



MORRISON HERSHFIELD  
Suite 600, 235 Yorkland Boulevard  
Toronto, Ontario M2J 1T1  
Tel: 416 499 3110  
Fax: 416 499 9658  
morrisonhershfield.com

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**Project Title:** HAF WIND ENERGY PROJECT

**Report:** 005-R03-1104037

**Title:** DECOMMISSIONING PLAN REPORT

**Client:** IPC Energy  
2550 Argentia Road Suite 105  
Mississauga, Ontario  
L5N 5R1

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Prepared by Morrison Hershfield Limited



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Table 1-B: General Project Schedule

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## 1.0 Project Overview

The HAF Wind Energy Project (“the Project”) Decommissioning Plan Report is prepared in accordance with the requirements of the Ministry of the Environment’s Renewable Energy Approvals Regulation (“the Regulation”), O.Reg 359/09, specifically with consideration of *Item 3* of the requirements outlined in *Table 1* of the Regulation.

The proposed HAF Wind Energy Project is to be situated in the Township of West Lincoln, in Niagara Region of Ontario. The Project would consist of five (5) Vestas V-100 1.8 megawatt wind turbines producing a nameplate capacity of 9.0-megawatts. If approved, the wind turbines would be erected for the purpose of capturing energy from the wind, a renewable resource, and converting it into clean, useable electricity. This electricity will be transported to consumers via interconnection facilities, including transformers and distribution lines. The footprint of these facilities is captured and described in reports prepared for this Renewable Energy Approval (REA).

The Renewable Energy Approval examines three phases: 1) Construction; 2) Operation and Maintenance, and 3) Decommissioning of the facility and its associated infrastructure. Each of these phases is described in separate reports. This report describes the Decommissioning of the facility. Generally, unless specified, this report describes the decommissioning on a turbine basis.

Infrastructure for the purposes of the REA and this Project includes turbines, foundations access roads, underground collector system, switching station, temporary staging areas, and maintenance and operations buildings. Transformers are located inside each wind turbine’s nacelle housing and therefore pad mounted transformer substations are not part of the footprint of this facility.

This report will detail the decommissioning activities, the duration, the environmental effects, and mitigation measures. The wind turbine locations are presented in **Table 1-A**. The general project schedule is found in **Table 1-B**, with the description of each phase of the project found in **Table 1-C**.

<b>Turbine Number</b>	<b>Northing</b>	<b>Easting</b>
1	604718	4775553
2	604889	4775173
3	606291	4774905
4	604359	4774307
5	606233	4773420

## 1.1. General Project Schedule

**Table 1-B** provides an overview of key project activities and projected dates.

<b>Activity</b>	<b>Date (Month, Year)</b>
Begin Renewable Energy Approval	April, 2010
Submit Renewable Energy Approval Application	June, 2012
Obtain Renewable Energy Approval	January, 2013
Commence Construction	March, 2013
Commercial Operation	August, 2013

### 1.1 Scope of the Project

The scope of the HAF Wind Energy Project includes the construction, operation and maintenance, and decommissioning of the facility and its associated infrastructure, including turbines and foundations, access roads, underground collector system, switching station, meteorological tower, temporary staging areas, and an operations building.

The scope of project activities is summarized in **Table 1-C**, which provides each phase (Construction, Operation and Maintenance, and Decommissioning) with the corresponding activities that will be undertaken. However, the decommissioning phase is most relevant to this report.

<b>Phase</b>	<b>Activities</b>
<b>Construction</b>	<ul style="list-style-type: none"> <li>• Surveying and geotechnical work</li> <li>• Access road construction and modification</li> <li>• Delivery of equipment</li> <li>• Foundation construction</li> <li>• Tower and turbine assembly and installation</li> <li>• Interconnection from turbines to Switching station</li> <li>• Switching station construction</li> <li>• Electrical tap line construction</li> <li>• Site clean-up and restoration</li> <li>• Turbine commissioning</li> </ul>
<b>Operation &amp; Maintenance</b>	<ul style="list-style-type: none"> <li>• Environmental effects monitoring</li> <li>• Turbine operation and electricity production</li> <li>• Annual and semi-annual maintenance</li> <li>• Repairs, as required</li> <li>• Community relations</li> </ul>

<b>Decommissioning</b>	<ul style="list-style-type: none"> <li>• Land clearing</li> <li>• Road construction/modification</li> <li>• Removal of turbines and ancillary equipment</li> <li>• Removal of electrical tap lines</li> <li>• Site restoration and rehabilitation</li> </ul>
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## 2.0 Decommissioning Procedure

The approximate end of lifecycle of each turbine is 25 years. Following this time, it may be possible to extend the lifecycle of some or all of the turbines by replacing or upgrading old components. The earliest anticipated decommissioning of the entire facility could begin at the end of the FIT contract period in April 2030 unless the contract is extended. It will become necessary at this point in time to decommission the entire facility and either remove or replace the turbines.

