MW, must be met by local generation in the Lower Mainland or on Vancouver Island, or by imports from the US. Any retirements of existing coastal generating facilities would exacerbate this short fall. The ILM Project will examine the available means to increase the ILM transmission network total transfer capability by as much as 2100 MW.

BC Hydro filed its 2006 Integrated Electricity Plan (IEP) and its Long Term Acquisition Plan (LTAP) with the BCUC at the end of March 2006 and filed amendments dated August 31, 2006. The LTAP identifies the need for additional transmission capacity between the Interior and the Lower Mainland between 2014 and 2019.

System planning studies will continue to assess the need and timing of an ILM solution. Scenario analysis continues to evolve as new information is made available such as the LTAP and updated load forecasts. Currently there is substantial evidence indicating a need for a solution by 2014.

There are three alternatives for increasing ILM system transmission capacity:

1. Upgrade of several existing transmission circuits and related components;
2. Construct a new 500 kV AC transmission line; or
3. Construct a new HVDC line and converter stations.

There are also potential “non-wires” solutions that could defer the need for additional ILM transmission capacity:

1. Addition coastal generation;
2. Higher DSM targets for load reduction; and
3. Additional imports from the US.

“Non-wires” options are not transmission solutions and would generally be BC Hydro’s responsibility. These options represent important portions of BC Hydro’s power supply portfolio analysis and are currently being examined by the BCUC through its review of BC Hydro’s IEP/LTAP Application.

BCTC is analyzing an option to upgrade existing circuits. This would involve increasing the capacity on four existing circuits connecting into the Lower Mainland.

Other options for increasing ILM transfer capability through construction of new lines have been reviewed by BCTC and compared with the potential NIC to MDN transmission project. These options include a new 500 kV transmission line between the Kelly Lake (KLY) and Cheekye (CKY) substations or a 500 kV line from NIC to Ingledow (ING) substation. If a new AC line is determined to be the preferred ILM option, the NIC-MDN project is the preferred new line solution.

An HVDC solution would follow the same NIC to MDN path as a 500 kV AC solution and have a similar environmental “footprint” except for new large converter stations at the existing NIC and MDN substations. These would require expansion of the existing property boundaries. At this time, an HVDC solution is considered unlikely; however, if such an option were selected as the preferred alternative, BCTC would file an amended Project Description and draft Terms of Reference with the EAO.

The NIC-MDN transmission line option, if selected as the preferred alternative, will require a Certificate of Public Convenience and Necessity (CPCN) from the BCUC. Amongst other things, the BCUC process will review the need and justification for the Project, the alternatives and the costs. The BCUC may choose to hold public hearings on the CPCN application.

### **3.0 PROJECT COMPONENTS AND INFRASTRUCTURE**

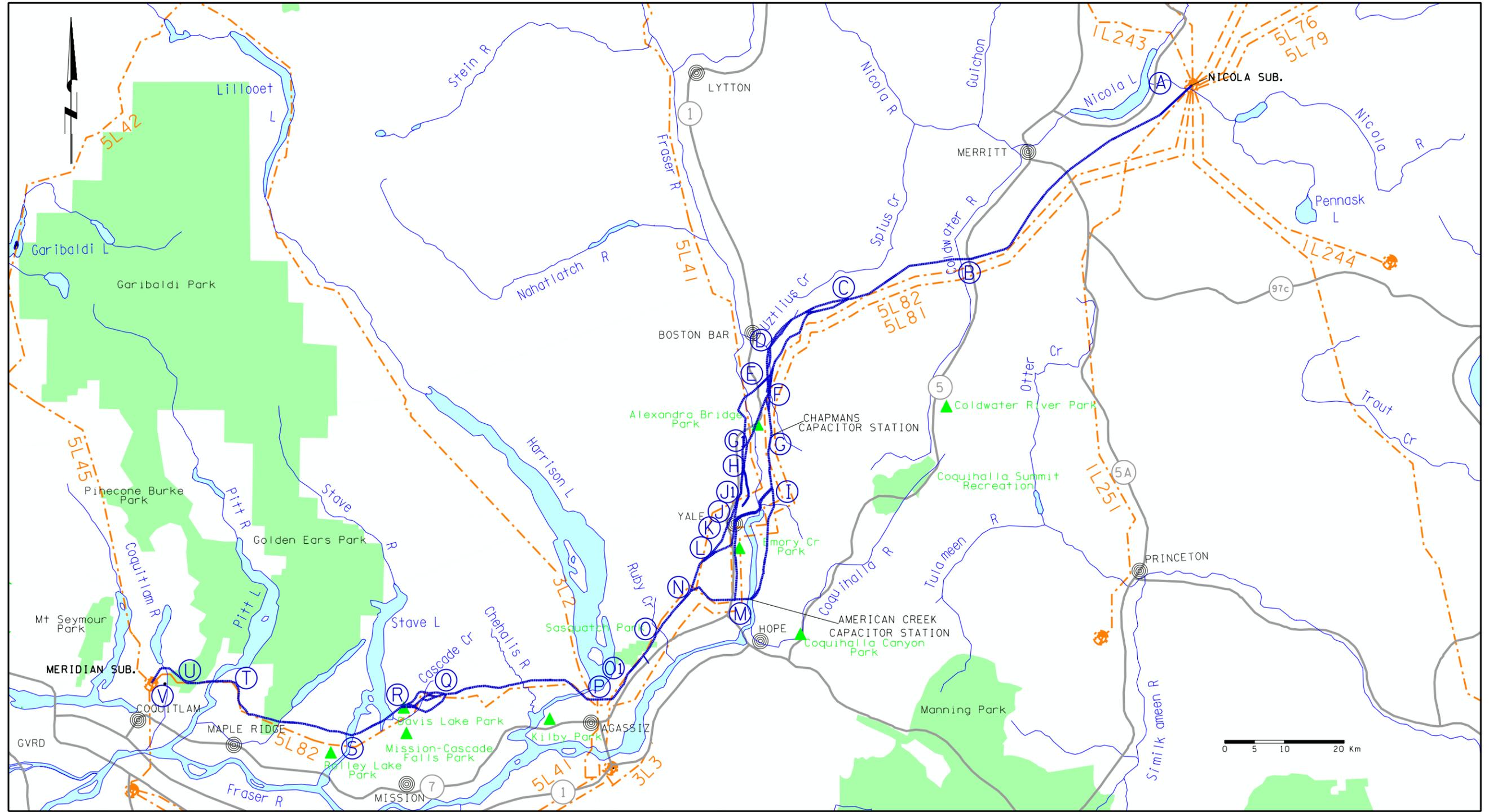
#### **3.1 Existing NIC to MDN Transmission Line Corridor**

