



**ENVIRONMENTAL ASSESSMENT OFFICE**

**HOLBERG WIND ENERGY**

**ASSESSMENT REPORT**

**With Respect to:**

Review of the Application for an Environmental Assessment Certificate  
Pursuant to the British Columbia *Environmental Assessment Act*, SBC 2002, c. 43

and

The Requirements of a Screening Report Pursuant to the  
*Canadian Environmental Assessment Act*, SC 1992, c.37

**Prepared by**

**Environmental Assessment Office**

**October 1, 2004**



# HOLBERG WIND ENERGY PROJECT

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## ACRONYMS AND ABBREVIATIONS

The following abbreviations are used in this Assessment Report:

AAC	Annual Allowable Cut
Act	BC <i>Environmental Assessment Act</i> (S.B.C. 2002, c.43)
Application	Application for an Environmental Assessment Certificate
CEAA	<i>Canadian Environmental Assessment Act</i>
CEA Agency	Canadian Environmental Assessment Agency
CMT	Culturally Modified Trees
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWS	Canadian Wildlife Service
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EAO	Environmental Assessment Office
EC	Environment Canada
EFZ	Enhanced Forestry Zone
HADD	Harmful Alteration, Disruption or Destruction
IAC	Interagency Committee
km	Kilometre(s)
LRMP	Land and Resource Management Plan
LWBC	Land and Water BC Inc.
ML/ARD	Metal Leaching/Acid Rock Drainage
MW	Megawatt
MWLAP	Ministry of Water, Land and Air Protection
MSRM	Ministry of Sustainable Resource Management, Archaeology and Registry Services Branch
NRCan	Natural Resources Canada
Project	Holberg Wind Energy Project
Proponent	Holberg Wind Energy GP Inc.
RDMW	Regional District of Mount Waddington
RMZ	Resource Management Zone
SARA	Species at Risk Act
TFL	Tree Farm Licence
VISLUP	Vancouver Island Summary Land Use Plan
WFP	Western Forest Products
WPPI	Wind Power Production Incentive
WTG	Wind Turbine Generator



# **EXECUTIVE SUMMARY**

## **Background**

On July 19, 2004, British Columbia's Environmental Assessment Office (EAO), pursuant to the British Columbia *Environmental Assessment Act* (the Act), accepted for review an application for an environmental assessment certificate (the Application) from Holberg Wind Energy GP Inc. (the Proponent) for the Holberg Wind Energy Project (the Project). The Project also required an environmental assessment under the federal *Canadian Environmental Assessment Act* (CEAA), and therefore a single, cooperative environmental assessment of the Application was undertaken in accordance with the Canada-British Columbia Agreement on Environmental Assessment Cooperation to meet the legal requirements of both governments while maintaining the existing roles and responsibilities of each level of government. The cooperative process was overseen and led by EAO.

## **Description of the Project**

The Project is located on the ridge tops of Mt. Brandes and Mt. Hansen, located on northern Vancouver Island near the community of Holberg. The Project consists of up to 45 wind turbines with a maximum capacity of 58.5 megawatts (MW), associated access and onsite roads, underground and overhead transmission lines, a substation to convert electricity for connection to the power grid, and ancillary facilities such as the concrete batch plant and the control facility.

The Project has a capital cost of approximately \$120 million, and will create an estimated 100 worker years of direct construction employment in British Columbia and up to 6 full-time jobs when fully operational.

The Project is predominantly on provincial Crown land and is mainly in an enhanced forestry zone under the Vancouver Island Summary Land Use Plan. A small percentage of the Project involves transmission lines/access roads on fee simple lands owned by Western Forest Products Ltd. (WFP). The Crown land involved in the Project falls within a Tree Farm Licence (TFL) held by WFP.

The Project, if approved and constructed, would produce electricity to meet domestic demand on Vancouver Island as well as promote the development of a new green energy industry in British Columbia. The Project is the second wind energy generation facility project to be reviewed under the Act, and in accordance with the Canada-British Columbia Agreement on Environmental Assessment Cooperation. The Project is the first wind farm project to negotiate an Electricity Purchase Agreement with BC Hydro.

## **Application Review Process**

The Application was made available for review and comment by government agencies, First Nations and the public. The Proponent responded to all comments, and made revisions to its proposed mitigation measures, monitoring programs and other commitments to address the concerns. These revisions were reviewed by an interagency committee comprised of relevant government agencies and First Nations, and conclusions reached on whether practical means had been proposed to prevent or reduce to an acceptable level any potential effects of the Project.

## **Public Feedback**

EAO established a 30 day public comment period on the Application. During the comment period EAO received one submission from the public which was supportive of the Project.

Twenty members of the public signed in during open houses on the Project conducted by the Proponent. The public asked questions regarding project related tourism facilities and short and long term employment opportunities. Participants expressed general support for the Project.

## **First Nation Feedback**

The Project is entirely in the Statement of Intent area of the Quatsino First Nation. The Quatsino First Nation was invited to participate in all aspects of the review, and were able to participate in some of the interagency committee meetings, as well as participate directly in the Archaeology Overview Assessment conducted in support of the Application.

The Quatsino First Nation was generally supportive of the wind energy project, but wanted assurance that their concerns with respect to archaeological resources were recognized. This issue was addressed to their satisfaction through the review.

Holberg Wind Energy GP Inc. has agreed to develop a consultation and benefits agreement with the Quatsino First Nations potentially addressing the frequency and scope of future meetings and commitments, including but not limited to employment and business opportunities.

## **Agency Feedback**

The key technical issues considered during the review of the Project were potential impacts on forestry, fisheries and fish habitat, wildlife resources (in particular impacts on birds and bats), recreation, socio-economic and health effects, visual impacts, archaeological resources and aboriginal interests.

Based on information subsequently provided by the Proponent in responding to review comments, including proposed mitigation measures and commitments, EAO and the federal Responsible Authority under CEAA (Natural Resources Canada) consider these issues to be adequately resolved.

## **Conclusions**

EAO is satisfied that:

- the Application adequately identified and assessed the potential significant adverse environmental, economic, social, heritage and health effects of the Project;
- public and First Nations consultation, and the distribution of information about the Project have been adequately carried out by the Proponent;
- issues identified by the public, Quatsino First Nation, and provincial, federal and local government agencies, which were within the scope of the environmental assessment (EA), were adequately addressed by the Proponent during the review of the Application; and
- practical means have been identified to prevent or reduce to an acceptable level any potential adverse effects of the Project.



Natural Resources Canada (NRCan), the federal Responsible Authority (RA) for the CEEA screening review of the Project, determined that the Project is not likely to cause significant adverse environmental effects. The Project is allowed to proceed subject to certificate conditions, Commitments and Assurances (Appendix B), and the follow-up and monitoring put forward by the Proponent.



# **PART A INTRODUCTION**

## **1. BACKGROUND**

Holberg Wind Energy GP Inc. (the Proponent) is proposing to produce electricity by constructing and operating a 58.5 MW wind energy generation facility on Mt. Brandes and Mt. Hansen, on northern Vancouver Island near the community of Holberg. The Holberg Wind Energy Project (the Project) includes up to 45 wind turbines, associated access roads, underground transmission lines, above ground transmission lines, a substation to convert the electricity for connection to the grid, and a control facility. The Project has a capital cost of approximately \$120 million, and will create an estimated 100 worker years of direct construction employment and up to 6 full-time jobs when fully operational.

In November 2003, the Proponent submitted the Holberg Wind Energy Project Description to the Environmental Assessment Office (EAO) which described the Project and the proposed scope of studies for the EA of the Project. On December 16, 2003, EAO issued a section 10 order stating that the Project was reviewable under the Act and that an EA certificate would be required. On February 10, 2004 Fisheries and Oceans Canada (DFO) circulated a project description to federal authorities pursuant to the *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements*, thereby triggering an EA under the CEAA.

EAO subsequently issued a section 11 procedural order which stipulated the scope of the Project, the scope of the assessment and the procedures and methods for the review of the application. One of the key requirements of the section 11 order was the Proponent prepare Terms of Reference for its Application for review and approval by EAO, in consultation with federal agencies. Draft Terms of Reference were submitted January 30, 2004 and made available for review by agencies, First Nations and the public. A Final Draft Terms of Reference were submitted April 14, 2004 and approved by EAO and by Natural Resources Canada (NRCan) as federal RA under CEAA on April 14, 2004.

On July 12, 2004, the Proponent submitted its Application for review under the Act. The Application was accepted for review on July 19, 2004. It is the second wind energy generation facility project to be reviewed under the Act and in accordance with the Canada-British Columbia Agreement on Environmental Assessment Cooperation. The Project is the first wind energy generation facility project to negotiate an Electricity Purchase Agreement with BC Hydro.

## **2. PURPOSE OF THIS REPORT**

The purpose of this Assessment Report is to:

- describe the Project;
- summarize the process for the review of the Application;
- report on the adequacy of distribution of information by the Proponent during the review of the Application;

- report on whether the Application has adequately identified and assessed the potential significant adverse environmental, economic, social, heritage or health effects of the Project including potential effects on First Nation interests;
- summarize the issues considered during the review of the Application;
- report on whether practical means have been identified to prevent or reduce to an acceptable level any potential adverse effects of the Project; and
- allow the federal RA to determine whether they may take a course of action identified in section 20(1) of the CEAA.

The Assessment Report, together with the Application, will be submitted to the Provincial Ministers of Sustainable Resource Management (MSRM), Water, Land and Air Protection (MWLAP) and Energy and Mines (MEM) for their review and decision on whether or not to issue an EA certificate for the Project. The same report is also used by the federal RA as part of the federal EA screening decision making process.

### **3. ENVIRONMENTAL ASSESSMENT PROCESSES**

#### **3.1 PROVINCIAL EA PROCESS**

The Project will be capable of producing 58.5 MW of electricity when fully developed, and therefore is a reviewable project under part 4 Energy Projects, *Reviewable Projects Regulation* (B.C. Reg. 370/02), since it has a rated nameplate capacity of more than or equal to 50 MW of electricity. An EA of the Project is therefore required in accordance with the Act.

The EA consists of two stages: the informal pre-application stage and the formal application review stage. The section 11 order issued January 30, 2004 outlines specific procedures for both stages of the assessment, including notification procedures, opportunities for government agencies, First Nations and the public to provide comments, and time limits for various steps in the assessment procedure.

Under the Act, a proponent may request that applications for provincial approvals under other statutes be processed concurrently with the EA review of a project. The Proponent did not apply for any such approvals potentially related to the Project. Section 11 of this report summarizes the permits, licences and authorizations that may be required for the Project.

Joint decision-making on whether an EA certificate will be issued for the Project is required by the Minister of Sustainable Resource Management, the Minister of Water, Land and Air Protection, and the Minister of Energy and Mines (responsible Minister for the Project).

#### **3.2. FEDERAL EA PROCESS**

The CEAA is the legal basis for the federal EA process. The CEAA outlines the responsibilities, requirements and procedures for the EA of projects and establishes a process for assessing the potential environmental effects of projects in which the Government of Canada has a decision-making responsibility.

CEAA is a planning tool to identify, understand, assess and mitigate, where possible, the environmental effects of a project. A project is subject to the CEAA where a federal authority enables a project to be carried out by proposing a project; selling, leasing, or otherwise transferring control or administration of federal land; contributing money or any other form of financial assistance to a project; or exercising in relation to the Project a regulatory duty (such as issuing a license, permit or approval) that is included in the CEAA *Law List Regulations*.

The financial incentive that may be provided to the Proponent by NRCan under the Wind Power Production Incentive (WPPI) triggers the need for a federal EA under CEAA. Hence, NRCan is the RA for the Project.

The RA determined that the Project required a screening level of assessment under CEAA. Before the RA can make a decision to allow the Project to proceed in whole or in part, they must ensure that an EA is carried out in accordance with the CEAA and that a screening report is prepared, and they must consider the EA findings before taking a course of action as per section 20(1) of CEAA.

### **3.3 COOPERATIVE FEDERAL/PROVINCIAL EA PROCESS**

Both the Act and CEAA enable agreements between jurisdictions in order to reduce or eliminate overlap and duplication. Using a framework developed by the Council of Ministers of the Environment, the federal and provincial governments have negotiated the “Canada-British Columbia Agreement for Environmental Assessment Cooperation (2004)”. Under this bilateral agreement, projects that require a review under both federal and provincial EA legislation, such as the Project, undergo a single, cooperative assessment meeting the legal requirements of both governments while maintaining the existing roles and responsibilities of each level of government.

In the case of the Project, the EA has been led by EAO. A project work plan was developed to identify the process for the cooperative EA. Federal government agencies were invited to comment on key documents prepared by the Proponent including the Terms of Reference and the Application, and were also invited to sit on the interagency committee and the wildlife working group to ensure that issues of federal concern were identified in the review of the Project. At the conclusion of the review, the federal RA and EAO jointly produced the present report which meets the requirements for an Assessment Report under the Act and a Screening Report under CEAA. Each government will make their respective decisions regarding approval of the Project based on the shared information gathered and analyzed through the cooperative review process.

### **3.4 SCOPE OF ASSESSMENT**

On January 30, 2004, EAO issued a procedural order under section 11 of the Act specifying the scope of the assessment to be undertaken for the Project. The scope of the Project and of the assessment was determined by EAO and the federal RA in consultation with other review participants. The scope of the assessment was ordered to include consideration of the potential effects of Project construction and operations on geology and terrain stability, hydrology and water quality, vegetation, wildlife and wildlife habitat, fish and fish habitat, land and resource uses (forestry, mining, recreation and access management, local land uses and visual impacts), cultural and heritage resources, socio-economic and health effects, First Nations interests, and other effects of mutual concern identified in the federal/provincial workplan. The effects of Project dismantling

and abandonment were also to be assessed to the extent practical. The assessment was to take into account practical means to prevent or reduce to an acceptable level any potential significant adverse effects.

As per section 16(1) of CEAA, the scope of the assessment also required consideration of the following factors:

- The environmental effects of the Project, including the environmental impact of malfunctions or accidents that may occur in connection with the Project, and any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out;
- The significance of the effects listed in the previous paragraph;
- Comments from the public that are received in accordance with the CEAA and regulations;
- Measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the Project; and
- Any other matter relevant to the screening that the RA may require to be considered.

Further, *Section 137 of Species At Risk Act (SARA) provides a consequential amendment to the definition of environmental effect*, as follows:

“environmental effect” means, in respect of the project,

- (a) and change that the project may cause in the environment, including and change it may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of SARA
- (b) and effect of any change referred to in paragraph (a) on
  - (i) health and socio-economic conditions,
  - (ii) physical and cultural heritage,
  - (iii) the current use of lands and resources for traditional purposes by aboriginal persons, or
  - (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, or
- (c) any change to the project that may be caused by the environment,

whether any such change or effect occurs within or outside Canada.

Terms of Reference for the Application were developed by the Proponent to define the information and assessment requirements in more detail for each of the above-noted impacts. The Terms of Reference were provided to provincial and federal government agencies, local government, the public and First Nations for comment prior to their approval by EAO and federal RA.

## **4 PROJECT INFORMATION**

### **4.1 PROJECT DESCRIPTION**

The Proponent is proposing to produce electricity by constructing and operating a 58.5 MW wind energy generation facility on northern Vancouver Island near the community of Holberg. The

Project includes up to 45 wind turbines, associated access and onsite wind farm roads, underground transmission lines, above ground transmission lines, a substation to prepare electricity for connection to the grid, and ancillary facilities such as the concrete batch plant and the control facility.

