

Executive Summary

Zero Emission Energy Developments, Inc. (ZED) is proposing the development of the Shinish Creek Wind Power Project with a total installed capacity up to 15MW. The project is located in Okanagan – Similkameen Regional District, approximately 33 km west of Summerland and approximately 33 km the west - southwest of Peachland, BC.

The proposed project will consist of seven 2.0 MW wind turbine generators manufactured by Vestas. The proposed permanent footprint of the project will be less than 72 Hectares (ha). Based on preliminary engineering design, temporary and permanent footprint of the key projects components are presented in Table 1.1-1. The General License of Occupation (GLOO) area covers approximately 1551 ha, while the Investigative Use Permit (IUP) area covers approximately 4645 ha.

The geographical maps below show the project location and layout in more details.

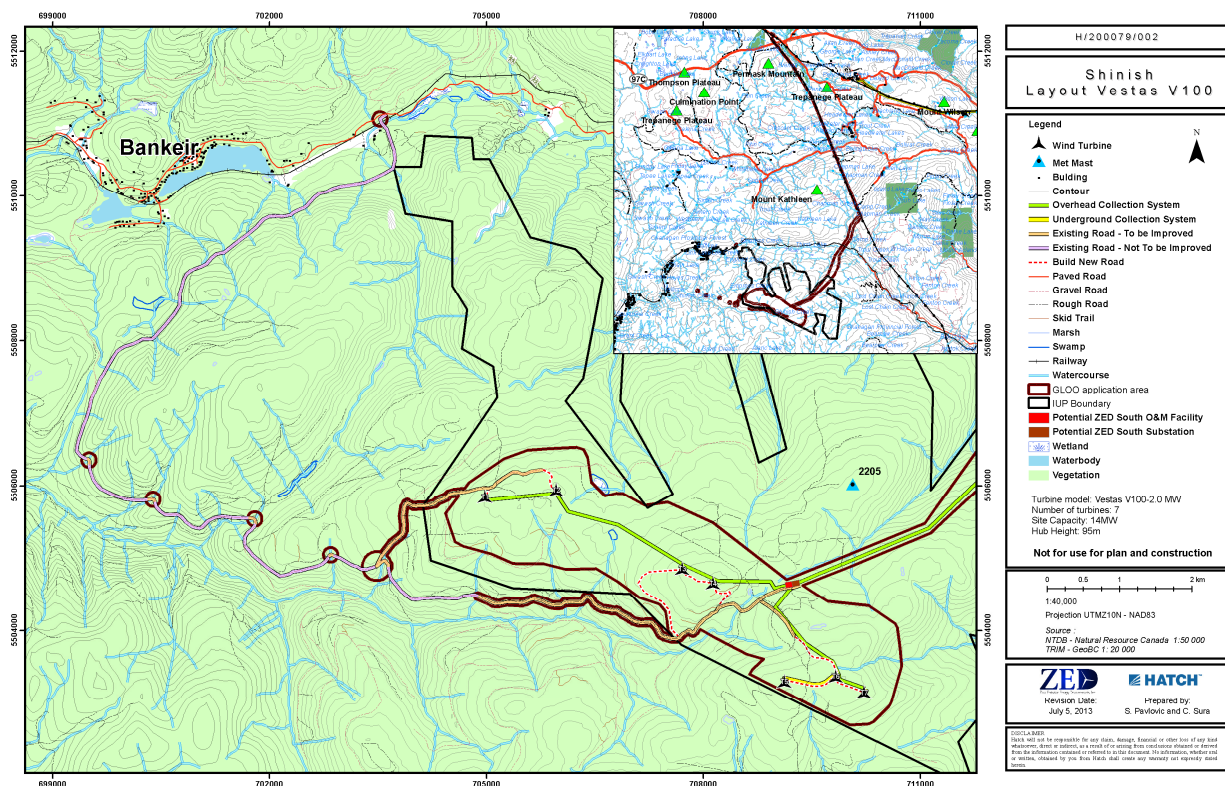


Figure 1.1-1: Overview Map of Project Area showing project location

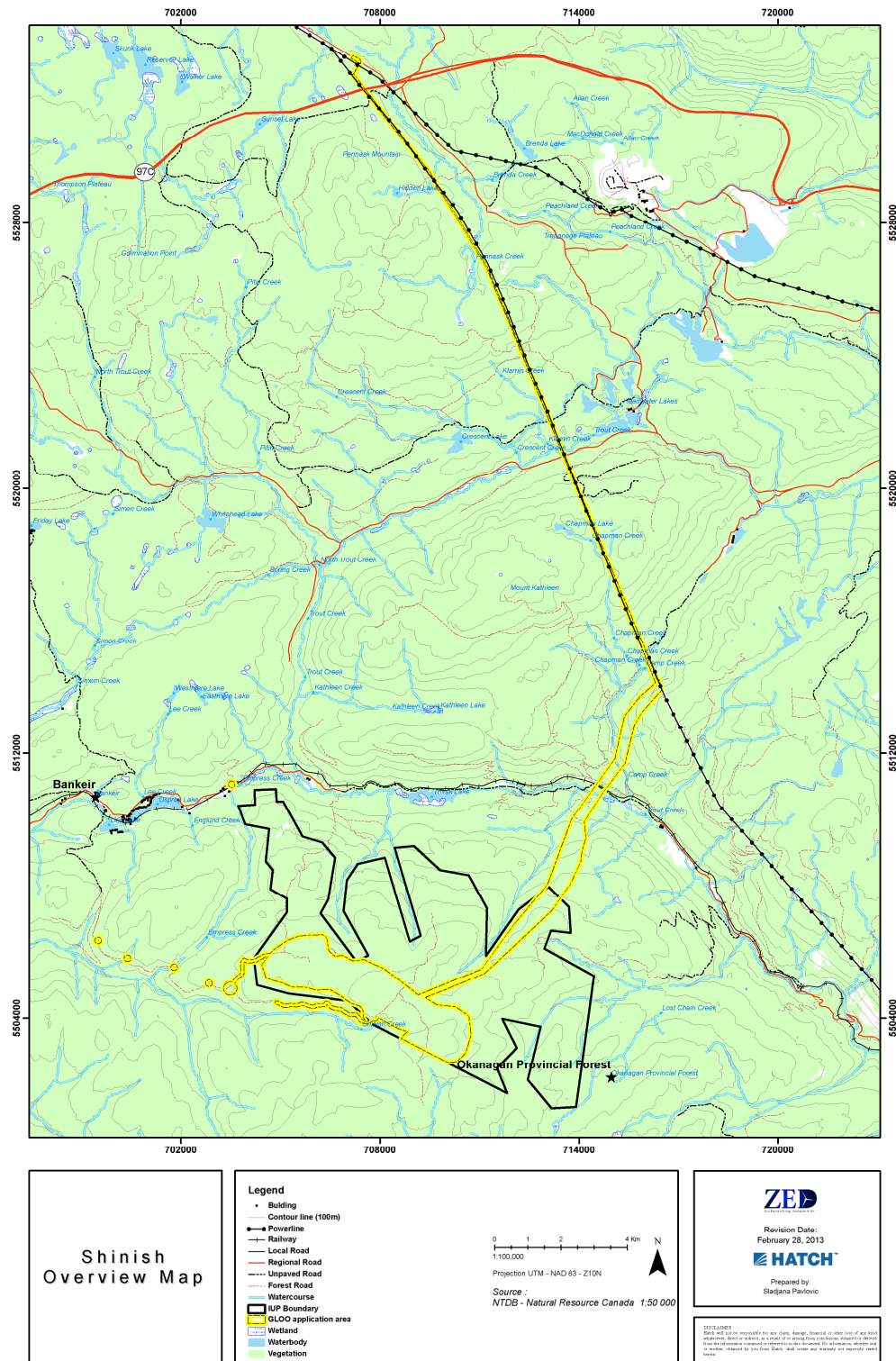


Figure 1.1-2: Overview of Project area showing IUP and GLOO

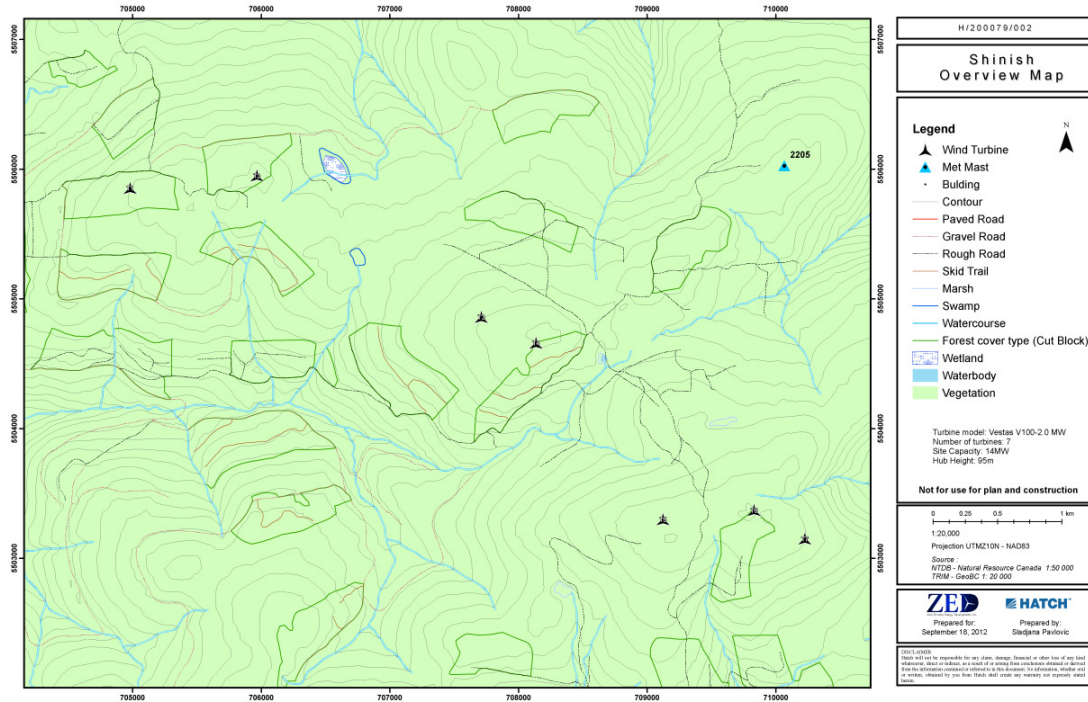


Figure 1.1-3: Overview Map of Project Area (1:20 000)

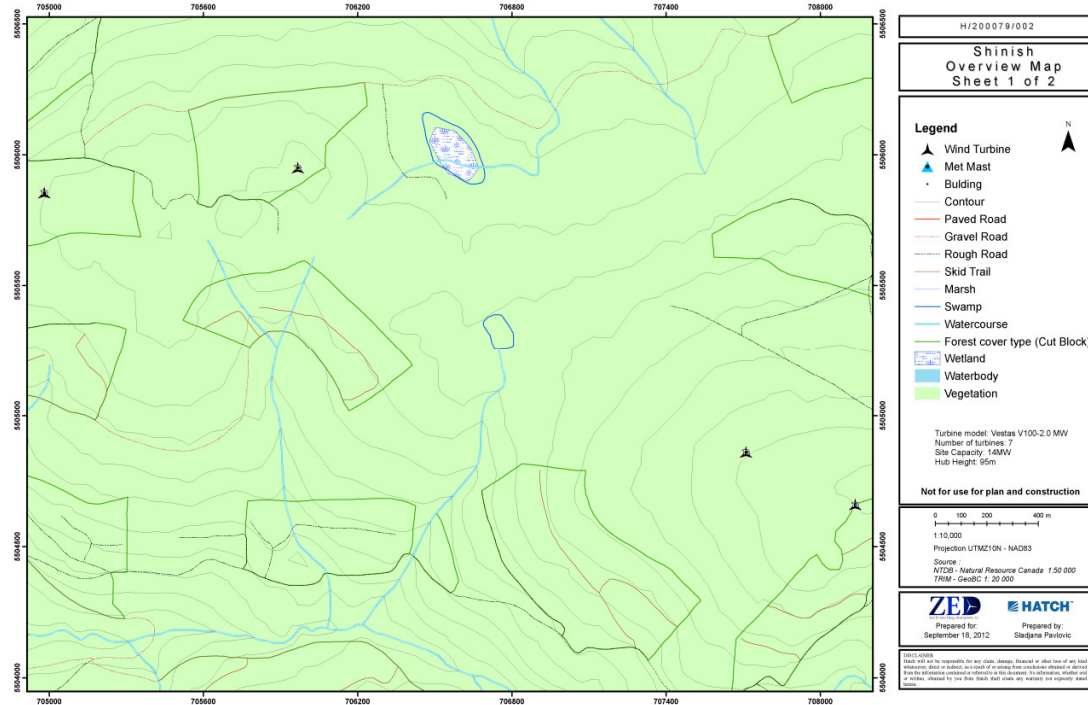


Figure 1.1-4: Overview Map of the Northwest Project Area (1:6 000)