The first 500 kV transmission line constructed between NIC and MDN was circuit 5L82. This transmission line was completed in 1979 after the completion of the Revelstoke Generating Station on the Columbia River. It is comprised primarily of guyed and rigid SCSTs. 5L82 is approximately 240 km long and defines the NIC to MDN corridor (see Figure 1: Interior to Lower Mainland Transmission Reinforcement Study Area and Existing Transmission Line System).

The NIC to MDN corridor also contains portions of circuits 5L81 and 5L41. 5L81, NIC to ING, a 500 kV SCST line, was completed in 1976 to carry power south from the Mica Generating Station, also on the Columbia River. This circuit parallels 5L82 between NIC and Harrison Hot Springs and ties into American Creek Capacitor Station (AMC). 5L81 leaves the corridor at Harrison Hot Springs to follow the Fraser Valley to ING.

Circuit 5L41, Kelly Lake Substation (KLY) near Clinton to ING, a 500 kV SCST, was completed in 1969 to carry power south to the Lower Mainland from generating stations on the Peace River. 5L41 parallels 5L81 and 5L82 between the headwaters of American Creek and Ruby Creek where it leaves the corridor to follow the Fraser Valley to Clayburn Substation (CBN) near Abbotsford.

Figure 1



**LEGEND**

- ROADS ..... ———
- WATERCOURSE ..... ———
- PROVINCIAL PARK/REC. AREA ..... ■■■■
- EXISTING TRANSMISSION LINE ..... - - - - -
- SECTION NODE ..... (A)

\*Base Mapping Derived From T.R.I.M.

REVISIONS		MADE	CHKD	INSP	INSP	DATE	FUNCTIONAL CODE
							2.07
INSPECTED	PROJECT NO.	<b>Hydro</b>					
INSPECTED	PHOTO DATE	SURVEY and PHOTOGRAMMETRY DEPARTMENT					
DATE	PHOTO SCALE	<b>INTERIOR - LOWER MANINLAND TRANSMISSION REINFORCEMENT PROJECT (ILM) Nicola to Meridian 500 Kv Transmission Option Key Plan</b>					
DATE	PHOTO SCALE						
GRID ORIGIN	DATUM						
N. T. S.	DWG. SCALE	CONTOUR INT.	DWG. No.				

DIGITAL MAP

### **3.2 Proposed Project Route and Components**

The NIC-MDN transmission line option would be a new 500 kilovolt (kV) single circuit steel tower (SCST) transmission line between Nicola Substation (NIC) near Merritt, B.C. and Meridian Substation (MDN) located in Coquitlam, B.C. The new transmission line option would parallel an existing 500 kV transmission line (5L82) for most of its approximately 240 km length. When the existing lines were constructed in the early 1970s, additional right-of-way (ROW) was acquired at that time, anticipating one or two future additional lines. Existing access roads would be used and some new access roads would be required. Logging and clearing would be required before construction.