The Project is approximately 5 km southwest of the community of Holberg. It lies in the Regional District of Mount Waddington, and in the Statement of Intent area of the Quatsino First Nation.

The Project is situated in an area on northern Vancouver Island that possesses a strong wind regime. The Proponent currently has meteorological towers with four anemometers installed on Mt. Brandes and Mt. Hansen (under licence of occupation from Land and Water BC) to more precisely measure wind speed and direction. This information is being provided for analysis and recommendations on the best layout for the Project to maximize the potential energy that could be generated from this site. The assessment reviews more turbine site locations than are required for full Project build out, allowing for some sites to be selected and others deleted in response to environmental or engineering constraints. Final location of the wind turbines and roads will be determined after the EA process has been completed but prior to tenures being issued by Land and Water BC (LWBC).

The Project is predominantly on provincial Crown land and is predominantly in an enhanced forestry zone under the Vancouver Island Land Use Plan. A small percentage of the Project involves transmission lines/access roads on fee simple lands owned by WFP. The Crown land involved in the Project falls within a TFL held by WFP.

## **4.2 PROJECT COMPONENTS**

The Project consists of multiple wind turbine towers in a clustered array in an area covered by a Crown Land Investigative Permit issued by LWBC, with final layout subject to minimizing environmental impacts and maximizing placement relative to wind. The Project includes the following on-site components and activities:

- Up to 45 wind turbines (including foundations, towers, blades and nacelles) with a maximum capacity of 58.5 MW of electricity;
- Up to 30 km of new access roads, new service roads and bridges to and within the Project site;
- Upgrades to existing access roads and bridges (including reactivated logging roads);
- Underground transmission cables between towers (up to 10 km), with overhead transmission lines (up to 6 km) for groups of towers to a substation located near the Project site;
- Upgrades to the existing overhead transmission line and any new overhead transmission required;
- A substation to convert the 33 kV electricity collected from the wind energy generation facility into 138 kV to connect to the existing power grid and a switchyard;
- Aggregate borrow site(s);
- Service center and control room;
- A concrete batch plant;
- Any offsite facilities or offsite activities related to the Project, including laydown area; and
- Any offsite facilities related to the Project such as the batch plant and a control room.

### **4.3 PROJECT PURPOSE**

Information related to the purpose and justification of the Project is discussed in section 2 of the Application.

The Project is intended to produce electricity to meet the domestic electricity demand on Vancouver Island as well as promote the development of a new “green” energy industry in British Columbia. In 2002/03 BC Hydro ran a Green Power Generation Procurement process, asking Independent Power Producers to submit proposals for new green power generation projects.

The Proponent registered to participate in this process and was a successful bidder. The Proponent subsequently negotiated an electricity purchase agreement with BC Hydro.

### **4.4 PROJECT ALTERNATIVES**

Information on potential alternatives to the Project are discussed briefly in section 2.3.8 of the Application. Potential alternatives to the Project include alternative turbine sites, substation location, and transportation alternatives. If the Project is not built, alternatives would include other projects that have been short-listed by BC Hydro through the 2002/03 Green Power Generation Procurement process and the Vancouver Island Call for Tenders or other calls for tender, or the construction of a new high voltage direct current line from mainland British Columbia to Vancouver Island.

## **PART B INFORMATION DISTRIBUTION AND CONSULTATION**

### **5 ACCESS TO REVIEW DOCUMENTATION**

EAO maintains an electronic Project Information Center, available through EAO website (<http://www.eao.gov.bc.ca>), for the purpose of facilitating public access to information on the EA reviews of projects. The Application and other information related to the review of the Project were posted on this website. This includes the documentation and correspondence received from the Proponent about the Project that is listed in Appendix A.

Information on the Project was also made available to the public through the federal EA process at the offices of the Canadian Environmental Assessment Agency (CEA Agency), the CEA Agency’s Project Registry website (<http://www.ceaa-acee.gc.ca>). The Project was registered on the Canadian Environmental Assessment Registry (CEAR 04-01-5925).

The Proponent contacted local stakeholders, made statements to local press, held open houses both during the pre-application and application period, as well as addressed local municipal councils, and set up an information booth at the local July 1, 2004 festivities. An information sheet was prepared and distributed at open houses in Holberg and Port Hardy. Applications were available in both Holberg and Port Hardy for public review.



## **6 PUBLIC CONSULTATION**

### **6.1 MEASURES UNDERTAKEN BY THE PROPONENT**

Public information distribution and consultation information is discussed in section 3 of the Application.

In preparing its Application, the Proponent met with the public, identified and contacted key stakeholders. The Proponent solicited input from these groups to identify potential issues or concerns.

Twenty members of the public signed in at the open houses during the Application review on the Project. The open houses were conducted by the Proponent. The public expressed general support for the Project, and were interested in both short and long term employment opportunities.

Area residents asked questions about project related tourism facilities, and short and long term construction jobs.

In accepting the Application for review, EAO determined the detailed public consultation plan for public review of the application as proposed was adequate. Consistent with this plan, the Proponent:

- held open houses on the Project that were advertised in advance;
- responded to comments received by EAO during the public review of the application; and
- provided a summary report to EAO of the results of the public consultation program.

The Proponent has also set up an information booth during the July 1, 2004 festivities in Port Hardy.

### **6.2 MEASURES UNDERTAKEN BY EAO AND RA**

In accepting the Application for review, EAO and federal RA evaluated the adequacy of the Proponent's program of public consultation. EAO and the RA were satisfied that sufficient steps had been taken by the Proponent to include stakeholder input in the preparation of the Application.

EAO established a thirty day formal public/agency comment period on the Application. A notice of the EA review of the Project and public comment period was advertised in the North Island Gazette, and posted on the electronic Project Information Centre on EAO website.

EAO attended Proponent sponsored open houses to make a presentation to the public on the EA process.

### **6.3 PUBLIC FEEDBACK**

During the thirty day formal public comment period on the Application, EAO received one comment from the Public. This comment expressed strong support for the Project.

## **7 FIRST NATION CONSULTATION**

### **7.1 PRE-APPLICATION STAGE**

#### Measures Undertaken by the Proponent

In preparing its Application, the Proponent contacted the Quatsino First Nation to evaluate their interest in the Project area in regards to potential cultural resources and traditional territories.

Consultation activities that were undertaken by the Proponent during the pre-application stage are contained in section 4 of the Application.

#### Measures Undertaken by EAO

EAO met with the Quatsino First Nation on February 20, 2004, and wrote to them on March 4, 2004, informing them of the Project, inviting them to participate in the EA, and providing information on the EA process. The Quatsino First Nation was provided an opportunity to comment on the Terms of Reference during their development and to participate in pre-application meetings. Having recently participated in the environmental assessment process on a different project, the Quatsino First Nation had a good understanding of their opportunities to participate in the Project review.

The Quatsino First Nation was informed that they would be invited to participate in the inter-agency committee that would be reviewing the application. EAO finalized an Economic Measures Agreement with the Quatsino First Nation to assist them in participating in the EA of the Project.

### **7.2 APPLICATION REVIEW STAGE**

#### Measures Undertaken by the Proponent

The Proponent provided the Quatsino First Nation with a copy of the Application on July 23, 2004. The Proponent communicated with the Chief and Council of the Quatsino Nation on numerous occasions, and arranged a community open house on August 11, 2004. The Quatsino First Nation subsequently requested the meeting be postponed until August 24, 2004, and then requested a further deferral until an unspecified date in September.

The Proponent continued to consult with the Quatsino First Nation by e-mail, phone and meetings regarding the Application review and consultation and benefits agreement negotiations. In consultation with the Chief and Council, Patrick Charlie was identified as a band member interested in the wind industry, and available to assist the Proponent in any locally occurring Project activities. In addition, a business owned by a Quatsino member, Wallas Contractors, was engaged to clear brush and further contracting is anticipated. A band member is also contracted to assist in the monthly retrieval of anemometer data from all anemometer sites.

A training program outline and schedule is being developed for the Quatsino First Nation, and it is anticipated that some band members will be selected for permanent operation positions. Construction will provide an opportunity for greater numbers of short term employment.

The Proponent has been meeting with the Quatsino First Nation since late 2002, discussing the Project, consultation process and an Economic Agreement. A draft protocol was negotiated and submitted to Chief Tom Nelson and his Councilors for review and approval in June 2004. A counter proposal from the Quatsino First Nations was received by the Proponent on August 24, 2004. Negotiations are on-going, and a successful conclusion is anticipated.

The comments provided by the Quatsino First Nation on the Application are discussed below in section 7.3 and section 9.3.

#### Measures Taken by EAO:

EAO and RA determined that the proposed First Nations consultation plan described in section 4 of the Application was acceptable.

EAO representatives met with Quatsino First Nation representatives on February 20, 2004 to discuss the EA of the Project and to continue relationship building.

Following notification by letter on March 4, 2004 to the Quatsino First Nation, they advised EAO that they wished to participate in the inter-agency committee reviewing the application. EAO provided funding to the Quatsino First Nation to assist in the review of the Application.

The Quatsino First Nation did not submit written comments on the Application. The Quatsino First Nation attended some of the inter-agency committee meetings and provided specific comments on archaeology. EAO also ensured that all Project documentation was sent to the Quatsino First Nation and that they were kept fully informed at all stages of the EA review.

### **7.3 QUATSINO FIRST NATION FEEDBACK**

The Quatsino First Nation was an active member of the interagency committee, and received copies of all review related documents, as well as invitations to all interagency committee meetings. The Quatsino First Nation provided feedback on issues of interest through committee discussion, with particular reference to archaeology issues. Their comments on these issues are discussed in Part C, Review of the Application, below.

Specific issues raised by the Quatsino First Nation during the review are discussed in section 9.3.

## **PART C REVIEW OF THE APPLICATION**

### **8 APPLICATION REVIEW PROCESS**

The Application review process was initiated on July 19, 2004, when the Application was formally accepted for review by EAO and the federal RA. Copies of the Application were distributed by the Proponent on July 19, 2004, and a 30-day comment period was held from August 3, 2004 to September 3, 2004. The Proponent was then given an opportunity to respond to the comments from the public, First Nations and government agencies. The Proponent's responses to these comments were received on September 13, 2004 and distributed to agencies, First Nations and relevant individuals for their review as to their adequacy. EAO and RAs consulted other reviewers in order to resolve outstanding issues. At the conclusion of the review, EAO in consultation with the RA prepared the Assessment Report with input from other review participants.

An interagency committee (IAC) was established by EAO to assist with the review of the Project. Participants included the following provincial and federal agencies, local governments and First Nations representatives:

Province of British Columbia

Environmental Assessment Office

Ministry of Water, Land and Air Protection

Ministry of Energy and Mines

Ministry of Forests

Ministry of Sustainable Resource Management, Archaeology Branch

Vancouver Island Health Authority

Land and Water BC

Government of Canada

Department of Fisheries and Oceans

Environment Canada

Canadian Environmental Assessment Agency

Natural Resources Canada

Canadian Wildlife Service

Department of National Defense

Local Government:

District of Port Hardy

Regional District of Mount Waddington

First Nations:

Quatsino First Nation

Three meetings of the IAC and Wildlife Technical Committee were held during the review of the Application to work collectively on resolving issues raised by the Application. The Proponent participated in all of these meetings. Notes of these meetings are posted on EAO's electronic Project Information Centre.

## 9 CONSIDERATION OF POTENTIAL PROJECT EFFECTS

The potential effects of the Project are discussed in section 6 of the Application, and in supplementary information submitted by the Proponent in response to comments from agencies, First Nations and the public on the potential effects of the Project. Both the Application and the supplementary information are available from EAO's electronic Project Information Centre for the Project at [www.eao.gov.bc.ca](http://www.eao.gov.bc.ca) and from the federal public registry ([www.ceaa-acee.gc.ca](http://www.ceaa-acee.gc.ca)). Included in the supplementary information is a revised Fish and Fish Habitat Section, an updated Table of Commitments and Assurances, Draft Wildlife Monitoring Plan and a draft Environmental Protection Plan.

### 9.1 ENVIRONMENTAL EFFECTS

To mitigate potential environmental effects resulting from construction of the Project, the Proponent has committed to develop, prior to the start of construction, an Environmental Management Plan (EMP) and to submit the relevant components of the EMP to the appropriate environmental agencies for review and acceptance. An Environmental Protection Plan (EPP) will be developed and approved prior to construction and will include the following component plans:

- Erosion and Sediment Control Plan;
- Wildlife Protection Plan;
- Vegetation Protection Plan;
- Traffic Management Plan;
- Accidents and Malfunctions Response Plan;
- Equipment Delivery Plan;
- Health and Safety Plan;
- Fish and Fish Habitat Protection Plan; and
- Hazardous Materials and Waste Management Plan

The Proponent has also committed to retain a qualified environmental monitor to work on-site during all phases of Project construction, and to undertake environmental quality audits to ensure all of the Proponent's contractors comply with the EPP.

The Proponent has made additional commitments regarding the mitigation, management and monitoring of potential impacts during operations. These are described in further detail in the sections below.

#### 9.1.1 Terrain Stability

##### Background

Terrain stability is the potential for earthquakes, landslides or sedimentation associated with road upgrades or construction, wind tower foundation works, or related infrastructure (concrete batch plants, transmission lines, and quarries). Deterioration of terrain stability may affect fish or fish habitat through landslides or sedimentation, as well as vegetation and forest site productivity through erosion or soil compaction. The issue of terrain stability affects all aspects of the Project.

Section 6.3 of the Application examines terrain stability issues as they relate to fish and fish habitat, vegetation and site productivity, access roads, existing forest roads, tower sites, and additional infrastructure.

### Impact Assessment and Mitigation

The impact assessment describes the likely impacts of the Project on terrain stability based on the proposed design scenario for the wind generation facility, assuming an operational life of 30 years. Mt. Brandes indicates a history of landslides on steep slopes in old growth forest, in regenerating forests and from roads. Mt. Hansen did not show evidence for active landslides, although erosion continues to occur in the steep stream channels and gullies on both mountains.

**Access Road:** Access roads involve upgrading of existing roads and the construction of a limited number of new segments. Potential terrain stability impacts associated with development and construction of access roads includes landslides and erosion/sedimentation. Planned routes involve the full range of terrain stability classes I (most stable) to V (least stable).

Upgrading of inactive existing roads will be completed using best management practices for road construction, as detailed in the *Forest Road Engineering Guidebook* (MOF 2002). Roads will be designed to minimize instability of road fills, minimize erosion and sedimentation. A qualified road engineer will do an assessment and prepare a remedial design for road segments to be upgraded.

Terrain stability impacts will be mitigated through measures to limit sedimentation and reduce the likelihood of landslides by:

- Avoiding any road construction in highly unstable (Class V) terrain;
- Upgrading to current standards consistent with *Forest Road Engineering Guidebook* (Ministry of Forests 2002) and section 2.4. of the Application;
- All roads to be assessed and designed by qualified forest road engineer, generally ballasted and surfaced with shot rock materials to provide all weather surface;
- New access road segments placed in areas with low potential for terrain instability;
- Erosion and sedimentation minimized through techniques for reducing the amount of excavation and number of cut slopes;
- Landslides prevented through limiting amount of sidecast soil and rock excavations, and by using only suitable and properly placed and compacted fills;
- Full benching and end hauling methods of road construction will be favoured;
- Excavated soil will be end-hauled and relocated to suitable sites away from water courses and slopes;
- Streams crossed with appropriately sized and designed culverts or other engineered crossings to minimize potential for sedimentation, surface water management structures where appropriate; and
- Erosion and Sediment Control Plan will be developed prior to construction.