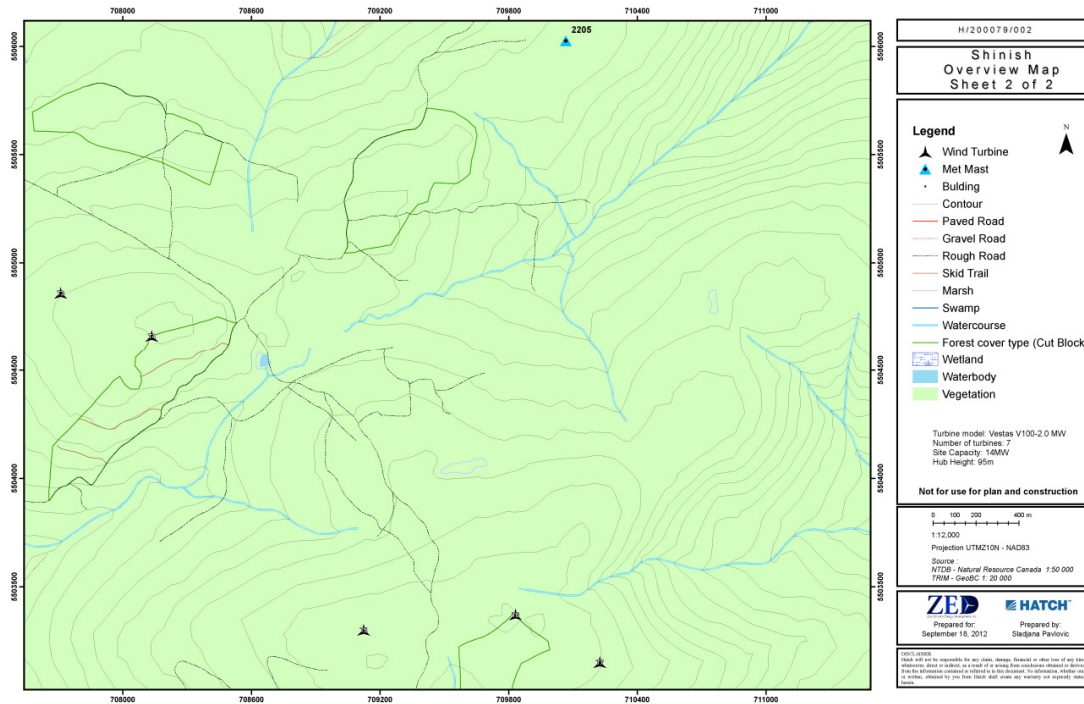


Figure 1.1-5: Overview Maps of the Southeast Project Area (1:6 000)

Table 1.1-1: Summary of Project disturbances for key components

Shinish- Project components	Number/ length	Temporary disturbance (m2) - during construction	Permanent Disturbance (m2)- during operation of wind farm after land reclamation	Comment
Wind Turbines	no.	2500 m2/per turbine	500 m2/per turbine	
Wind Turbine Generator	7	17,500	3,500	
Total for 7 turbines (m2)		17,500	3,500	
Roads	length (m)	18m width	5m width	
Existing roads that do not need improvement	17,632	-	-	
Existing Roads that need improvement	9,925	178,650	49,625	
New Roads	4,056	73,008	20,280	
Total for roads (m2)		251,658	69,905	
Collection Network	length (m)	20m (underground) /30m (overhead)	2 m (underground)/15m (overhead)	
Underground collection network	1,529	30,582	3,058	Approximately 1200m of underground collection line will be installed along new or existing roads.

Overhead collection network - on site	6,900	207,000	103,500	
Overhead collection network - from site to substation	33,742	1,012,260	506,130	Approximately 20km of overhead collection line will be installed along BC Hydro ROW.
Total for collection network (m2)		1,249,842	612,688	
Other components	no.			
Substation	2	27,300	6,000	Design shows two substations, further analysis will show if only one substation will be sufficient.
O&M facilities	2		20,000	Area used as Laydown area during construction will be converted in O&M facility towards the end of construction. Design shows two O&M buildings, further analysis will show if only one O&M facility will be sufficient.
Laydown area	1	19,900		
Total for other components (m2)		47,200	26,000	
Total for all components (ha)		156.6	71.2	Actual disturbance areas should be smaller as overlapping areas of disturbance for components have been considered separately in this table.