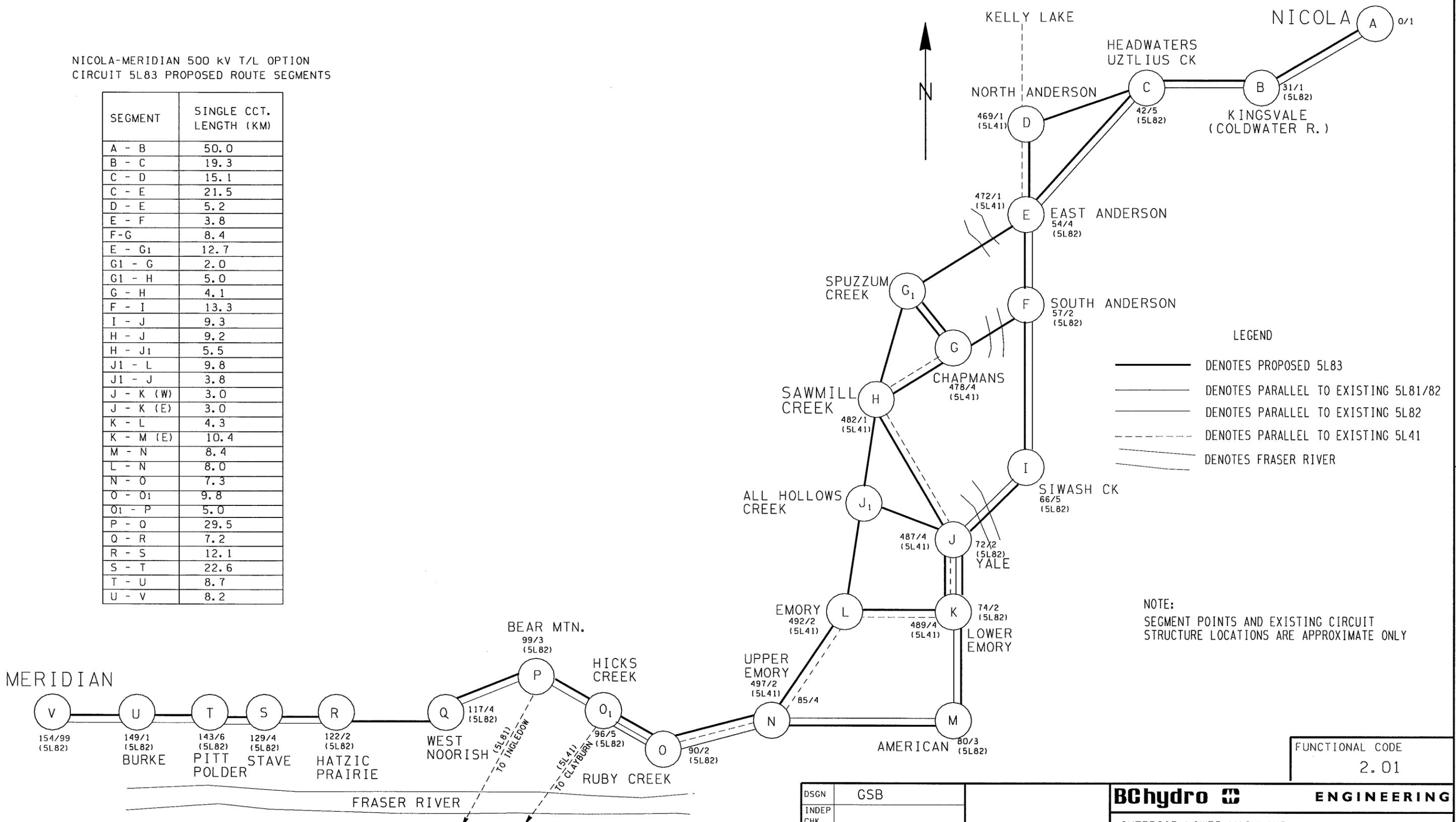
Statutory ROW already exists for approximately 85% of the route (210 km). The existing ROW would need to be widened to varying degrees (on average approximately 36 m) in several segments totaling approximately 70 km. Widening adjacent to the existing ROW would be on Crown land and a few private parcels. There are a number of locations where the new line would need to be located on new ROW not adjacent to the existing corridor (i.e. the new line would depart the existing right-of-way and then return). The amount of new ROW not adjacent to the existing corridor would be approximately 30 km. This new ROW would be on Crown land. Please see Appendix A.

There are a number of route alignment alternatives (please see Figure 2). The final alignment will be determined based on information gathered through the environmental assessment studies, First Nations and public consultation, and engineering analysis.

Figure 2

NICOLA-MERIDIAN 500 KV T/L OPTION  
CIRCUIT 5L83 PROPOSED ROUTE SEGMENTS

SEGMENT	SINGLE CCT. LENGTH (KM)
A - B	50.0
B - C	19.3
C - D	15.1
C - E	21.5
D - E	5.2
E - F	3.8
F-G	8.4
E - G <sub>1</sub>	12.7
G <sub>1</sub> - G	2.0
G <sub>1</sub> - H	5.0
G - H	4.1
F - I	13.3
I - J	9.3
H - J	9.2
H - J <sub>1</sub>	5.5
J <sub>1</sub> - L	9.8
J <sub>1</sub> - J	3.8
J - K (W)	3.0
J - K (E)	3.0
K - L	4.3
K - M (E)	10.4
M - N	8.4
L - N	8.0
N - O	7.3
O - O <sub>1</sub>	9.8
O <sub>1</sub> - P	5.0
P - Q	29.5
Q - R	7.2
R - S	12.1
S - T	22.6
T - U	8.7
U - V	8.2



**LEGEND**

- DENOTES PROPOSED 5L83
- DENOTES PARALLEL TO EXISTING 5L81/82
- DENOTES PARALLEL TO EXISTING 5L82
- DENOTES PARALLEL TO EXISTING 5L41
- DENOTES FRASER RIVER

**NOTE:**  
SEGMENT POINTS AND EXISTING CIRCUIT  
STRUCTURE LOCATIONS ARE APPROXIMATE ONLY

FUNCTIONAL CODE  
2.01

μ	NO	REMARKS	DATE	DESIGNED	INDEP CHK	DFTG	DFTG CHK	INSP	REV	ACPT
REVISIONS										

DSGN	GSB	<b>BChydro</b> <b>ENGINEERING</b>
INDEP CHK		
DFTG	DP	
DFTG CHK		
INSP		
REV	<i>BL</i>	INTERIOR-LOWER MAINLAND TRANSMISSION REINFORCEMENT PROJECT (ILM)
ACPT	GSB	NICOLA-MERIDIAN 500 KV T/L OPTION PROPOSED ROUTES SEGMENT DIAGRAM
DATE		2006-DEC
DISTR		μ M
DWG NO		5L83-T07-B17
CAD		R 0

A 500 kV series capacitor station would be added along the corridor, close to the mid-point between Merritt and Coquitlam, to provide series compensation of the new transmission line. Depending on the outcome of routing analysis and system studies, this may be accomplished within the existing transmission system footprint or may require the development of a new capacitor station on a new site adjacent to the project corridor.

