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## Digby Wind Power Project

### Environmental Assessment Report

Report Prepared for:  
SkyPower Corp  
250 Yonge Street  
Toronto, ON M5B 2L7

Project No.1030972.01

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April 2009

**DIGBY WIND POWER PROJECT ENVIRONMENTAL ASSESSMENT**

Foreword

**FOREWORD**

This Environmental Assessment Report is intended to meet the requirements for a Screening under the *Canadian Environmental Assessment Act* and requirements of an environmental registration pursuant to the Nova Scotia *Environment Act*. The two separate environmental assessment processes are similar in certain aspects but have their own requirements as set by provincial and federal government agencies. This report integrates the work completed to meet both sets of requirements, including those requirements that do not overlap the two processes. This report generally follows the structure expected by Natural Resources Canada, as presented in their guidance document, "Environmental Impact Statement Guidelines for Screenings of Inland Wind Farms Under the *Canadian Environmental Assessment Act*" (2003) supplemented by provincial requirements for environmental assessment registration outlined in "The Proponent's Guide to Wind Power Projects: Guide to Preparing an Environmental Assessment Registration Document" (NSE 2007, updated 2008).

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Executive Summary

**EXECUTIVE SUMMARY****Introduction**

SkyPower Corp. (SkyPower) a Toronto based renewable energy developer, partnering with Nova Scotia-based community economic development organization Scotian Windfields Inc., is proposing to construct and operate a 30-megawatt (MW) wind power facility. The wind power facility will consist of 20 1.5 MW wind turbine generators with a 34.5 kV collection system connected to a new substation, on land located in Gulliver's Cove, Digby County, Nova Scotia. The proposed Project is referred to as the Digby Wind Power Project ("the Project").

The Digby Wind Power Project will provide enough power for more than 10,000 homes annually and have a positive effect on the environment through displacement of burning fossil fuel. In light of both Canada's and Nova Scotia's commitment to reduce greenhouse gas emissions and invest in renewable energy, the Digby Wind Power Project will be an important component of Nova Scotia's energy mix.

**Regulatory Approvals**

The Digby Wind Power Project has a nameplate capacity exceeding 2 MW, which requires the Proponent to undertake a Class I Undertaking pursuant to the Nova Scotia *Environment Act*. In addition, SkyPower is anticipating the requirement to undertake a screening-level environmental assessment for this Project under the *Canadian Environmental Assessment Act (CEAA)* as a result of applying for funding from Natural Resources Canada (NRCan) under the ecoEnergy for Renewable Power (EERP) program. This environmental assessment (EA) report is intended to meet the requirements of both federal and provincial EA processes. Additionally, this EA will provide support in seeking other environmental and planning approvals necessary for this Project.

**Project Description**

The Project will consist of 20, 1.5 MW, GE 1.5sle wind turbine generators. The following ancillary facilities are also considered part of the Project:

- 34.5 kV collection lines (to link the wind turbines to the onsite substation);
- 575V – 34.5kV range pad transformers located beside each turbine;
- substation (to step up the electric output from 34.5 kV to 69 kV);
- access roads;
- transmission line to Conway substation (approximately 10.6 km long); and
- crane pads for assembly of wind turbines.

There will be no maintenance building on site. The onsite substation area will be fenced and graveled.

**Project Activities**

The development of the proposed Project will include several phases, including site preparation and construction, operations and maintenance, and decommissioning. Activities within these phases will include:

- surveying;
- developing access roads;
- clearing and grubbing;
- grading;
- piling and foundation excavation;
- pouring turbine foundations;

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- equipment lay-down and turbine assembly;
- tower, generator, and rotor assembly;
- collection system and transmission line/connection to grid;
- installation of substation equipment;
- clean-up and reclamation;
- turbine commissioning;
- access and inspection;
- rotor, generator and tower disassembly;
- access roads;
- removal of concrete foundation; and
- decommissioning of the distribution lines.

**Construction Schedule**

The proposed construction schedule for the Project is presented in Table E.1. The life-span of the proposed Project will likely equal or exceed 20 years. Decommissioning activities will last roughly the same amount of time as comparable construction activities.

