BUTE INLET HYDROELECTRIC PROJECT

PROPOSED BY BUTE HYDRO INC.

TERMS OF REFERENCE
FOR AN APPLICATION FOR AN
ENVIRONMENTAL ASSESSMENT CERTIFICATE

PURSUANT TO THE

BRITISH COLUMBIA *ENVIRONMENTAL ASSESSMENT ACT*
AND

GUIDELINES FOR THE PREPARATION OF AN
ENVIRONMENTAL IMPACT STATEMENT

PURSUANT TO THE

CANADIAN ENVIRONMENTAL ASSESSMENT ACT

MARCH 2009

PREPARED BY THE
BRITISH COLUMBIA ENVIRONMENTAL ASSESSMENT OFFICE
and
CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY

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Abbreviations

The list below represents the list of acronyms and abbreviations used frequently in this Guideline document.

BC	British Columbia
EA	environmental assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
Km	kilometer
kV	kilovolt
MW	megawatt
project	Bute Inlet Hydroelectric Project
RIC	Resources Inventory Committee (now Resources Information Standards Committee)
VEC	Valued Ecosystem Component

PART 1: Background

1 PREFACE

The Bute Inlet Hydroelectric Project (project), proposed by Bute Hydro Inc., is subject to review under the British Columbia *Environmental Assessment Act* S.B.C. 2002, c.43 pursuant to an Order issued under Section 10 of that Act . The project is also subject to a review under the *Canadian Environmental Assessment Act* SC 1992, c.37 given the requirement for Fisheries and Oceans Canada, Transport Canada and Indian and Northern Affairs Canada to issue permits, authorizations and/or approvals pursuant to the *Fisheries Act*, the *Navigable Waters Protection Act* and the *Indian Act*, respectively. On January 9, 2009, the Minister of Fisheries and Oceans recommended to the Minister of the Environment that the project be referred to a federal review panel due to the potential for the project to cause significant adverse environmental effects which cannot be readily mitigated. Given that the project had already been subject to an Order under Section 10 of the British Columbia *Environmental Assessment Act*, a joint review panel will not be undertaken. Rather, the review processes under the federal and provincial processes will be coordinated to the extent possible.

The purpose of this document is to identify for the proponent, Bute Hydro Inc., the nature, scope and extent of the information that must be addressed in the preparation of the Application / Environmental Impact Statement (EIS) (hereinafter referred to as the EIS) for its proposed Bute Inlet Hydroelectric Project. The proponent will prepare and submit an EIS that examines the potential environmental effects, including cumulative effects, of the construction, operation, maintenance, foreseeable modifications, and where relevant, closure, decommissioning and restoration of temporary sites and facilities associated with the project and that evaluates their significance. For the purposes of the British Columbia *Environmental Assessment Act*, the EIS will examine the adverse environmental, social, economic, health and heritage effects of the project. This information will be used in the coordinated environmental assessment (EA) of the project by the Government of British Columbia pursuant to the British Columbia *Environmental Assessment Act* and the Government of Canada pursuant to the *Canadian Environmental Assessment Act*.

While the EIS Guidelines provide a framework for preparing a complete and understandable EIS, it is the responsibility of the proponent to provide sufficient data and analysis on any potential environmental effects to permit proper evaluation by a review panel, Aboriginal groups, the public, and technical and regulatory agencies. The EIS Guidelines outline the minimum information requirements while providing the proponent with flexibility in selecting methods to compile data for the EIS.

The EIS will identify the federal and provincial government agencies, Aboriginal people, and other parties involved in its development. The proponent is encouraged, when speaking with other government organizations, Aboriginal people, the public and stakeholders, where appropriate, to ensure that the EIS responds adequately to any concerns raised.

The British Columbia Environmental Assessment Office and the Canadian Environmental Assessment Agency will use their best efforts to coordinate, to the extent possible, some of the key steps of the EA processes to minimize the potential for duplicative activities.

2 SCOPE OF PROJECT

The scope of the project established for EA purposes comprises the various components of the project as described by the proponent in the document dated December 19, 2008 entitled "Revised Project Description for the Bute Inlet Hydroelectric Project" as well as the activities and works described in these guidelines.

Generally, the project would include the construction and operation of a three interconnected groups of run-of-river hydro facilities on tributaries to rivers that drain into Bute Inlet on British Columbia's central coast. In total, the three groups would be comprised of 17 run-of-river facilities, generating a total capacity of 1,027 MW. The project includes eight facilities which would be located in or near the Homathko River Drainage (Homathko Group), six facilities that would be located in the Southgate River drainage, (Southgate Group), and three facilities in the Orford River drainage (Orford Group).

Homathko Group Facilities:

- Bear River hydroelectric facility;
- Coola Creek hydroelectric facility;
- Scar Creek hydroelectric Facility;
- Whitemantle Creek hydroelectric facility;
- Brew Creek hydroelectric facility;
- Jewakwa River hydroelectric facility;
- Heakamie River hydroelectric facility; and
- Gargoyle Creek hydroelectric facility.

Southgate Group Facilities:

- Allaire Creek hydroelectric facility;
- Southgate River 2 hydroelectric facility;
- Southgate River 1 hydroelectric facility;
- Raleigh Creek hydroelectric facility;
- Icewall Creek hydroelectric facility; and
- Elliot Creek hydroelectric facility.

Orford Group Facilities:

- East Orford River hydroelectric facility;
- North Orford River hydroelectric Facility; and
- Algard Creek hydroelectric facility.

Figure 1 illustrates the proposed project location and general project layout.

Each group of facilities would be connected to the proposed Southgate Substation (referred to as the Pigeon Valley Collector Substation in figures associated with this document) through 216 km of 230 kV collector transmission lines on a new right of way. From the proposed Pigeon Valley Collector substation, electricity would be transmitted 227 km through a 500 kV trunk transmission line to the point of interconnection with the British Columbia Transmission Corporation grid, at the Malaspina substation near Earls Cove.

The scope of the project includes the construction, operation, maintenance, foreseeable modifications and, where relevant, the closure, decommissioning and restoration of temporary

Figure 1. Project Location and General Layout

sites and facilities associated to the Bute Inlet Hydroelectric Project. More specifically, the following works and activities are included in the scope of the project:

- the 17 run-of-river generating facilities including the intake structures, headpond storage, weir, powerhouses, tailrace structures and spillways associated with each of these facilities;
- the control and management of water being diverted;
- the water conveyance facilities (water conveyance system);
- the transmission lines (500 kV transmission trunk line and interconnection and the 230 kV collector transmission lines;
- the permanent access roads (new or modified);
- maintenance access routes along the transmission corridor (new or modified);
- all related works and activities including all temporary facilities required for the construction of the previously mentioned facilities, in particular:
  - ✓ temporary control structures and diversion works (cofferdams, diversion canals or tunnels, etc.);
  - ✓ all temporary or permanent electrical power supply lines, such as those supplying energy for camps and worksites;
  - ✓ radio towers;
  - ✓ permanent and temporary work camps;
  - ✓ boat launches and barge landings;
  - ✓ recreational facilities for workers;
  - ✓ temporary access roads (new or modified);
  - ✓ bridges and watercourse crossings (new or modified);
  - ✓ construction or modification of any transport infrastructure (e.g., road, maritime, air);
  - ✓ treatment of wastewaters and waste management as well as modifications or new infrastructures required for this management;
  - ✓ drinking water supply;
  - ✓ borrow pits and quarries;
  - ✓ management of excavation material;
  - ✓ construction worksites, storage areas and staging areas;
  - ✓ handling and storage of petroleum products and hazardous materials;
  - ✓ handling, storage and use of explosives; and
- any other modification to the mentioned works that would result from the studies presently underway.

Finally, it is understood that several elements of the project must still be clarified and that it will be necessary to include in the scope of the project, the environmental mitigation and compensation measures that would require the construction and management of works that may cause effects (e.g., sills, spits, upstream and downstream migration works for fish, temperature control structures, minimum flow control structures and management, etc.).

3 GUIDING PRINCIPLES

3.1 Environmental Assessment as a Planning Tool

Environmental assessment is a planning tool used to ensure that projects are considered in a careful and precautionary manner in order to avoid or mitigate the possible adverse effects of development on the environment and to encourage decision makers to take actions that promote sustainable development and thereby achieve or maintain a healthy environment and a healthy economy.

The EA of this project must, in a manner consistent with those purposes, identify its possible environmental effects; propose measures to mitigate adverse effects; and, predict whether there will be likely significant adverse environmental effects after mitigation measures are implemented.

3.2 Public and Aboriginal Consultation

Meaningful involvement in the EA takes place when all parties involved have a clear understanding of the proposed project as early as possible in the review process. Therefore, the proponent is required to continue to provide up-to-date information describing the project to the public and Aboriginal groups, and especially to the communities likely to be most affected by the project, including communities along the proposed transmission line routing. The proponent shall also involve Aboriginal people in determining how best to deliver that information, e.g., the types of information required, different formats, and the possible need for community meetings. The proponent will also explain the results of the EA in a clear and direct manner to make the issues comprehensible to as wide an audience as possible.

An objective of the overall review process is to involve potentially affected Aboriginal interest to ensure the environmental assessment identify any changes that the project may cause in the environment and the effects of any such changes on the current use of lands and resources for traditional purposes by Aboriginal persons. The proponent must ensure that it engages with Aboriginal people that may be affected by the project and that have asserted or have established Aboriginal rights, Aboriginal title or treaty rights.

The EIS should consider and describe the aboriginal traditional territories and assess potential impacts on aboriginal rights and title by undertaking archaeological studies and other assessment studies and information requirements identified by aboriginal groups. These include, but are not limited to: Traditional Use Studies, Aboriginal Interest and Use Studies, Traditional Ecological Knowledge, and Traditional Land Use. The EIS should consider and describe the measures to prevent and mitigate potential impacts identified through studies.

3.3 Traditional and Local Knowledge

Traditional and local knowledge has an important contribution to make to an EA. Traditional and local knowledge refers to the broad base of knowledge held by individuals and by communities that may be based on teachings, personal observation and experience or passed on from one generation to another through oral and/or written traditions. This tradition is dynamic, substantive, and distinct living knowledge.

Traditional and local knowledge, in combination with other information sources is valuable in achieving a better understanding of potential impacts of projects. Traditional and local knowledge may, for example, contribute to the description of the existing physical, biological and human

environments, natural cycles, resource distribution and abundance, long and short-term trends, and the use of lands and land and water resources. It may also contribute to project siting and design, identification of issues, the evaluation of potential effects and their significance, the effectiveness of proposed mitigation, cumulative impacts and the consideration of follow-up and monitoring programs.

Certain issues relevant to the review process are firmly grounded in traditional and local knowledge, such as harvesting, land use, physical and cultural heritage resources, and others. Although the basis for traditional and local knowledge and science-based knowledge can differ, they may on their own or together, contribute to the understanding of these issues.

The EA will promote and facilitate the contribution of traditional and local knowledge to the review process. It is recognized that approaches to traditional and local knowledge, customs and protocols may differ among communities and persons with respect to the use, management and protection of this knowledge. The federal review panel will consider the views of communities and traditional and local knowledge holders during the review process and determine which information should be kept confidential. The proponent must incorporate into the EIS the traditional and local knowledge to which it has access or that it may reasonably be expected to acquire through appropriate due diligence, in keeping with appropriate ethical standards and without breaching obligations of confidentiality.

3.4 Sustainable Development

Sustainable development seeks to meet the needs of present generations without compromising the ability of future generations to meet their own needs. The objective of sustainable development is to achieve a balance between preserving of environmental integrity, ensuring social equity and improving of economic efficiency.

A project that takes these concerns into account shall strive to integrate and balance the objective in the planning and decision-making process and shall incorporate citizen participation. The project, including its alternative means, shall take into account the relations and interactions among the various components of the ecosystems and meeting the needs of the population.

3.5 Precautionary Approach

Under the *Canadian Environmental Assessment Act*, one of the purposes of federal EA is to ensure that projects are considered in a careful and precautionary manner before authorities take action in connection with them, to ensure that such projects do not cause significant adverse environmental effects. The precautionary principle informs federal decision-makers to take a cautionary approach, or to err on the side of caution, especially where there is a large degree of uncertainty or high risk.

Principle 15 of the 1992 Rio Declaration on Environment and Development states that “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. In applying the precautionary approach, the proponent shall:

- demonstrate that all aspects of the project have been examined and planned in a careful and precautionary manner in order to ensure that they would not cause serious or irreversible damage to the environment, especially with respect to environmental functions

and integrity, considering system tolerance and resilience, and/or the human health of current or future generations;
- outline and justify the assumptions made about the effects of all aspects of the project and the approaches to minimize these effects;
- ensure that alternative means of carrying out the project are evaluated and compared in light of risk avoidance, adaptive management capacity and preparation for surprise;
- ensure that in designing and operating the project, priority has been and would be given to strategies that avoid the creation of adverse impacts; and
- identify any proposed follow-up and monitoring activities, particularly in areas where scientific uncertainty exists in the prediction of effects.