Specific components of the NIC-MDN transmission line option include:

1. Approximately 240 km of new single circuit 500 kV transmission line between Nicola Substation near Merritt and Meridian Substation in Coquitlam following an existing statutory right-of-way for most of the corridor. Right-of-way widenings would be necessary in some areas. Further, due to terrain stability, access limitations, environmental sensitivity, First Nations interests and other issues, it is anticipated that new right-of-way would be required through sections of the Fraser Canyon and the Fraser Valley in order to avoid certain areas;
2. A 500 kV single circuit termination at NIC, including a line termination structure, circuit breakers, 122.5 MVAR of reactive compensation, and associated equipment within the existing substation property boundaries;
3. A 500 kV single circuit termination at MDN, including a line termination structure, circuit breakers, and associated equipment within the existing substation property boundaries; and
4. A 500 kV series compensation station involving an expansion of either the existing American Creek or Chapmans capacitor stations, or construction of a new capacitor station at a new site. There is an unused site at Ruby Creek, currently owned by BC Hydro that may be an option for locating a new capacitor station. The location will depend on the route chosen and the final system requirements. However, it is technically advantageous to locate the series capacitor station near the mid-point of the proposed transmission line route.

## **4.0 FIRST NATIONS ENGAGEMENT**

### **4.1 BCTC/BC Hydro First Nations Engagement**

BC Hydro (Aboriginal Relations and Negotiations) will lead the engagement of First Nations and will coordinate the First Nations engagement process with the broader public consultation program. BCTC will be responsible for leading discussions on transmission system matters.

BCTC will lead the broader public consultation program. First Nations will be presented with every opportunity to benefit from the broader public engagement process but will also be offered separate engagement processes that are designed to meet specific cultural and community needs.

### **4.2 First Nations Engagement Objectives**

BCTC and BC Hydro recognize that consultations must be meaningful from a First Nations perspective. Specific expectations will depend on the particular First Nation being consulted and may change over time. Elements of what will be accepted as meaningful consultation are defined by the following objectives:

1. to show respect for Aboriginal rights, duties and authority;
2. to ensure flexibility and a mutually agreeable process;
3. to provide funding to First Nations to engage in consultation processes;
4. to address First Nations interests;
5. to share information; and
6. to allow adequate time for the consultation process.

### **4.3 Proposed First Nations Engagement Plan**

BC Hydro, on behalf of the BCTC, will commit to undertaking notification and consultation activities with First Nations to build sustainable relationships. Consultation deliverables will include:

1. a project overview document;
2. an opportunity for First Nations input to the engagement plan and EAC application Terms of Reference;

3. an agreement on capacity funding;
4. regular project communications;
5. a First Nations Engagement Report;
6. opportunities for First Nations comment on the Application; and
7. notification of Ministry decision(s).

Engagement initiatives will be undertaken throughout the pre-application stage of the project including the preparation of the EAC Application, and subsequently, during the public comment period and in conjunction with Technical Working Group review activities following submission of the Application.

#### **4.4 Key First Nations**

An examination of asserted traditional territory, Statement of Intent boundaries and known consultation boundaries indicates that thirty-five First Nations and six Tribal Councils are likely to have interests in the Project and will be consulted individually (by Band) or collectively (e.g. by Tribal Council or Alliance). See Appendix B for a list.

Although the Project may appear by proximity to potentially affect only one Band and its members within a Nation of affiliated Bands, all of the Bands may assert rights collectively across the combined traditional territory of the Nation (i.e. Upper Nicola and Okanagan Nation). Consequently it may be necessary to consult the entire Nation and its member Bands as well as the individual Band.

#### **4.5 Consultation Activities Completed to Date**

All potentially affected First Nations and tribal councils have received initial notification materials regarding the NIC-MDN transmission option and a conceptual schedule of principle milestones. All but two bands have received face-to-face presentations about the NIC-MDN option and been given the opportunity to gain a general familiarity with the location and nature of the potential project.

A second round of meetings will begin in November with a two-fold objective:

1. Continue to build awareness and develop a productive relationship with BCTC and BC Hydro.
2. Begin to put in place capacity funding to facilitate First Nations participation in the early portion of pre-application activities including development of the Terms of Reference.

## **5.0 PUBLIC CONSULTATION**

### **5.1 General Approach**

BCTC's general approach for notifying and consulting with public stakeholders includes the following principles:

1. An open public process: interested parties will be encouraged to participate throughout the planning process and regulatory review, with effective two-way communication. The consultation process is viewed as an opportunity for constructive dialogue with an informed audience;
2. Meaningful consultation: interested parties expect that consultations will be real and meaningful from their perspective. Specific expectations may vary among the people being consulted and may change over time.
3. Transparent and accountable: interested parties expect that they will be provided with access to all relevant information and that they will be informed about changes in the project and decisions made by BCTC.
4. Consultation, not consensus: input from the public, along with information gathered through technical, environmental and social impact studies, will inform BCTC decisions.

### **5.2 Public Consultation Objectives**

BCTC has a responsibility to communicate project intent, respond to public issues and concerns, and gather suggestions with regard to its construction, schedule and operations.