**Table E.1 Anticipated Project Activity Schedule**

Surveying	August 2009
Clearing	September 2009-February 2010
Development of access roads	September 2009-February 2010
Delivery of equipment	November 2009-January 2010
Foundation construction	October 2009-January 2010
Wind turbine installation	November 2009-February 2010
Construction of overhead collection system	September 2009-January 2010
Installation of substation equipment	November 2009-February 2010
Installation of transmission line	September 2009 –January 2010
Turbine commissioning	February - April 2010
In-service	No later than April 2010

**Environmental Management Strategy**

SkyPower is committed to ensuring that the construction, operation, and decommissioning of the proposed Project are conducted in an environmentally responsible manner. SkyPower will ensure the recommended mitigation measures for the Project are successfully implemented. To accomplish this objective, the following initiatives will be addressed: integration with the corporate environmental management framework; compliance with worker health and safety rules; emergency response planning; environmental protection planning; and environmental monitoring.

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**Stakeholder Consultation and Aboriginal Engagement**

The consultation activities for the Digby Wind Power Project included a public Project announcement in the local community of Rossway (May 2008), a presentation to the Municipality of Digby County Council (November 2008) and meeting with the Planning Advisory Committee (December 2008), a public Open House in Rossway (November 2008), and direct contacts with regulatory agencies, landowners and other interested parties throughout the course of the study. SkyPower has directly engaged the Mi'Kmaq community through information mailouts, face to face meetings and the commissioning of a Mi'Kmaq Ecological Knowledge Study. The public and Aboriginal communities will be invited to submit written comments on the proposed Project and information contained in the EA document during the EA review process. Additional stakeholder and community outreach initiatives are planned for the Spring and Summer of 2009 including the launch of a Project website, mailout of community newsletter, meeting with municipal council, door-to-door community outreach program and a public open house. The public and Mi'kmaq community will continue to be engaged in future phases of development. SkyPower will develop and implement a community liaison and issues resolution program for Project operations.

**Impact Assessment**

No significant adverse residual environmental effects of the Digby Wind Power Project are likely, considering the existing conditions of the Project site, the design of the Project and mitigation measures recommended to be implemented as part of the Project. A summary of the predicted environmental effects and mitigation measures for this Project is presented in Table E.2.

**Table E.2 Summary of Impact Management and Proposed Mitigation Measures**

Environmental Component	Project Activity	Potential Effects	Mitigation Measures
Birds and Other Wildlife	Construction & Decommissioning	Sensory disturbance	<ul style="list-style-type: none"> <li>• Visitors will remain within relevant areas, both in-vehicle and on-foot and will aim to preserve the site's natural areas.</li> <li>• Ensure that overall disturbance will be limited to designated workspaces and performed in compliance with the <i>Migratory Birds Convention Act</i>.</li> <li>• Delivery vehicles will remain on designated roads.</li> </ul>
		Habitat loss/alteration	<ul style="list-style-type: none"> <li>• Habitat loss may be mitigated by only clearing the land necessary for construction activities and by limiting the overall land disturbance to within designated workspaces.</li> <li>• Upon completion of construction and/or decommissioning, habitat will be restored to the extent possible.</li> <li>• Areas of significance (e.g., nesting sites) will be avoided, to the extent possible.</li> </ul>
		Mortality	<ul style="list-style-type: none"> <li>• In order to reduce the potential of bird mortality, land clearing and construction activities will be performed in compliance with the <i>Migratory Birds Convention Act</i> (e.g., outside the critical time periods for breeding birds). If this is not possible during detailed layout surveying activities, a biologist on-site, in consultation with NSDNR and CWS, will prepare and implement a monitoring and mitigation plan for breeding activity which may include: the identification of nests within or</li> </ul>

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**Table E.2 Summary of Impact Management and Proposed Mitigation Measures**