In doing so, the proponent shall consider the guiding principles set out in the Government of Canada *Framework for the Application of Precaution in Science-based Decision Making About Risk* (2003).

3.6 Use of Existing Information

In preparing the EIS, the proponent is encouraged to make use of existing information relevant to the project. When relying on existing information to meet the requirements of various sections of the EIS Guidelines, the proponent must either include the information directly in the EIS or clearly direct (e.g., through cross-referencing) the reader to where it may obtain the information. When relying on existing information, the proponent must also comment on how representative the data are, clearly separate factual lines of evidence from inference, and state any limitations on the inferences or conclusions that can be drawn from them according to the criteria for information quality set out in the EIS Guidelines. For instance:

- assumptions should be clearly identified and justified;
- all data, models and studies must be documented such that the analyses are transparent and reproducible;
- the uncertainty, reliability and sensitivity of models used to reach conclusions must be indicated;
- conclusions should be substantiated; and,
- the studies should be prepared using best available information and methods.

3.7 Use of Confidential Information

The EIS that is made publically available for comment should not contain:

- Information that could cause specific, direct and substantial harm to the proponent, to a witness, or specific harm to the environment by its disclosure;
- Information that is confidential (i.e., financial, commercial, scientific, technical, personal or other nature), that is treated consistently as confidential, and the person affected has not consented to the disclosure; or
- Information that is likely to endanger the life, liberty or security of a person through its disclosure.

The proponent must inform the federal review panel and the BC Environmental Assessment Office in writing for a determination as to whether specific information requested by these guidelines should be submitted to, and retained by the review panel and the BC Environmental Assessment Office, as confidential.

4 PREPARATION AND PRESENTATION OF THE ENVIRONMENTAL IMPACT STATEMENT

4.1 Study Strategy and Methodology

The proponent is expected to observe the intent of the EIS guidelines and to identify all environmental, social, economic, health and heritage effects that are likely to arise from the project (including situations not explicitly identified in these guidelines), the mitigation measures that will be applied, and the significance of any residual effects. It is possible that the EIS Guidelines may include matters that, in the judgement of the proponent, are not relevant or significant to the project. If such matters are omitted from the EIS, they must be clearly indicated with appropriate justification so that Aboriginal groups, the public and other interested parties have an opportunity to comment on this judgement. Where the federal review panel or the British Columbia Environmental Assessment Office disagrees with the proponent's decision, they may require the proponent to provide additional information.

In describing methods, the proponent will document how it used scientific, engineering, traditional and other knowledge to reach its conclusions. Assumptions must be clearly identified and justified. All data, models and studies will be documented such that the analyses are transparent and reproducible. All data collection methods must be specified. The uncertainty, reliability and sensitivity of models used to reach conclusions will be indicated.

The EIS will identify all significant gaps in knowledge and understanding where they are relevant to key conclusions presented in the EIS. The steps to be taken by the proponent to address these gaps will also be identified. Where the conclusions drawn from scientific and technical knowledge are inconsistent with the conclusions drawn from traditional knowledge, the EIS will contain a balanced presentation of the issues and a statement of the proponent's conclusions.

The EIS will provide a baseline description of the environment, including the components of the existing environment and environmental processes, their interrelations and interactions as well as the variability in these components, processes and interactions over time scales appropriate to this EIS. The proponent's description of the existing environment shall be in sufficient detail to permit the identification, assessment and determination of the significance of potentially adverse environmental effects that may be caused by the project, to adequately identify and characterize the beneficial effects of the project, and provide the data necessary to enable effective testing of predictions during the follow-up program.

The baseline description should include results from studies done prior to any physical disruption of the environment due to initial site clearing activities planned as part of the site preparation phase. The baseline description shall include characterization of environmental conditions resulting from historical and present activities in the local and regional study area.

In describing the physical and biological environment, the proponent must take an ecosystem approach that considers both scientific and traditional knowledge and perspectives regarding ecosystem health and integrity. The proponent must identify and justify the indicators and measures of ecosystem health, social health and integrity it uses. These must be related to project monitoring and follow-up measures.

For the biological environment, baseline data in the form of inventories alone are not sufficient to assess effects. The proponent shall consider the resilience of relevant species populations,

communities and their habitats. The proponent shall summarize all pertinent historical information on the size and geographic extent of relevant animal populations as well as density, based on best available information. Habitat at regional and local scales should be defined in ecological mapping of aquatic and terrestrial vegetation types and species (e.g., ecological land classification mapping). Habitat use should be characterized by type of use (e.g., spawning, breeding, migration, feeding, nursery, rearing, wintering), frequency and duration. Emphasis must be on those species, communities and processes identified as valued ecosystem components (VECs). However, the interrelations of these components and their relation to the entire ecosystem and communities of which they are a part must be indicated. The proponent must address issues such as habitat, nutrient and chemical cycles, food chains, productivity, to the extent that they are appropriate to understanding the effect of the project on ecosystem health and integrity. Range and probability of natural variation over time must also be considered.

In describing the socio-economic environment, the proponent must provide information on the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect the people and communities in the study area in a way that recognizes interrelationships, system functions and vulnerabilities. A description of the rural and urban settings likely to be affected by the project should be provided.

Information such as present and future use of land and resources, including transportation infrastructure, public health infrastructure and services (municipal water treatment for domestic use or human consumption, wastewater treatment, landfill), housing and housing values, commercial fisheries in the area, recreation and tourism should also be provided to the extent that this information is required to assess potential adverse effects of the project on human health and socio-economic conditions in the area, and to assess the effects of the environment on the project.

If the background data have been extrapolated or otherwise manipulated to depict environmental conditions in the study areas, modelling methods and equations must be described and must include calculations of margins of error and other relevant statistical information, such as confidence intervals and possible sources of error.

4.2 Presentation and Organization of the Environmental Impact Statement

The proponent shall avoid repetition by describing, for each VEC, the project setting, the anticipated effects on the VEC, the proposed mitigation measures, the significance of residual effects and, where relevant, the proposed compensation, in the same section of the EIS. Consideration should be given to having a stand-alone section for the cumulative effects assessment.

The proponent shall present the environmental impact statement in the clearest possible language. A glossary defining technical words and acronyms shall be included. The EIS will provide a list of all acronyms and abbreviations used in the document. The proponent shall provide charts, diagrams, tables, maps and photographs, where appropriate, to clarify the text. Perspective drawings that clearly convey the various components of the project shall also be provided. Wherever possible, maps shall be presented in common scales and datum to allow for comparison and overlay of mapped features.

For purposes of brevity, the environmental impact statement may make reference to the information that has already been presented in other sections of the document, rather than repeating it. A key subject index would also be useful and should reference locations in the text

by section and sub-section. Detailed studies shall be provided in separate volumes and shall be referenced by volume, section and page in the text of the main document of the environmental impact statement.

To facilitate the identification of the documents submitted and their coding in the Canadian Environmental Assessment Registry, the title page of the environmental impact statement and its related documents should contain the following information:

- project name and location;
- title of the document, including the term “environmental impact statement”;
- subtitle of the document;
- names of the proponent;
- the date.

The proponent shall provide copies of the environmental impact statement for distribution, including an electronic version in a searchable, PDF format, as directed by the federal Panel and the British Columbia Environmental Assessment Office.

The EIS shall specify the organization of the document. This shall include a list of all tables, figures, and photographs referenced in the text of the EIS. A Table of Concordance, which cross references the information presented in the EIS with the information requirements identified in the EIS Guidelines, will be provided. A complete list of supporting literature and references will be provided. As required, detailed information pertaining will be provided in Appendices.

4.3 Executive Summary

The EIS will contain an executive summary which will include the following:

- A concise description of all key facets of the project (land tenure, facilities, and associated activities);
- A succinct description of information distribution activities and consultation measures undertaken for Aboriginal people, public, and government agencies, with a summary of the issues raised and solutions suggested during these consultations;
- A general overview of key impact issues and proposed impact management measures; and
- The conclusions and significance determinations from the assessment.

Part II: Content of the Environmental Impact Statement

SECTION 1. Introduction and Project Background

1.1 Background

1.1.1 The Proponent

The proponent shall:

- provide contact information (i.e., name, address, phone, fax, email etc.)
- identify itself and the name of the legal entity that would develop, manage and operate the project;
- explain corporate and management structures, as well as insurance and liability management related to the project;
- specify the mechanism used to ensure that corporate policies will be implemented and respected for the project;
- summarize key elements of it's environment, health and safety management system and discuss how the system will be integrated into the project; and
- identify key personnel, contractors, and/or sub-contractors responsible for preparing the environmental impact statement.

1.1.2 Project Overview

The proponent shall briefly summarize the project, by presenting the project components, associated activities, scheduling details, the timing of each phase of the project and other key features. If the project is part of a larger sequence of projects, the proponent shall outline the larger context and present the relevant references, if available.

The intent of this overview is to provide the key components of the project, rather than a detailed description, which will follow in Section 1.3 of the present guidelines.

1.1.3 Project Location

The proponent shall provide a concise description of the geographical setting in which the project will take place. The description shall be focused on those aspects of the environment important for understanding the potential environmental effects of the project. This description shall integrate the natural and human elements of the environment in order to explain the interrelationships between the physical and biological aspects and the people and their communities. This description may include the following information:

- main ecological constraints of the environment;
- any existing designated environmentally sensitive areas, such as national, provincial and regional parks, ecological reserves, wetlands, estuaries, and habitats of provincial or federally listed species at risk and other sensitive areas;
- the current land use in the area and the relationship of the project facilities and components with any existing land use including traditional, private and crown lands;
- local communities; and
- the environmental significance and value of Bute Inlet and the surrounding area.

The environmental impact statement (EIS) will provide expanded description and mapping of the project location, including each of the project components outlined in Section 1.3.

1.1.4 Legal Framework and the Role of Government

To understand the context of this environmental assessment (EA), this section should identify, for each jurisdiction, the government bodies involved in the EA as well as the EA processes. More specifically, for all components of the project, the proponent shall:

- identify the environmental and other specific regulatory approvals and legislation that are applicable to the project at the federal, provincial, regional and municipal levels;
- identify government policies, resource management, planning or study initiatives pertinent to the project and discuss their implications;
- identify any relevant Land Use Plans, Land Zoning, or Community Plans;
- identify and delineate major components of the project and identify those being applied for and constructed within the duration of approvals under provincial and federal legislation;
- provide a summary of the regional, provincial and/or national objectives, standards or guidelines that have been used by the proponent to assist in the evaluation of any predicted environmental effects;
- identify all property rights and/or water leases for use or required by the project, including all agreements signed or to be signed by the proponent and the governments.

SECTION 2. Project Justification

2.1 Need and Purpose of the Project

The proponent must clearly describe the need for the proposed project. The need for the project is defined as the problem or opportunity the project is intending to solve or satisfy. The 'need for' will establish the fundamental rationale of the project. The 'purpose of' the project defines what the proponent hopes to accomplish by carrying out the project. 'Need for' and 'Purpose of' the project should be established from the perspective of the proponent and provide a context for the consideration of alternatives to the project.

The proponent will discuss the need for new or additional electrical generating capacity and energy resources, and that the best scenario for meeting that need includes the proposed project. The statement of the project's justification shall be presented in both energy and economic terms. The EIS shall outline how the proposed project meets the objectives of the British Columbia Energy Plan, the Clean Power Call, and how the proposed transmission line is consistent with the BC Utilities Commission review of transmission line needs for the province. The proponent shall describe the extent to which this justification is based on meeting the energy and power needs of British Columbia and BC Hydro or to supply other needs.

The proponent shall present the following information:

- forecasted energy and capacity needs, including a consideration of the seasonality of the proposed power production;
- committed supply; and
- anticipated reductions in needs resulting from energy efficiency programs carried out by BC Hydro, the province or other parties.

- the volume and value of British Columbia's electricity exports between 2000 to 2008; and
- the volume and value of British Columbia's electricity imports between 2000 to 2008

Additionally, the proponent shall provide information on the feasibility of the energy produced by the project being used to provide electricity to local communities.

As well, the section on the 'purpose of' the project will include a discussion of the extent to which the proposed project will contribute to BC targets to reduce greenhouse gas emissions.

2.2 Consideration of Alternatives

The EIS must include an analysis of alternative means of carrying out the project that are technically and economically feasible and the environment effects of any alternatives means. Further, for the purposes of the *Canadian Environmental Assessment Act*, the EIS must include a consideration of the alternatives to the project. For further guidance, the proponent is referred to the Canadian Environmental Assessment Agency guidance document "Addressing '*Need for*', '*Purpose of*', '*Alternatives to*' and '*Alternative Means*' under the *Canadian Environmental Assessment Act*" (1998). When assessing project alternatives, the proponent is encouraged to take into account the relations and interactions among various components of the ecosystems, including affected communities. Further, the proponent is encouraged to demonstrate how the preferred alternative contributes to sustainable development.