The objectives of the Project public consultation plan are:

1. Project Justification: to provide information to interested and affected residents and stakeholders about the need for the project;
2. Public Education: to explain the rationale for the project;
3. Issues Identification and Management: to identify and address potential issues and concerns from a community and stakeholder perspective; and

4. Public Input: to identify opportunities for individuals to have input into BCTC decisions that may affect them and, where feasible, make adjustments to the plan based on their input.

### **5.3 Proposed Public Consultation Plan**

BCTC will undertake public notification and consultation activities throughout the preparation of the EAC and CPCN applications to engage in meaningful public input and feedback. BCTC will also undertake formal public consultation activities, such as scheduled public meetings and information sessions, during the public comment period following submission of the Application for regulatory and public review.

Consultation activities that will be undertaken through all stages of the project include the following:

1. Public issues scoping and community profiling;
2. Website development and printed materials;
3. Meetings with media in the project area;
4. Meetings with key stakeholder groups;
5. Open houses, information sessions and meetings to raise awareness, and to identify and address issues and concerns;
6. Ongoing issues tracking and proactive response;
7. Public notification of events, meetings and the status of the project using, for example, advertising, and mailouts;
8. Providing comprehensive reporting of the process and results of the consultation process, including consultation summaries to support the EAC and CPCN applications.

See Appendix C for an Initial Stakeholders List.

## **6.0 SCOPE OF ENVIRONMENTAL ASSESSMENT**

During the pre-application stage, efforts will focus on the scoping of issues for review and the development of Terms of Reference (TOR) for the EAC Application. The TOR will also satisfy requirements identified by the CEA Agency for an environmental screening assessment (or comprehensive study) under *CEAA*. Input received during consultation with federal, provincial and municipal agencies, the public and First Nations will be of critical importance in the development of the TOR.

BCTC will submit the draft TOR for regulatory review and approval. The draft TOR will outline proposed scope of the technical studies, assessment methodologies, public and First Nations consultation programs and general format and organization to be implemented during preparation of the EAC application, and concurrently, to meet the environmental assessment requirements under *CEAA*.

It is anticipated that the scope of the environmental assessment will consider potential effects to the following biological, physical, and cultural resources:

1. Aquatic species and habitat;
2. Terrestrial ecosystems, vegetation and wildlife;
3. Land use and socioeconomic/socio-community conditions;
4. Visual landscape and recreational resources;
5. First Nations traditional use;
6. Heritage and archaeological resources; and
7. Public health issues.

Additional assessment topics may be added to this list during preparation of the TOR and the course of the environmental assessment studies.

Based on the findings of the assessment studies, environmental mitigation measures will be recommended that, where appropriate, will be incorporated into detailed alignment, tower placement decisions, and other aspects of project design to attempt to avoid adverse effects. In addition, mitigation measures will be compiled in a detailed Environmental Management Plan that will be used to minimize effects associated with

specific activities and procedures during project construction and operation. This document will be finalized subsequent to project approval.

In addition to the assessment results, the EAC Application will describe the potential for residual effects to occur after implementation of recommended mitigation measures. As required under *CEAA*, it will also contain an assessment of cumulative environmental effects, an analysis of potential accidents and malfunctions, and an evaluation of the effects of the environment on the project.

### **6.1 Key Environmental and Socioeconomic Issues**

A brief overview of key biological, socioeconomic and public health issues involved in the Project, as well as an indication of how they will be dealt with in the EAC Application, is provided below.

#### ***Aquatic Species and Habitat***

The transmission line corridor between NIC and MDN, as well as much of the existing and proposed new access, intersects or runs parallel to a large number of streams, many of which support populations of fish and other aquatic organisms. Fish present in the project area that are of particular interest to regulatory agencies, First Nations and the public include all five species of Pacific salmon, steelhead trout, kokanee, bull trout, and cutthroat trout. In addition, the middle Fraser River, which will be crossed by the proposed transmission line in the vicinity of Yale, supports white sturgeon, a species of special concern under the federal *Species at Risk Act (SARA)*.

The EAC Application will describe the results of a fish and fish habitat inventory and assessment, to be undertaken in 2006/2007 to identify critical and sensitive spawning, rearing and riparian habitats within and adjacent to the corridor. The document will also evaluate potential effects to aquatic habitats associated with necessary right-of-way clearing, access development, and transmission line construction, and describe environmental mitigation and habitat compensation strategies to be implemented during the course of the project. Technical input will be sought from regional habitat biologists with Fisheries and Oceans Canada and the BC Ministry of Environment, as well as local streamkeeper groups, where applicable.

### ***Terrestrial Wildlife and Vegetation***

Vegetation and wildlife resources that occur along the NIC-MDN transmission corridor will be described in the EAC Application based on a review of background documents, digital resource inventories, and field studies to be undertaken in 2007. Habitat mapping will be used to delineate ecological units and describe ecological-landscape relationships. Existing and available terrestrial and predictive ecosystem mapping will be used where possible. Predictive Ecosystem Mapping (PEM) exists for the Merritt Timber Supply Area from the upper portions of Uztlius Creek east to Merritt. Terrestrial Ecosystem Mapping (TEM) exists for portions of the Fraser Timber Supply Area from the Uztlius Creek south to Coquitlam. All fieldwork will follow methods described in Wildlife Habitat Rating Standards contained in the Resource Inventory Committee standards and protocols. Studies relating to vegetation will focus on ecosystems, rare elements and weeds while those pertaining to wildlife will describe the distribution of and habitat use by amphibians, reptiles, birds and mammals, including species protected under SARA and species of provincial concern.