In addition to avoiding road construction in class V terrain, Road SJ49 will have geotechnical review prior to any re-construction or extension as it has generated landslides in the past. Roads in class IV terrain are expected to generate impacts in the moderate range relative to baseline. New roads are expected to generate moderate levels of erosion and sedimentation compared to baseline in

undeveloped areas. Erosion and sedimentation will be managed through the Erosion and Sedimentation Plan, and construction monitoring.

**Service roads:** Most service roads to wind turbines lie in terrain class I through III and are therefore not expected to generate landslides and/or erosion/sedimentation. Construction will generally follow prescriptions outlined above, including development of an Erosion and Sediment Control Plan. In addition:

- Service road construction will be avoided in class V terrain;
- Where service roads occur in class IV terrain, impacts are predicted to be moderate;
- Where possible setbacks of roads and excavations for road construction will be a minimum of 15 m from the top of gullies or abrupt slope breaks;
- No soil stock piling even temporarily near tops of slopes;
- Vegetation removal will be minimized; and
- Runoff from service roads will be managed to avoid inputs to headwaters of sensitive streams through use of small retention ponds and/or distributing flow over larger surface areas where erosion and land slide potentials are low.

**Wind turbine generator sites:** Foundation placement for turbines will be dependent on geotechnical conditions encountered at each proposed site, and will include detailed site specific investigation and design.

Wind turbine generators will most likely be situated in terrain stability classes I to III therefore the potential for landslides will be low in these areas. Where sites are in class IV, impacts would be moderate. Sites in class V terrain will be avoided. With respect to erosion/sedimentation, the potential is classified as moderate when compared with baseline areas, and will be minimized by:

- Locating towers to allow setback distances from steep (class IV and V) slopes and areas of natural erosion and gullying;
- Site clearing will be minimized;
- Mitigation for erosion and sedimentation will be implemented;
- Sediment control structures (silt fencing and sediment logs, berms) will be used to manage sediment generation during wet periods;
- Areas with highest potential to generate sediment will be scheduled for drier months of the year;
- Landslides will be minimized by avoiding surcharging slopes or gully headwalls with excavated soil, and wasting of rock on slopes or near gullies; and
- Where necessary, polyethylene sheeting will be used to prevent erosion on cut face.

**Infrastructure:** The proposed infrastructure (transmission lines, quarries and batching plants) lie primarily in terrain stability classes I through III therefore the expected magnitude of potential impacts with respect to land slides is predicted to be low. Where infrastructure is proposed for terrain class IV, the magnitude of potential impacts would be moderate. Infrastructure construction will be avoided on sites with terrain stability of Class V.

**Transmission Lines:** The transmission line from Holberg to Port Hardy is an existing line requiring upgrading of the pole crosses and line, but not replacement of poles. The higher voltage line will

require some additional clearing, with potential risk from a terrain stability perspective. However, there are few locations along the line where landslides from upslope might reach the transmission line. Landslides that contact power poles have the potential to damage the line. In the event the transmission line is buried for most of its length, surficial materials are sufficient for trenching and burial. Alternatively, an overhead line with localized line burial in areas where landslides may occur could reduce the potential for damage. Relocation of two or three poles currently in small debris flow fans would reduce the potential for future damage. There are some locations where there are insufficient surficial materials for burial, requiring drilling and blasting in order to trench the line. At river crossings, burial would pose a significant challenge for fish and fish habitat. Careful assessment of possible future logging areas on steep slopes upslope of the transmission line will reduce the likelihood of harvesting associated landslides in the future.

Transmission lines within the wind generation facility area will be both buried and aerial. Buried transmission lines are designed to be trenched in terrain with stability classes III or lower, and therefore terrain stability impacts are predicted to be low. Impacts will be mitigated by:

- Minimizing removal of vegetation;
- Use of low impact trenching methods;
- Early implementation of erosion protection and sediment control measures;
- Strict adherence to the Erosion and Sediment Control Plan; and
- Routing transmission line in areas of terrain stability classes I through III.

**Rock Quarries:** Rock quarries generally pose a low risk for terrain stability when appropriately sited to not undermine slopes. Quarries will be located in areas of existing bedrock outcrops or bedrock excavations, or near areas where extensive bedrock removal is already necessary for other infrastructure.

**Concrete Batching Plant:** The plant will be sited to ensure appropriate setbacks from potentially unstable slopes, and with adequate bearing capacity for the expected structural loads to be accommodated. Wash water will be recycled or appropriately stored and discharged to prevent saturation of sensitive slopes, and erosion and transport of sediment that could impact slope stability and/or streams and water quality. No additional mitigation is required.

### Monitoring

Monitoring will be carried out for all Project components, with focused attention on areas of highest potential for terrain stability impacts (landslides, erosion, sedimentation). Monitoring will document soil and geological conditions encountered in excavations, and the location and nature of fills used in roads and other structures. Information generated will be used to assist in reducing potential impacts and will be used to prescribe restoration works where needed. Detailed mitigative prescriptions will follow best management practices and standard methods for restoration.

Baseline water quality monitoring and periodic monitoring at selected surface water sampling stations will be carried out to confirm that sedimentation is not impacting water quality of local surface streams in the Project Area. Acid rock drainage is not predicted, however periodic monitoring of pH and total dissolved solids will be included in water quality monitoring schedule of parameters to detect changes that might occur as a result of bedrock weathering.



## Interagency committee Review of the Application

Comments on the terrain stability section of the Application were submitted by NRCan. The main terrain stability issues identified by NRCan include:

- Maps and diagrams of insufficient clarity;
- References to published landslide data does not include location information; and
- Additional information needed on transmission line location and possible landslides.

The Proponent prepared revised maps and diagrams to address the majority of NRCan concerns, and responded to questions.

NRCan was generally satisfied with the assessment of terrain stability impacts, and the proposed mitigation measures and monitoring commitments proposed by the Proponent in the Application.

The Proponent has committed to follow-up field checking to assess locations where the current terrain stability study has identified landslide hazards along the transmission line. This field work will include the locations where potential landslides might cross the existing transmission line right-of-way.

The Proponent reproduced a number of terrain stability maps to ensure that information was clear.

## Conclusion

During this cooperative environmental assessment EAO and the RA have considered: the Application; comments on the terrain stability effects of the Project; proposed mitigation measures and related commitments from the Proponent. Based on this information and provided that the Proponent implements the actions described in the Commitments and Responsibilities Table: Holberg Wind Energy, EAO and the RA are satisfied that the Project will not have significant adverse impacts to terrain stability.

### **9.1.2. Geology**

#### Background

Section 6.4 of the Application outlines regional and site specific geology, and how the Project may cause adverse environmental impacts on the geology of the area. Potential impacts on the Project due to geology such as the potential impacts of earthquakes are discussed in section 7.4 of the Application.

The Holberg Wind Energy area was geologically evaluated using a variety of existing information sources, including Western Forest Products Forest Development Plan, as well as field mapping in 2003 at an approximate scale of 1:10,000. The Project lies in the Nahwitti Lowland, and the terrain is composed of a series of relatively narrow west-northwest trending ridges and valleys. The topographic relief in the area varies from low hills above sea level near Holberg Inlet, to crested mountain ridges (e.g. Mt. Brandes, Mt. Hansen) with relief of nearly 600 m, and the proposed location for turbine siting. The topography is a reflection of the underlying geology, with valleys

and low hills in areas of limestone and sedimentary rocks susceptible to weathering between ridges of more weathering resistant volcanic rocks. There is some faulting in the area including the Holberg and Mahatta Faults, involving a significant vertical component of movement.

Metal Leaching and Acid Rock Drainage (ML/ARD) occurs where sulphur type rocks are exposed to air and rain, and subject to natural weathering. ML/ARD has been an issue in the region, and may potentially be of concern in the Project area.

Karst results from the dissolution of soluble bedrock, typically limestones, and includes sinkholes and caves. Although karst may occur in the vicinity of the Project, the karst potential formations do not occur on either Mt. Hansen or Mt. Brandes where proposed wind generation facilities are sited.

### Impact Assessment and Mitigation

The Project area is located in an area of relatively low seismic activity (Zone 5 seismic zone, 0 high risk, 6 low risk) and surface traces of active faults have not been identified by regional geological mapping.

The Project involves the upgrading of existing roads, construction of a limited number of new access road segments, new service roads, wind turbine generators and infrastructure (transmission lines, quarries, concrete batch plants and substation). Potential geological impacts associated with the proposed development include slope stability and ARD/ML.

Potential impacts to geology are expected to be low, and will be minimized by limiting the amount of disturbance caused by bedrock excavation, especially in the wind turbine generator locations and roads. Excavated bedrock will benefit other aspects of the Project. Bedrock cuts, when properly designed and engineered, will have a very low potential for environmental impact.

Potential for ML/ARD is low, and will be evaluated through periodic monitoring and testing. Inspections during construction will evaluate exposure of potential ML/ARD rock. Monitoring would be consistent with the Erosion and Sedimentation Plan.

### Review of the Application

Comments on the geology section of the Application were submitted by MWLAP, LWBC and NRCan. NRCan provided comments, for information only, on the effects of earthquakes. The main terrain geology issues identified were:

- No commitment to monitoring for ML/ARD;
- Concerns for any planned blasting; and
- Location of quarries.

The Proponent has committed that any required blasting will be done by a qualified contractor pursuant to appropriate regulations. The Proponent has committed to ML/ARD monitoring in the table of Commitments and Assurances. Quarries are expected to be within the road right of way and would be addressed through road construction by WFP.

## Conclusion

EAO is satisfied that the proposed mitigation measures and related commitments will prevent or reduce to an acceptable level any potential adverse effects of the Project on geology including ML/ARD. NRCan, as the RA for the CEAA screening, is satisfied that after taking into account the proposed mitigation measures, the Project will not have significant adverse environmental effects on site geology, including ML/ARD.

### **9.1.3. Hydrology and Water Quality**

#### Background

The Application identifies a number of Project related activities that have the potential to alter the surface hydrology and water quality of the development area unless appropriate practices are applied (section 6.5 of the Application).

The Project area includes 3 major (Goodspeed, San Josef and Macjack Rivers) and 3 minor (unnamed) watersheds for a total drainage area of 329 km<sup>2</sup>. The proposed Project area is generally in the headwaters of small tributary streams that feed mainstem rivers. The small tributary streams drain terrain that varies in elevation between approximately 100 m and 600 m above sea level.

Mt. Brandes is located on the topographic spine of Vancouver Island. While landslides are a local issue, rain-on-snow events are considered a large factor in their frequency, along with debris flows. The small tributaries in the Project site will be subject to rain-on-snow events which can result in flashy discharge regimes on the streams and typically generate the more significant peak runoff events in the tributaries.

The Project area is generally the rainiest zone in British Columbia and is typified by mild winters and cool summers. Mean annual precipitation is 2,228 mm and varies from 1000 mm to 4,400 mm within the entire zone, with a gradient of temperature and oceanic influence across the study area with the Project being located in the portions of the watersheds that are the wettest, coolest and generally the least influenced by the ocean. Extreme rain events are not unusual. With low evapotranspiration, the wet winters result in saturated soils from November through May. Soils in the Project area will likely be moist to very wet all year round.

All three major watersheds in the Project area have been subject to logging, and show a number of logging related landslides. Some hydrological impacts have affected the tributary streams and mainstem areas in the past but these impacts should now be in recovery.

Surface water data is available from the gauge on the San Josef River. The 100-year maximum instantaneous flood is typically used to design culverts and bridges for stream crossings and the 200-year maximum instantaneous flow is used by the province as the design standard for flood protection. The 10-year, 7-day low flow is typically used to identify baseflow conditions and to assess stream habitat for fish.

Stream data was collected for 13 streams in the Project area, with the objective to identify the relative sensitivity of the stream reaches to changes in flow regime and sediment loading. These

streams typically have moderate sediment loads and are subject to limited control by vegetation leading to low to moderate rates of stream bank erosion.

### Impact Assessment

Project components that may potentially result in impacts to hydrology and water quality include:

- Access roads;
- Clearing and disturbance of the actual footprint of the development including wind turbine generator sites and service roads; and
- Infrastructure (concrete batching plant, quarries, sub-station, transmission lines).

Potential hydrology and water quality impacts include:

- Flow regime changes;
- Water table changes;
- Water quality degradation (sedimentation and temperature); and
- Physical changes to stream health (debris flows/floods).

The Proponent proposes mitigation measures in section 6.5.3 of the Application:

- Correct road design and construction;
- Minimizing the number of stream crossings;
- Roads will be generally ballasted and surfaced with shot rock to provide all weather surface capable of heavy equipment traffic;
- Ditches and culvert inlet/outlets will be armoured as needed to protect soils from erosion;
- Implementation of an erosion and sediment control management plan;
- Site drainage management;
- Revegetation of the wind turbine sites; and
- Monitoring of Project related erosion and sedimentation, baseline water quality monitoring, and periodic monitoring at selected surface water sampling stations.

### Review of the Application

Comments on the hydrology and water quality sections of the Application were submitted by Ministry of Forests (MOF), Fisheries and Oceans Canada (DFO) and MWLAP. The main hydrology and water quality issues identified include:

- Maintenance of hydrological integrity;
- Maintenance of water quality for fish and amphibians;
- Installation of appropriate drainage structures in compliance with the *Fisheries Act* and applicable Forest Practices Code; and
- Potential water quality impacts from the concrete batch plant.

Stream water quality will be monitored targeting peak flow events during major rainstorms, and sediment sources investigated during anomalous high turbidity events. Negative impacts will be mitigated.

MWLAP expressed concern about potential water quality impacts related to the concrete batch plant and possible fuel spills. MWLAP made a number of recommendations with regards to fuel storage and equipment maintenance. To address these concerns, the Proponent has stated that refuelling of equipment will be done in accordance with the existing regulations for logging operations in the area. The Proponent also stated that the concrete batch plant will be located in Holberg, where all excess water will be contained and prevented from escaping to fish bearing waters.

## Conclusion

EAO is satisfied that the proposed mitigation measures and related commitments will prevent or reduce to an acceptable level any potential adverse effects of the Project on hydrology and water quality. NRCan, as the RA for the CEAA screening, is satisfied that after taking into account the proposed mitigation measures, the Project will not have significant adverse environmental effects to hydrology or on water quality.

### **9.1.4. Vegetation**

#### Background

Biogeoclimatic subzones contain areas with similar climate, vegetation and site conditions. For each subzone, MOF has developed a classification system that categorizes forest types. One biogeoclimatic subzone variant, the Montane Very Wet Coastal Western Hemlock occurs within the study area. This variant occurs at higher elevations up to 800 m. Forests on zonal sites are dominated by western hemlock, amabilis fir, and to lesser extent western red cedar, yellow cedar and mountain hemlock. Higher elevation and wet sites support greater amounts of yellow cedar and mountain hemlock. Major understorey species include Alaskan blueberry (*Vaccinium alaskaense*), five leaved bramble (*Rubus pedatus*), *Hylocomium splendens*, *Rhytidiadelphus loreus*, and *Rhytidiopsis robusta*.