Environmental Component	Project Activity	Potential Effects	Mitigation Measures
			immediately adjacent to work areas, and flagging them for avoidance during construction, to the extent possible.
	Operation	Sensory disturbance	<ul style="list-style-type: none"> <li>None required.</li> </ul>
		Mortality	<ul style="list-style-type: none"> <li>To reduce the potential for increased bird fatalities due to collision with wind turbines, several decisions were made in the planning of the wind farm. The turbines to be used extend no higher than 120 m above the ground thus avoiding the flight height of nocturnally migrating landbirds. Lighting will be the minimum allowed by Transport Canada for aeronautical safety, and white strobe lights (CL-865) may be used with the minimum intensity and flashes per minute allowable. The turbines for this Project will be built using tubular steel towers, as some data indicate that lattice towers encourage perching by raptors during hunting and, as a result, may put these birds at risk of collisions. Post-construction monitoring will direct the need and form of further post-construction mitigation measures</li> <li>A bird and bat monitoring program will be developed in consultation with NSDNR and CWS. Based on the results of the program necessary modifications to mitigation plans and/or wind farm operations will be undertaken.</li> </ul>
Soils and Vegetation	Construction & Decommissioning	Soil erosion and compaction	<ul style="list-style-type: none"> <li>Limit access to the turbine sites via established access roads, where possible.</li> <li>Size of access roads will be kept to the minimum required for the safe construction, operation and decommissioning of the equipment.</li> <li>Whenever possible, clearing activities will be timed to periods when the ground surface is best able to support construction equipment (winter or dry season).</li> <li>Replace topsoil stored on-site to enable the reclamation of land to its original condition.</li> <li>Compacted soil will be reclaimed as required.</li> <li>Topsoil will be stored onsite for future use in restoring the land to its original condition</li> <li>Standard erosion and sediment control measures will be implemented as required.</li> <li>Topsoil and subsurface soils will be separated and stored on-site to be replaced appropriately after the pouring of the concrete foundation. When the soils are stored they will be covered with a tarp or otherwise protected from erosion and runoff.</li> </ul>
		Loss of plant species	<ul style="list-style-type: none"> <li>Follow- up rare plant surveys will be conducted to assist with micro-siting of turbines and access roads.</li> <li>Where Plant Species of Conservation Concern are encountered, avoidance to the extent possible will be considered, especially where there may be a threat</li> </ul>

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**Table E.2 Summary of Impact Management and Proposed Mitigation Measures**

Environmental Component	Project Activity	Potential Effects	Mitigation Measures
			to the regional population. <ul style="list-style-type: none"> <li>• Prior to construction, digital way-point files revealing the precise locations of all “Red”, “Yellow” and “Undetermined” listed species identified during field work within the area proposed for development will be provided to NSDNR.</li> </ul>
Wetlands	Construction & Decommissioning	Loss of wetland area and/or function	<ul style="list-style-type: none"> <li>• Avoid all wetlands, where possible.</li> <li>• Conduct functional analyses for wetlands that cannot be avoided.</li> <li>• Obtain regulatory approval (including compensation for no net loss of function) from NSE for wetland alteration as required. Turbines will not be constructed within 30 m of a wetland unless approved by NSE.</li> </ul>
Water Quality/ Aquatic Environment	Construction & Decommissioning	Surface water contamination	<ul style="list-style-type: none"> <li>• Watercourses will be avoided to the extent possible.</li> <li>• Overhead powerlines preclude the need for instream work.</li> <li>• If alteration of watercourses is required, regulatory approval from NSE of the proposed alteration will be obtained prior to construction.</li> <li>• All activities, including equipment maintenance and refuelling, will be controlled, or will be done off-site, to prevent entry of petroleum products or other deleterious substances, including any debris, waste, rubble or concrete material, into a watercourse.</li> <li>• Construction material, excess material, construction debris, and empty containers will be stored away from watercourses and watercourse banks.</li> <li>• A contingency plan for accidental spills will be developed for the Project.</li> <li>• Turbines will not be constructed within 30 m of a watercourse unless approved by NSE.</li> </ul>
		Sediment loading	<ul style="list-style-type: none"> <li>• Watercourses will be avoided to the extent possible</li> <li>• If watercourse alterations are required, they will be done in consultation with NSE/DFO in accordance with regulatory requirements.</li> <li>• Land clearing and construction near watercourses should occur between June and September 30 where possible.</li> <li>• Temporary erosion and sediment control measures, silt fence, straw bales (<i>etc.</i>) will be used and maintained until 100% of all work within or near a watercourse has been completed and stabilized.</li> <li>• Visual assessments will be completed both quarterly and after severe storm events to ensure the effectiveness of erosion and sedimentation controls.</li> <li>• Temporary sediment control measures will be removed at the completion of the work but not until permanent erosion control measures, if required, have been established.</li> </ul>
		Surface water flow	<ul style="list-style-type: none"> <li>• Watercourses will be avoided to the extent possible.</li> <li>• Access roads constructed across existing watercourse that require a culvert will follow standard industry</li> </ul>

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**Table E.2 Summary of Impact Management and Proposed Mitigation Measures**