The decommissioning of the Project will conform to standard industry practices in force at the time of decommissioning. **Vineland Power Inc.** will remove all of the main components (including, turbines, nacelles, blades, collector system, Switching station, meteorological tower etc.) of the facility. All components will be recycled and/or reused where possible. Each turbine site will be reclaimed to a suitable land-use.

Turbine foundations will be removed and the land reclaimed. The final design of the turbine foundations will determine the type of foundation material used and the approach to removing it. Generally, foundations of each turbine will be broken down into removable pieces to a depth of one metre below ground level using heavy equipment. Each concrete section and associated structural steel will be removed from the turbine foundation and transported off-site. This material may be recycled or used as scrap material depending on the condition of the material removed. All holes created from the removal of the turbine foundations will be filled, and top-soil will be re-applied to provide for suitable reclamation.

It should be noted that decommissioning includes the removal of all project components, including, turbines, foundations, access roads, underground collector system, switching station, and meteorological tower. These components will be recycled, reused, or disposed of appropriately and in conformity with the practice in effect at that time. Buried cables may be abandoned in accordance with Ministry practices and applicable regulations in effect.

Consultation will be required during the decommissioning of the facility to ensure that no negative impacts are observed. Vineland Power Inc. will work with impacted land users and agencies to coordinate the removal of components and land reclamation.

Disturbed portions of the facility will undergo natural re-vegetation, seeding or replanting to return the site to pre-facility conditions. Particular attention will be paid to areas prone to erosion. Post-decommissioning site drainage will be retained according to pre-existing conditions.

Before decommissioning can occur, environmental monitoring will take place. This will include those action items listed in the **Environmental Effects Monitoring Plan (EEMP)**. Generally, this entails surveys to identify bird nesting areas to ensure that there is as little disturbance as possible to the surrounding wildlife during decommissioning of the project. Environmental effects monitoring may recommend additional environmental mitigation

where required. Each element of the decommissioning phase is described more extensively in the subsections below. Environmental effects caused by the decommissioning phase of the project will be mitigated as described in the EEMP and **Environmental Impact Study**.

The subsections below corresponded to the activities described in earlier phases of the project. The **Design and Operations Plan Report** and **Construction Plan Reports** are useful references in holistically understanding this undertaking.

### ***2.1 Land Clearing***

A decommissioning pad-staging area will be constructed immediately adjacent to the turbine. This 20 meter by 40 meter areas will be cleared, graded and constructed using aggregate material to support the weight of heavy machinery that is required to dismantle each turbine. It is expected that this activity will take approximately two months for each of the projects five turbines. This area will adhere to the REA setbacks for water bodies, natural heritage, and land use. The area used during the construction phase as a crane pad to erect each turbine will be used for this purpose.

### ***2.2 Road Construction/Modification***

The existing access roads used during the operation phase of the project will be upgraded as required overtime with aggregate material if deemed necessary, based on the geotechnical conditions of the facility. Before decommissioning can take place, roads will be checked and improved to confirm accessibility for equipment required for decommissioning. This activity is expected to take approximately three (3) weeks.

### ***2.3 Removal of Turbines and Ancillary Components***

Each turbine and its components will be disassembled on site and will be confined to the construction footprint already established during the construction phase. All turbine components and parts will be removed and either reused or recycled where possible. Removal of turbines and ancillary components will take approximately two months for all five turbines.

Turbine foundations will be removed and the land reclaimed. The final design of the turbine foundations will determine the type of foundation material used and the approach to removing it. Generally, foundations of each turbine will be broken down into removable pieces to a depth of one metre below ground level using heavy equipment. Each concrete section and associated structural steel will be removed from the turbine foundation and transported off-site. This material may be recycled or used as fill depending on the condition of the material removed. All holes created from the removal of the turbine foundations will be filled, and top-soil will be re-applied to provide for suitable reclamation.