The study area is within Western Forest Products Tree Farm License #6, and timber harvesting has been occurring on these lands since 1950. Timber harvesting has had, and continues to have a major impact on the habitat resources of the study area. Forests within the study area are a combination of old growth and second growth stands. Old growth stands are located primarily along the tops of Mt. Brandes and Mt. Hansen and second growth forest in the valley bottoms.

Thirteen ecosystems occur within the study area and have been mapped and ground tested, and are described in detail in the Application (section 6.6.2), including their utility as wildlife habitat. However, wildlife habitat is discussed in detail in the Wildlife section (6.7).

No Species at Risk or red listed plant communities occur within the study area, but three of the habitats mapped are on the provincial blue-list. The maximum area potentially impacted by the proposed development and the communities are:

- 0.76 ha - Western redcedar/Western hemlock – Sword fern (RS);
- 3.59 ha - Amabilis fir/Sitka spruce – Devil’s club (AD); and
- 0.8 ha - Western redcedar/Yellow cedar – Skunk cabbage (RC).

The areas impacted will change as the precise siting for each wind generator turbine is determined. In the Mt. Hansen south portion of the study area, two polygons containing blue-listed plant communities occur, but will not be impacted by the current Project footprint. On Mt. Hansen north, blue-listed plant communities occur in three polygons, and all three blue-listed communities will likely be impacted, 0.24 ha (15%) of the Amabilis fir/sitka spruce – devil’s club, 0.02 ha (50%) of the Western redcedar/Yellow cedar – Skunk cabbage.

Rare plant species on the NW end of Vancouver Island are the disjunctly occurring species of the Brooks Peninsula, including plants that were formerly thought as “Queen Charlotte endemics”. These species have their main occurrence on the Brooks Peninsula primarily above 650 m. Thus, the highest sites in the Project area are on the lower end of the potential for these species. Six of these rare plants, which have now been down listed to yellow, may occur in the study area. In addition, 4 Brooks Peninsula species may also occur although the likelihood of their occurrence is less than that of yellow listed species.

While there are some sites of interest, the overall potential for the occurrence of red- or blue- listed plants is low. The potential for Brooks Peninsula/Queen Charlotte disjuncts and endemics is low as the Project area is too low in elevation, and provides little mineral soil and rocky substrates.

### Impact Assessment

The greatest effect on vegetation is direct loss of ecosystems and the plant species they contain. This will occur due to clearing along existing and new roads, at tower sites, along the 5 short transmission lines and at the service and maintenance centre. Project impacts will be minimized by:

- Minimize area to be cleared of vegetation;
- Using existing roads wherever possible, and minimizing construction of new roads;
- Routing transmission lines along road right of ways wherever possible;
- Encouraging revegetation of disturbed areas using native species;
- Controlling vegetation where necessary by cutting and minimizing herbicide use;
- Where possible, alter clearing to avoid blue-listed communities;
- Manage construction activities to protect all vegetation including blue-listed communities adjacent to worksites;
- Avoid removal of old or old-looking trees and large trees from within or adjacent to blue-listed communities, as well as large logs on the forest floor;
- Preparing a Vegetation Management Plan including monitoring; and
- Preparing and implementing an Accident and Malfunctions plan.

### Review of the Application

Comments on vegetation from section 1.1.8 of the Application were received from MWLAP. The main issue was management of weed species around turbine towers, access roads and under the transmission line.

The Proponent has proposed to conform to the Ministry of Forests protocols for controlling weeds around industry facilities, access roads and under transmission towers where necessary by cutting and by minimizing herbicide use.

## Conclusion

EAO is satisfied that the proposed mitigation measures and related commitments will prevent or reduce to an acceptable level any potential adverse effects of the Project on vegetation. NRCan, as the RA for the CEAA screening, is satisfied that after taking into account the proposed mitigation measures, the Project will not have significant adverse environmental effects on vegetation and soils.

### **9.1.5. Transmission Line**

#### Background

The Project application discusses transmission lines in section 6.3, 6.12 and Appendix 13. The required transmission lines include an upgrade from Port Hardy to Holberg, as well as new transmission lines from turbine clusters to the substation, and from the substation to Holberg.

#### **Line Upgrade – Port Hardy to Holberg**

The existing 25 kV line between Port Hardy and Holberg, covering a distance of 45 km, will be converted to a 138 kV line using the existing poles and right of way. To ensure local service is not disrupted two 25 kV step down transformers will be installed, and a microwave repeater pole will be upgraded to 138 kV.

#### Impact Assessment

Although a line upgrade is planned, the existing right of way will be widened to accommodate the 138 kV line. No significant impacts are anticipated, as clearing adjacent to the existing BC Hydro right of way impacts primarily immature coniferous and deciduous trees. A few snags (wildlife trees) have been identified for removal due to line safety concerns.

The line will cross two water courses. The Glenlion River is in a deep ravine under the right of way near the substation, and an unnamed creek flows into a small wetland at the south end of the right of way. Although there are no records of fish in these water bodies, they are being treated as fish bearing, with best management practices proposed for work near either water course to prevent any sedimentation, and a 15 m riparian right of way will be maintained along the creeks. In addition, other intermittent creeks and wetlands will be the subject of best management practices including sediment and control measures. Additional detail is contained in the Fisheries Section.

#### **New transmission line – Holberg to Project substation**

The Project Substation is proposed for the road junction for Department of National Defence (DND) radar station, and the Winter Harbour Road. An existing 25 kV transmission line runs 4 km west from Holberg to the old DND town site, and continues west for a further 4 km before turning south to Winter Harbour. The construction of a line on the opposite side of the road from the existing line was determined to involve fewer impacts than twinning the transmission line in the current right of way. The new line will be co-located for a short distance with the existing line to avoid impacts near

the Goodspeed River. The removal of a limited number of old growth trees will be required for line safety.

### Impact Assessment

To minimize impacts, the transmission line will be located on the opposite side of the road from the existing line. Best management practices will be maintained when working near any creeks. Vegetation removal will be minimized.

### Review of the Application

MOF suggested that WFP should be contacted prior to construction of overhead transmission lines to ensure adequate clearance for logging equipment.

The Proponent has agreed to consult with WFP regarding transmission line heights.

### Conclusion

EAO is satisfied that the proposed mitigation measures and related commitments will prevent or reduce to an acceptable level any potential adverse effects from the Project's new transmission line. NRCan, as the RA for the CEAA screening, is satisfied that after taking into account the proposed mitigation measures, the Project transmission line will not have significant adverse environmental effects.

## **9.1.6. Wildlife**

### Background

Baseline information and potential impacts to wildlife resources and terrestrial habitat associated with development and construction activities for the Project are outlined in section 6.7 of the Application and Appendix 12.2, 12.3. Existing baseline information from several sources was augmented by habitat field studies, and wildlife surveys in winter, spring and early summer. Additional information will be obtained in planned fall wildlife surveys.

While information on many species was reviewed, special emphasis was given to marbled murrelets, bats and birds in migration and other species at risk. Information on habitat is discussed in section 6.6 of the Application, and section 9.1.4 of this report.

Habitat was mapped using RIC, MELP and MOF (1998) protocols at the 1:20,000 scale. A 6-class RIC rating system based on habitat was used to assess the value of habitats to black-tailed deer (winter and spring security and forage) and bear (forage, security and denning). A 4-class rating system (H-high, M-moderate, L-low, N-nil) was used to assess the value of habitats to bats (roosting habitat/caves and rock crevices), marbled murrelet (suitable nesting trees), northern goshawk (suitable nesting trees) and band-tailed pigeon (forage and nesting trees). Field work was augmented by low level helicopter surveys to complete the assessment of marbled murrelet nesting habitat.



A total of 106 species of birds were positively identified as occurring within the study area based on observation (Appendix 12.3 Application), and are categorized for discussion purposes:

- Water associated birds: seabirds, waterfowl, waders, shorebirds, kingfishers and American dipper;
- Marbled murrelet;
- Raptors (eagles, falcons, hawks, owls);
- Birds in migration; and
- Other birds (62 species, grouse (2), pigeons (1), woodpeckers (5), various perching birds (51), goatsuckers (1), swifts (1), and hummingbirds (1)).

Information that marbled murrelets occur, and probably nest in the study area in combination with their threatened status (SARA listed Schedule 1) gave them prominence in this assessment. Surveys were designed to investigate: the presence of potential nesting sites in or immediately adjacent to proposed clearing for wind turbine generators; and overflight activity in the airspace to be shared with operating wind turbine generators.

To obtain a regional perspective of marbled murrelet flight patterns, radar surveys were conducted near the mouths of the San Josef and Macjack Rivers, and Winter Harbour, with one survey per site. Survey results were consistent with those for northwestern Vancouver Island with 75 detections per watershed. Radar surveys were also conducted within or near the edge of each of the five subdivisions of the project area. Each site was typically surveyed for a total of two to three days from April through June. Approximately 70 to 205 marbled murrelets were detected per site.

Within the study area the study team recorded five species of falconiform raptor and four species of owl, including the *swarthy* (Vancouver Island) subspecies of the northern pygmy owl which is provincially blue listed.

Pulses of flight activity by migratory birds were observed in radar surveys conducted in April, May and June. During one of the six early mornings radar surveys conducted in April, a large number of migrants (>667) were detected passing over the study area. Additional information is needed to fully assess the presence of birds in migration over the Project area.

Two other bird species at risk were identified. Band-tailed pigeons (blue listed) were frequently recorded during April, May, and June field trips. The study team estimated (no benchmark habitat) they nest in mature and old growth stands, and forage in the early seral stage regenerating with its red elderberry and other fruit bearing species. Pine grosbeak (*charottae* subspecies) is also blue-listed, and was observed in a small flock near B12 on Central Brandes in February. However, this species is not believed to breed in the Project area.

Bats were the only species of mammal for which systematic surveys were conducted. However, other mammal species were noted through direct observation or sign. Ten species of bat occur on Vancouver Island, with two being provincially listed. Keen's long-eared myotis is red-listed, and Townsend's big-eared bat is blue-listed. While bat distribution declines at higher elevations, data indicates many species are distributed above 600 m in the area, and all 10 species could potentially occur in the Project area. The study area could be used by bats for roosting, foraging, or hibernation.

Bats may also traverse the ridges as they commute from their day roosts to nocturnal feeding areas located outside the study area, or migrate through the study area in late summer or autumn.

Although bats were the only species of mammal for which systematic surveys were conducted, other mammal species were noted through direct observation or sign. The study area supports a wide range of wildlife species characteristic of coniferous forests at the north end of Vancouver Island. They comprise amphibians, reptiles, birds, and small and large mammals.

Published studies suggest 29 species of mammals should occur in the study area. Twelve of these mammals were detected in the study area from direct observation or sign during the field program. These included: hoofed mammals (Columbian black-tailed deer and elk), carnivores (black bear, grey wolf, cougar, river otter, mink, marten, racoon), rodents (beaver, mouse, Townsend's vole, red squirrel), and bat (*Yuma myotis*).

The ermine is rare but widely distributed on Vancouver Island. The Vancouver Island subspecies (*Mustela erminea anguinae*) is blue-listed. Although this subspecies should occur in the Holberg area, it was not observed during field studies, and habitat preferences make its presence in the Project area unlikely.

The Vancouver Island subspecies of wolverine (*Gulo gulo vancouverensis*) is a red-listed species and is the rarest mammal on Vancouver Island. The most recent occurrence in the Holberg area is from 1977. Its current status is unknown and some biologists consider it extirpated.

No shrew sampling was conducted, but three species probably occur in the study area: dusky shrew, vagrant shrew, and common water shrew. The Vancouver Island subspecies of common water shrew (*Sorex paulustris brooksi*) is red-listed, and would be expected to occur along the San Josef River, a few permanent tributaries that drain from Mt. Hansen and Mt. Brandes, and possibly a few small ponds and wetlands that occur in the study area.

Amphibian presence was obtained by examining all wetlands and bogs where surface water accumulated. Five species of amphibians and one reptile were recorded during field investigations in the study area including Northwestern salamander, red-backed salamander, rough-skinned newt, northwestern garter snake and red-legged frog (blue-listed). Northwestern salamanders were observed in many wet bogs, making this the most frequently recorded salamander. Two individual blue-listed red-legged frogs were observed, both at mid-slope. The species recorded conform to those expected to occur, with two exceptions: Clouded salamander and western toad have been recorded in the area, and were thus expected to occur; and common garter snake has been reported for northern Vancouver Island, however, neither were observed by the study team.

### Impact Assessment

Potential impacts on wildlife include:

- Loss or alteration of habitat including nesting habitat;
- Sensory disturbance;
- Changes in movement patterns; and
- Direct wildlife mortality from collisions with turbine towers and turbine blades.

Nominally 65 ha are scheduled for clearing for the wind turbine generator sites, access roads, transmission lines and ancillary sites. Most of this will be on ridge tops. No site specific attributes (nests, feeding areas, wetlands) were identified that require specific avoidance, but nesting habitat for marbled murrelets does exist, and information collected confirmed the species' occurrence as well as probable nesting in the study area.

As a SARA listed species (Schedule 1) the marbled murrelet is of considerable conservation concern. Potential impacts on murrelet nesting habitat and collisions will be minimized through Project design, specifically avoiding clearing H1, H2 and A1. In at least one site (B10) a murrelet was observed flying into the canopy, suggesting a nest. Additional work will be conducted at this site to evaluate the presence of any nest prior to any proposed construction. H13, H14 and H15 warrant a rating of moderate for collision impacts, and should be avoided if possible in the final design. North Brandes R23, R21, B3 and 18A sites are adjacent to potential murrelet habitat, and impact potential was assessed at low to moderate.

The *swarthy* (Vancouver Island) subspecies of northern pygmy owl is blue-listed provincially and was observed twice, once near H1, and near the Goodspeed River some distance from the Project area. Impacts to this species during construction will be minimized by following the mitigative measures listed below.

Bats are the species of mammal most likely to be impacted by the wind turbines. Impacts include:

- Destruction of summer roosts;
- Destruction of hibernacula; and
- Mortality from collisions with turbines.

Recent studies suggest the majority of collisions occur during migration or dispersal in late summer or autumn. Two species of migratory bats occur on Vancouver Island, the hoary bat and the silver-haired bat. The hoary bat has been found to have high casualty rates at some wind generation facilities in the USA. Two non-migratory species of bats occur on Vancouver Island and are both species at risk. They include Keen's long-eared myotis (red listed species) and Townsend's big-eared bat (blue listed species). Impacts will be mitigated by following the measures listed below. Post-construction wildlife monitoring will focus on marbled murrelets, migratory birds and bats.

Five other (non bat) mammalian species at risk may occur in the study area:

- Wolverine (probably extirpated);
- Common water shrew;
- Ermine; and
- Elk.

Wolverine, a red listed species provincially, is most likely extirpated, and will therefore not be affected by the Project. Common water shrew (Vancouver Island subspecies) occurs in the area, primarily along watercourses. Their habitat is not expected to be affected by the Project, particularly with the avoidance of wetlands and bogs. Ermine have habitat preferences which do not coincide with the Project area. Neither elk nor elk sign were observed in field work, and the area is known to

support few elk. Elk are not expected to be impacted by the Project, particularly with no major changes in access for hunting as a result of the Project.