The existing transmission line right-of-way, as well as the alternative alignments being considered for certain sections of the proposed transmission line, traverse many areas that provide high value habitat for plant and wildlife communities, including wide expanses of ungulate winter range, and a number of parks and protected areas. Other examples of important habitat include several Special Resource Management Zones for spotted owls, crossed by the right-of-way between the headwaters of Uztlius Creek and Coquitlam Mountain. Southwest of Merritt, through the Spius Creek, Uztlius Creek and Anderson River drainages, the right-of-way crosses the spine sub-unit of the North Cascades Grizzly Bear Population Unit. Near Yale, depending on the selected alignment, the right-of-way may abut the Yale Garry Oak Ecological Reserve and further to the southwest, traverse mountain goat winter range on Zofka Ridge. Near the south end of Harrison Lake and the Chehalis River, the new right-of-way may cross the proposed Harrison-Chehalis Wildlife Management Area. Further west, the existing right-of-way crosses Pitt Polder, wetlands that provide valuable nesting habitat for sandhill cranes, as well as habitat for other resident and migratory birds, and wildlife species.

Potential effects to terrestrial ecosystems, wildlife habitat, and wildlife species may occur as a result of activities involved in right-of-way and access preparation and maintenance

(e.g., vegetation clearing), tower installation, and conductor stringing. Effects during operation may occur due to the presence of the new transmission line, as well as the expanded clearing footprint. These potential effects are expected to be most pronounced along those sections of the corridor that require widening of the existing transmission line right-of-way or establishment of new right-of-way.

The results of the environmental assessment will be used to modify the alignment, tower locations and tower designs, where practical, to avoid or minimize any adverse effects. Special emphasis will be placed on devising means to protect species of federal and provincial concern. Where such solutions are not feasible, site-specific mitigation/compensation measures will be developed with input from specialist consultants, regulatory agencies, and interested stakeholders. These measures will be described in the EAC Application.

#### ***Land Use and Socio-economic/Socio-community Conditions***

From NIC east to the Fraser Canyon, the existing 500 kV right-of-way crosses open, lightly forested rangeland, much of which is held in the Agricultural Land Reserve. In the Nicola Valley, most of this land is privately owned. In contrast, most of the area beyond Howarth Creek, westward to the canyon, is unsurveyed Crown land, held under forest licenses and grazing leases. Forestry remains a primary land use along the existing and proposed rights-of-way as the transmission line moves west towards the Fraser Valley and the Lower Mainland. As it descends from high to mid elevations and down into the Fraser Lowlands, agriculture and residential land use become increasingly prominent. Through this area, west toward Coquitlam, the corridor traverses or passes close to several provincial parks and protected areas, including:

1. Sasquatch Provincial Park,
2. Cascade Falls Regional Park,
3. Rolley Lake Provincial Park,
4. Golden Ears Provincial Park,
5. Pinecone-Burke Provincial Park, and
6. Pitt Polder Ecological Reserve.

In addition, it runs adjacent to the Pitt Lake Unit of the Pitt-Addington Marsh Wildlife Management Area and may cross the proposed Chehalis River Wildlife Management

Area. It also crosses the proposed Blue Mountain Protected Area, on the east side of Alouette Lake.

Potential effects on land use and socio-community attributes associated with the NIC-MDN transmission line option will be evaluated in several studies including an agricultural impact assessment, a forest and forestry use assessment, and a socio-economic assessment. The extent of urban, agricultural, commercial, industrial, and First Nations lands, as well as parks, ecological reserves, and other protected areas crossed by the Project corridor will be delineated. Areas of active resource development, such as logging, mining and gravel extraction, and areas of urban growth will be identified.

Potential land use conflicts will be identified and mitigation measures developed to minimize or avoid project-related effects. The assessment will also address potential effects on local traffic patterns, existing industrial and commercial operations, recreational use, and property values during construction and operation of the new transmission line.

### ***Archaeological Resources, Heritage Resources and First Nations Traditional Use***

The existing corridor traverses the asserted traditional territory, and in some cases, on or near reserve lands, of approximately thirty-five First Nations. An Archaeological Overview Assessment (AOA) and a heritage resources inventory and assessment will be undertaken by specialist consultants, with the involvement and approval of First Nations and the BC Ministry of Tourism, Sport and the Arts, Archaeology Permitting and Inspection Section. Following the AOA, more detailed Archaeological Impact Assessments (AIA), involving subsurface investigations at selected sites along the right-of-way, will likely be required to confirm the presence (or absence) of archaeological resources. A Heritage Inspection Permit(s) under the *Heritage Conservation Act* will be secured prior to undertaking these assessments.

During First Nations engagement, the project team will request access to existing traditional use studies or site-specific information describing traditional use in areas to be crossed by the transmission line and associated access roads. Since such information may be considered confidential, it may not be directly referred to in the EAC Application

but will be taken into account during route selection and design, as well as the development of mitigation measures for project construction and operation.

The heritage resources inventory and assessment will identify historical sites within the proposed transmission line corridor such as the Hudson Bay Company Brigade Trail and the Douglas Portage Trail, both of which, depending on the final route selected through this area, may be approached and/or crossed in the vicinity of the Fraser Canyon. Mitigation measures will be recommended to avoid or minimize impacts to any historical features intersected by the transmission line right-of-way or access. These measures will be incorporated into project design and construction plans, and described in the EAC Application.