### ***2.4 Removal of Underground Collector System***

The low voltage underground collector system connecting project turbines to the switching station will be removed from the site and recycled, reused or disposed of appropriately.

## ***2.5 Removal of Access Roads***

Removal of access roads will be undertaken in consultation with participating landowners. If requested, access roads will be left for the landowner's personal use or restored to the project's pre-facility conditions.

## ***2.6 Restoration of Land and Water***

The landscape adjacent to the project location consists of an area of approximately 4808ha and is generally agricultural in land use. The land inside the project area is mostly flat, with an elevation of 190 m to 197 m above mean sea level. Within 120 metres of the project location, streams are relatively small, some only seasonal. The subject properties in which turbines are to be located consist of agricultural fields that are tilled and planted seasonally with sod and crops such as corn and soybeans. Field sizes vary considerably. The landscape is fragmented with open fields, roads, fences, planted crops and vegetation, and settlement areas.

The HAF Wind Energy Project site will be remediated to its pre-facility condition following the disassembly and removal of all project infrastructure. Areas of the facility that have been disturbed will undergo natural revegetation or will be replanted with species similar to those found in the surrounding area. All top soil that is stripped during decommissioning activities will be re-applied. These activities will take approximately two weeks. Vegetation will re-grow over the following summer season. The **Natural Heritage Assessment, Environmental Impact Study**, and **Water Assessment and Impact Reports** provide a thorough description of the pre-facility conditions of the project location.

### **2.6.1 Restoration of Land**

Specific areas that will be disturbed by the project's facility and related equipment, which will require remediation include turbine foundations, temporary laydown areas, switching station, access roads, and underground collector system. Any land that is disturbed or compacted during decommissioning will be de-compacted and graded. Disturbed portions of the facility will undergo natural re-vegetation, seeding or replanting to return the site to pre-facility conditions. Site restoration measures will also ensure that the soil nutrient content is restored to pre-existing conditions. Particular attention will be paid to areas prone to erosion. Planting designs, if required will be completed by a qualified landscape architect. Post-decommissioning site drainage will be retained according to pre-existing conditions.

### **2.6.2 Restoration of Waterways**

Watercourse and water body impacts will be minimal. The layout of the project facility was designed to minimize environmental impacts to waterways located within proximity to the facility. **The Water Assessment and Impact Report** provides greater detail on existing conditions, potential impacts, and mitigation measures. During the decommissioning phase of the project no direct impacts to surrounding watercourses is anticipated, therefore no restoration activities will be required. If contamination of surface and groundwater occurs due to accidental spills or erosion during the decommissioning phase, risks will be minimized by the implementation of the Environmental Effects Monitoring Plan (EEMP). In all cases MOE and the appropriate agencies will be notified so that the incident can be corrected and investigated.

The EEMP includes plans for fuel, oil, and lubricant handling and storage. Storage and use of these materials during construction, operation and decommissioning phases of the project will comply with all applicable provincial and federal regulations, codes, and guidelines. Please see the HAF Wind Energy Project EEMP for response measures to be followed in the event of a hazardous materials spill.

## **2.7 Waste Management**

The project will not produce toxic or hazardous materials during decommissioning. Some petroleum, oils, and lubricants (POL) and other fluids, that may be considered toxic, may be brought on site for turbine decommissioning. Excess POL waste removed from the project site will be disposed or recycled according to provincial and municipal environmental waste management standards. Non-hazardous waste material will be handled by the municipal waste management system.

Excess materials required during decommissioning will be reused where possible and recycled as an alternative to reuse. Some materials may be sent to the municipal landfill where necessary. The contractor will conform to municipal and provincial disposal requirements for landfill waste and transport of excess construction materials.

### **2.7.1 Solid Waste**

Any solid waste generated as a result of decommissioning of the HAF Wind Energy Project will be produced from the dismantling of the turbine and tower structures, foundations, underground collector system and vegetation cleared as required for equipment access to the site. The preferred method of disposing of solid waste for the decommissioned facility is reuse and recycling. It is expected that the main sources of salvage materials generated from the decommissioning of the project's facility will include steel from the turbine tower and copper from nacelle bearing materials and electrical conductors. In the event that materials cannot be reused or recycled, waste materials will be transported to the nearest MOE approved waste disposal facility as required.