All amphibians in the study area are sensitive to habitat disturbance. Their size and requirement for damp habitats limits their ability to move out of a potential zone of impact. The red-legged frog is blue-listed (vulnerable) and a species of Special Concern by the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The western toad (not observed) is classified as a species of Special Concern by COSEWIC. Vegetation clearing could destroy local habitat. The impact can be minimized by avoiding bogs and wetlands wherever possible and using specific mitigation for reptiles (cavity medium and large diameter fill).

Potential effects on wildlife can be avoided and/or reduced in magnitude through mitigation measures implemented during construction and operation. Ten mitigation measures are proposed:

- Minimize areas to be cleared of vegetation;
- Avoid nesting sites;
- Clear vegetation outside critical bird breeding period established in consultation with CWS and MWLAP;
- Prepare and implement an environmental management system (EMS) or EPP;
- Manage interactions between employees/contractors and wildlife;
- Minimize duration of construction;
- Reduce impacts through detailed turbine site selection and design, particularly for B10 and H2, including additional site specific monitoring;
- Revegetate disturbed soil with native species (reclamation component EMP);
- Construct overhead transmission lines below the height of the forest canopy install bird diverters where necessary; construct new lines and upgrade old lines to be bird friendly where possible;
- Prepare and implement an Accidents and Malfunctions Plan;
- Install medium intensity white flashing obstruction lighting if approved by Transport Canada; and
- Develop and implement a comprehensive and adaptive wildlife monitoring plan.

### Review of the Application

Comments on the wildlife impacts section of the Application were submitted by Canadian Wildlife Service (CWS), MWLAP and DFO. The Quatsino First Nation provided verbal comments. The main issues included:

- Potential bird and bat mortality rate from turbines, particularly regarding Marbled Murrelets and other migratory birds;
- Marbled murrelet behaviour patterns, movement in general and nest approach and departure;
- Sampling methods including additional July and fall sampling;
- Concern regarding efficacy of carcass search monitoring approach by humans and dogs;
- Size of buffer zone to known nests; and
- Wildlife Monitoring Plan design and duration, and emerging technology.

The Proponent has committed to meeting with Environment Canada (EC), MWLAP and members of the Marbled Murrelet Recovery Team to discuss and finalize a monitoring plan that addresses outstanding issues. A supplementary report on wildlife monitoring, including a July and August/September fall migration survey, will be submitted to agencies in October. The report will contain further information regarding survey methodologies.

The Proponent has also committed to researching emerging technologies for monitoring bird mortalities from impacts with wind turbine generators.

The Proponent included a brief monitoring strategy in the Application (6.7.2). In response to preliminary agency comments, a more comprehensive Draft Wildlife Monitoring Plan was prepared dated August 18, 2004.

MWLAP and CWS have stated that the draft monitoring plan provides the level of detail they require at this stage of the EA and that further detail can be provided after the EA has been completed and before construction starts.

### Conclusion

EAO is satisfied that the proposed mitigation measures during construction and operation and related commitments will prevent or reduce to an acceptable level any potential adverse effects of the Project on wildlife. NRCan, as the RA for the CEAA screening, is satisfied that after taking into account the proposed mitigation measures, the Project will not have significant adverse environmental effects on wildlife resources.

## **9.1.7. Fish and Fisheries Habitat**

### Background

The Application identifies a number of Project related activities that have the potential to impact fish, fish habitat, water quality, and riparian habitat in the Project area (section 6.8 of the Application). Preliminary comments from DFO and MWLAP suggested the fisheries section be rewritten, and a revised section was provided September 13, 2004. Supplementary information was provided on September 17, 2004.

There is a significant base of fisheries information due to work conducted by WFP over the last 20 years. Additional fish distribution information will be collected in the fall 2004, prior to construction, for stream with insufficient current information. Existing information has been mapped at the 1:5000 scale. A precautionary approach has been adopted for stream assessment. Where fish are not located, but no barrier is identified following survey/resurvey, the stream will be treated as fish bearing and appropriate mitigation implemented.

The Project activities including access roads involve three watersheds: the San Josef River, the Goodspeed River and the Macjack River watersheds. All three watersheds contain coho, cutthroat and Dolly Varden. There are no known SARA listed fish species in the Project area, however Dolly Varden and Cutthroat trout, provincially blue listed species, do occur in all three watersheds. Steelhead trout are not listed, but are a species of concern.

Although chinook, chum, pink, and sockeye salmon and steelhead trout are listed to be present in some or all of these watersheds, they are unlikely to be within the tributaries that are adjacent to the Project area. None of the streams that are crossed by roads within the project area provide typical habitat (spawning and rearing) for these species. These species spawn and/or rear in mainstems or larger tributaries of rivers (chinook, pink, chum, steelhead) or lakes (sockeye) and do not typically inhabit small tributaries like the streams located adjacent to the Project area.

Coho salmon, cutthroat trout and Dolly Varden char have been sampled in the tributaries that are adjacent to the Project area. These species spawn and rear in these smaller tributaries and they are the species that will likely inhabit the streams at the two bridge sites that are identified within the fisheries discussions.

All crossings will be installed to protect all fish species. Crossing structures will be constructed to meet or exceed provincial and federal fish habitat guidelines.

### Turbine Sites

The turbine sites are contained in three watersheds: the San Josef, the Goodspeed and the Macjack River watersheds. Turbine sites are located upstream of the limit to fish access within each drainage, and involve only primary order drainages. No fisheries impacts are anticipated, and an Erosion and Sedimentation Plan will be developed and implemented to insure no inputs to fish bearing systems being fed by higher order drainages near turbine sites.

### Access Roads

Existing logging roads in the valley bottoms will be used without modification by this project. Where logging trucks are using existing roads no upgrading is needed for Project traffic, as the logging loads are in excess of any anticipated Wind Turbine loads.

There will be upgrades to existing logging roads, including re-activating roads that are no longer in use, and extending roads where they presently terminate to access the Wind Turbine Generator (WTG) sites. All construction of roads will only be started once Road Engineers have fully documented all changes, additions and upgrades, and received all necessary approvals (including DFO) for the work to proceed. All work will be consistent with the Forest Practices Code “*Fishstream Identification Guidebook*,” and “*Riparian Management Area Guidebook*”. Construction, where appropriate, will be limited to outside the Instream work windows, that is, July 1<sup>st</sup> to September 15<sup>th</sup>.

Currently only 2 crossing with known fish habitat have been identified. Both of these streams have been identified for a bridge crossing.

Modification of the existing transmission line: The current transmission line, which runs from Port Hardy to Holberg, will be upgraded utilizing the existing poles, with upgraded insulators. The width of the existing right of way will not increase over the existing 10m wide clearance. A few additional trees will be removed to ensure the safety of the transmission line, but there will be no expansion of the current right of way. Riparian vegetation and stream crossings will not be affected by this

upgrade, as the work will be performed by workers in a bucket truck, as they perform maintenance today, with the truck staying on the adjacent road.

New Transmission line: New buried/overhead transmission lines will be constructed where power is to be brought into the substation from turbine clusters. The line from the WTG's on Mt. Hansen will be buried, until it follows the existing access road to tie into the Holberg – DND right of way. There are no stream crossings on this section, and no fisheries impacts anticipated. From Mt. Brandes (East) there are two short sections that connect the WTGs to the Winter Harbour right of way, and neither of these sections cross streams. The WTG's on Mt. Brandes (West) connect to the existing right of way from the DND to Winter Harbour right of way, and there is the potential to cross the headwaters of some creeks following a disused roadbed. In the location of the stream headwaters, the disused road bed will be the power line right of way, so its construction will have no impact directly on fish habitat. The Erosion Sediment Control Plan will be strictly followed in this construction to ensure no downstream effects on fish or fish habitat.

### Species at Risk

Coastal cutthroat trout and Dolly Varden char are identified as Blue Listed species. Populations of coastal cutthroat trout on the east coast of Vancouver Island and the lower mainland, near Vancouver, are in serious decline. The Project area is not within these specified areas where the populations are in decline. The watersheds adjacent to the Project area flow to the west coast of Vancouver Island.

Dolly Varden char are blue-listed throughout their distribution along the British Columbia coast. As Blue-Listed species occur within the Project area, all species in the drainage will be afforded the same protection. All species will be protected through the implementation of the habitat policies outlined by the federal and provincial governments.

Steelhead trout utilize the Macjack, Goodspeed, and San Josef River watersheds. Steelhead trout are of special interest to government agencies and non-governmental organizations. Therefore they will be afforded the same protection as the blue listed species within the watersheds. Steelhead trout will be protected through the implementation of the habitat policies outlined by the federal and provincial governments. Provincial and federal guidelines for stream crossings and riparian management will be adhered to during all phases of the project.

### Impact Assessment

The key potential impacts on fish and fish habitat that are relevant to the Project are:

- Sedimentation; and
- Loss of riparian vegetation.

Unavoidable loss of productive capacity of fish habitat will be minimized by adopting the following mitigation strategies:

- Minimizing stream crossings on fish bearing waters;

- Designing road crossings in a manner that minimizes habitat loss, using design standards that will meet or exceed *Forest and Range Act* standards and the *Riparian Management Area Guidebook*, including open structures for fish bearing crossings;
- Revegetating using willow staking and reseeded into disturbed areas;
- Assessing potential for non-fish bearing crossings to deliver sediment to fish-bearing waters;
- Developing and implementing an Erosion and Sediment Control Plan;
- Developing and implementing a monitoring plan for construction and water quality;
- Minimizing the clearing of riparian vegetation for stream crossings and beneath transmission lines;
- Implementing long term comprehensive road maintenance standards;
- Limiting instream construction to instream timing windows unless otherwise permitted by DFO; and
- Conducting pre-construction, construction and post-construction monitoring for fish, fish habitat and water quality.

An authorization under subsection 35(2) of the federal *Fisheries Act* does not appear to be required to address Harmful Alteration, Disruption or Destruction (HADD) of fish habitat, as no habitat destruction is anticipated. HADD has been addressed in the Application.

#### Review of the Application

DFO and MWLAP submitted comments on the fish and fish habitat section of the Application. The main issues included:

- Concern for Dolly Varden, a provincially blue-listed species and steelhead trout;
- Stream crossings and maintenance of riparian vegetation for amphibians as well as fish;
- Potential for ongoing sedimentation;
- Recognition of Riparian Management Zones, not just Riparian Reserve Zones;
- Extent of road upgrading;
- Transmission line information consistent with elsewhere in Application;
- Concrete truck washing near tower foundations;
- Data standards and stream assessment standards; and
- The need for a stronger commitment to monitoring and details on monitoring.

The Proponent provided clarification on planned transmission line work and the potential for replacement of existing poles. The Proponent made the following commitments to address issues raised by agencies:

- Provincial and federal guidelines for stream crossings and riparian management will be adhered to during all phases of the project;
- Preparation and implementation of an EMP;
- Preparation and implementation of an Erosion and Sediment Control Plan;
- Preparation and implementation of an Accidents and Malfunctions Plan;
- Employing qualified managers for Construction Manager and Operations Manager, and Environmental Monitor; and
- Full containment of water from washing of concrete trucks.



DFO and MWLAP are satisfied that the proposed mitigation measures and commitments will adequately address fish and fish habitat impacts of the Project, and that the Project will have no net loss of fish habitat.

## Conclusion

EAO is satisfied that the proposed mitigation measures and related commitments will prevent or reduce to an acceptable level any potential adverse effects of the Project on fish and fish habitat. NRCan, as the RA for the CEAA screening, is satisfied that the Project will not have significant adverse environmental effects on fish and fish habitat.

## **9.2 SOCIO-ECONOMIC, ARCHAEOLOGICAL AND HEALTH EFFECTS**

Sections 6.11 and 10.5 of the Application discuss the potential social and economic impacts of the Project. The following factors were included in the assessment:

- Land Use and Other Resource Impacts;
- Archeological, Cultural and Heritage Resources;
- Socio-economic and health effects;
- Noise; and
- Recreation and visual effects.

### **9.2.1 Land Use and Resource Impacts**

#### Background – Land Use

Land use is discussed in section 6.9 of the Application. Crown land use on Vancouver Island is governed by the provisions of the Vancouver Island Summary Land Use Plan (VISLUP). Plan implementation is guided by the *Forest Practices Code*, the *Mineral Exploration Code*, the *Petroleum and Natural Gas Act*, the *Park Act*, the *Land Act*, the *Wildlife Act* and the *Environment and Land Use Act*.

The entire proposed Project area lies within uninhabited provincial Crown land and a few small pieces of Fee Simple Crown Grant parcels owned by the DND and WFP. The Project area lies within the San Josef-Koprino Enhanced Forestry Zone. The overall management direction within this zone is timber harvesting and other commercial/industrial land use receives an enhanced management emphasis while maintaining fish values and watershed integrity.

The Project area lies within the Regional District of Mount Waddington Regional Plan; however, the Project area is primarily Crown land and not formally subject to the Regional Plan. The private fee simple lands held by WFP and the DND fall under the jurisdiction of the Regional District of Mount Waddington.

The Regional District of Mount Waddington is currently drafting a bylaw, which allows for wind generation facilities on Crown lands to regulate potential conflicts within their jurisdiction.

## Impact Assessment – Land Use Planning

Under the VISLUP, utility corridors and commercial/industrial uses within the general management zones are generally accepted land use activities within the zone, due to general compatibility with the intent of this designation. These uses within the Enhanced Forestry zones are given general approval and conditional opportunity, provided the activity is acceptable. “Special operational conditions” may be imposed to ensure practices are consistent with the intent of the zone, that is, increased timber production.

The Project will have both short term and some long-term impacts upon the land-base within the proposed development areas. The total loss of productive forest land as a result of this Project would be 10.2 hectares. This includes areas for non-forest roads, turbine towers and overhead transmission lines.

## Review of the Application

The main issues discussed by agencies were related to the Regional District of Mount Waddington’s interest in establishing zoning that could accommodate alternative energy production. The Regional District is currently working in conjunction with LWBC and wind energy proponents to develop a wind energy policy.

## Conclusion

EAO is satisfied that the Project is consistent with the approved land use regime as outlined in the Vancouver Island Summary Land Use Plan. NRCan, as the RA for the CEAA screening, is satisfied that after taking into account the proposed mitigation measures, the Project will not have significant adverse environmental effects on land use.

### **9.2.2. Forestry and Mining**

#### Background

Forestry is discussed in section 6.9.2.1 of the Application. The proposed development areas are mainly within Western Forest Products Tree Farm Licence #6 with a small portion being located within Fee Simple Crown Grant land held by DND. The Proponent has worked closely with WFP to ensure that development of the Project will have a minimal impact upon the forest land-base. All of the major proposed road access networks were designed to accommodate Western Forest Products logging trucks. The Project area that falls within the DND lands will not have an impact on forestry as the areas are not used for active harvesting operations.

Mining is discussed in section 6.9.2.2 of the Application. No registered mineral claims have ever been made within the areas proposed for development by the Proponent. Should mineral or ore deposits be located at the Project site only open pit mining at the same location as wind turbine generators are mutually exclusive activities. Deeper subsurface adit mining could conceivably function with an active wind turbine site situated above.

## Impact Assessment

The most noticeable short term impact upon the forested land base will be the extent and amount of road construction and overland aerial transmission line built during the initial construction phase. All of the timber felled during this period will need to be harvested by WFP at their earliest opportunity. An estimated 30,000m<sup>3</sup> of merchantable timber will be processed from the construction activities. This harvesting is not considered an impact to the forest resource as it will aid WFP in their operations.