### ***Visual Landscape and Recreation Resources***

Clearing and installation of new transmission towers and conductors along the existing right-of-way and in proposed areas of new right-of-way could result in adverse effects to the visual landscape and recreation resources. Such effects are likely to be of particular concern on the slopes above the Fraser Canyon, visible from Highway 1, Alexandra Bridge Provincial Park, Yale, Kent, and, depending on the outcome of route selection decisions, the American Creek area. Visual effects associated with new clearing and transmission towers will also occur in the Fraser Valley, particularly in the vicinity of Ruby Creek, Sasquatch Provincial Park, Bear Mountain, Harrison Hot Springs, Hatzic Prairie, and Cascade Falls Regional Park. As the transmission line moves west through Mission, Maple Ridge, Pitt Meadows and Coquitlam, potential visual effects are expected to be of significant concern to the public and other stakeholders. Also of concern through this area will be visual and recreational effects in natural areas such as parks, ecological reserves and wildlife management areas.

Specialists will be retained to prepare an inventory of recreation resources, including visual landscapes, and recreation features, opportunities and viewpoints along the length of the proposed transmission line corridor. This work will be undertaken with reference to existing data and mapping maintained by Ministry of Forests and Range (MoFR) Recreation Inventory staff. Technical input will be provided to the project team regarding recommended alignment and tower locations, relative to sight lines. Three-dimensional landscape renderings from different representative viewpoints for use

during public and First Nations engagement will be developed. These will be used to assess effects to visual landscape and recreation resources/features associated with the final transmission line route and site-specific tower designs. This information will be incorporated into the EAC Application.

### ***Public Health Issues***

Key health issues associated with construction, operation and maintenance of a new 500 kV transmission line will be identified in the EAC Application. During clearing and construction, such issues will likely include short-term localized increases in noise levels and air pollutant emissions (e.g., fugitive dust, exhaust) associated with equipment operation. The EAC Application will include a description of pre-project ambient noise and air quality conditions at a representative number of sites along the alignment, focusing on potentially sensitive sites such as residential areas, schools, health care facilities, and community centres. Relevant regional and municipal bylaws and guidelines will be reviewed and used to develop site-specific mitigation measures to limit public health effects during construction.

Potential effects of transmission line operation on public health, including those associated with air and water quality will also be discussed in the EAC Application. Extremely low frequency (ELF) electromagnetic field (EMF) levels, such as those generated during the transmission and use of electric power do not have a demonstrated adverse effect on human health. However, EMF continues to be a concern of some stakeholders. The EAC Application will address existing and projected EMF levels within and adjacent to the ROW. The air and water quality assessments and the EMF assessment will involve a review of the most current literature and codes of practice, will make reference to site-specific issues and concerns, and will recommend best management practices for mitigation of effects.

## **6.2 Additional Permit, License and Approval Requirements**

In addition to project approval under *BCEAA* and *CEAA*, BCTC will apply to a number of federal and/or provincial agencies for approval to carry out specific aspects of the project. For example, works to be conducted in or adjacent to a watercourse may require provincial approval under the *Water Act* and/or federal approval under the *Fisheries Act* or *Navigable Waters Protection Act*. Acquisition of new right-of-way on

Crown land will require a statutory right-of-way easement and/or a License of Occupation under the provincial *Land Use Act*. BCTC will apply for a park use permit under the *Park Act* for clearing of right-of-way and/or installation of new transmission structures in a provincial park. Removal of timber from the right-of-way will require a License to Cut and a timber mark from MoFR.

To the extent possible, applications for permits, licenses and approvals identified during the course of the environmental assessment and review process will be prepared concurrently with the EAC Application.

## 7.0 SCHEDULE

**Table 1: Key Project Milestones**

## 8.0 CONCLUSIONS

The ILM transmission system must be able to provide adequate transmission capacity for the safe and reliable supply of electricity to meet the growing demand in the Lower Mainland and on Vancouver Island. The existing system has limited transfer capability, and is thermally limited during winter peak periods. As a result of the growing demand for electricity, firm export commitments, and the need for a reliable and efficient transmission system, the transfer capability of the Interior and the Lower Mainland transmission system requires reinforcement by 2014.

Engineering and planning studies completed by BC Hydro and BCTC have determined that a new 500 kV transmission line between Nicola Substation, near Merritt, and Meridian Substation, located in Coquitlam, is a preferred option for reinforcing the transmission system. This will enhance the total transfer capability by as much as 2100 MW, provide flexibility of dispatching interior generation resources, improve system efficiency and reduce the need for “reliability-must-run” generation in the Lower Mainland and on Vancouver Island.

In order to construct a new transmission line, BCTC will require a CPCN, and the Project will be subject to a harmonized federal-provincial environmental review. The environmental assessment will consider the potential effects of the project on various biological, physical and cultural resources in the project area. To address the requirements of the CPCN and the EAC applications, BCTC will conduct a range of technical and environmental studies, and will engage First Nations, the public and other stakeholders to identify and address Project-related issues.

Engagement activities will be undertaken with First Nations and the public throughout the detailed planning and construction of the project. This will include public open houses, information sessions and meetings, supported by information materials and feedback mechanisms to enable First Nations, the public and other stakeholders to be fully informed about the project.

Based on the assessment of effects and input from First Nations and other stakeholders, BCTC will establish project and environmental mitigation and monitoring measures.

These will reduce, and where possible, avoid potential adverse effects associated with the design, construction, operation and maintenance of the Project.