The wind turbines proposed for the project are manufactured by a tier 1 company. The turbine model selected has an extensive operational track record in North America and Canada. The proposed wind turbines are of proven technology and of the typical size and height that comply with IEC 61400-12 standards. The turbine positions are in the process of being permitted by Transport Canada that sets the requirements for color and markings for each unit. The turbines will be painted military grade off white color and equipped with obstruction lights according to Canadian Aviation Regulations (CARs) 2012-1 (Standard 621), on the direction of Transport Canada. The collection network, electrical lines that collect electricity from turbines and connect to substation, will be constructed on wooden poles of typical height between 12m and 15m, and may deviate from this typical height at some places due to terrain constraints.

Note that the met tower shown on Figure 1.1-1 will be removed prior to construction. Potentially, a new permanent Met tower will be constructed at the site to collect reference data

during the operation of the wind farm. The need and location of permanent Met tower will be confirmed at later date, based on discussions with BC Hydro and the turbine vendor.

Key Impact Issues

Aquatic Environment

The primary pathways of effects on the Aquatic Environment are related to: upgrades to eight existing culverts (*i.e.*, widening) at existing road crossings; new culvert installations where necessary as dictated by terrain and water flows; installation and removal of the overhead and underground collection and interconnection feeder lines; the potential for erosion and sedimentation of local watercourses as a result of land clearing and road construction activities; and the potential for spills of hydrocarbons or lubricants into local watercourses. These effects have a potential to occur during Construction or Decommissioning Phases of the Project. Potential effects will be mitigated to the extent possible by adhering to the Terms and Conditions of Fisheries and Oceans Canada (DFO) Operational Statements for Overhead Line Construction and Directional Drilling (Pacific Region Version 3.0); adhering to the Fish-stream Crossing Guidebook (BC MFLNRO, BC MOE and DFO 2012) and the provincial Forest Planning and Practices Regulation (Part 5) specifications for the construction of new stream crossings (Province of BC 2004); and implementation of the following Construction Environmental Management Plans (CEMPs): Erosion and Sediment / Soil Management Control Plan (#4), Spill Prevention and Emergency Response (#8), and Landscape Design and Restoration Plan (#11).

Terrestrial Environment

The primary pathway of effects on the Terrestrial Environment during Construction is largely related to land clearing that has the potential to disturb or remove habitat and can cause sensory disturbance to wildlife. The potential remains for sensory disturbance to cause habitat abandonment or alienation of some bird species (particularly the blue-listed and federally "Threatened" olive-sided flycatcher) during Construction and Operations. However, the increased impacts may be negligible due to the existing timber harvesting disturbances that have been required to remove the beetle killed timber in the area. The remaining residual effects of the Project during Operations are largely limited to collisions or other effects on birds, bats (barotrauma), and a potential number of avian Species-at-Risk including olive-sided flycatcher and sandhill crane as a result of the operation of wind turbines.

The significance of residual effects of turbine operation on local bird, bat, and avian Species-at-Risk (*i.e.*, mortality and habitat avoidance) is uncertain, and therefore, will be subject to an Operational Environmental Management Plan (OEMP) following the principles of Adaptive Management. Additional mitigation measures to reduce effects on wildlife to the extent possible during Construction include implementation of the Human-Wildlife Conflict Management Plan (#14) and Landscape Design and Restoration Plan (#11). Potential effects on wetlands will be mitigated by the implementation of relevant federal and provincial BMPs for overhead line construction and culvert installation as well as CEMPs for Erosion and Sediment / Soil

Management Control Plan (#4), Air Quality and Dust Control (#1), Spill Prevention and Emergency Response (#8), and the Landscape Design and Restoration Plan (#11).

Socio-Economic

The primary pathway of effects on the Socio-Economic environment is associated with the presence of a small temporary workforce during the Construction phase and the potential for nuisances such as construction traffic and detours. During the approximate 18 month Construction phase, the anticipated number of persons directly employed on the Project will range between 15 and 80, including activities associated with road and construction upgrades. The Project's direct employment will total an estimated 56 person-years (PYs) during its Construction phase.

Most employment could be sourced within the region, however, some of the positions related to turbine assembly are specialized and may need to be sourced outside of the Province or through the turbine manufacturer. During the Operations phase, the Project will employ approximately 10 (full-time and part-time) workers per year. The regional study area is well populated and serviced and an increase of approximately 10 individuals, even if they brought their families, would not stress nearby communities. Economic benefits of the Project will be modest given the size of the local economy and the modest number of Operations phase employment positions.