Over the next 5 to 10 years WFP will incorporate the new harvest areas developed by main access routes for the Project into their annual harvest plans. An estimated 150,000m<sup>3</sup> of harvestable timber could be potentially developed from this road network.

Construction of “non-forestry” access roads, infrastructure buildings, aerial transmission power lines and portions of the worksites which can not be effectively reclaimed as productive forest land could potentially be assessed as reductions on the Total Harvestable Land Base during the next management plan review. 12% of the “non-forestry” access roads are in inoperable non-productive timber types and 60% of the wind turbine generator sites are located within non-productive or marginally productive timber types. The total decrease in Total Harvestable Land Base as a result of the Project is estimated at 10.2 hectares. It is conceivable that this impact will be seen as non-material and need not show up as an AAC loss. This decision would be made by the provinces Chief Forester during the next Timber Supply Review.

## Review of the Application

MOF and MWLAP submitted comments on forestry. The main issues included:

- Potential timber supply impacts;
- Requirement for a road use agreement with WFP;
- Requirement for permits from MOF for forest clearing and road construction;
- Adequate height of any transmission lines to allow movement of forest harvesting equipment; and
- Number and aerial extent of worksites to not be reclaimed.

## Conclusion

EAO is satisfied that the proposed mitigation measures and related commitments will prevent or reduce to an acceptable level any potential adverse effects of the Project on timber supply, forestry operations and mining. NRCan, as the RA for the CEAA screening, is satisfied that, after taking into account the proposed mitigation measures, the Project will not have significant adverse environmental effects on forestry resources.

### **9.2.3 Archaeological, Culture and Heritage Resources**

#### Background

Section 6.10 of the Application contains an archaeological overview assessment (AOA). The AOA involved documentary research, direct consultation with the Quatsino First Nation and groundtruthing.

The AOA was conducted with the permission of the Quatsino First Nation and in conjunction with the Quatsino Treaty Office and Traditional Use Study (TUS) Department.

The documentary research revealed that there were no recorded place names directly in the Project area and no recorded traditional use sites within the immediate Project area. Pertinent and previously recorded archaeological site data was researched from the MSRM which proved that there are no documented archaeological sites within and immediately adjacent the proposed Project area.

Consultation with the local First Nations indicated that there were no current uses for traditional purposes or traditional use sites within or adjacent to the proposed impact areas of the Project.

Groundtruthing of the Project did not identify any culturally modified trees (CMT's) or other archaeological features. The Project area was studied in four turbine/tower clusters. One of the four clusters was considered to contain a moderate potential for CMT locations due to the large size of the cedar trees. The other three cluster locations were of low potential.

Based on the findings of the AOA the proposed Project has a moderate (in one small Project area) to low potential for impacts to CMT features and sites and for other surface and subsurface archaeological remains the rating is low.

#### Review of the Application

MSRM commented on the preferred approach if further archaeological work discovers any sites. The preferred approach would be for the Proponent to re-design that specific component of the Project to avoid impacts to the archaeological site. If such redesign is not possible, then these sites may require mitigative actions, such as detailed data recover which would require a permit under the *Heritage Conservation Act*.

The Proponent has committed to avoiding any archaeological sites that may be discovered during further archaeological work.

#### Conclusion

EAO is satisfied that the proposed mitigation measures and related commitments will prevent or reduce to an acceptable level any potential adverse effects of the Project on archaeological resources. NRCAN, as the RA for the CEAA screening, is satisfied that after taking into account the proposed mitigation measures, the Project will not have significant adverse environmental effects on archaeological resources.

### **9.2.4 Socio-economic and Health Assessment**

#### Background

Section 6.11 of the Application includes a summary of socio-economic, community infrastructure and related trends within the local and regional area potentially impacted by the Project. The Regional District of Mount Waddington scores the lowest of all BC regional districts for

employment diversity. The Regional District of Mount Waddington has experienced declines in employment and population over the last decade. Population and employment declines are attributed to the closing of the Island Copper Mine, reductions in forestry operations and a general decline in the salmon fishery.

### Impact Assessment

The socio-economic and health impacts were assessed for the construction phase of the Project and for the operation phase of the Project.

#### *Construction*

During construction the Project is expected to have minimal impact on local infrastructure apart from transportation of material and work crews and the disposal of minor amounts of construction related waste, worker refuse and sewage. Most construction workers are anticipated to be local, and therefore an increase in demand for local health care services is anticipated to be minor except in the event of a construction emergency. A trained Environmental Monitor and Health and Safety Inspector will be in place on a full time basis during the construction phase.

Economic impacts during construction primarily include job creation and increased business for local contractors. Contractors will be required to hire locally including hiring from the members of the Quatsino First Nation to the extent possible. Direct employment during construction is estimated at 100 person-years with a value of \$8 million. New job creation is estimated to account for approximately 80% of this total.

The Project has a total capital cost of approximately \$120 million with \$30 million in material and labour being estimated for the construction phase. The projected value of supplies and services that will be procured directly from the local area during construction is \$4 million.

The Proponent is anticipating that the manufacturing of wind turbine support towers will be contracted from within British Columbia which would add an estimated \$12 to \$15 million to the provinces economy during construction.

#### *Operation*

Social impacts from operations primarily include maintenance jobs and training programs developed with local colleges, improved road maintenance and improved electrical energy security for Vancouver Island.

Operation of the Project does not generate pollution and will not have an impact on local air quality or on the health of residents in the local area. Local infrastructure will be minimally impacted during operations as there are no solid wastes and virtually no liquid waste discharges from the facility.

The Project would have a \$1.1 to \$1.7 million annual green credit value to BC Hydro as they will own the emissions credits from the facility. The Project would also enhance the energy security and price stability on Vancouver Island.

The primary economic impacts of the operation of the Project include job creation, increased business for local service firms and tax revenue for the Regional District of Mount Waddington. There will be up to six full-time operations and maintenance staff with salaries and overhead being approximately \$500,000 annually. Local residents and up to three Quatsino First Nation band members will be given preference for these permanent positions.

Supplies and services obtained from local business during operations is estimated at \$1 million annually as each permanent job related to the Project should create between two and three support jobs locally.

Socio-economic impacts are considered to be more positive than negative and therefore do not require mitigation. Health impacts are expected to be minimal except in the event of a serious accident during construction. An emergency response plan will be developed by the Proponent and will address health care requirements in the case of an emergency.

### Review of the Application

The Project is expected to significantly benefit the local economy. No significant adverse socio-economic effects or health effects are anticipated.

### Conclusion

EAO is satisfied that the Project will not have significant adverse socioeconomic or health impacts. NRCan, as the RA for the CEAA screening, is satisfied that, after taking into account the proposed mitigation measures, the Project will not have significant adverse environmental effects on health or socioeconomic conditions.

## **9.2.5 Noise**

### Background and Impact Assessment

Noise is discussed in section 6.9.6 of the Application. Most sound emitted from the Project will occur during construction. On-site construction will take approximately eight months with noise being typical of heavy construction including truck traffic, heavy equipment and blasting.

Blasting will occur for short durations and will be limited to daytime only. Blast waves for tower foundations will be controlled and inward, decreasing any noise resulting from the blast. Blasting may also be required to construct roads. Road blasting involves outward blasting and will therefore involve more noise than blasting for tower foundations.

There are no residences in the immediate Project area however, the residents of Holberg will hear trucks passing through town as well as intermittent sounds from blasting and other construction related activities.

During wind farm operation the turbines and towers are expected to emit approximately 20-25 decibels at a distance of 100m. This is the normal amount of sound during the night in rural areas (background noise). Since the town of Holberg is the closest residential area and it is a minimum of

1000m away the noise emitted during wind farm operation is not expected to be detectable above the normal background noise.

### Review of the Application

No comments with regards to noise impacts were received.

### Conclusion

EAO, and NRCan as the RA for the CEAA screening, are satisfied that the Project will not have significant adverse noise impacts.

## **9.2.6 Recreation**

### Background

Recreation and Access Management is discussed in section 6.9.3 of the Application. Recreational activities in the region include sport fishing, hiking, aboriginal heritage and culture, adventure tourism (kayaking, scuba diving, etc.), eco-tourism and logging tours.

Tourist infrastructure in the region consists of small hotels, motels, B&B's campgrounds, lodges and a ski facility at Mt. Cain. Two Provincial Parks are located in the Project area including Cape Scott Provincial Park and Raft Cove Provincial Park. Cape Scott Provincial Park is a popular hiking area and is located approximately 10 km north-west of the nearest Project structure. Raft Cove Provincial Park is undeveloped and is located approximately 8 km south-west of the nearest Project structure.

### Impact Assessment

The overall impact of the Project will be less than that of the normal annual logging operation. Construction noise or dust is not expected to impact hikers and other recreational users due to the trails and campgrounds not being in close proximity to the Project area. Traffic access to some of the recreational areas may be delayed for short periods of time as the turbine towers are trucked to the site but overall access will not be restricted.

The Proponent has committed to developing a Traffic Management Plan to ensure impacts on recreational road users will be minimized.

### Review of the Application

Comments on recreation were submitted by MOF and NRCan. The main issues included:

- Development of new access areas for recreational users;
- Need for controlled access;
- Public notification and education; and
- Traffic management.

The Proponent has stated that they do not feel the need to restrict access to their sites.

The Proponent provided information regarding the transportation of wind tower generators to the Project site. They propose to use the old Utah Mine site for a laydown area and truck the equipment from there to the Project site using private logging roads. The Proponent has already signed an agreement with WFP to share the private logging roads. The Traffic Management Plan will be implemented to incorporate the WFP road rules and further ensure road safety with the increased traffic volume. The Proponent stated that the percentage change in total traffic due to there project would be minimal.

### Conclusion

EAO and NRCan as the RA for the CEAA screening, are satisfied that proposed access management measures and related commitments will prevent or reduce to an acceptable level any potential adverse effects related to access improvements to the mountain ridges and increased traffic on private logging roads, and that the Project will not have significant adverse environmental effects on regional recreational resources.

### **9.2.7 Visual**

#### Background

The visual impact assessment is discussed in section 6.9.4 of the Application. The visual impact assessment was conducted in accordance with the British Columbia Ministry of Forests' Visual Impact Assessment Guidebook. The landscape at the Project site is characterized by mountain ridges just over 600m above mean sea level on Mt. Hansen and Mt. Brandes and valleys 80 to 100 m above sea level between them.

Overall the landscape of the Project area is dominated by a natural rainforest environment with annual forestry activity being evident. The Project area falls within an Enhanced Forestry Zone (EFZ) as described in the Vancouver Island Summary Land Use Plan (VISLUP). EFZ's do not have any special visual management objectives but visual resources are important and must be evaluated.

#### Impact Assessment

The Project will add wind turbine generators, power transformers, underground and overhead transmission lines, access and service roads and an electric sub-station to the landscape. The visual assessment was done on four separate sections including:

- Wind turbine generator pads and corridors;
- Electric distribution and transmission lines/collection system;
- Access and service roads; and
- A sub-station.

#### *Wind turbine generator pads and corridors*

The wind turbine generator construction pads will be cleared for foundation placement and turbine erection. These pads will be connected by access/service roads creating wind turbine generator



corridors. These corridors will be located along the ridges of Mt. Brandes and Mt. Hansen. Existing trees on the mountain ridges can reach 20 to 45 metres in height.

Visual simulations were prepared to show the effects the Project would have on the views from the most visually representative locations with the Project area. The visual simulation was prepared to scale and included imposing wind turbine towers onto actual photographs.

Actual photos were taken from areas where the Project site is within view of public areas. Visually sensitive points can occur within and in the vicinity of four separate areas surrounding the Project site.

It was determined that from the beaches at San Josef Bay and Raft Cove there would be no wind turbine generators visible. From the San Josef Main Road (approximately 17 km from Holberg) there would be approximately four wind turbine generators visible. Other areas where wind turbines would be visible include spots on Ronning Main Road, Winter Harbour Road, the old Department of National Defence town site and from Holberg Inlet. It is recognized that the wind turbine towers will be more visible on bright clear days and will tend to blend into the background on cloudy and grey days.

#### *Electric distribution lines/collection system*

Electric distribution cables will be buried underground when running between wind turbine towers. Where the groups of towers are separated the cable will transition to overhead transmission lines. Underground cables will be buried along permanent service roads and there the only visual impact will be from overhead lines.

Two new sections of overhead transmission line will be required for the Project. One is a 600 m section from Mt. Brandes down to the Winter Harbour Road and the other is a 1.2 km section from West Mt. Brandes to the northwest of the radar station. Neither section is expected to have any adverse visual impact.

#### *Access road and service road sites*

For this Project access and service roads will follow or utilize existing WFP roads where they exist. New roads will be developed throughout the wind turbine generator corridor system along the ridgetops. The extent of the visual impacts will primarily be from the air as there are no easily accessible public locations nearby with great enough altitude to see the roads.

#### *Project sub-station site*

The sub-station site will consist of a graded area approximately 50m by 150m located approximately 8 km from Holberg. The sub-station will be surrounded by a chain link and barbed wire fence. It will be visible from the Winter Harbour Road but not from Holberg itself.

#### *Lighting and dark-sky impacts*

The wind turbine towers will require lighting for maintenance, security and safety. Aircraft lighting will be provided on selected wind turbine generator for air traffic safety purposes, and general lighting will be provided around the sub-station and service and control center.

The lights on the wind turbine generators for aviation safety and the security lights on buildings for Project personnel will be visible at night, but will represent a minor impact on the surrounding area.

### Review of the Application

MOF submitted comments on visual considerations. The main issues included:

- The need to take public opinion into account in site planning for minimizing visual impact; and
- Tower visibility from the proposed North Coast Trail.

The Proponent stated that the wind turbine sites are not visible from Cape Scott Park, the North Coast Trail or Raft Cove as the combination of intervening hills, thick foliage and earth curvature prevent line of sight to the WTG sites.

### Conclusion

EAO is satisfied that proposed site planning measures and related commitments will prevent or reduce to an acceptable level any potentially adverse visual effects of the Project. NRCan, as the RA for the CEAA screening, is satisfied that, after taking into account the proposed mitigation measures, the Project will not have significant adverse visual environmental effects.

## **9.2.8 NORAD Radar Installation**

### Background and Impact Assessment

On the northerly end of the main Mt. Brandes ridge there is a major radar facility which has been in operation by the DND for a few decades.

Following the Proponent providing information on their project proposal including construction and operation procedures, the DND provided a statement claiming that they have no objections to the proposed development. This statement was provided with the understanding that if there are changes to the current proposal DND will need to reassess their position.

### Review of the Application

No comments with regards to the NORAD radar installation were received.

### Conclusion

NRCan as the RA for the CEAA screening is satisfied that the Project will not have significant adverse environmental effects on the Mt. Brandes NORAD Radar Station.

## **9.3 FIRST NATIONS INTERESTS**

During the review of the Application, Quatsino First Nation was invited to comment on the Application as it relates to possible project impacts on aboriginal interests.

On August 19, 2004, the Quatsino First Nation provided verbal comments on the archaeology section, and follow up during construction.