2.2.1 Alternatives to the Project

The mandate of the federal review panel includes a consideration of the alternatives to the project. The EIS must include an analysis of alternatives to the project; describing functionally different ways to meet the project's need and achieve the project's purpose from the perspective of the proponent. For each identified alternative to the proposed Bute Inlet Hydroelectric project that are within the control and/or interests of Plutonic Hydro Inc., this section of the EIS must explain how the proponent developed the criteria to identify the major environmental, economic and technical costs and benefits of those alternatives, and how the proponent identified the preferred project based on the relative consideration of the environmental, economic and technical benefits and costs. This must be done to a level of detail which is sufficient to allow the federal review panel, the public and Aboriginal people to compare the project with its alternatives. The consideration of alternatives to the project should include:

- management of the demand by means of energy conservation and efficiency;
- the purchase of electricity from suppliers other than the proponent (thermal, wind, nuclear sectors, coal, etc.);
- the addition by the proponent of more capacity at existing generating stations; and
- all other options available to the proponent, in the event that the project is not carried out (i.e. no-go alternative).

2.2.2 Alternative Means of Carrying Out the Project

For the purposes of the *Canadian Environmental Assessment Act*, the EIS must also identify and describe alternative means of carrying out the project that are technically and economically feasible. If there is more than one alternative means that is technically and economically feasible, the EIS must also describe the environmental effects of each alternative means. In describing the

preferred means, the EIS should identify the relative consideration of environmental effects, and technical and economic feasibility. The criteria used to identify alternative means as unacceptable, and how these criteria were applied, must be described, as must the criteria used to examine the environmental effects of each remaining alternative means to identify the preferred alternative.

Alternatives means of carrying out the project, its facilities and components will be discussed in this section of the EIS. The discussion will include assessments of:

- other potential sites for the project;
- other locations for delivery of the electricity to the BCTC grid;
- other possible transmission line alignments;
- alternative means of constructing the transmission line, such as underground lines;
- options for sharing existing infrastructure and transmission line routings with other projects; and
- other possible access road alignments.

SECTION 3. Project Description

The overall project would be developed as the following facilities and components:

3.1 Hydroelectric Facilities

The EIS shall include expanded descriptions of construction, operation and decommissioning (as required) of each of the seventeen project facility components and related infrastructure, accompanied by detailed drawings. As appropriate to convey the information, the EIS will present descriptions, locations, plans, figures and/or drawings for each of the facilities:

The following detailed information shall be presented:

- General arrangement and design drawings of the facility (including headpond, intake, penstock route, diversion channel, powerhouse and tailrace);
- Production capacity in MW;
- Access roads, including new roads, upgraded roads, existing roads and roads required for construction and maintenance access routes (if required);
- Plans for disposal of reactive waste rock generated encountered during excavation (if required);
- Intake design, including design parameters, elevation and intake type, including:
  - ✓ The EIS shall discuss the construction of the intake, including the methods for temporary stream diversion, development of the weir site, decommissioning of the temporary diversion channel, installation of trash racks, screens and all gates and valves erosion protection measures, and completion of the intake structure and related infrastructure;
- Water conveyance system, including length and diameter, including:
  - ✓ The EIS shall describe the water conveyance system, including the low pressure conduit and the high pressure penstock. The EIS shall discuss the excavation of the trench for the buried low pressure conduit (including any blasting activities), installation

of the low pressure conduit, construction of thrust blocks, anchors, and access manholes, excavation and construction of surface penstock supports, and installation of the high pressure penstock;

- Powerhouse and generation equipment, including elevation, turbine type and capacity, including:
  - ✓ The EIS shall describe the construction of the powerhouse and tailrace structures (including blasting and excavation), installation of the turbines, generators, and mechanical systems, installation of electrical and telecommunications equipment, construction of the switchyard, and the installation of switchyard equipment;
- Transmission interconnection;
- Testing and commissioning of the project, including:
  - ✓ the 72-hour test required under an Energy Purchase Agreement with BC Hydro and testing the performance of the transmission line;
- Related infrastructure;
- Staging, borrow and spoil areas;
- Plant start up under various conditions including filling the headpond, filling the penstock, commissioning the turbine generator sets, intake operations (including the rubber weir, the Coanda screen, the sluice gate, the headgate and the trash racks), plant monitoring and control, and plant shutdown scenarios and methods; and
- A decommissioning or redevelopment plan shall be provided for all components that are of a temporary nature. This shall include including ownership, transfer and control of the different project components as well as the responsibility for monitoring and maintaining the integrity of some of the structures.

3.2 Transmission Lines and Substations

The EIS will include descriptions of the transmission line and related infrastructure for all relevant stages of development (e.g. construction and operation/maintenance, and decommissioning and abandonment (where appropriate)). The description will be accompanied by detailed drawings, including towers, conductor, stream crossings, right-of-way, etc….

The following detailed information shall be presented:

- the construction activities associated with the main trunk line, collector lines and the transmission corridor shared with the East Toba River and Montrose Creek transmission line;
- the installation of the line support structures, the electrical conductors and fixtures, and the proposed substation;
- Presentation of design criteria and construction plans for stream and other watercourse crossings along the transmission corridor;
- construction activities associated with the proposed substation located near the mouth of the Southgate River. The discussion shall include the survey of the transmission alignments and structure layout, establishment of staging areas, clearing and grubbing of new access trails, the requirement for and alignment of maintenance access routes, upgrade of existing access, alternative practices for right of way clearing and sediment and erosion control methods;

- brush clearing techniques;
- anticipated requirements for routine maintenance (including vegetation management along transmission lines, switchyard inspections, line and pole inspections, and erosion maintenance measures) and emergency maintenance of the transmission line corridor including responses to unscheduled outages;
- information on the planned use of chemical suppression techniques for vegetation along the transmission lines and maintenance access routes (if required); and
- a decommissioning or redevelopment plan shall be provided for all components that are of a temporary nature. This shall include including ownership, transfer and control of the different project components as well as the responsibility for monitoring and maintaining the integrity of some of the structures.

3.3 Access Roads and Related Infrastructure.

The EIS shall also provide a description of the project facilities and the activities associated with access roads and related infrastructure for all relevant stages of development (e.g. construction and operation/maintenance, and decommissioning and abandonment (where appropriate)). The description shall be accompanied by detailed drawings and cross sections, where relevant:

- access roads;
- barge landings (including the use of existing permanent barge landings at Homathko, Bear, Potato Point, Southgate and Orford and any necessary upgrades, and temporary barge landings);
- bridges;
- stream crossings
- rights of ways; and
- airstrips, including exact locations, uses and guidelines for use.

The following detailed information shall be presented:

- the survey of the existing road alignments in the Southgate, Orford, Homathko, Bear and Gargoyle River valleys which will be used to access the project facilities;
- establishment of staging and borrow areas and clearing and grubbing of the right of ways;
- erosion protection measures;
- the excavation (cut and fill) of new road sub bases (where required);
- the construction of new road bases;
- construction and/or upgrading of new bridges;
- plans for disposal of reactive waste rock generated encountered during excavation (if required;
- installation and/or upgrading of drainage structures and culverts;
- The EIS shall discuss maintenance activities associated with the operation of the access road corridor, including road grading and surfacing, vegetation ,management, ditching, inspection and maintenance of culverts and bridges;
- erosion control maintenance;
- signage;
- information on any use of chemical suppression techniques for vegetation along the access roads;
- a description of proposed road access control, both during operations and in the long-term; and

- a decommissioning or redevelopment plan shall be provided for all components that are of a temporary nature. This shall include including ownership, transfer and control of the different project components as well as the responsibility for monitoring and maintaining the integrity of some of the structures.

3.4 Ancillary Works and Activities

The EIS shall provide a description of both temporary and permanent ancillary works and activities associated with the project, including construction/work camps and related infrastructure, water supply, waste disposal, energy supply, radio towers, etc. The planning and nature of the decommissioning activities for temporary facilities, including ownership, transfer and control of the different project components as well as the responsibility for monitoring and maintaining the integrity of some of the structures. A decommissioning or redevelopment plan shall be provided for all components that are of a temporary nature.

3.5 Construction Schedule

The EIS shall provide a detailed estimated schedule for the construction of each facility and component of the project, focusing on anticipated major milestones. Decision trees will be presented, detailing a stream crossing selection method for project infrastructure such as bridges, culverts, transmission lines and water conveyance structures.

3.6 Labour Requirements

The EIS shall discuss the labour requirements for the proposed project throughout each phase of the project. The discussion shall include the major categories for labour pool requirements, such as:

- design engineers;
- civil contractors;
- mechanical/electrical contractors;
- transmission line contractors;
- transportation contractor;
- camp facility contractor; and
- environmental monitors.

3.7 Support Resources and Logistics

The EIS shall discuss the intended approach and associated logistics for the delivery of services required for each phase of the project. This will include such items as food and amenities, accommodations, water supply, waste disposal, material requirements (including equipment rental or supply), energy/fuel supply, transportation/traffic, communication requirements.

The EIS shall provide information regarding the location through which the majority of remaining resources and logistical support will be provided for each phase of the project. In considering which location will be used, the proponent shall give consideration to the availability of major services which may be required.

3.8 Project Benefits

This section of the EIS will discuss the benefits of the project, including:

- the production of renewable energy;
- employment and training opportunities for the construction and operation stage, including seasonal employment over the life of the project to maintain the transmission line right of way;
- water rental and land lease/purchase fees to the Province;
- payments to the regional tax base;
- local investment, including the use of local goods and services; and
- social and economic benefits to the public and Aboriginal people.

Where possible, information on the benefits of the proposed should be not be aggregated, but presented for each potentially affected municipality, regional district and/or Aboriginal community.

SECTION 4. Consultation

The proponent shall describe the ongoing and future consultations and the information sessions that it will hold or that it has already held within the context of the project at the local, regional and provincial levels, where applicable. It shall provide a summary of discussions, indicate the methods used and their relevance, the places where the consultation was held, the persons and organizations consulted, the concerns voiced and the extent to which this information was incorporated in the design of the project as well as in the EIS. Moreover, the proponent shall describe any outstanding issues and describe ways to address these outstanding issues. The proponent will also provide a description of efforts made to distribute project information and provide a description of information and materials that were distributed during the consultation process.

With respect to consultations associated with the identification of valued ecosystem components (VECs), the proponent shall identify those VECs, processes, and interactions that either were identified to be of concern during any workshops or meetings held by the proponent or the British Columbia Environmental Assessment Office, or that the proponent considers likely to be affected by the project. In doing so, the proponent must indicate to whom these concerns are important and the reasons why, including social, economic, recreational, and aesthetic considerations. The proponent must describe any issues raised or comments noted regarding the nature and sensitivity of the area within and surrounding the project and any planned or existing land and water use in the area. The proponent must also indicate the specific geographical areas or ecosystems that are of particular concern to interested parties, and their relation to the broader regional environment and economy.

Consultation should include discussions with the following groups, as appropriate:

- Aboriginal groups that may be affected by the project;
- Land owners affected directly by the project;
- Business owners affected by the potential effects of the project, including tourism and commercial recreation operators;
- Mineral tenure lease holders affected directly by the project;
- Forestry companies that have active tenures within the project area;
- BC Transmission Corporation;
- BC Hydro;
- City of Campbell River;
- City of Powell River;

- City of Sechelt
- Environment Canada;
- Integrated Land Management Bureau;
- Ministry of Environment;
- Ministry of Energy, Mines and Petroleum Resources
- Ministry of Forests and Range;
- Indian and Northern Affairs Canada;
- Fisheries and Oceans Canada;
- Transport Canada;
- Sunshine Coast Regional District
- Strathcona Regional District;
- Powell River Regional District;
- Powell River Regional Economic Development Society;
- Community Futures of Strathcona; and
- Vancouver Coastal Health Authority.

This section shall also demonstrate conformance with the provisions included in the Section 11 Order that has been issued for the project.

SECTION 5. Study Area Boundaries and Key Issues

Scoping establishes the boundaries of the EA and focuses the assessment on relevant issues and concerns. By defining the spatial and temporal boundaries, a frame of reference for identifying and assessing the environmental effects associated with the project will be established. Different boundaries may be appropriate for each VEC.

A description of the boundaries of the proposed project in a regional context showing existing and planned future land use, current infrastructure and proposed improvements to these infrastructure, including transportation (all modes), power distribution corridors and lines, urban areas and water supplies (individual and community), must be provided.

5.1 Identification of key issues

The EIS must explain and justify methods used to predict the effects of the project on each VEC, which includes biophysical and socio-economic components, the interactions among these components and on the relations of these components within the environment. The information presented must be substantiated. In particular, the proponent will describe how the VECs were selected and what methods were used to predict and assess the adverse environmental effects of the project on these components. The value of a component not only relates to its role in the ecosystem, but also to the value placed on it by humans. The culture and way of life of the people using the area affected by the project may themselves be considered VECs. The spatial and temporal boundaries used in the assessment may vary as appropriate, depending on the VEC.