ZED will formulate a purchasing strategy to source goods and services based on local capacity and capabilities, thereby enhancing local economic benefits.

During Construction and Operations, population effects are predicted to be negligible. Effects on labour market and business opportunities will be positive but modest.

Health

The primary pathways of effects on human health are limited to the Construction and Operation of the project infrastructure, including the wind turbines.

During Construction and Operations, there is the potential for personal injury to persons passing through the Project site (e.g., recreational users and workers using access roads), and traffic accidents associated with the temporarily increased volume of truck traffic to and from the site. Proposed mitigation measures include development of a comprehensive safety plan, providing other land users with project information so they are aware of upcoming work, and providing signage at access points with a 1-800 contact number for ZED.

It is anticipated that there will be minimal residual traffic impacts. Proposed measures to mitigate traffic impacts include development of a comprehensive traffic management plan for each stage of construction.

Noise impacts from operation of turbines is considered to be at a low level. The nearest residential dwelling is approximately 5 km from the Project site. There is, however, the need to address equipment noise during construction. These measures will include maintaining specific construction hours as much as possible. During Operations, turbine-generated noise will be maintained at a level that is in keeping with the requirements of the Crown Land Use

Operational Policy: Wind Power Projects (amended August 15, 2010), which is below 40 dB at the closest permanently occupied year round residence. Ice throw and ice shed can pose a danger to people in proximity of turbines. To mitigate this residual effect, the turbines have been located at a safe setback distance from any occupied structure, road or public area. Additional measures will include providing warning signs and the turbine operations and maintenance team following approved turbine manufacturer operations and maintenance safety guidelines when servicing turbines in potential icing scenarios. The turbines will have a remotely operated automatic shutdown feature to allow management to take discretionary actions to manage turbine operation, including deactivating a turbine, for safety reasons, in the event of a weather related or other event.

Potential structural hazards include full or partial blade failure and turbine collapse. Mitigation measures include the implementation and execution of a regular maintenance schedule, the development and enforcement of health and safety plans, and the establishment of emergency response procedures to transfer injured individuals to the nearest treatment centre in the event of a structural failure.

Land and Resource Use

In terms of Land Use, the Project is consistent with local and regional resource objectives as outlined in the Thompson-Nicola Regional District (TNRD) and Regional District of Okanagan – Similkameen (RDOS) Official Community Plans, bylaws, and policies; Okanagan-Similkameen Land and Resource Management Plan LRMP; and directions and guidelines pertaining to Provincially designated protected areas, reserves and land use. The SSA crosses Pennask Creek Protected Area in order to provide approximately 400 metres of underground feeder. However, no impact to the Park is anticipated as the underground feeder will be located within an existing service road exemption inside the park.

The LSA includes various Crown land tenures and resource values including three registered forest licenses (much of which has been harvested to remove the beetle killed timber); 39 mineral and placer claims and one placer reserve, two guide-outfitter territories, and five registered trapline areas. There are 17 units of recreation features in the LSA as identified in the Recreational Features Inventory, and 28 Visual Quality Objectives units as identified by the Okanagan-Similkameen LRMP.

Other Crown tenures lying wholly or partly within the LSA include six licences of occupation: one for commercial recreation; one for an electric power line; and four for wind power (investigative and monitoring phase). These Crown land tenures and resource values are potentially affected through the placement of Project components and changes to the access to, or use of, these Crown resources. Crossing and proximity agreements with tenure holders are in progress and will be obtained prior to Construction.

The significance of the Project's residual effects on aesthetic and visual resources is considered to be at a low level. During the Operations phase of the Project, wind turbine operation, including the towers and their rotating blades, will have an effect on the visual character of the areas surrounding the project. The visibility of the turbines will depend on a number of factors,

including the position of the observer/receptor, weather conditions, like cloud or fog cover, topography, paint and the finish of turbines, towers and turbine markings (lighting which affects nighttime visibility). Visual simulations from three representative viewpoints in the vicinity of the Project site have been completed.

With respect to Navigation, Transportation, and Access, the layout of turbines, collection line routes, and access roads was planned to minimize potential effects on the natural environment, and constitutes a negligible difference to the existing network of roads and cleared rights-of-way access.