In developing the EAC Application, BCTC will work closely with the BCEAO to ensure that technical and environmental studies, and the engagement processes for First Nations and the public meet the expectations of review agencies and other stakeholders. With this approach, BCTC is confident that the transmission system reinforcement will be planned, constructed, operated and maintained in the best interests of its customers and the people of British Columbia.

## APPENDIX A: RIGHT OF WAY REQUIREMENTS

**Preliminary: Current State 5L83 Right-of-Way Requirements Summary Table**

Line Segment	ROW Length (km)	New ROW Length (km)	Area of New ROW (Ha)	Length of Additional RW / Widening (km)	Area of Additional RW / Widening (Ha)
A – B	50.0	-	-	0.9	4.3
B – C	19.3	6.5	32.5	12.8	46.4
C – D	15.1	15.1	75.5	-	-
C – E	21.5	-	-	21.5	99.8
D – E	5.2	-	-	1.0	3.2
E – F	3.8	-	-	3.8	20.8
E – G	12.0	-	-	-	-
E – H	19.7	19.7	98.5	-	-
G – H	4.1	-	-	-	-
F – I	13.3	-	-	13.3	56.7
I – J	9.3	-	-	9.3	42.2
H - J (East)	9.2	-	-	9.2	-
H - J (West)	9.2	-	-	9.2	34.7
H - J1	5.5	5.5	27.5	-	-
J1 – L	9.8	9.8	49.0	-	-
J1 – J	3.8	3.8	19.0	-	-
J - K (West)	3.0	-	-	3.0	-
J - K (East)	3.0	-	-	3.0	10.8
K – L	4.3	-	-	4.3	18.6
K - M (East)	10.4	-	-	10.4	37.4
K - M (West)	10.4	-	-	10.4	45.9
I – M	22.7	22.7	113.3	-	-
M – N	8.4	-	-	8.4	34.0
L – N	8.0	-	-	8.0	28.9
N – O	7.3	-	-	7.3	29.0
O – P	14.8	-	-	9.8	46.4
P – Q	29.5	-	-	10.3	16.6
Q – R	7.2	7.2	35.8	-	-
R – S	12.1	-	-	-	-
S – T	22.6	-	-	-	-
T – U	8.7	-	-	0.9	2.6
U – V	8.2	-	-	-	-
TOTAL	240.5	28.8	143.8	67.6	230.7



= route (via Chapmans)

**APPENDIX B: INITIAL FIRST NATIONS LIST**

**First Nation Band**

1. Aitchelitz Band
2. Boothroyd Indian Band
3. Boston Bar First Nation
4. Chawathil Band
5. Cheam Indian Band
6. Chehalis Indian Band
7. Coldwater Indian Band
8. Cook's Ferry Indian Band
9. Katzie First Nation
10. Kwantlen First Nation
11. Kwaw-kwaw-a-pilt First Nation
12. Kwikwetlem First Nation
13. Leq' a: mel First Nation (formerly Lakahahmen)
14. Lower Nicola Indian Band
15. Nicomen Indian Band
16. Matsqui First Nation
17. Nooaitch Indian Band
18. Okanagan Indian Band
19. Osoyoos Indian Band
20. Penticton Indian Band
21. Peters Band
22. Scowlitz First Nation
23. Seabird Island
24. Shackan Indian Band
25. Shxw'ow'hamel First Nation (formerly Ohamil)
26. Siska Indian Band
27. Skawahlook First Nation
28. Spuzzum
29. Squamish
30. Tsawwassen First Nation
31. Tseil-Waututh First Nation
32. Upper Nicola Band
33. Upper Similkameen Indian Band
34. Westbank
35. Yale

**Tribal Council / Society**

1. Nautsamawt Tribal Council
2. Nicola Tribal Association
3. Okanagan Nation Alliance
4. Sto:lo Nations Society
5. Sto:lo Tribal Council
6. Nlakapamux Tribal Council

### **APPENDIX C: INITIAL STAKEHOLDER LIST**

#### Federal Agencies

- Canadian Environmental Assessment Agency
- Environment Canada
- Fisheries and Oceans Canada
- Health Canada
- Indian and Northern Affairs Canada
- Transport Canada
- Fraser River Port Authority
- Industry Canada
- Natural Resources Canada
- Parks Canada

#### Joint Federal/Provincial

- Fraser River Estuary Management Program

#### Provincial Agencies

- Ministry of Aboriginal Relations and Reconciliation
- Ministry of Agriculture and Lands
- Ministry of Energy, Mines and Petroleum Resources
- Ministry of Environment
- Ministry of Forests and Range
- Ministry of Public Safety and Solicitor General
- Ministry of Tourism, Sports & the Arts
- Ministry of Transportation
- Agricultural Land Commission
- BC Utilities Commission
- BC Hydro

#### Regional Government

- Thompson-Nicola Regional District
- Fraser Valley Regional District
- Greater Vancouver Regional District

#### Municipal Government

- Village of Harrison Hot Springs
- District of Kent (includes Village of Agassiz)
- District of Mission
- District of Pitt Meadows
- District of Maple Ridge
- City of Coquitlam

#### Stakeholder groups

- Property owners
- Ratepayer groups
- Transmission customers

## Appendix C

- Industry user groups (e.g., BC Cattlemen's Association; Forestry)
- Recreational user groups (both "grass-roots" – such as local branches of Naturalist associations; and business-oriented – i.e., tourism-related)
- Provincial and regional non-governmental environmental groups
- Local naturalist/environmental groups
- Local opinion leaders
- Community residents

### Media

Local and Provincial

### Internal

BCTC and BC Hydro staff