The valued ecosystem components and valued socio-economic components that will be assessed in the EIS will include, at a minimum:

- fish and fish habitat, including salmon;
- water quality;
- water quantity;

- wildlife and wildlife habitat, including grizzly bears, mountain goats and species at risk such as a marbled murrelet;
- vegetation, including species at risk and old growth forests;
- physical and cultural heritage resources;
- Traditional territory and resource uses;
- industrial land and resource use;
- navigable waters;
- visual quality;
- tourism and commercial recreation use; and
- public recreational use.

This list of VECs should be modified as appropriate by the proponent in the EIS, following consultations with the public, Aboriginal groups, federal and provincial government departments and relevant stakeholders.

5.2 Spatial Boundaries

In determining the spatial boundaries to be used in assessing the potential adverse and beneficial environmental effects, the proponent must consider, but not be limited to, the following criteria:

- The physical extent of the proposed project, including any offsite facilities or activities;
- The extent of aquatic and terrestrial ecosystems potentially affected by the project;
- The extent of potential effects arising from noise, light and atmospheric emissions;
- The extent to which traditional land use and Aboriginal rights, including title or treaty rights, could potentially be affected by the project; and
- Lands used for residential, commercial, industrial, recreational and aesthetic purposes by communities whose areas include the physical extent of the project.

These boundaries must also indicate the range of appropriate scales at which particular baseline descriptions and the assessment of environmental effects are presented. The proponent is not required to provide a comprehensive baseline description of the environment at each scale, but must provide sufficient detail to address the relevant environmental effects of the project and the alternative means. The EIS must contain a justification and rationale for all boundaries and scales chosen.

The spatial study areas for the EIS must encompass the areas of the environment that can reasonably be expected to be affected by the project, or which may be relevant to the assessment of cumulative environmental effects. Study areas must encompass all relevant components of the environment, including people, non-human biota, land, water, air and other aspects of the natural and human environment, notably, traditional land use. Study boundaries must be defined taking into account traditional knowledge, ecological, technical and social considerations.

The proponent is advised to consult with federal and provincial departments and agencies, local government and Aboriginal people, taking into account public comments, to confirm the spatial boundaries used in the EIS.

The EIS shall identify the proposed spatial study boundaries for the VEC groups outlined in section 5.1.

5.3 Temporal Boundaries

The temporal boundaries of the project shall cover all phases of the project: construction, operation, maintenance, foreseeable modifications and, where relevant, the abandonment and decommissioning of works and the reclamation of the sites affected by the project. If the proponent does not believe the full temporal boundaries should be used, the EIS shall identify the boundaries used and provide a rationale for the temporal boundaries selected.

The approach taken to determine the temporal boundary of assessment should take into account the following elements:

- duration of the operational period;
- design life of engineered controls; and
- frequency and duration of natural events and human-induced environmental changes (e.g., seismic occurrence, flood, drought, glaciation, climate change, etc.).

SECTION 6. Project Setting

6.1 Physical Environment

The EIS shall detail the geophysical aspects of the Bute Inlet Hydroelectric project within the defined study area boundary. Unless specified, each of the following sections should be considered to include the setting of all relevant components of the scope of the project outlined in Part 1, Section 2.

6.1.1 Physiography And Topography

The EIS shall provide a description, supported with maps and drawings as appropriate, of the physiography and topography of all important terrain features in the project area.

6.1.2 Soils and Geology

The EIS shall describe soil characteristics and geology in the area of each of the relevant project components, supported with maps and drawings as appropriate.

Specific information included in the EIS should include erosion potential, soil classification, acid rock drainage and metal leaching potential. As required, geochemical testing shall be completed utilizing the Policy for Metal Leaching and Acid Rock Drainage at Mine Sites in British Columbia (MEM and MELP, 1998) and the Guideline for Metal Leaching and Acid Rock Drainage at Mine Sites in British Columbia (Price and Errington, 1998), and the results reported in the EIS. Where relevant, the information will include a description of the following elements:

- surficial geology;
- bedrock geology; and
- hydrogeology.

6.1.3 Natural Hazards

For appropriate components of the project, the EIS shall provide:

- terrain stability mapping consistent with methodology in RIC (1996);

- avalanche, landslide and debris flow potential, flood potential and other possible natural hazards potential; and
- a detailed assessment of the potential for seismic activity along local fault systems.

6.1.4 Atmospheric Environment

This section will include, without being limited to it, a description of the following elements within the defined study area boundary:

- the prevailing climate conditions, including the identification of available data sources (e.g. Meteorological Service of Canada, recording stations, etc.);
- the predominant wind conditions, including direction, velocity and seasonal variations, including severe outflow conditions; and
- precipitation, including the identification of available data on quantity, type, volume and frequency.

6.1.5 Surface Hydrology and Water Quality

The EIS shall provide an expanded description of the methods, analysis, and results of surface hydrology and water quality investigations within the defined study area boundary. Unless specified, each of the following sections will include all watercourses potentially affected by the project.

6.1.5.1 Hydrology

The EIS shall provide an expanded description of the methods, analysis, and results of the surface hydrology investigations within the defined study area boundary.

The EIS shall include:

- all current water uses and points of discharge for the facility watercourses and affected tributaries (e.g. recreation, fisheries, drinking water, etc.);
- a description of information on surface hydrological regimes, including the baseline information from stage stations;
- quantified estimates of baseline flow regimes;
- proposed extraction volumes to supply surface water to the project;
- a description of flows downstream of the intake; and
- hydrographs which demonstrate river flows before and after diversion throughout the calendar year.

These deliverables will be founded on principles of the methodology contained in the Assessment Methods for Aquatic Habitat and Instream Flow Characteristics in Support of Applications to Dam, Divert or Extract Water from Streams in British Columbia (Lewis et. al., 2004) and the Draft Guidelines for Instream Flow Measurements for Waterpower Projects (Land and Water BC, 2003). Additionally, baseline flow information will be supported by data collected from automated stream gauging stations that will be operated based on Manual for Standard Operating Procedures for Hydrometric Surveys in British Columbia (RIC, 1998).

Any alterations to these standard methodologies that were required to collect or interpret the hydrological data will be detailed in the EIS, with an accompanying indication of the reliability of the method and findings.

6.1.5.2 Water Quality

The EIS shall provide an expanded description of the methods, analysis, and results of the water quality investigations from the watercourses potentially affected by the project, including the marine environment.

The EIS will include, but not be limited to, a summary and discussion of water quality (e.g. standard water quality parameters, total gas pressure and temperature) at upstream control, mid facility, and downstream locations of each reach, as well as at marine barge landing sites.

The methodology used during the water quality studies will be based on Hatfield et al. (2007), Lewis et. al (2004) as well as Guidelines for Designing and Implementing a Water Quality Monitoring Program in British Columbia (RIC, 1998a), Ambient Freshwater and Effluent Sampling Manual (RIC, 1997) and Guidelines for Interpreting Water Quality Data (RIC, 1998b).

Any alterations to these standard methodologies on the collection or interpretation the water quality data will be detailed in the EIS, with an accompanying indication of the reliability of the method and findings.

6.2 Aquatic Environment

The EIS shall provide an expanded description of the methods, analysis, and results of studies designed to investigate aquatic habitat, fauna and any threatened or endangered species within the defined study area boundary. Unless specified, each of the following sections should be considered to include all the watercourses potentially affected by the project and footprint of the marine barge landing sites.

6.2.1 Aquatic Habitats

For the relevant spatial boundaries, the EIS will include, but not be limited to, a description of the following elements:

- an overview description and analysis of aquatic habitats;
- a description of aquatic environment and available aquatic habitat;
- the locations and descriptions of barriers to fish passage on all facility watercourses, presented on maps and diagrams, with supporting photographs;
- a description of marine environments associated with the footprint of the barge landing facilities (e.g. marine mammal, subtidal and intertidal habitats);
- the identification and documentation of existing wetlands, estuaries, ponds, streams, lakes and rivers;
- the identification and description of any sensitive aquatic habitat (if present);
- the identification and description of any remediation, disruption or destruction of aquatic habitat caused by existing access roads;
- a conceptual habitat compensation plans; and
- instream flow measurements that take into account the habitat requirements of aquatic and riparian-dependent species.

Aquatic habitats will be characterized by identifying and classifying all stream reaches (e.g. confinement, order, pattern, and gradient) in all catchments. The main intake, powerhouse site and diversion section of each facility will be mapped to aid in identification of reach breaks,

obstructions, cascades, and riparian area boundaries. Field investigations will include the collection of physical habitat characteristics.

These deliverables will be founded on principles of the methodology contained in the following guidance documents:

- Guidelines for the collection and analysis of fish and fish habitat data for the purpose of assessing impacts from small scale hydro power projects in British Columbia (Hatfield et al., 2007);
- Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures - Version 2.0 (RIC, 2001a);
- Fish Habitat Assessment Procedures (Johnston and Slaney, 1996);
- Fish-Stream Identification Guidebook, second edition version 2.1 (FPCBC, 1998);
- Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures - Version 2.0 (RIC, 2001b); and
- Fish Habitat Assessment Procedures (Johnston and Slaney, 1996).

Any alterations to the referenced methodologies for the collection or interpretation of the aquatic habitat information will be detailed in the EIS, with an accompanying indication of the reliability of the method and findings.

The generalized approach that will be used to direct the studies should include:

- Initial surveys conducted to identify and evaluate fish and aquatic habitat in the study area (considering weather conditions and terrain hazards);
- Detailed surveys designed and conducted based on results of initial surveys, fish species/life stage encountered and their utilization of the study area (e.g. spawning surveys, snorkel surveys, etc); and
- Timing and methodology of detailed surveys based on selected species/life stage of concern in the study area and will vary accordingly.

6.2.2 Aquatic Fauna

The EIS shall include, but not be limited to, the following:

- a description of marine habitat use and species presence (e.g. fish, invertebrates, marine mammals and shellfish) in the footprint of the barge landing facilities;
- the historical review and literature survey of freshwater fish species and their distribution in the project area, and a determination of presence/absence of non-anadromous fish species from the headpond area and diversion reach;
- a description of habitat use by the resident fish species;
- a description of fish bearing tributaries in the project footprint area and fish species distribution;
- the determination of presence/absence of anadromous fish species from the headpond area and diversion reach;
- a description of any existing fisheries (commercial, subsistence, sport fishing) in the area;
- the collection and analysis (according to standard methods) of benthic drift samples from select sites on each of the project creeks/rivers and will be analyzed; and
- in consultation with the BC Conservation Data Centre and Fisheries and Oceans Canada. the identification and description of any federally and/or provincially listed aquatic species at risk in the project impact area, including:

- ✓ species listed by the Committee on the Status of Endangered Wildlife in Canada classification as endangered, threatened, or of special concern;,
- ✓ species listed on Schedule 1 of the federal *Species at Risk Act*; and/or
- ✓ Red or Blue listed species according to the BC Conservation Data Centre.

These deliverables will be founded on principles of the methodology contained in the following guidance documents:

- Guidelines for the collection and analysis of fish and fish habitat data for the purpose of assessing impacts from small scale hydro power projects in British Columbia (Hatfield et al,. 2007);
- Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures - Version 2.0 (RIC, 2001a);
- Fish Collection Methods and Standards - Version 4.0 (Resources Information Standards Committee, 1997);
- Fish Habitat Assessment Procedures (Johnston and Slaney, 1996);
- Field Identification of Coastal Juvenile Salmonids (Pollard et al., 2006);
- Fish-Stream Identification Guidebook, second edition version 2.1 (FPCBC, 1998); and
- Reconnaissance (1:20,000) Fish and Fish Habitat Inventory: Standards and Procedures - Version 2.0 (RIC, 2001b).

Any alterations to the referenced methodologies for the collection or interpretation of the aquatic habitat information will be outlined in the EIS, with an accompanying indication of the reliability of the method and findings.

The generalized approach that should be used to direct the studies consists of:

- Initial surveys conducted to identify and evaluate fish and aquatic habitat in the study area (considering weather conditions and terrain hazards);
- Detailed surveys designed and conducted based on results of initial surveys, fish species/life stage encountered and their utilization of the study area (e.g. spawning surveys, snorkel surveys, etc); and
- Timing and methodology of detailed surveys based on selected species/life stage of concern in the study area and will vary accordingly.

6.3 Terrestrial Wildlife and Vegetation

The EIS shall provide a description of the methods, analysis, and results of studies designed to investigate terrestrial wildlife within the study area boundary. Unless specified, each of the following sections should be considered to include all the area within the project study boundary. This section will include a description of terrestrial habitat and will provide a detailed discussion of the biophysical characteristics of the catchments. Habitat mapping (1:20,000) based on acceptable biophysical/vegetation parameters will form a framework for the assessment of potential impacts. The information provided will include a review of existing data. Expected information sources should include, but not be limited to, the following:

- ✓ Recent satellite photography and/ or air photos;
- ✓ Digital Terrain Resource Information Management (TRIM) base mapping;
- ✓ Government reporting and mapping; and
- ✓ Privately held reporting and mapping (i.e. repositories with forestry companies, Aboriginal people).