Archaeological Resources

The LSA has been identified as containing areas of archaeological potential. Activities associated with the Construction Phase that modify the ground surface have the potential to affect Archaeological Resources. A HCA-permitted AIA will be conducted as a mitigation measure prior to the Construction Phase of the Project. The AIA will evaluate whether the Project components that constitute the SSA, will affect Archaeological Resources. Mitigation to reduce adverse effects on archaeological sites encountered could include avoidance of these resources, systematic data recovery, archaeological construction monitoring, or a combination of these options. In addition, mitigation and protocols have been outlined that recognize the importance of Archaeological Resources that could be encountered during the Construction Phase. A reporting protocol for unanticipated archaeological finds identified during the Construction Phase will be followed as per the Archaeological Chance Find Management Plan (ACFMP/CEMP #9).

Conclusion from environmental and socio-economic assessments

For the consideration of the Responsible Authorities, it is the opinion of Zero Emission Energy Developments, Inc. at the time of review that the Project is not likely to cause significant adverse environmental, socio-economic, or community effects, taking into account the implementation of appropriate mitigation measures, as identified in the Development Plans (DP's) "Table of Proposed Commitments for the Shinish Creek Wind Power Project". Additional reporting relating to this DP is forthcoming, and will include the completion of the Archaeological Impact Assessment (AIA), and Metal Leaching and Acid Rock Drainage (ML/ARD) Assessment. At that time, a final review of potential adverse effects can be completed.

First Nations Engagement and Communications

ZED understands that the land has significant importance to the First Nations and Aboriginal interests must be respected. As a result, ZED has considered the potential project impacts on First Nations interests based on the use of the land and the resources within the vicinity of the Project.

During engagement with First Nation's, ZED's goal was to understand the nature of the interests and to determine how those interests may be reasonably accommodated within the scope of the Project.

ZED was directed by the Province to engage with the following Okanagan Nation Alliance First Nations:

1. Lower Similkameen Indian Band;
2. Upper Similkameen Indian Band;
3. Westbank First Nation; and
4. Penticton Indian Band.

The Okanagan Nation Alliance's Chief Executive Council met in December 2011. Based on that meeting, WFN and PIB submitted a letter to the Ministry of Forest, Lands and Natural Resource Operations stating that PIB and WFN would be taking the lead for ONA in Project negotiations with ZED. Furthermore the letter stated that: "Based on several meetings and conversations between ZED, WFN and PIB, as well as information provided to us by ZED about the Project, WFN and PIB have mutually agreed to support the Project subject to the following conditions:

- Completion of an AIA on the Project to the satisfaction of WFN and PIB;
- Negotiation and execution by ZED, WFN and PIB of a mutually beneficial Impact Benefit Agreement between ZED, WFN and PIB; and
- Other conditions precedent that may be identified as a result of ongoing consultation about the Project as mutually agreed upon by ZED, WFN and PIB."

Following receipt of this letter of clarification, ZED proceeded to enter into in-depth discussions with WFN and PIB. In the following year and a half, ZED engaged with the two communities, met the conditions and in May 2013, ZED, PIB and WFN entered into an Impact Benefits Agreement.

ZED was also directed by the Province to notify the following First Nations:

- Shackan Indian Band;
- Nooaitch Indian Band;
- Coldwater Indian Band;
- Nicola Tribal Council (comprised of the Upper Nicola Band, Coldwater Indian Band, Cook's Ferry Indian Band, Nicomen Indian Band, Shackan Indian Band, and Siska Indian Band); and
- Nlaka'pamux Nation Tribal Council (comprised of Ashcroft Indian Band, Boothroyd Band, Boston Bar Band, Kanaka Bar Indian Band, Lytton First Nation, Oregon Jack Creek Band, Skuppah Indian Band, Spuzzum First Nation)

No response was received from the above communities, however in March 2012, the Nicola Tribal Council acknowledged by way of letter that they had received and reviewed the Preliminary Field Reconnaissance and had found it "detailed and meticulous." The letter was also copied to their member communities. ZED also did not receive any response from the Nlaka'pamux Nation Tribal Council or their member communities.

ZED believes that the Project design and proposed mitigation measures (see Section 10 "Summary of Commitments and Conclusions") will reduce the residual risk to First Nations interests. ZED will continue its engagement with PIB and WFN during the construction and operation of the Project.