Cranes will be necessary to dismantle the turbines and towers. All associated components will be removed offsite using a flatbed truck. Turbine towers and parts will be reused if possible or recycled accordingly.

The foundation of each turbine will be broken down into pieces to a depth of one metre below ground level using heavy equipment. The concrete sections and associated structural steel removed from the turbine foundations will be transported off-site. All holes created from the removal of the turbine foundations will be filled, and top-soil will be re-applied.

Waste materials generated from the dismantling of the turbine foundation will be reused, recycled or transported to the nearest waste disposal facility will be made in consultation with a waste management company at the time decommissioning activities occur. Any surface cables and poles will be removed from the site and reused, recycled or disposed of accordingly.

Clearing of the surrounding environment during the decommissioning phase will be kept to a minimum. Regenerated construction staging and laydown areas used during the construction



phase of the project may need to be cleared again for decommissioning activities. The clearing of land to undertake decommissioning activities will not utilize any slash and burn methods.

Upon the completion of decommissioning activities, the turbine disassembly areas, reclaimed access roads, and other areas cleared as required for decommissioning activities will be reseeded or replanted with species similar to those found in the surrounding area. These areas will undergo natural regeneration to their original state. Where erosion prone areas exist, replanting in the surrounding area may be required to minimize the impacts of erosion.

### **2.7.2 Liquid Waste**

Liquid waste generated as a result of decommissioning activities of the HAF Wind Energy Project may include fuel, oil and lubricants found inside the wind turbines, as well as the machinery equipment brought onsite during the decommissioning process.

The storage and use of any fuels, oils and lubricants during the operation of the project's facility will comply with all applicable provincial and federal regulations, codes, and guidelines. The disposal and cleanup of any liquid waste will be in accordance to the procedures outlined in the **Design and Operations Report** for the HAF Wind Energy Project.

## ***2.8 Consultation and Decommissioning***

Vineland Power Inc. will consult with adjacent land users, local roads board, local municipality, federal agencies, provincial agencies, police and emergency services, and otherwise make suitable notice of the decommissioning of the facility to those impacted by such activities.

## ***2.9 Emergency Response and Communications Plans***

In the event an emergency occurs during decommissioning phase of the HAF Wind Energy Project all appropriate authorities will be notified. Any Emergency Response and Communication required during the decommissioning phase of the project will follow the guidelines and procedures documented in the **Design and Operations Report**.

## ***2.10 Decommissioning During Construction (Abandonment of Project)***

In the event that construction of the HAF Wind Energy Project cannot be successfully completed (i.e. financial limitations) it is expected that the rights to the Project would be successfully sold and constructed by the purchasing developer. If the rights to the Project are not successfully sold, Vineland Power Inc. will be responsible for the decommissioning of the Project and the restoration of the project site to pre-existing conditions. Decommissioning during construction will follow the same procedures and environmental mitigation measures that would be followed for decommissioning the project facility after ceasing operation.

## ***2.11 Decommissioning Notification***

A Decommissioning Notification will be given to all appropriate stakeholders and authorities at the commencement of decommissioning activities. Notification of Decommissioning and associated activities will be communicated as described in the **Design and Operations Report**.

### ***2.12 Other Approvals***

Decommissioning of the Project's facility will comply with applicable legislation in effect at that time. Any additional approvals or permits which may be required to successfully decommission and restore the project's facility to pre-existing conditions will be obtained in consultation with the appropriate local and provincial authorities prior to the commencement of decommissioning activities.

### 3.0 Environmental Monitoring

Environmental monitoring involves providing good leadership and management structures to maintain a situational understanding of the environmental effects that occur during construction. This section describes how environmental monitoring, as described in the **Environmental Effects Monitoring Plan (EEMP)** relates to the Decommissioning Phase of the project.

#### 3.1 Leadership and Management Structures

The Proponent is responsible for providing leadership and management for the implementation of the Environmental Effects Monitoring Plan (EEMP). The Proponent and their agents or representatives are responsible to ensure that they diligently adhere to the procedures and practices outlined in the EEMP as well as legal and regulatory conditions of approvals. Once decommissioning is completed, the proponent will confirm that environmental restoration efforts were correctly completed.