Ground truthing (field confirmation) will be conducted to confirm assumptions made in the draft mapping. Any sensitive habitats potentially impacted by the Project, such as wetlands and estuaries will be visited, photographed and described using standard methodology (MOE and MOF, 1998).

6.3.1 Wildlife and Wildlife Habitat

The EIS shall include, but not be limited to, the following:

- an overview of valued wildlife in the study area, including;
  - ✓ the identification and description of federally and provincially listed wildlife species at risk, including:
    - o species listed by the Committee on the Status of Endangered Wildlife in Canada classification as endangered, threatened, or of special concern;
    - o species listed on Schedule 1 the federal *Species at Risk Act*.
    - o Red or Blue provincially listed species according to the BC Conservation Data Centre;
  - ✓ wildlife species identified under the provincial *Forest and Range Practices Act*; and
  - ✓ species deemed to be regionally important (prioritized by government agencies, public concern, or Aboriginal groups) whose known range overlaps the project, and for which suitable habitat may be present;
- a description and results of seasonal bird surveys for both breeding and winter use, using standardized methods (e.g., RIC, 1999), including marbled murrelet radar studies during the breeding season;
- description and identification of any migratory bird species that may be present in the project area;
- a review and summary of all available existing information for each terrestrial VEC (vertebrate and invertebrate), including a description of habitat use and habitat requirements, if available;
- a description and results of surveys for riverine birds (e.g., Harlequin Duck) (RIC, 1998c);
- a description of known constrained areas such as year-round protected nest sites (e.g., bald eagle, marbled murrelet, peregrine falcon), wildlife habitat areas (proposed and established), ungulate winter ranges, parks, old growth management areas, and ecological reserves;
- the inventories of existing terrestrial wildlife species (e.g. for mammals, amphibians, reptiles, birds, etc.), including known location records from the BC Conservation Data Centre;
- a description of habitat use and requirements for the resident wildlife species in the area;
- the mapping of existing wildlife VEC species distributions;
- the mapping of parks, reserves, management areas, conservancies, unique and sensitive ecological sites, wetlands, areas of concentrated use by wildlife, known and potential migration routes, and federal lands;
- the description of temporal and spatial habitat use by selected species of concern, based on habitat suitability;
- the descriptions and delineations of suitable wildlife habitat, as defined by SARA, in the study area and its relation to the project;

- the comparison of the footprint of the proposed project overlain with habitat suitability mapping of watersheds to identify any potential disruption of high quality habitat of federally or provincially listed species at risk; and
- the results of targeted wildlife surveys if existing information is incomplete or insufficient. These results will be used to assess impacts in detail and to prescribe mitigation.

6.3.2 Vegetation

The section of the EIS will include, but not be limited to, the following:

- an overview of valued, sensitive and rare plants and plant communities in the study area,, including:
  - ✓ federally and provincially listed species at risk, including:
    - o species listed by the Committee on the Status of Endangered Wildlife in Canada classification as endangered, threatened, or of special concern;
    - o species listed on Schedule 1 of the federal *Species at Risk Act ;*
    - o Red or Blue provincially listed species according to the BC Conservation Data Centre;
  - ✓ vegetation species identified under the provincial *Forest and Range Practices Act*; and
  - ✓ species deemed to be regionally important (prioritized by government agencies, public concern, or Aboriginal people) whose known range overlaps the project area;
- a review and summary of all available existing information for each VEC, including a description of habitat requirements, if available;
- inventories of rare plants and plant communities, including known location records from the BC Conservation Data Centre; and
- descriptions and delineations of sensitive habitats and its relation to the project.

6.4 Human Environment

The EIS shall detail land use associated with the project within the study area boundary. Unless specified, each of the following sections should be considered to include all project components described in the scope of project in Part I, Section 2 of this document.

One of the important questions to consider in the EA is the increased access to the study area as well as the conflicts in usage that may ensue. In addition, the proponent shall consider the changes made to the practice of activities in the short and long term. The data used shall come from multiple sources including land users and local and regional government agencies.

6.4.1 Land Use

The EIS shall describe, at a minimum, the following:

- the current land uses in the study area;
- the prevailing land use regime and all land use designations by Aboriginal people, federal, provincial, and local government;
- any current or proposed planning initiatives in the project area;
- the location of camps, regardless of the degree of permanence;

- the location and description of protected areas in the region, including but not limited to, the Homathko Estuary Provincial Park,
- the location and description of logging or mining sectors, quarries and borrow areas, outfitting operations and vacation leases, as well as any other type of occupation of the territory;
- the areas with mining potential and the existing mining rights or mining leases;
- the location of any shellfish and finfish aquaculture facilities in the project area;
- the frequency of land use (e.g., hunting, trapping, fishing, logging, preservation, tourism or commercial recreation uses, boating, vacationing), including harvesting of species for the practice of hunting, fishing, trapping and gathering;
- the location of the hunting grounds affected by the project. The EIS shall describe the quality and the extent of the affected habitats on these hunting grounds in terms of species, abundance and interest for the local populations;
- the spatial relationship between the proposed project and existing land status and use;
- Crown land requirements for the project;
- any private land acquisition needed for the project;
- measures required to resolve any potential conflicts of various project components with pre-existing land uses (e.g. mineral claims, crown land, commercial recreation tenures, etc.); and
- a map illustrating the primary transportation and travel axes in the study area (canoe routes, winter roads, etc.) that are known and used frequently.

6.4.1.1 Navigable Waters and Navigation

The EIS shall identify the river dimensions at the proposed points of crossing, and the location of any existing man made or natural obstructions within the creek or its tributaries that are deemed navigable by a Navigable Waters Protection Officer within the defined study area boundary.

The proponent shall consider the Aboriginal and local communities knowledge of navigation in the project area and shall include a description of this knowledge. This section of the EIS will describe the sectors currently used for navigation and identify those that would become dangerous or not accessible following project construction. This assessment will take into account the types of users.

Supporting information will include, but not be limited to, the following:

- detailed information and design drawings of proposed crossing and instream structures including:

  ✓ location of any proposed works;

  ✓ name of waterway;

  ✓ mapping coordinates of the proposed crossing points and instream structures (latitude/longitude);

  ✓ Applicable chart and topographic map number;

  ✓ legal descriptions;

  ✓ physical characteristics of the waterway, i.e., length, width, depth, seasonal flow and fluctuations;

  ✓ gradient at crossing site;

  ✓ construction methodology; and

- ✓ photographs of any proposed crossing sites;

- a description of any crossings in the pathway of transmission corridor that may involve Navigable Waters or transportation;
- detailed information (as specified above) and design drawings of proposed aerial crossings or instream structures;
- detailed information (as specified above) and design drawings of proposed bridge crossings structures;
- description of any crossings in the pathway of the access road that may involve Navigable Waters or transportation;
- description of any barge facilities that may impact on Navigable Waters or transportation;
- a record of consultation conducted with the Navigable Waters Protection Division, Transport Canada regarding the design flood level for structures crossing streams in the catchment; and
- a description of all known current, past, or likely future usage for navigation.

6.4.1.2 Tourism and Commercial Recreation Activities

The proponent shall describe the tourism and commercial recreation activities practiced in the study area including ecotourism, adventure tourism, backcountry tourism, sport and recreational hunting and fishing activities, outdoor activities (canoeing, kayaking, hiking, camping, etc.), wildlife viewing, scuba diving, resorts. The proponent shall identify those sectors where elements of the study area are of special recreational interest.

The proponent shall present the profile and the number of persons practicing these activities, the sites used, the frequency and duration of the activities, the period of the year, the practices and expectations of users, as well as the economic contributions to Aboriginal and local communities. For sport hunting and fishing activities, the portrait will also include the species sought and, where possible, the hunting and fishing success.

The proponent shall describe the existing infrastructure in place which makes it possible to practice these activities and identify the stakeholders operating recreational-tourism enterprises in the study area. The various organizations involved in tourism and commercial recreation development of the region will be identified including, if possible, the location and description of their development.

6.4.2 Landscape

The proponent shall describe the topography and interesting elements of the landscapes in the study area..

Section 7.5 requires the EIS to identify the effects on the visual environment and the changes in the aesthetic quality of the landscape. With this objective in mind and to clearly grasp the intensity of the effects, the proponent shall present visual simulations prior to the beginning and at the end of the construction, of the main points of interest that it will have identified.

The proponent shall also indicate the manner in which the works and infrastructures of the project will be integrated into the landscape.

6.4.3 Archaeological and Historical Resources

The EIS will include a general description of the historical and archaeological resources of the region. Specific historical and archaeological studies relating to known and/or suspected resources shall be conducted within the defined study area boundary. If any issues arise at any of the sites, the EIS will document how the issues will be addressed at each of the relevant site. These studies should be prepared by a professional archaeologist or historical resource consultant. The information provided will include, but not be limited to, the following:

- an overview of regional archaeological knowledge with an emphasis on land use through time;
- a preliminary overview of the region's post-contact history with an emphasis on historical land use;
- an identification of all known historical/archaeological resources in the project area;
- an analysis and evaluation of the significance of known resources and their relationship to the landscape;
- a landscape analysis of the area and preparation of a system for ranking the sensitivity of archaeological and historical resources. Areas of potential impact should be evaluated utilizing the ranking system and should include detailed mapping clearly showing the evaluation of the sensitivity of the potential impact areas to contain historical and/or archaeological resources;
- a summary of consultation with appropriate Aboriginal groups and an evaluation of their interests in this area;
- the identification and description of the nature, significance, and extent of archaeological resources in potential conflict with the project development and/or which may be adversely impacted by project activities; and
- the provision of management recommendations to address identified conflicts in order to minimize or avoid potential adverse impacts to archaeological resources subject to the BC *Heritage Conservation Act* and those otherwise of concern to Aboriginal groups.

6.4.4 Socio-Community Profile And Population Demographics

The EIS shall document the existing population distribution, demographics, and social profile within the project boundaries as well as in the nearest community and urban centers to the project areas. This description shall include both Aboriginal and non-Aboriginal communities.

6.4.4.1 Housing

The EIS shall describe the existing housing and accommodation supply in the region surrounding the project. The description will focus on areas within or near the project that may be utilized by the project workforce during project development, construction, and operation.

6.4.4.2 Services

The EIS shall provide a brief description of existing services, such as education, justice, policing, fire protection, social support services, health and emergency services within the project boundaries, and at a regional scale.

6.4.4.3 Socio-Economics

In describing the socio-economic environment, the proponent will provide information on the functioning and health of the socio-economic environment, encompassing a broad range of matters that affect the people and communities in the study area. The EIS will include a description of the following elements:

- the local and regional economy, including economic drivers within the project boundaries, and at a regional scale (e.g. Powell River and Campbell River);
- the regional labour market, including unemployment rates, labour supply, and training opportunities;
- the existing economic undertakings in the area that could be affected by development of the project;
- a description of the public health setting, including the identification of existing hospitals, clinics, ambulance stations, or other emergency services that may be relied upon during development, construction, and operation of the project; and
- a description of the baseline factors affecting public health setting of the project, including existing water quality, water supply, and waste disposal.

6.5 Aboriginal Considerations

The EIS must identify the lands, waters and resources of specific social, economic, archaeological, cultural or heritage value to Aboriginal people, including Métis, that assert Aboriginal rights, including title and treaty rights or in relation to which Aboriginal rights, including title and treaty rights have been established and that may be affected by the project. The EIS must identify traditional activities, including activities for food, social, ceremonial and other cultural purposes, in relation to such lands, waters and resources with a focus on the current use of lands, waters and resources for traditional purposes, and the sites and features of the landscape associated with such uses. Traditional land use may include areas where traditional activities such as camping, travel on traditional routes, gathering of country foods (hunting, fishing, trapping, planting and harvesting) activities were carried out. The proponent should provide information that would include a description of traditional dietary habits and dependence on country foods and harvesting for other purposes, including harvesting of plants for medicinal purposes. The analysis should focus on the identification of potential adverse effects of the project on the ability of future generations of Aboriginal people to pursue traditional activities or lifestyle.

6.5.1 Identification of Aboriginal People Potentially Affected by the Project

Aboriginal people that may be affected by the project will be identified in the EIS. Potentially affected Aboriginal people include those where any component of the proposed project will be located within their identified traditional territory.

The geographic limits of the analysis undertaken to address considerations of Aboriginal people will be provided, supported with maps as required. The study area will take into consideration the traditional territories of each Aboriginal group, relative to the proposed project footprint.

6.5.2 Consultation with Aboriginal People

A summary of the completed, ongoing, and future consultation with Aboriginal people will be provided.