Public Consultation and Communications

Overview

Cornerstone Planning Group and Zero Emission Energy Developments (ZED) designed and have implemented a Public Consultation and Communications Program for the Shinish Creek Wind Power Project. The Program objectives are to:

- Introduce the Shinish Creek Wind Power Project to potentially interested individuals and organizations
- Identify issues that are important to potentially interested individuals and organizations
- Develop relationships with local stakeholders
- Provide a variety of methods for target audiences to submit input
- Document and summarize input for the Development Plan (DP) in support of the General License of Occupation (GLOO) application

Target audiences for the Public Consultation and Communications Program include:

- Local residents (Kelowna, Penticton, Westbank, Summerland, and Regional District of Okanagan-Similkameen)
- Regional District of Okanagan-Similkameen
- Municipal governments (Summerland and Penticton)
- Relevant provincial ministries and agencies
- Relevant federal departments and agencies
- Local non-governmental organizations
- Local businesses
- Local agriculture/ranching operations
- Farms and wineries
- Local recreation/ecotourism organizations
- Local outfitters
- Local media
- Tenure holders
- Adjacent operators

Information Distribution Activities

ZED undertook information distribution activities, including advertisements in local newspapers, newsletters to stakeholders, a project open house in the District of Summerland on November 23, 2012 and links to a project website (www.zeroemissiondevelopments.com) containing project information. Detailed activities are provided in Section 6 of the Development Plan.

Summary of Issues Raised

From public consultation efforts to date, ZED received input through a variety of feedback mechanisms. The following table represents a summary of key issues raised during consultation with the public. The nature of an open house event allows for comments to be noted, but not ascribed to specific individuals. A detailed list of issues raised and ZED responses to those issues is provided in Section 6 of the Development Plan.

Table 1.1-2: Consultation Key Issues Summary

Group consulted and contact names	Dates of meetings, calls, correspondence	Summary of issue raised and proposed solutions	Mitigative measures adopted/ rationale for not adopting /proponent comments
Multiple contacts	Feedback received November 2011 – March 2012	Interest in employment	ZED will utilize local services and resources wherever possible. ZED is maintaining a Schedule of Contractors who have expressed interest in providing ZED their services and will forward this Schedule to its General Contractor for the Project.
Open House attendees	Project Open House November 23, 2011	Concern regarding project impacts on recreational activities	ZED will consult with recreational user groups and clubs wherever possible to identify and address Project access and security in its Socio-economic assessment.
Open House attendees	Project Open House November 23, 2011	Interest and concerns regarding impacts and costs to local communities and infrastructure	The Project will provide Construction, Operation and Maintenance employment, and ZED will utilize both local and regional supply sources for the provision of goods and services wherever possible. ZED will also maximize local input whenever possible during all phases of the Project's development. Once fully operational, the Project will generate emission-free electricity (enough to power approximately 5000 homes) fed directly into BC Hydro's power grid, which services Summerland and the surrounding area, as well as additional tax revenue. Power purchase rates are published in BC Hydro's Standing Offer Program Rules, and SCWPP is 100% privately funded.
Open House attendees	Project Open House November 23, 2011	Interest in project components locations	Proposed turbine and project component locations within the SCWPP will be included in the Development Plan as part of the License of Occupation application to the Ministry of Forests, Lands and Natural Resource Operations.
Open House attendees	Project Open House November 23, 2011	Concern regarding potential impact on wildlife and wildlife habitat	The Project's environmental assessment of wildlife and wildlife habitat (Section 4.4.1) identifies any potential impacts the Project may have on within the local study area.

Open House attendees	Project Open House November 23, 2011	Potential impacts to local environment	The Project's environmental assessment identifies any potential impact the Project may have on protected areas within the local study areas. These assessments will be included in the Development Plans as part of the General Area License of Occupation applications to the Ministry of Forests, Lands and Natural Resource Operations.
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Agency Consultation

ZED Project representatives consulted with key agencies, organizations and institutions regarding environmental assessment, and required approvals/permits during early Project development, including:

- Ministry of Forests, Land and Natural Resource Operations
Ministry of Environment
- Environment Canada – Canadian Wildlife Service
- District of Summerland
- Regional District of Okanagan-Similkameen

Topics discussed in communication with these agencies meetings related primarily to anticipated information requirements for the Development Plan including: zoning, permitting, consultation processes, wildlife, wildlife habitat, fish, aquatic habitat, mapping, local hunting, water quality, migratory patterns, local First Nations, and Archaeological Impact Assessments. Key agency issues are identified in detail in Section 4 of the Development Plan.