The Proponent will appoint a Project Manager to oversee the environmental monitoring for this project. During all phases and stages of the project, the Proponent must retain qualified professionals to confirm that environmental monitoring is correctly conducted. The qualified environmental monitoring professional(s) must regularly report and document the execution of the EEMP.

Vineland Power Inc. is committed to working with all stakeholders to reduce or eliminate the impacts of this proposed project. Vineland Power Inc. affirms its commitment to implement the EEMP and ensure the effectiveness of the environmental impact study. Vineland Power Inc. will ensure that the environmental concerns and mitigation measures described in the Renewable Energy Approval Application are addressed and implemented in the field.

#### 3.2 Environmental Effects Monitoring Plan

The Environmental Effects Monitoring Plan is found as part of the **Design and Operations Report**. The HAF Wind Energy Project's *Environmental Effects Monitoring Plan* (EEMP) has been developed by Morrison Hershfield (MH) to describe the environmental protection measures required for all activities associated with the HAF Wind Energy Project. The *Environmental Effects Monitoring Plan* outlines the necessary monitoring protocols required to ensure that mitigations measures are effective and adequate. This plan should be considered a supporting document to the rest of the *REA Package* and fulfills the requirements outlined by *Ontario Regulation 359/09 - Renewable Energy Approvals* under the *Green Energy Act*.

The *EEMP* is applicable to all employees of Vineland Power Inc. working on the construction, operation and maintenance, and decommissioning phases of the HAF Wind Energy Project and provides guidance to Vineland Power Inc.'s contractors and subcontractors on environmentally safe standards for project activities during operation and environmental monitoring of the project.

### ***3.3 Purpose and Objectives of the EEMP***

The *Environmental Effects Monitoring Plan* has been prepared to provide the required protection measures for all project activities associated with HAF Wind Energy Project.

The purpose of the *Environmental Effects Monitoring Plan* is:

- To ensure that Vineland Power Inc.'s commitments to minimizing environmental effects are met.
- To provide a description of the environmental concerns related to the construction, operation, maintenance, and decommissioning of the HAF Wind Energy Project and instructions for mitigation of the potential impacts of these activities.
- To provide concise and clear instructions for implementing mitigation measures for the protection of environmental resources, and minimizing potential adverse environmental effects. To provide a means of tracking and recording actual effects of the project on valued ecosystem components.
- To ensure that the HAF Wind Energy Project operations meet all provincial, federal and municipal requirements.
- To provide a reference document for planning and/or conducting operation, maintenance or decommissioning activities that may have an impact on the environment.

The Environmental Effects Monitoring Plan is intended to be a supporting document of the REA application that provides guidelines for the protection of valued ecosystem components during operation, maintenance and decommissioning activities. Background information contained within the Environmental Effects Monitoring Plan is covered in more detail in the other technical reports of the REA Package

## **4.0 Summary**

The proposed HAF Wind Energy Project can be decommissioned with minimal impacts to the environment provided that the decommissioner adheres to the environmental mitigation measures provided here and within the Environmental Impact Study. Furthermore, environmental monitoring will reduce the risk of potential environmental impacts by outlining procedures based on regulations and good practices for waste management, health and safety, abandonment, and emergency response and training.

The Environmental Impact Study (EIS) of the REA application package describes the potential impacts of the project on significant natural features within 120 metres of the project location. The EIS provides mitigation and impact reduction measures where applicable. Impacts resulting from the decommissioning of underground crossings of watercourses by electrical lines are discussed in the Water Bodies Impact Assessment Report, where appropriate mitigation measures to reduce these impacts are also described. Environmental monitoring plans have been developed and are discussed in the Environmental Effects Monitoring Plan included within the Design and Operations Report included in the REA package.

## **5.0 Consultant Legal Statement**

Morrison Hershfield Limited (“MH”) produced this report in accordance with our Proposal and information provided by IPC Energy (“the Client”) and is based upon statements by the Client on the proposed design, construction, operations, maintenance, and decommissioning of the proposed wind energy project. The information and statements contained herein are for the sole benefit of the Client for the purposes of the Renewable Energy Approval.

The contents of this report are based upon our understanding of guidelines, regulations, and statutes which we believe to be current at this time. Changes in guidelines, regulations, statutes, and enforcement policies can occur at any time, and such changes could affect the conclusions and recommendations of this report.

While we have referred to and made use of reports and specifications prepared by others, we assume no liability for the accuracy of the information contained within those reports and specifications.