6.5.3 Traditional Use Issues

The EIS will discuss traditional uses within the study area, as provided through consultation with the Aboriginal groups. Any traditional use information that is deemed to be sensitive by the respective Aboriginal groups will be described to the level of detailed allowed by the group. Confidential data will not be discussed in the EIS, as outlined in the Guiding Principles.

Traditional land use areas can include:

- places were animals were harvested;
- places were plants were harvested;
- places where rocks and minerals were collected for tools, weapons, medicines, etc…;
- important animal populations;
- notable animal use areas (ex. salt licks, breeding grounds, staging areas);
- repetitive animal habitat areas (ex. beaver ponds);
- habitation sites;
- burial groups and grave sites;
- spiritual places, includes places where people have died and places used for spiritual training;
- travel and trade routes, non-timber resources, such as cedar strips, as indicators of timber resource harvesting sites.

Traditional use areas can relate to the use of certain specific locations within the overall traditional territory of an Aboriginal group.

6.5.4 Contemporary Use Issues

The EIS will discuss the contemporary use of land and resources within the area by Aboriginal groups, as provided through consultation with potentially affected Aboriginal groups. Any contemporary use information that is deemed to be sensitive by the respective Aboriginal groups will be described to the level of detailed allowed by the group. Confidential data will not be discussed in the EIS, as outlined in the Guiding Principles

6.5.5 Aboriginal Rights and Title

A discussion of the Aboriginal rights, including title and treaty rights, supported with maps as appropriate, will also be provided in the EIS.

6.5.6 Aboriginal Archaeological Resources

This section of the EIS shall include a discussion of the archaeological findings in the project impact area that are of particular interest to Aboriginal people.

SECTION 7. Impact Assessment

7.1 Impact Assessment Methodology

This section will describe the project's effects on the environment, social, economic, health and heritage values and on Aboriginal people. Potential effects from all components of the project include in the scope of project (Part 1, Section 2) shall be discussed. The proponent shall indicate the project's effects during construction, operation, maintenance, foreseeable modifications and, where relevant, the closure, decommissioning and restoration of temporary sites and facilities associated with the project, and describe these effects using appropriate criteria. The proponent shall consider both the direct and indirect, reversible and irreversible, short- and long-term and cumulative environmental effects of the project. In predicting and assessing the project's effects, the proponent shall indicate important details and clearly state the elements and functions of the environment that may be affected, specifying the location, extent and duration of these effects and their overall impact. This assessment shall focus primarily on the key issues identified in Section 5.1.

In undertaking the environmental effects assessment, the proponent will use best available information and methods. All conclusions must be substantiated. Predictions shall be based on clearly stated assumptions. The proponent shall describe how it has tested each assumption. With respect to quantitative models and predictions, the proponent shall discuss the input that underlie the model, the quality of the data and the degree of certainty of the predictions obtained.

The assessment shall reveal the environmental effects of the project, the mitigation measures proposed to be implemented and an assessment of the effectiveness of those measures. Where mitigation measures are proposed to be implemented for which there is little experience or for which there is some question as to their effectiveness, the potential risks and effects to the environment should those measures not be effective should be clearly and concisely described.

An impact matrix methodology in combination with identification of VECs will be used to evaluate various social and environmental impacts of the proposed project. The Impact Assessment will include the following general steps:

1. Identification of the activities and components within the scope of the project;
2. Predicting/evaluating the potential environmental effects on identified valued ecosystem components;
3. Identification of mitigation measures for each potential environmental effect;
4. Determination of residual effects;
5. Ranking of any residual environmental effect based on various criteria; and
6. Determination of the potential significance of any residual environmental effect following the implementation of mitigation.

The proponent is expected to employ ecological risk assessment frameworks that categorize the levels of detail and quality of the data required for the assessment. These tiers are as follows:

- Tier 1: Qualitative (Expert opinion, literature review, and existing site information);
- Tier 2: Semi-quantitative (Measured site-specific data and existing site information); and
- Tier 3: Quantitative (Recent field surveys and detailed quantitative methods).

Thus, if the Tier 2 assessment still indicates a potential for effects to valued ecosystem components then a Tier 3 assessment would need to be conducted to reduce the level of uncertainty. If the risk characterization component is uncertain this may necessitate the probabilistic modelling of the fish and wildlife population level consequences of the proposed project.

The consideration of views from the public and Aboriginal groups, including any perceived changes attributed to the project, must be recognized and addressed in the assessment method.

The proponent will present as accurately as possible the anticipated effects of the project on the elements described in Sections 2 to 6. More specifically, the assessment shall, without being limited thereto, address the elements discussed in the following sections.

7.2 Effects on the Physical Environment

- any geomorphological characteristics (erosion of the banks and riparian vegetation, the transport and deposit of sediments caused, for example, by variations in flows and levels (frequencies and amplitudes) and the ice regime, sediment assessment by segment of rivers, degradation and aggradation sectors as well as the characteristics over time and space of the new dynamic balance) of the affected rivers and their tributaries;
- any modification of the hydrogeological conditions close to the works (generating stations, weirs);
- the potential effects on the estuarine and marine environment of Bute Inlet;
- any modifications to the thermal regime and ice regime;
- any loss of areas considered as “carbon sinks”;
- any project’s contribution to atmospheric emissions, including emissions profile (type, rate and source) for each component of the project; and
- any expected annual and total greenhouse gas (GHG) emissions and the project’s contribution to total provincial and national GHG emissions on an annual basis.

7.3 Effects on the Aquatic Environment

- any geomorphological changes and their effects on hydrodynamic conditions and fish habitats (e.g., modification of substrates, dynamic imbalance, silting of spawning beds, etc.);
- any effects of the physical-chemical changes of the aquatic environment on fish and their habitat (turbidity, oxygen, etc.), such as supersaturation of dissolved gas downstream from release structures, if present;
- any hydrodynamic modifications of effected river sections with respect to fish habitat under various operating and hydrological conditions;
- any modifications of hydrological conditions on fish habitat and on the fish species’ life cycle activities (e.g., reproduction, fry-rearing, movements, etc.);
- any anticipated changes in the composition and characteristics of the populations of various fish species, includes shellfish and forage fish following modifications to the aquatic environment;
- any potential impacts on riparian areas that could affect aquatic biological resources and productivity taking into account any anticipated modifications to fish habitat;
- the identification of any potential harmful alteration, disruption or destruction of fish habitat, including the calculations of any potential habitat loss (temporary or permanent) in terms of surface areas (e.g., spawning grounds, fry-rearing areas, feeding, etc.);

- Instream flow requirement (IFR) guidelines will be explained and compared to the projected calculations (Hatfield *et. al*., 2007);
- the changes in activities related to the life cycle of fish (e.g., migration, reproduction) caused by hydrological changes;
- any effects to critical zones for the life cycle of fish caused by the alteration of stream flows during project operation;
- any alteration to fish habitat resulting from the refurbishment or installation of watercourse crossing structures;
- any modifications in the use of the environment by estuarine and marine fish with respect to their life cycles (e.g., migration, spawning, emergence);
- any modifications in migration or local movements (upstream and downstream migration, and lateral movements) following the construction and during the operation of works (physical and hydraulic changes) both in the main watercourse and the tributaries
- assessment of potential fish entrainment;
- the identification of any potential stream crossing works and their construction and post construction impacts on aquatic habitat;
- the identification of water bodies potentially affected by the transmission line corridor and potential impacts on fish and shellfish populations;
- any modification to the use of estuarine and marine habitats by fish and marine mammals with regard to their life cycles; and
- any modifications and use of the environment and habitats used by listed aquatic species.

7.4 Effects on Wildlife and Vegetation

- any current and predicted level of habitat fragmentation for the study area and the assessment of the extent of effects caused by fragmentation on key valued wildlife;
- potential effects on wildlife populations, habitat use, habitat availability and quality and food supply, including in particular, grizzly bear and mountain goat;
- any spatial and temporal changes to habitat (cover types, ecological land unit in terms of quality, quantity, diversity and distribution) and to wildlife distribution, relative abundance, movements, habitat availability and the potential to return the area to pre-disturbance wildlife habitat and population conditions, including:
    - ✓ anticipated effects on wildlife due to improved or altered access into the area and the level of vehicle movements both on designated routes and at random over the landscape (e.g., vehicle collisions with wildlife, obstructions to daily or seasonal movements, dust and noise);
    - ✓ anticipated effects of habitat fragmentation and structure changes in vegetation communities and the implications to wildlife, by identifying and mapping the changes anticipated by the project and other planned activities;
- for each habitat unit, the potential effects of the project on provincially and federally listed species at risk and their critical habitat, including:
    - ✓ species listed by the Committee on the Status of Endangered Wildlife in Canada classification as endangered, threatened, or of special concern;
    - ✓ species listed on Schedule 1 of the federal *Species at Risk Act*, in particular, marbled murrelet*;*
    - ✓ Red or Blue provincially listed species according to the BC Conservation Data Centre;

- where plant communities or ecological land unit classes are identified as rare, or where a significant percentage of a specific type may be removed by the project or fragmented by the disturbance footprint, describe the regional significance of those units and the anticipated effects;
- any effects of the project on old-growth habitat and old-growth dependent species;
- losses, structural changes, or fragmentation of habitat (quality, area, functions) for avian species and communities;
- collision risk of migratory birds with transmission line infrastructure;
- modifications in the abundance, distribution and productivity of land mammals;
- losses of area, fragmentation and functions of wetlands;
- any effects of the project on biodiversity, including:

  ✓ the contribution of the project to any anticipated changes in regional biodiversity including measures to minimize such change;

  ✓ how changes in biodiversity and endemism if any could potentially affect local and regional ecosystems;

- the potential effects of any increased road dust levels if any on potentially-affected communities, wildlife and vegetation; and
- description of forest succession planning for the transmission line.

7.5 Effects on Human Environment

- any potential impacts on local socio-economics issues, including;

  ✓ any potential project impacts on human demographics in the area;

  ✓ any potential impacts on availability of local labour;

  ✓ any potential impacts on housing and property values;

  ✓ any effects caused by the influx of workers on local service (e.g. education, justice, policing, fire protection, social support services and emergency) or community infrastructures such as roads, water supply, parks and other natural sites of particular interest; and

  ✓ local, regional and provincial economic spin-offs associated with the project and other economic factors (positive and negative) that affect the population (job opportunities, development of related services, local procurement, land and property values) as well as businesses and local government;

- any potential impacts on human health associated with air quality, potential contamination of country foods, drinking water quality, electric and magnetic fields, and noise exposure;
- any effects of the work on the physical and cultural heritage, including effects on important archaeological assets;
- any effects on the visual environment and the effects that changes to the aesthetic quality of the landscapes will have on businesses which rely on the aesthetic and recreational interest of the area. The EIS shall consider the effects of the project on the aesthetic and recreational interest and potential and shall specify the steps that will be taken to maintain the aesthetic and recreational interest of the zones affected by the various components of the project. This assessment will include the perspective of pertinent parties (e.g. outfitters, lodge owners, fishing guide operators, sightseeing tour operators, etc.);
- any potential effects on unique sites or special features such as environmentally sensitive areas, reserves or protected areas;

- any potential effects of the project on land uses;
- any potential impacts of the development on navigable waters, including where relevant:
  - ✓ the distinction between the various types of navigation and boats (commercial, recreational, traditional) taking into account these distinctions in the descriptions and the assessment of the effects.
  - ✓ maps identifying zones that are at risk or impassable as well as navigable segments of the affected rivers;
  - ✓ maps identifying anticipated water level reductions as well as their location on navigable watercourses affected by the project;
  - ✓ a table showing the current average depths and the anticipated reductions as well as their location on various navigable segments of the affected watercourses;
  - ✓ a map indicating current and planned access to affected rivers; and
  - ✓ a table showing current and anticipated mean monthly flows and the influence of these flows on navigability at critical sites;
- any potential impacts to forestry and logging operations; and
- any anticipated effects related to changes in public access, if any, effects on hunting, trapping, and gathering activities, and any beneficial effects.

7.6 Effects on Aboriginal Rights and Interests

- the EIS shall provide a discussion of potential social and/or economic effects to Aboriginal groups that may arise as a result of the project. Based on information provided by First Nations, or, if First Nations do not provide this information, on available information from other sources, the proponent will identify potential effects on current and traditional uses of land and resources by aboriginal people;
- the EIS will consider effects on hunting, fishing, trapping and other traditional uses of the land (e.g. collection of medicinal plants, use of sacred sites, etc.), as well as related effects on lifestyle, culture and quality of life of First Nations and measures to avoid or mitigate effects on traditional uses;
- the EIS will consider the effects of alterations to access into the area on Aboriginal groups, including deactivation or reclamation of access roads;
- the EIS shall consider the effects of the project on heritage and archaeological resources in the project area that are of importance or concern to Aboriginal groups; and
- The EIS will review what factors may inhibit or foster economy and other benefits to First Nations communities.