#### **9.4 DECOMMISSIONING AND RESTORATION**

The expected operational life of the Project is twenty-five years. At the end of this period, the Proponent will decide whether to refurbish, replace or remove the turbines. The Proponent has committed to submit a complete and detailed decommissioning and restoration plan to LWBC, one year in advance of its intention to cease the operations of the Project. The plan will ensure that the Holberg Wind Energy development area is returned, to the fullest extent practical, to its pre-construction state and will thus be ultimately sustainable. This plan will address turbines and ancillary equipment, buildings and foundations, transmission lines and poles and site restoration. The Proponent submitted a preliminary Decommissioning and Restoration Plan during the review of the Application.

##### Review of the Application

NRCan and other review participants reviewed the preliminary Decommissioning and Restoration Plan. EAO and the RA found the document to be acceptable for the purposes of the EA.

### **10. FEDERAL ASSESSMENT REQUIREMENTS**

In addition to the assessment of the environmental effects of the Project (as discussed in section 9 above), the federal screening of the Project has also considered the following factors:

- The effects of the environment on the Project;
- The environmental impacts of accidents and malfunctions; and
- Cumulative environmental effects of the Project.

Each of these factors are discussed in more detail in the following sections.

#### **10.1 EFFECTS OF THE ENVIRONMENT ON THE PROJECT**

##### Background

The CEAA requires that the EA include consideration of the effects of the environment on the Project. In section 7.0 of the Application, the Proponent assessed the potential risk to the construction, operations or maintenance of the Project from the environment.

The risks identified by the Proponent include fire, seismic activity, extreme weather events, land slides or other mass ground movements and climate change/fluctuation. The factors with the highest risks are discussed below.

## Seismic Activity – Earthquakes

Seismic considerations were discussed in section 6.4 of the Application. The Project area is located in Zone 5 on a scale of 0 (high-risk) to 6 (low-risk) in British Columbia. Seismicity is frequent in the region, with small earthquakes scattered over a wide area that covers most of northern Vancouver Island including offshore areas to the east and west.

No active faults have been identified by regional geological mapping in the area of the Project. Site-specific seismic hazard calculations for Mt. Hansen and Mt. Brandes were obtained from the Geological Survey of Canada, Pacific Geoscience Centre.

No review comments regarding seismic considerations were received.

## Extreme Weather Events

Based on data from nearby weather stations, extreme temperature is not expected to impact the Project. Lightning is rare, and towers will be equipped with lightning protection and grounding to avoid damage to the nacelle system or power grid components. Excessive wind speeds will trigger automatic shut down of turbines. The frequency of snow and ice is low enough so that access and operations will probably not be impacted. Visibility problems due to fog and cloud may represent a risk to migratory birds, bats, and any aircraft which may be flying extremely low overhead. The Proponent has committed to a lighting design to meet Transport Canada's standards and minimize wildlife mortality. Additional lighting for beacons for aircraft visibility will also be installed at various high points throughout the Project area.

No issues were raised regarding the impact of extreme weather events on the Project.

## Climate Change

Changes in climate are already occurring on a measurable scale: over several decades, mean annual and seasonal temperatures are warmer, extreme weather events and catastrophes are thought to be more frequent, and growing seasons are longer. These changes are expected to increase in magnitude over the next 50 years.

The two primary ways that climate change could affect the Project:

- An increase in extreme weather events and associated natural catastrophes. Possible impacts from extreme weather events are discussed in the Application and this Assessment Report.
- An increase in the need for alternative energy forms. British Columbia is a province heavily reliant on hydro electric power. The Project would contribute to sustainable energy generation and lessen British Columbia's dependence on hydro electric power.

No issues were raised regarding the impact of climate change on the Project.

## Conclusions

NRCan as the RA for the CEAA screening is satisfied that potential effects of the environment on the Project will not have significant adverse environmental effects.

## 10.2 ACCIDENTS AND MALFUNCTIONS

### Background

Section 9 of the Application provides an assessment of the potential for accidents and malfunctions during Project construction and operation. An Accidents and Malfunctions Plan (the Plan) will be prepared with its objectives being:

- Identification of potential hazards and risks;
- Establishment of emergency response plan;
- Orderly and timely decision making and response process; and
- Incident management organization with clear missions and lines of authority.

The Plan will cover all accidents and malfunctions that could occur during Project construction or operations and the definitions of “accident”, “spill” and “emergency” will be the same as the definitions listed in the Ministry of Water, Land and Air Protection Guidelines.

The Proponent recognizes the following potential impacts during construction:

- Erosion and sedimentation;
- Disposal of woody debris;
- Adverse impacts on water quality arising from spills of fuels or other hazardous materials;
- Accidental discharge of hazardous substances;
- Blasting and concrete work;
- Adverse impacts on air quality and generation of dust;
- Conflicts with local traffic; and
- Worker and public safety.

During the construction phase environmentally sensitive areas will be designated as such and construction activities will be restricted. These sensitive areas may include riparian zones and areas around important trees and wildlife habitat features.

During construction the Proponent will ensure that sedimentation levels in local watercourses do not exceed the DFO/MELP approved levels outlined in their 1992 *Land Development Guidelines for the Protection of the Aquatic Habitat*. Construction in or near water will only occur during DFO approved fisheries timing windows.

Woody debris disposal and fire protection will be in compliance with Provincial regulations and safety standards as per the *BC Forest and Range Practice Act-Forest Practices Code*, *BC Fire Code* and the *BC Building Code*.

Water quality could be impacted by the Project from fuel storage, fuelling and equipment maintenance; storage and use of hazardous materials; in-stream work; and concrete placement. To avoid fuel and hazardous materials impacts minimal fuel will be stored at the Project site and hazardous materials will be stored on-site in a secure location.

In-stream work will be conducted during DFO approved fisheries timing windows and blasting near watercourses will be undertaken in compliance with the 1998 *DFO Guidelines for Use of Explosives in Canadian Waters*. Concrete work which can be lethal to fish due to its acidic content will be conducted in a manner to avoid impacts including treating waste water used in construction and releasing concrete waste water into settling ponds.

Dust production is not expected to be an issue in the wet local climate, but should it arise, roads will be wetted to minimize the effect.

During operations of the Project the potential accidents and/or malfunctions include fire in the turbine generators or control centre, electrical equipment failures and mechanical equipment failures.

In the event of a fire in a turbine generator it would be contained within the turbine generator itself and would provide little to no risk for the surrounding environment. A fire in the Project substation would cause a loss of generation to the grid but little to no impact for the surrounding environment. Both the turbine generators and the substation would be equipped with alarm systems so that the appropriate emergency personnel could be alerted if a fire were to occur.

If an electrical failure were to occur in a turbine generator the impact to electrical generation would be small due to the number of turbines in a wind energy generation facility. The impact to the environment would be minimal or non-existent. A transformer failure at the switchyard could result in total power generation being lost until it was repaired. Personnel would be alerted to any electrical problems through monitoring of the equipment and they would be dispatched to make necessary repairs.

Concern has previously been raised with regards to the effect of severe weather events on the Project and subsequent risk to the public. The wind turbines are designed with a number of safety features including:

- Mechanical brakes on generators;
- Hydraulic pitch mechanism for each of the three turbine blades to turn blades to a braking position;
- Centrifugal tip brake, when engaged the tips of the airfoils will pitch to braking positions; and
- “Yaw” system which will turn the blades 90° out of the wind preventing the blades from turning.

Tower failure has rarely been observed and is associated with non-professionally installed systems and inadequate foundations. Appropriate design and construction of the foundations will minimize any such risk for the Project. Nonetheless, should tower failure occur, the remoteness of the Project means there is no significant risk to personnel safety and property resulting from such a failure and impacts on the environment would be confined.

## Review of Application - Accidents and Malfunctions

Comments on the Accidents and Malfunctions assessment were submitted by DFO, NRCan, and MWLAP. The main issues included:

- NRCan provided detailed information on the most recent earthquake hazard mapping; and
- Concrete truck washing water disposal.

Seismicity is discussed in section 10.1 of this Assessment Report. The Proponent has committed to appropriate design of foundations, using the latest available information provided by NRCan.

The discharge of concrete truck wash water is addressed in section 9.1.4 of this Assessment Report.

## Conclusion

NRCan, as the RA for the CEAA screening, is satisfied that the potential accidents and malfunctions will not result in significant adverse environmental effects, based on information provided for review.

## **10.3 CUMULATIVE ENVIRONMENTAL EFFECTS**

### Background

Section 16(1) of CEAA requires that every screening include consideration of the environmental effects of any cumulative environmental effects that are likely to result from the Project in combination with other projects or activities that have been or will be carried out and the significance of any cumulative environmental effects. A cumulative effects assessment must consider any residual impacts resulting from the environmental effects on the Project after mitigation measures are applied. If residual environmental effects lead to other effects (socio-economic, health, archaeological) those effects must also be considered in the cumulative effects assessment.

Section 8.0 of the Application identifies nine key issues for analysis of effects on VEC's. Table 8.3 of the Application summarizes the significance evaluation of the nine key issues on VEC's and possible residual effects. WPPI requires follow up research, monitoring or other recovery initiatives where residual environmental effects are rated medium or higher. All residual impacts identified were rated low.

When the Proponent filed its Application in July 2004, it reported that the Project, after further mitigation measures, would have no long term residual effects from the construction, operation and decommissioning activities on valued ecosystem components and SARA listed species, and therefore no cumulative effects.

### Impact Assessment

Comments on the Cumulative Effects Assessment were submitted by DFO. The main concern identified was the need to identify another key impact of sedimentation.

The Proponent committed to avoiding adverse impacts from sedimentation and to building protection measures into the Erosion and Sediment Control Plan.

The Cumulative Effects Assessment was deemed satisfactory by the RA and CEA Agency and addressed all outstanding issues identified during the review.

### Conclusion

NRCan, as the RA for the CEAA screening, is satisfied that the Project will not result in significant cumulative adverse environmental effects.

## **10.4 FOLLOW-UP AND MONITORING**

The Proponent has committed to a number of monitoring programs in its:

- Table of Commitments and Assurances;
- Draft Environmental Protection Plan; and
- Draft Wildlife Monitoring Plan.

The monitoring programs cover fish and fish habitat effects, hydrology, vegetation, wildlife and wildlife habitat effects, and will be developed in further detail by the Proponent prior to start of construction.

If the Project is approved, the Proponent will be required, as a condition of certification and federal approval, to submit reports on compliance with its commitments to EAO and NRCan prior to start of construction, prior to start of operation and at the end of the first year of operation.

## **11. PERMITS, LICENCES AND AUTHORIZATIONS**

The Proponent will be required to obtain Crown land tenures under the *Land Act* from LWBC prior to construction and operation of the Project. The Proponent has filed an application with LWBC which has been accepted.

The only instream works associated with construction of the Project will be those required for road building, upgrading existing road and for construction of the transmission line. Approval under the *Water Act* may be required from LWBC for changes in and about a stream, dependent upon the timing of works and site conditions.

A water license pursuant to the *Water Act* may be required by the Proponent for a short term water supply during construction for the purposes of concrete mixing.

Approvals, permits and licenses may be required under the *Forest Act* for removal of Crown timber and for the use of Forest Service Roads.

A site alteration permit under section 12 of the *Heritage Conservation Act* (HCA) and/or a site investigation permit under section 14 of the HCA would be required from MSRM Archaeology and



Registry Services Branch, in the event that unexpected archaeological materials are encountered during construction.

Authorizations under the *Wildlife Act* may be required from MWLAP for works that adversely affect, wildlife, for example, destruction/disturbance of any bird nests during clearing activities.

Authorization under the *Waste Management Act* may be required from MWLAP for disposal of concrete truck water.

The Proponent will be required to obtain the necessary zoning and permits from the Regional District of Mount Waddington.

During operation and for wildlife monitoring purposes the Proponent will be required to gain permits for carcass surveys under the *Migratory Birds Convention Act*.

The Proponent may be required to obtain a permit under the *Wildlife Act* for fish sampling purposes.

## **PART D CONCLUSIONS**

Based on the:

- Information contained in the Proponent's Application;
- Proponent's public and First Nations consultation program;
- Government agency, Quatsino First Nation and public comments on the Project, and the Proponent's responses to these comments; and,
- Commitments and mitigation measures identified in Appendix B to be undertaken by the Proponent during the construction and operation of the Project;

EAO is satisfied that:

- The Proponent's Application adequately identified and assessed the potential significant adverse environmental, economic, social, heritage and health effects of the Project;
- Public and First Nations consultation, and the distribution of information about the Project have been adequately carried out by the Proponent;
- Issues identified by the public, Quatsino First Nation and provincial and federal government agencies, which were within the scope of the EA, were adequately addressed by the Proponent during the review of the Application; and,
- Practical means have been identified to prevent or reduce to an acceptable level any potential adverse effects of the Project.

### **FEDERAL CONCLUSIONS**

Taking into account the above-mentioned documents and the implementation of the mitigation measures identified in the EA, NRCan, the federal RA, has determined that the Project will not have any significant adverse environmental or cumulative effects on the environment. The Project is allowed to proceed subject to the follow-up and monitoring put forward in the EA. Further information on the federal conclusions can be found on the federal cover page to this report.

# **APPENDIX A**

## **DOCUMENTATION AND CORRESPONDENCE FOR THE HOLBERG WIND ENERGY PROJECT PREPARED BY OR FOR THE PROPONENT**

## **APPENDIX A**

### **DOCUMENTATION AND CORRESPONDENCE FOR THE HOLBERG WIND ENERGY PROJECT PREPARED BY OR FOR THE PROPONENT**

1. July 30, 2004: Environmental Assessment Certificate Application for the Proposed Holberg Wind Energy Project, Vancouver Island, B.C., submitted by Holberg Wind Energy GP Inc. to the Environmental Assessment Office (EAO).
2. August 18, 2004: Draft Monitoring Plan for Potential Wildlife Impacts associated with Holberg Wind Energy (version 1.0) prepared by Robertson Environmental Services Ltd. for Holberg Wind Energy GP Inc.
3. September 3, 2004. Document from Holberg Wind Energy GP Inc. to EAO titled Holberg Wind Energy Project Open Houses August, 2004, Holberg submitted by Holberg Wind Energy GP Inc.
4. September 13, 2004: E-mail from Holberg Wind Energy GP Inc. to EAO with attachment titled Responses of Regulatory Agency Comments, including maps, regarding the Environmental Assessment Application for the Proposed Holberg Wind Energy Project.
5. September 17, 2004: E-mail from Holberg Wind Energy GP Inc. to EAO with attachment titled Additional Responses regarding the Environmental Assessment Application for Holberg Wind Energy GP Inc. with attached maps.
6. September 17, 2004. E-mail from Holberg Wind Energy GP Inc. to EAO with attached maps for terrain stability.
7. September 17, 2004. Memorandum from Holberg Wind Energy GP Inc. titled Additional Responses Regarding the Environmental Assessment Application for the Holberg Wind Energy Project Specifically: MWLAP Comments on the Fish and Fish Habitat Impacts Section (Section 6.8).
8. September 30, 2004. Supplemental map dated September 29, 2004.
9. October 5, 2004: Email from Holberg Wind Energy GP Inc. to the EAO with attachment titled Summary of Commitments and Assurances - Application for an Environmental Assessment Certificate for the Holberg Wind Energy Project.

# **APPENDIX B**

## **PROPONENT'S COMMITMENTS**

**Summary of Commitments and Assurances**  
**Application for an Environmental Assessment Certificate**  
**for the Holberg Wind Energy Project**

**Note:**

This document is intended to replace Section 10 of the Environmental Assessment Application for the proposed Holberg Wind Energy Project

Prepared by Holberg Wind Energy GP Inc.