Environmental Component	Project Activity	Potential Effects	Mitigation Measures
			<p>practice, installing culverts of sufficient size to accommodate expected maximum flows within the watercourse.</p> <ul style="list-style-type: none"> <li>A Water Approval will be obtained for all required watercourse crossings and the conditions of approvals will be followed.</li> </ul>
		Fish mortality	<ul style="list-style-type: none"> <li>Watercourses will be avoided to the extent possible.</li> <li>Watercourse crossings, where required, will occur between the period of June 1 to September 30 unless otherwise approved by NSE</li> <li>Where possible, culverts will be installed during low flow periods. If water is present, watercourses will be dammed and flow will be preserved through water pumps. In this case, a biologist would be on site to facilitate fish rescue within the dammed area.</li> </ul>
Noise	Construction & Decommissioning	Increases in sound levels due to the transportation and operation of clearing equipment	<ul style="list-style-type: none"> <li>Nearby residents will be advised of significant sound generating activities and these will be scheduled to create the least disruption to receptors.</li> <li>Heavy equipment will be operated between 7:00 a.m. and 10:00 p.m., avoiding Sundays and holidays unless absolutely necessary.</li> <li>Construction equipment will have mufflers.</li> <li>Noise abatement equipment, in good working order, will be used on all heavy machinery used on the Project.</li> </ul>
	Operation	Increase sound levels	<ul style="list-style-type: none"> <li>None required.</li> </ul>
Tourism	Construction & Decommissioning	Effect on tourism and recreation	<ul style="list-style-type: none"> <li>None required.</li> </ul>
	Operation	Effect on tourism and recreation	<ul style="list-style-type: none"> <li>None required.</li> </ul>
Visual	Operation	Change to visual landscape	<ul style="list-style-type: none"> <li>Turbines will be all of the same type and model, and will be painted light grey to reduce reflection.</li> <li>Screening opportunities for adjacent residences through tree planting or other measures may be considered where post-construction evaluation indicates a legitimate concern.</li> </ul>
		Lighting	<ul style="list-style-type: none"> <li>Lighting will be the minimum allowed by Transport Canada to ensure the appropriate level of aeronautical safety.</li> </ul>
		Shadow flicker	<ul style="list-style-type: none"> <li>None required.</li> </ul>
Archaeological and Cultural Resources	Construction	Disturbance	<ul style="list-style-type: none"> <li>Areas of significance will be avoided to the extent possible.</li> <li>Additional follow-up work may be required depending on final design and layout.</li> <li>Upon discovery of an artifact, work will be stopped in the area and the appropriate authorities will be contacted.</li> </ul>
Land Use	Construction	Reduction of forested land	<ul style="list-style-type: none"> <li>Existing RoWs (e.g., woods roads) will be used to the greatest extent possible. New access roads will be constructed to minimize the Project footprint.</li> <li>Turbines and substations, with their relatively small footprint on the land, have been sited with consideration</li> </ul>

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**Table E.2 Summary of Impact Management and Proposed Mitigation Measures**

Environmental Component	Project Activity	Potential Effects	Mitigation Measures
			<ul style="list-style-type: none"> <li>for the potential impact to existing land uses.</li> <li>Existing logging and access roads built earlier in construction schedule will be used to install the collection system.</li> </ul>
	Operation	Disruption to undeveloped woodlands or infrastructure	<ul style="list-style-type: none"> <li>The Project has been designed to minimize impacts to the local land use. No mitigation, therefore, is required as no significant impacts are predicted.</li> </ul>
Health and Safety	Operation	Electromagnetic Fields (EMFs)	<ul style="list-style-type: none"> <li>None required.</li> </ul>
		Infrasound energy	<ul style="list-style-type: none"> <li>None required.</li> </ul>
		Ice throw	<ul style="list-style-type: none"> <li>During construction and operation activities, access to the wind turbine facility will be restricted to authorized personnel wearing proper personal protective equipment and who have had appropriate safety training.</li> <li>During site visits, vehicles will be parked up-wind of the turbines.</li> <li>Warning signs will be posted at the perimeter of the Project area, discouraging trespassing on private lands.</li> <li>During operation, access to the wind turbine sites will be restricted to authorized personnel only.</li> </ul>
Local Community	Construction	Hazards and/or inconveniences to forestry operation	<ul style="list-style-type: none"> <li>Road construction schedule will consider planned forestry operation in the area to ensure required access is maintained.</li> <li>No modification to existing roads expected</li> <li>A Special Move Permit and any associated approvals will be obtained through the Department of Transportation and Infrastructure Renewal for heavy load transport.</li> </ul>
			Operation
		Effect on property values	

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