7.7 Other Effects to Consider

7.7.1 Potential Accidents and Malfunctions

The proponent will therefore conduct an analysis of the risks of accidents and malfunctions, determine their effects and present a preliminary emergency measures plan for the construction and operation phases of the works to be built and for existing works that will be modified.

The proponent shall examine all factors that could compromise or improve safety conditions in areas affected by the project. The following factors in particular shall be addressed:

- **Works:** The proponent shall study any possible dangers to users of the study area or consequences to the environment resulting from construction, start-up and operation of

the works, no matter what the origin of these dangers may be (blasting, seismicity, outflow conditions, precipitation, act of commission or omission, modification of river flow, hazardous wastes and other);

- **Fires:** The proponent shall study fire hazards related to construction and operation of the works and to increased human presence in the study area. The consequences of an increased number of forest fires in the region shall be evaluated;
- **Roads:** The proponent shall study the risk of road accidents for wildlife as well as for humans, including hazardous materials spillage; and
- **Waterways:** The proponent shall study the potential dangers of using waterways in all seasons, particularly in areas of increased flow and around the tailrace canals.

The proponent shall describe the maintenance and monitoring programs for the works, including related developments and facilities, designed to reduce the risk of accidents, including:

- limiting access to the sites;
- safety installations (monitoring, emergency shutdown and fire-control systems, emergency power systems, etc.) and control measures;
- devices to detect abnormalities in dams and how they operate; and
- guidelines for re-evaluating the updating the maintenance and monitoring programs.

The proponent shall pay special attention to the sensitive elements of the environment (e.g., homes or lodges, natural sites of interest, areas of major use, etc.) that may be affected, in the event of an accident or a major malfunction.

Moreover, the proponent shall present a preliminary emergency measures plan making it possible to react adequately in the event of an accident. An emergency measures plan generally addresses the following elements:

- for manned generating stations, the plans for alerting and evacuating the employees;
- for unmanned generating stations, plans for alerting and notifying company officials and mobilizing emergency personnel to the site;
- pertinent information in the case of an emergency (persons in charge, equipment available, plans and maps to locate works, etc.);
- the company's internal emergency intervention structure and decision-making mechanisms;
- the means of communication with the external emergency preparedness organization;
- the measures envisaged to protect the populations that could be affected;
- the means to quickly alert populations that could be affected, in collaboration with the municipal and governmental organizations concerned (advising public authorities of the alert and subsequent information about the situation; and
- the program to update and re-evaluate emergency measures.

This plan shall address the main actions to deal with crisis situations. It shall describe the dangers to the safety of individuals and property, describe the planned measures to protect the population and the environment in the event of an accident and indicate the type of expertise required on site. The proponent shall explain how these measures will be presented to the communities concerned.

The preliminary plan shall clearly indicate the link with municipal and Aboriginal authorities, communication mechanisms, as well as the integration potential with the emergency plans of

local communities. If an emergency plan has already been submitted for a given territorial unit, it can be updated to incorporate the new development.

For those accident scenarios having consequences, real or anticipated, on the neighbouring population, the proponent must make sure to implement coordination measures with the communities concerned. A final emergency measures plan must be submitted by the proponent prior to the commissioning of the project. It shall indicate how the proponent plans to ensure the protection of the population and the environment if a major accident were to occur or if an unusual situation (weather-related or other) were to arise.

7.7.2 Effects of the Environment on the Project

The definition of an 'environmental effect' under the *Canadian Environmental Assessment Act* includes any change to the project that may be caused by the environment. The assessment must take into account how local river conditions and natural hazards, such as severe and/or extreme weather conditions and external events (e.g., flooding, ice jams, rock slides, avalanches, fire, outflow conditions and seismic events) could adversely affect the project. Longer-term effects of climate change must also be discussed up to the projected post-closure phase of the project.

Consideration of applicable climate elements must include, but not be limited to:

- An estimate of its importance to the project;
- An estimate of how sensitive the project is to variations of this element, including a review/analysis of predicted flow regimes with climate change; and
- A discussion of climate data used.

The sensitivity of the project to long-term climate variability and effects must be identified and discussed. The Canadian Environmental Assessment Agency Procedural Guide, *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners* (November 2003), provides guidance for incorporating climate change considerations in an EA.

The EIS will provide details of a number of planning, design and construction strategies intended to minimize the potential environmental effects of the environment on the project.

7.7.3 Cumulative Environmental Effects

The proponent shall identify and assess the project's cumulative effects. Cumulative effects are defined as changes to the environment due to the project combined with the existence of other works or other past, present and reasonably foreseeable future projects.

In the cumulative effects assessment, the proponent shall adhere to the approach described in the Canadian Environmental Assessment Agency's *Cumulative Effects Assessment Practitioners Guide* (1999).

Cumulative effects may result if:

- implementation of the project being studied caused direct residual negative effects on the environmental components, taking into account the application of technically and economically feasible mitigation measures; and/or
- the same environmental components are affected by other past, present or reasonably foreseeable future actions (projects or activities).

The environmental components that will not be affected by the project or will be affected positively by the project can, therefore, be omitted from the cumulative effects assessment. A cumulative effect on an environmental component may, however, be important even if the assessment of the project's effects on this component reveals that the effects of the project are minor.

Accordingly, the proponent shall:

- Identify and justify the environmental components that will constitute the focus of the cumulative effects assessment. The proponent's assessment should emphasize the cumulative effects on the valued environmental components that could potentially be most affected by any components of the project. To this end, the proponent must consider, without limiting itself thereto, the following components likely to be affected by the project:
  - ✓ fish and fish habitat, including salmon and other valued fish species;
  - ✓ recreational use of the area, including navigation or for business owners who use the area (e.g. lodge owners, tourism operators, sightseeing and guiding operators, etc.);
  - ✓ key valued wildlife species, such as grizzly bear and its habitat, and provincially or federally listed species at risk; and
  - ✓ Aboriginal rights and interests.
- Present spatial and temporal boundaries for the cumulative effect assessment for each VEC selected. The boundaries for the cumulative effects assessments will again depend on the effects being considered (i.e., will generally be different for different effects). These cumulative effects boundaries will also generally be different from (larger than) the boundaries for the corresponding project effects;
- Identify the sources of potential cumulative effects. Specify other projects or activities that have been or will be carried out that could produce effects on each selected VEC within the boundaries defined, and whose effects would act in combination with the residual effects of the project. In particular, consideration shall be given to the proposed transmission line routing in combination with other proposed routings. Boundaries shall be determined in consultation with the public, Aboriginal groups, federal and provincial government departments and relevant stakeholders;
- Describe the mitigation measures that are technically and economically feasible;
- Determine the significance of the cumulative effects. The proponent shall assess the effectiveness of the measures applied to mitigate the cumulative effects. In cases where measures exist that are beyond the scope of the proponent's responsibility that could be effectively applied to mitigate these effects, the proponent shall identify these effects and the parties that have the authority to act. In such cases, the proponent shall summarize the discussions that took place with the other parties in order to implement the necessary measures over the long term; and
- Develop a follow-up program to verify the accuracy of the assessment or to dispel the uncertainty concerning the effectiveness of mitigation measures for certain cumulative effects.

If the project is likely to result in improved infrastructure in the area or may facilitate access into the area, the proponent should evaluate the likelihood of further development in the area that could result in increase cumulative effects on the same valued ecosystem components.

The EIS must describe the analysis of the total cumulative effect on a VEC over the life of the project, which requires knowledge of the incremental contribution of all projects and activities, in

addition to that of the project. The EIS must include different forms of effects (e.g., synergistic, additive, induced, spatial or temporal) and identify impact pathways and trends.

The proponent should also give consideration to developing the cumulative effects assessment as a stand alone document.

7.7.4 Capacity of Renewable Resources

The EIS must describe the effects of the project on the capacity of renewable resources to meet the needs of the present and those of the future. The EIS must identify those resources likely to be impacted by the project, and describe how the project could affect their sustainable use. The EIS must also identify and describe any criteria used in considering sustainable use. Sustainable use may be based on ecological considerations such as integrity, productivity, and carrying capacity.

7.8 Mitigation Measures

Under the *Canadian Environmental Assessment Act*, mitigation is defined as the elimination, reduction or control of the adverse environmental effects of the project, and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means. As a first step, the proponent is encouraged to use an approach based on the avoidance and reduction of the effects at the source. Such an approach may include the modification of the design of the project or relocation of project components.

The proponent shall describe the standard mitigation practices, policies and commitments that constitute mitigation measures and that will be applied as part of standard practice regardless of location. The proponent shall then describe its environmental protection plan and its environmental management system, through which it will deliver this plan. The plan shall provide an overall perspective on how potentially adverse effects will be minimized and managed over time. As well, the proponent shall describe its commitments, policies and arrangements directed at promoting beneficial or mitigating adverse socioeconomic effects. The proponent shall discuss the mechanisms it will use to require its contractors and sub-contractors to comply with these commitments and policies and with auditing and enforcement programs.

The EIS shall specify the actions, works, minimal disturbance footprint techniques, best available technology, corrective measures or additions planned during the project's various construction and operation phases to eliminate or reduce the significance of adverse effects. The impact statement shall also present an assessment of the effectiveness of the proposed mitigation measures. The reasons for judging if the mitigation measure reduces the significance of an adverse effect shall be made explicit.

The proponent must indicate what other mitigation measures were considered, including the various components of mitigation, and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation must be justified. The proponent must identify who is responsible for the implementation of these measures and the system of accountability.

In addition, the proponent will identify the extent to which technology innovations will help mitigate environmental effects.

For all of the biophysical and human effects, the proponent shall present the mitigation measures that they intend to implement. Wherever possible, it shall provide detailed information on the

nature of these measures, their implementation, their management and the post-installation follow-up.

7.8.1 Biophysical Environment

As for the biophysical environment, the following measures shall be considered where relevant:

- the terms and conditions and the measures to protect the environment, paying special attention to shorelines, surface water, vegetation, wildlife and wildlife habitats, including temporary measures;
- the management of water levels, flows and fluctuations in consideration of uses and species of interest;
- the establishment of minimum flows for ecological, aesthetic or navigation purposes taking into account government policies. The proponent shall justify the relevance of the preferred methods selected;
- the installation of protective devices to prevent fish entrainment and fish mortality;
- the installation of fish-ways;
- the establishment of maintenance and flushing flows;
- the installation of preventative measures and/or operational controls to prevent siltation of watercourses;
- the restoration of the plant cover on altered sites;
- measures to control the introduction of invasive species into the project area;
- the development of replacement habitats; and
- the avoidance, protection or relocation of provincially or federally listed species at risk.

This short list can be complemented by other measures deemed adequate by the proponent to mitigate the anticipated effects.

7.8.2 Minimum Flow Regimes

The establishment and application of a minimum flow regime shall consider and include the following points, each of which shall be explained in detail:

- the chosen hypotheses and their justification (choice of target species, description of life cycles, choice of physical variables, etc.);
- the number and location of physical and biological measures and the representative nature of the data;
- the way in which the requirements of the various species at all stages of their life cycle are taken into account and integrated;
- the approach leading to the choice of the methods for assessing these flows, taking into account the characteristics of each of the river segments (e.g., size, level of disturbance, winter conditions, etc.) as well as the uncertainties associated with the methods chosen and the data collected;
- the way in which the various uses to be protected are taken into account;
- the consideration of various abiotic variables (depth, speed, substrate cover, thermal regime, geomorphology, etc.) at various spatial (macro-, meso- and micro-habitat) and temporal scales;
- the consideration of specific hydrological events (spring freshet, high-water periods, low-water periods, etc.) in the application of an ecological minimum flow regime;

- the source and availability of data, their validity, degrees of uncertainty associated with the methods for extrapolating and transposing data from one watershed to another;
- the validation of the predictions obtained through the various models chosen;
- the temporal distribution (annual and inter-annual) of the minimum flows;
- the choice of minimum flow selection criteria based on the results obtained by means of the various assessment methods;
- the quantitative and qualitative appreciation of the residual habitats following the determination of the minimum flows; and
- the permanence of these flows, in consideration of the natural hydrological conditions of the watercourses, for example, during an extended drought.

An analysis of the necessity and, if applicable, the calculation of minimum flow values to ensure long-term maintenance of the productive capacity of habitats shall be carried out in its entirety for all river segments where flow will be altered by the hydroelectric developments

7.8.3 Human Environment

For the human environment, mitigation measures can have a very broad or a very narrow scope based on whether the effect is regional, local or site specific. Ideally, these mitigation measures should be discussed with the populations concerned. Thus, among others, the following mitigation measures may be considered:

- developing effective communication tools to inform the populations concerned and to take into account their perceptions and knowledge with regard to:
  - ✓ the potential effects related to the sampling and handling of species necessary to acquire knowledge;
  - ✓ any other issue deemed a concern by the communities concerned, including First Nations, Powell River, Campbell River, and Sechelt;
- if applicable, ensuring archaeological supervision and safeguarding of sites of great value, salvage excavations and the survey of sites threatened with destruction or submersion;
- if applicable, establishing a program for the protection or possible relocation of burial sites;
- enhancing archaeological discoveries and traditional knowledge in cooperation with local communities;
- identifying and implementing measures seeking to reduce the effects on physical and cultural heritage resources and recreational and tourism activities,
- measures to reduce or compensate for economic or job losses, where applicable; and
- planning a program to inform workers from local communities about available training programs and the requirements of contractors.