October 2004

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## Acronyms and Abbreviations

The following abbreviations are used in this Assessment Report

BMP	Best Management Practices
CEMP	Construction Environmental Management Plan
CWS	Canadian Wildlife Services
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EAO	Environmental Assessment Office
EC	Environment Canada
EMP	Environmental Management Plan
MOF	Ministry of Forests
MOT	Ministry of Transportation
MWLAP	Ministry of Water, Land and Air Protection
NAV	Navigation
NRCan	Natural Resources Canada
Project	Holberg Wind Energy Project
QFN	Quatsino First Nation
RDMW	Regional District of Mount Waddington
TC	Transport Canada
WCB	Workers Compensation Board
WFP	Western Forest Products
WTG	Wind Turbine Generator



	COMMITMENTS AND ASSURANCES	TIMING				SOURCE(S)	CONCERNED PARTIES
		Design/Pre-Construction	Construction	Operation	Decommissionin		
	<b>Holberg Wind Energy GP Inc. will:</b>						
	<b>ENVIRONMENTAL MANAGEMENT</b>						
	<p><b>Management of environmental mitigation</b></p> <ul style="list-style-type: none"> <li>• develop an Environmental Management Plan (“EMP”) prior to construction start up, incorporating the Construction Environmental Management Plan (“CEMP”) for the Holberg to Port Hardy transmission line work, and the following: <ul style="list-style-type: none"> <li>○ Erosion and Sediment Control Plan (NRCan, DFO, EC, MWLAP)</li> <li>○ Wildlife Protection Plan (NRCan, CWS, MWLAP)</li> <li>○ Traffic Management Plan (NRCan, MoT, MoF, WFP)</li> <li>○ Accidents and Malfunctions Response Plan (NRCan, DFO, EC, WCB)</li> <li>○ Equipment Delivery Plan (NRCan)</li> <li>○ Health and Safety Plan (NRCan)</li> <li>○ Fish and Fish Habitat Protection Plan (NRCan, DFO, MWLAP)</li> <li>○ Hazardous Materials and Waste Management Plan (NRCan, MWLAP)</li> <li>○ Vegetation Management Plan (NRCan, MWLAP)</li> </ul> </li> </ul> <p>(Issue to bracketed agencies for approval before</p>	X	X	X		EA Application Section 2.5.1.1, 2.5.2.1, 6.8, 6.11 6.13 and 6.12.4	<p>NRCan, DFO, EC, MWLAP</p> <p>NRCan, CWS, EC, DFO MWLAP</p> <p>NRCan, MoT, MoF WFP</p> <p>NRCan, DFO, EC, WCB</p> <p>NRCan</p> <p>NRCan</p> <p>NRCan, DFO, MWLAP</p> <p>NRCan, MWLAP</p> <p>NRCan, MWLAP</p>

	<p>construction.)</p> <ul style="list-style-type: none"> <li>require the General and all Subcontractors to comply with the EMP.</li> <li>retain a qualified Environmental Monitor to work on-site during Project construction, to undertake environmental audits and ensure commitment with the EMP.</li> <li>make the Construction Manager responsible for the implementation of the Environmental Management Plan, which will be tied to payment for services.</li> <li>ensure that the Construction Manager and the Environmental Monitor make it a priority to implement the EMP to minimize adverse effects of the Project on the environment.</li> <li>ensure the EMP includes best management practices (BMPs).</li> <li>develop each stream crossing structure to be built according to the Erosion and Sedimentation Control Plan.</li> <li>use Best Management Practices (BMPs) throughout the construction</li> </ul>	X	X				<p>DFO, MWLAP</p> <p>NRCan, MWLAP</p> <p>NRCan</p> <p>NRCan</p> <p>NRCan</p> <p>NRCan, DFO</p> <p>NRCan</p>
<b>PROJECT CONSTRUCTION</b>							
	<p><b>Roads</b></p> <ul style="list-style-type: none"> <li>have all access and service roads designed by a qualified Professional Engineer.</li> <li>have all access and service roads designed to minimize erosion and sedimentation.</li> <li>design Project access and service roads to minimize impact on fish habitat.</li> <li>implement dust control on roads, when conditions dictate</li> </ul>	X				EA Application Section 2.3 and 2.4.4.2	<p>NRCan, DFO, MWLAP, MoF</p> <p>NRCan, DFO, MWLAP, MoF</p> <p>NRCan, DFO, MWLAP, MoF</p> <p>NRCan, DFO, MWLAP, MoF</p>
	<p><b>Blasting</b></p> <ul style="list-style-type: none"> <li>hire a blasting contractor with all applicable credentials, permits and licenses, as required by the Explosives Act, when needed.</li> <li>Minimize blasting within the critical bird breeding period,</li> </ul>	X	X				<p>NRCan, MWLAP</p> <p>NRCan, CWS, MWLAP</p>

	in consultation with CWS and MWLAP.							
	<b>Traffic</b> <ul style="list-style-type: none"> <li>implement Traffic Management Plan.</li> <li>develop an Equipment Delivery Plan, once the wind turbine generator (WTG) is selected in order to plan for the types, numbers and scheduling of construction-related traffic that will travel local roads in order to get to each site.</li> </ul>	X	X			EA Application Section 2.4.3.1	NRCan, Holberg Wind Energy GP Inc.	
	<b>Hazardous Materials Storage</b> <ul style="list-style-type: none"> <li>implement Hazardous Materials and Waste Management Plan.</li> </ul>			X	X	X	EA Application Section 9.8.3.4	NRCan, MWLAP
	<b>Safety</b> <ul style="list-style-type: none"> <li>install obstruction lights that conform to Transport Canada and NAV Canada regulations.</li> <li>obtain Transport Canada and NAV Canada permits prior to construction.</li> </ul>	X	X				EA Application Section 6.7	NRCan, CWS, TC, NAV Canada, MWLAP, DND NRCan, TC, NAV Canada
<b>PUBLIC CONSULTATION</b>								
	<b>Consultation Post Certification</b> <ul style="list-style-type: none"> <li>commit to continue consultation with the public and to address Project issues and concerns, including: <ul style="list-style-type: none"> <li>visual impacts from the Project.</li> <li>traffic safety.</li> <li>employment opportunities.</li> </ul> </li> </ul>	X	X	X	X		EA Application Section 6.9.4	MoF, RDMW, WFP
<b>FIRST NATIONS CONSULTATION</b>								
	<ul style="list-style-type: none"> <li>continue consultation with the Quatsino First Nation</li> <li>develop consultation agreement with Quatsino First Nation addressing frequency of meetings, scope of future meetings and commitments, including but not limited to employment and business opportunities.</li> <li>train up to 3 members of the Quatsino First Nation to staff some of the Project's permanent jobs.</li> </ul>	X	X				EA Application Section 2.4 and 6.11	NRCan, EAO, QFN NRCan, EAO, QFN  NRCan, EAO, QFN
<b>TERRAIN STABILITY</b>								
	<ul style="list-style-type: none"> <li>use relief culverts, drainage culverts, wing ditches and water bars as appropriate on all roads.</li> <li>use rock surface and gravel base on roads with high use and/or heavy load requirements.</li> </ul>	X	X	X			EA Application Section 2.4.4.2 and 6.8	NRCan, DFO, MWLAP NRCan, DFO, MWLAP  NRCan, DFO, MWLAP

	<ul style="list-style-type: none"> <li>implement Erosion and Sediment Control Plan during wet conditions.</li> <li>construct only the minimum length of road necessary.</li> </ul>		X				NRCan, DFO, MWLAP
<b>HYDROLOGY AND WATER QUALITY</b>							
	<b>Acid Rock Drainage / Metal Leaching</b> <ul style="list-style-type: none"> <li>appoint Environmental Monitor to monitor or coordinate monitoring for acid rock drainage and metal leaching during construction (pH, Conductivity, TDS, ABA shake Test).</li> </ul>	X	X			EA Application Section 6.4.4.1	NRCan, MWLAP
	<b>1.0 WATER QUALITY</b> <ul style="list-style-type: none"> <li>perform pre, during and post construction water quality tests.</li> </ul>	X	X	X			NRCan, MWLAP
<b>VEGETATION</b>							
	<b>Weeds</b> <ul style="list-style-type: none"> <li>conform to the Ministry of Forests regulations for controlling weeds around Project facilities.</li> <li>conform to Western Forest Products (WFP) weed control practice.</li> </ul>		X	X		EA Application Section 10	NRCan, MoF, MWLAP NRCan, WFP
	<b>Vegetation Removal / Upkeep</b> <ul style="list-style-type: none"> <li>commit to clearing only minimum vegetation necessary for construction of the Project.</li> <li>minimize vegetation clearing around nests and dens</li> <li>remove vegetation outside the critical bird breeding period, in consultation with CWS and MWLAP.</li> </ul>		X			EA Application Section 6.7	NRCan, CWS, MWLAP NRCan, CWS, MWLAP NRCan, CWS, MWLAP
<b>WILDLIFE</b>							
	<b>EMP</b> <ul style="list-style-type: none"> <li>include bear safety training and awareness</li> <li>include a restoration plan for wildlife habitat around WTGs</li> </ul>	X X	X X			EA Application Section 6.7	NRCan, CWS NRCan, MWLAP
	<b>Wildlife Monitoring Plan – Heron / Raptor Surveys</b> <ul style="list-style-type: none"> <li>conduct a pre-construction nest survey to ensure that no new nests have been built, even where none have been found to date.</li> <li>Construction to conform to BMPs</li> </ul>	X	X			EA Application Section 6.12.4	NRCan, CWS, MWLAP NRCan, MWLAP
	<b>Wildlife Monitoring Plan – Bird and Bat Mortality Surveys</b>					EA Application	

<ul style="list-style-type: none"> <li>▪ in consultation with the Marbled Murrelet Recovery Team, CWS and MWLAP, undertake a comprehensive and innovative, adaptive monitoring plan including development of threshold values as described in Draft Monitoring Plan for Potential Wildlife Impacts Associated with Holberg Wind Energy, to be reported and tracked within the framework of Holberg’s EMP. Although ungulates, amphibians and bats will also be monitored, the focus of the Wildlife Monitoring Plan will be on bird mortality and utilization rates, using scientifically rigorous methodology including carcass searches supported by studies on carcass removal rates, and other methods, with particular attention to Marbled Murrelets, raptors, bats and migratory songbirds. <ul style="list-style-type: none"> <li>– As part of the Wildlife Monitoring Plan, Holberg is committed to investigating real-time bird/bat monitoring techniques and if feasible, implementation of those techniques.</li> </ul> </li> <li>▪ complete two more surveys prior to construction. A bat, migrant songbirds and other SAR survey will be conducted in late August and September 2004 to better understand the composition of resident and migratory populations, to be reported in October supplementary report.</li> <li>▪ commit to post construction bird monitoring during the spring and fall peak migratory periods, and Marbled Murrelet breeding season.</li> <li>▪ investigate the feasibility of establishing and implementing an adaptive management measures such as automatic shutdown “early warning system” to prevent migratory bird mortality due to collisions, possibly incorporating remote sensing.</li> </ul> <p>The Wildlife Monitoring Plan will be reviewed and approved by the relevant agencies prior to construction, and implemented for two years post construction.</p> <p>The results of carcass recoveries, mortality rates, Marbled Murrelet activity and behaviour within the project area, and, possibly other factors observed to that point, will be discussed with relevant agencies and used to determine whether monitoring should be continued for another year and what level is needed to ensure the requirements of the Species at Risk Act</p>	X	X			Section 6.7 and 2.8	NRCan, CWS, MWLAP
	X					NRCan, CWS, MWLAP
		X	X			NRCan, CWS, MWLAP
	X					NRCan, CWS, MWLAP
	X					NRCan, CWS, MWLAP

	and Migratory Birds Convention Act are addressed.						
	<b>Construction, General</b> <ul style="list-style-type: none"> <li>minimize the duration of construction in order to reduce the impact on wildlife.</li> </ul>		X			EA Application Section 6.7	NRCan, CWS, MWLAP
	<b>Marbled Murrelets</b> <ul style="list-style-type: none"> <li>pre-construction nesting surveys will be conducted in high nesting suitability locales.</li> <li>proposed (pre-construction) WTG sites will be re-located in the event that survey work shows significant wildlife habitat disturbance, in consultation with CWS and MWLAP.</li> <li>keep overhead transmission lines below the height of the forest canopy, construct new lines and upgrade old lines to be bird friendly, where possible.</li> </ul>	X	X			EA Application Section 6.7	NRCan, CWS, MWLAP
		X					NRCan, CWS, MWLAP
			X				NRCan, CWS, MWLAP
<b>FISH AND FISH HABITAT</b>							
	<b>Fish Bearing Stream Crossings</b> <ul style="list-style-type: none"> <li>use open-bottom structures for fish crossings, and make them amphibian friendly, maintaining natural stream characteristics.</li> <li>avoid causing a Harmful Alteration Disruption or Destruction (HADD).</li> <li>should an unavoidable HADD occur, develop habitat impact mitigation plans, including a detailed compensatory habitat strategy to ensure no net loss of habitat.</li> <li>have the qualified Environmental Monitor on-site during construction to monitor stream crossings and to ensure that mitigation measures are implemented.</li> <li>not modify existing bridges across fish streams, as they are built to standards in excess of our load requirements.</li> <li>ensure road construction contractor builds clear span crossings across planned stream crossings 530-1 and 731-2, avoid any in stream support or structures, and prevent damage to stream and banks, if these crossings are needed.</li> <li>limit clearing of riparian vegetation to that required for road construction.</li> <li>conduct construction activities upstream of fish bearing</li> </ul>	X	X			EA Application Section 6.8 and 10	NRCan, DFO
		X					NRCan, DFO
		X					NRCan, DFO
		X	X				NRCan, DFO
		X	X				NRCan, DFO
		X	X				NRCan, DFO
			X				NRCan, DFO

	waters in accordance with the Erosion and Sediment Control Plan so as to prevent negative impacts to fish habitat.		X				NRCan, DFO
	<b>Fish Access to Streams Within Project Area</b> <ul style="list-style-type: none"> <li>complete fieldwork on all streams not presently covered by the Western Forest Products (WFP) fish-bearing stream database.</li> </ul>	X				EA Application Section 6.8.1.9	NRCan, DFO
	<b>Riparian Habitat</b> <ul style="list-style-type: none"> <li>avoid damage to riparian habitats, except at stream crossings.</li> </ul>		X	X		EA Application Section 6.8	NRCan, DFO
<b>ARCHAEOLOGY</b>							
	<b>Archaeological Impact Management</b> <ul style="list-style-type: none"> <li>commit to preserving archaeological artifacts.</li> <li>inform all construction contractors that archaeological remains are protected by law.</li> <li>promptly inform Quatsino First Nations of unanticipated archaeological discovery.</li> <li>apply operational procedures of the Archaeology and Registry Services Branch on Found Human Remains to all facets of Project development and related archaeological investigations, with disposition of such remains to be determined in consultation with affected parties.</li> <li>in the event that unrecorded archaeological materials are exposed during construction, activity in the immediate vicinity of those materials will be suspended pending completion of further assessment by a qualified archaeologist and determination of an appropriate course of action that complies with the requirements of the Heritage Conservation Act.</li> </ul>	X	X X	X X	X X	EA Application Section 6.10.7	NRCan NRCan NRCan, QFN NRCan, MWLAP  NRCan