7.8.4 Mitigation Measures

More specifically, the proponent shall present a compensation program for any losses in identified fish habitat that complies with Fisheries and Oceans Canada's policies. In this regard, monetary compensation is not an acceptable compensatory option. Compensation measures are not designed to compensate for economic losses, but rather to maintain or increase the net productivity of the fish habitat. Consequently, damages to fish habitat can only be compensated by a project to create or improve fish habitat.

The proponent is responsible for finding and proposing an adequate compensation project for any residual losses resulting from the project. Fisheries and Oceans Canada may, however, advise the proponent throughout the process.

A compensation project generally includes the following elements:

- general nature of proposed compensation works and how and when they would be constructed, demonstrating that the proposed compensation would not result in or induce a harmful alteration, disruption or destruction;
- the position of the proposed compensation on Fisheries and Oceans Canada's hierarchy of preferences, and an explanation why any positions higher on Fisheries and Oceans Canada's hierarchy of preferences cannot be achieved;
- a presentation of the goals and objectives targeted by the compensation work;
- the precise location (latitude and longitude, lot number, with photographs, etc.) of each site to be developed;
- a description of surface area and property rights and confirmation of land tenure and of legal access to the site and/or that the location can be legally controlled;
- a demonstration of the benefits of the development based on an estimate of the gains in production capacity resulting from the proposed development compared to the existing habitat, including the net amount of habitat likely to be created for each location and habitat type (riparian, instream, etc., in m^2 or other relevant unit) and the calculated compensation ratio as net habitat gains relative to likely habitat losses;
- a description of the interventions, planned methods and estimated work schedule;
- a demonstration that the site is not subject to limitations (waterfall downstream, etc.) that could compromise its success;
- a description of the biological, hydrological, physical and chemical characteristics of the targeted sites before and after the developments;
- a description of the fish habitat functions that would be created;
- an estimate of the time required to attain the objectives sought;
- documentation on the chances of success of the proposed compensatory developments;
- a presentation of the follow-up program/monitoring plan to ensure that the objectives have been reached and contingency plans should the compensation measures be unsuccessful in meeting stated objectives; and
- a discussion of consultation efforts with local Aboriginal group on the proposed compensation and how their comments have been considered.

In cases where compensation measures are required to attain the objective of no net loss, the hierarchy of compensation options, described in the *Practitioners Guide to Habitat Compensation*, must be followed.

The proponent should also design a program to compensate the residual losses of wetlands. The program shall target these three objectives:

- no net loss of wetland function;
- preservation of avian productivity; and
- protection of species at risk included in Schedule 1 of the *Species at Risk Act.*

7.9 Determination of the Significance of Residual Impacts

The proponent is expected to take all reasonable precautions to protect the environment. Hence, all reasonable means (e.g., best available technology economically achievable) are expected to be used to eliminate or mitigate adverse environmental effects. After having established the mitigation and compensation measures, the EIS shall present any residual effects of the project on the components of the biophysical and human environments persisting despite the proposed mitigative activities.

The EIS shall include a summary of the project's residual effects so that the reader clearly understands the real consequences of the project, the degree of mitigation of the effects and which effects cannot be mitigated or compensated for. A summary table that presents the effects before necessary mitigation measures on the various components of the environment, the mitigation measures applied and the residual effects shall be included in the study.

This approach implies that the proposed mitigation measures shall be considered an integral part of the project at the time when the significance of the project's environmental effects is determined. During the course of the project, the proponent shall ensure that these measures are effectively implemented.

The EIS must identify the criteria used to assign significance ratings to any predicted adverse effects. The EIS must contain a detailed analysis of the significance of the potential residual adverse environmental effects it predicts. It must contain clear and sufficient information to enable the review panel, Aboriginal groups and the public to understand and review the proponent's judgment of the significance of effects. The proponent must define the terms used to describe the level of significance.

The proponent must assess the significance of predicted adverse effects according to the following categories:

- Magnitude of the effect;
- Geographic extent of the effect;
- Timing, duration and frequency of the effect;
- Degree to which effects are reversible or mitigable;
- Ecological and social context;
- Probability of occurrence; and
- Existence of environmental standards, guidelines or objectives for assessing the impact.

The final ranking of overall impact will be based on the following criteria:

- NIL = No predicted residual impact to the VEC resulting from the project.
- NEGLIGIBLE = potential residua impact may cause a slight decline in a resource (VEC) in the study area, but the resource should return to baseline levels during the life of the project. Recommended mitigation measures are sufficient; no additional management action is required.
- LOW = potential residual impact may result in a slight decline (<5% change from baseline) in a resource (VEC) in the study area during the life of the project. Recommended mitigation measures are sufficient, but monitoring may be recommended.
- MODERATE = potential residual impact could result in a decline (5%-15% change from baseline), in a resource (VEC) to lower than baseline, but stable, levels in the study area

during the life of the project or into the foreseeable future. Management actions such as research, monitoring, and/or recovery might be required.

- HIGH = potential residual impact could result in a decline (>15%) in a resource (VEC) to lower than baseline, and potentially unstable levels, in the study area during the lifetime of the project or into the foreseeable future. This resource is of management concern and research, monitoring and/or recovery initiatives should be considered. An integrated resource management framework is recommended.
- POSTIVE = potential residual impact could result in an increase in a resource (VEC) to higher than baseline levels in the study area, during the life of the project.

The analysis of the significance of the effects shall contain sufficient information to allow the authorities concerned, Aboriginal groups and the public to understand and evaluate the reasoning of the proponent. In particular, the proponent will provide a summary of the regional, provincial or national objectives, standards or guidelines that have been used to assist in the evaluation of the significance of environmental effect.

If significant negative effects are identified, the proponent shall determine the probability that they will occur. The proponent shall also address the degree of scientific uncertainty related to the data and methods used within the framework of its environmental analysis.

The EIS must clearly explain the method and definitions used to describe the level of the adverse (e.g., low, medium, high) for each of the above categories and how these levels were combined to produce an overall conclusion on the significance of adverse effects for each VEC. This method must be transparent and reproducible.

7.10 Summary Of Commitments

The EIS shall include:

- A summary of all significant management commitments;
- Any applicable standards;
- Provide any special management practices or design feature commitments; and
- A “table of proposed commitments” will be provided which will summarize the timing and responsibility for each of the actions for which a commitment has been made.

7.11 Summary of Project Impacts and Mitigation Measures

For all key valued ecosystem components that were assessed, the proponent will provide in a Table format, a summary of the following key information:

- a concise summary of the project’s impacts;
- a summary of mitigation and compensation measures;
- a brief description of any potential residual impacts; and
- a brief description of cumulative impacts.

SECTION 8. Environmental Management

8.1 Planning

The purposes of the EMPs are to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety. Furthermore, analysis of the data obtained as a result of enacting the EMPs can be used to confirm any project specific assumptions and make corrective plans where necessary. The EIS shall provide and commit to the expected components of the EMPs.

The finalization of detailed EMPs will occur through consultation with federal and provincial government agencies, Aboriginal groups, the public and other stakeholders. The EIS shall provide an overview of EMPs proposed for the construction and operations/maintenance phases of the Bute Inlet Hydroelectric project.

Pertinent legislation, regulations, industry standards, documents and legislative guides shall be used in the development of the EMPs.

8.2 Environmental Management Plans

The EIS shall provide the preliminary outline of a Construction Environmental Management Plan and an Operations Environmental Management Plan, with the full preparation and submission to appropriate authorities to occur prior to project construction and operations, respectively. The EMPs will serve to provide guidance on specific actions and activities that will be implemented to decrease the potential for environmental degradation during construction and operation, and to clearly define the proponent's ongoing environmental commitment. The EMP's will include direction on the following, as appropriate for the project phase:

- Surface Water Quality and Sediment Control Plan;
- Waste Management Plan;
- Acid Rock Drainage Management Plan;
- Air Quality and Dust Control Plan;
- Water Quality/Quantity Monitoring Plan;
- Contaminated Sites Management Plan;
- Hazardous Waste Management and Spill Plan;
- Accidents and Malfunctions Plan;
- Emergency Response Plan;
- Landscape Design and Restoration Plan;
- Wildlife/Vegetation Monitoring Plan;
- Bear-Human Conflict Management Plan;
- Outdoor Recreation Use Management Plan;
- Archaeological Sites Management Plan;
- Fisheries and Aquatic Fauna Monitoring Plan;
- Fish Habitat Compensation Plan;
- Transmission Line Monitoring/Mitigation Plan;
- Parameters and Procedures of Operation; and
- Other, if need identified with regulatory agencies.

The EIS shall also identify any EMPs or other mitigation tools that can be used to minimize potential effects on Aboriginal people. Such EMPs and/or related mitigation tools will be developed in consultation with the Aboriginal groups, and may include:

- Archaeological and Heritage Resources Monitoring Plan;
- Traditional Use Monitoring Plan; and
- Other, as needs are identified.

The EIS shall also include a description of how the proponent's responses to Aboriginal issues and concerns will be monitored during project construction and operation, and during decommissioning and abandonment of temporary facilities and will outline any process for handling issues that may arise (e.g. stop work plans, modification of design, etc.).

8.3 Decommissioning and Reclamation Plan

The EIS shall provide the preliminary outline of a Decommissioning and Reclamation Plan for the temporary components associated with the project. The full preparation and submission of the plan to appropriate authorities will occur prior to the decommissioning of the temporary components of the project. The Plan will serve to provide guidance on specific actions and activities that will be implemented to decrease the potential for environmental degradation in the long-term during decommissioning and abandonment activities, and to clearly define the proponent's ongoing environmental commitments.

8.4 Follow-Up Monitoring Program

The proponent must include a framework upon which effects monitoring and follow-up actions will be based throughout the life of the project, including the post-closure phase, should the project proceed.

A follow-up program must be designed to verify the accuracy of the EA and to determine the effectiveness of the measures implemented to mitigate the adverse environmental effects of the project. The follow-up program must be designed to incorporate pre-project information which would provide the baseline data, compliance data (such as established benchmarks, regulatory documents, standards or guidelines) and real time data (such as observed data gathered in the field). As part of the follow-up program, the proponent must describe the compliance reporting methods to be used, including reporting frequency, methods and format.

Environmental assessment effects predictions, assumptions and mitigation actions that are to be tested in the follow-up monitoring program must be converted into field-testable monitoring objectives. The monitoring design must include a statistical evaluation of the adequacy of existing baseline data to provide a benchmark against which to test for project effects, and the need for any additional pre-construction or pre-operational monitoring to establish a firmer project baseline.

The proponent shall propose a schedule for the follow-up program. The schedule shall indicate the frequency and duration of effects monitoring. This schedule is to be developed after statistical evaluation of the length of time needed to detect effects given estimated baseline variability, likely environmental effect size and desired level of statistical confidence in the results (Type 1 and Type 2 errors).

The description of the follow-up program must include any contingency procedures/plans or other adaptive management provisions as a means of addressing unforeseen effects or for correcting

exceedances as required to comply or to conform to benchmarks, regulatory standards or guidelines.

The follow-up program must describe roles and responsibilities for the program and its review process, by both peers, Aboriginal groups, and the public.

The EIS must provide a discussion on the need for, and requirements of, a follow-up program and include:

- The need for such a program and its objectives;
- A tabular summary and explanatory text of the main components of the program including:
  - ✓ description of each monitoring activity under that component,
  - ✓ discussion on which of the three generic program objectives the activity is fulfilling (i.e. confirm mitigation, confirm assumptions; verify predicted effects);
  - ✓ specific statement from the EA that goes along with that generic objective and will be the focus for that activity (e.g., *follow-up objective*: verify predicted effects; *environmental assessment effect*: no adverse effects at the population level for white-tailed deer because of vehicle strikes due to increased traffic within the site study area); and
  - ✓ specific monitoring objective for that activity (e.g., record occurrence of vehicular collisions with deer on-site to verify predicted effects);
- How it would be structured;
- A schedule for the finalization and implementation of the follow-up program;
- Roles to be played by the proponent, regulatory agencies, Aboriginal people and others in such a program;
- Possible involvement of independent researchers;
- The sources of funding for the program; and
- Information management and reporting.

The follow-up program plan must be described in the EIS in sufficient detail to allow independent judgment as to the likelihood that it will deliver the type, quantity and quality of information required to reliably verify predicted effects (or absence of them), confirm EA assumptions and confirm the effectiveness of mitigation.

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