



Mohawk College  
Hamilton, ON

Project Description Report

Fennell Campus Wind Project

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Project Report

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# Mohawk College

## Fennell Campus Wind Project

### Project Description Report

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## 1. Introduction

Mohawk College of Applied Arts and Technology (hereinafter referred to as “Mohawk”) is proposing to develop a 6-kW wind project titled Fennell Campus Wind Project (hereinafter referred to as the “Project”). As required, Mohawk is commencing with the Renewable Energy Approval (REA) process as described in Ontario Regulation 359/09 under the Environmental Protection Act. This Project Description Report has been prepared in accordance with O. Reg. 359/09.

The Project is located at 135 Fennell Avenue West, Mohawk College, within the City of Hamilton (single-tier municipality).

Mohawk is the proponent of the Project. The contact information is as follows:

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Chief Building and Facilities Officer  
Mohawk College of Applied Arts and Technology  
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Hatch Ltd. (Hatch) has been retained to assist Mohawk in meeting the REA requirements. Contact information for Hatch is as follows:

Sean K. Male, M.Sc.,  
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The Project Description Report is the first step in the REA process. Mohawk will complete the requirements for obtaining the REA as identified in O. Reg. 359/09.

## 2. Project Details

The following sections are intended to satisfy the requirements of Table 1 to O. Reg. 359/09: Section 10 – Project Description Report which directs the proponent to provide a description of the Project.

### 2.1 Energy Sources to Generate Electricity

Wind energy will be used to generate electricity.

### 2.2 Facilities, Equipment and Technology

The proposed Project is a renewable energy generation facility which will use wind turbine technology. There are currently two options with respect to turbine placement. These options are both located in close proximity to each other, and are shown in Figure 2.1. Specifically, two 3.5-V Vertical Axis Wind Turbine Systems will be mounted on a 29-ft pole, for greater access to the wind. The generators are direct drive, low speed, permanent magnetic generators with an exterior rotor. A fail safe is incorporated to allow for a safety shutdown during power outages and routine maintenance. The turbine height itself is 3.11 m, with a rotor diameter of 2.75 m. The rated wind speed is 12.5 m/s and it will operate to wind speeds up to 45 m/s. (Specifications for the wind turbine are provided in Appendix A.)

Power from the Project will be connected to Mohawk College, Fennel Campus. No access roads, laydown areas or temporary office buildings will be required to construct or operate the Project.

### 2.3 Class of the Renewable Energy Facility

The Project will be a Class 2 wind facility. That is, the Project has a nameplate capacity of greater than 3 kW but less 50 kW and is not in contact with water.

### 2.4 Federal Involvement

No Federal lands or resources will be utilized for the Project and based on the resources within the Project area, issues under Federal jurisdiction are not anticipated. Therefore, no Federal involvement (including permits and approvals) is required.

### 2.5 Project Activities

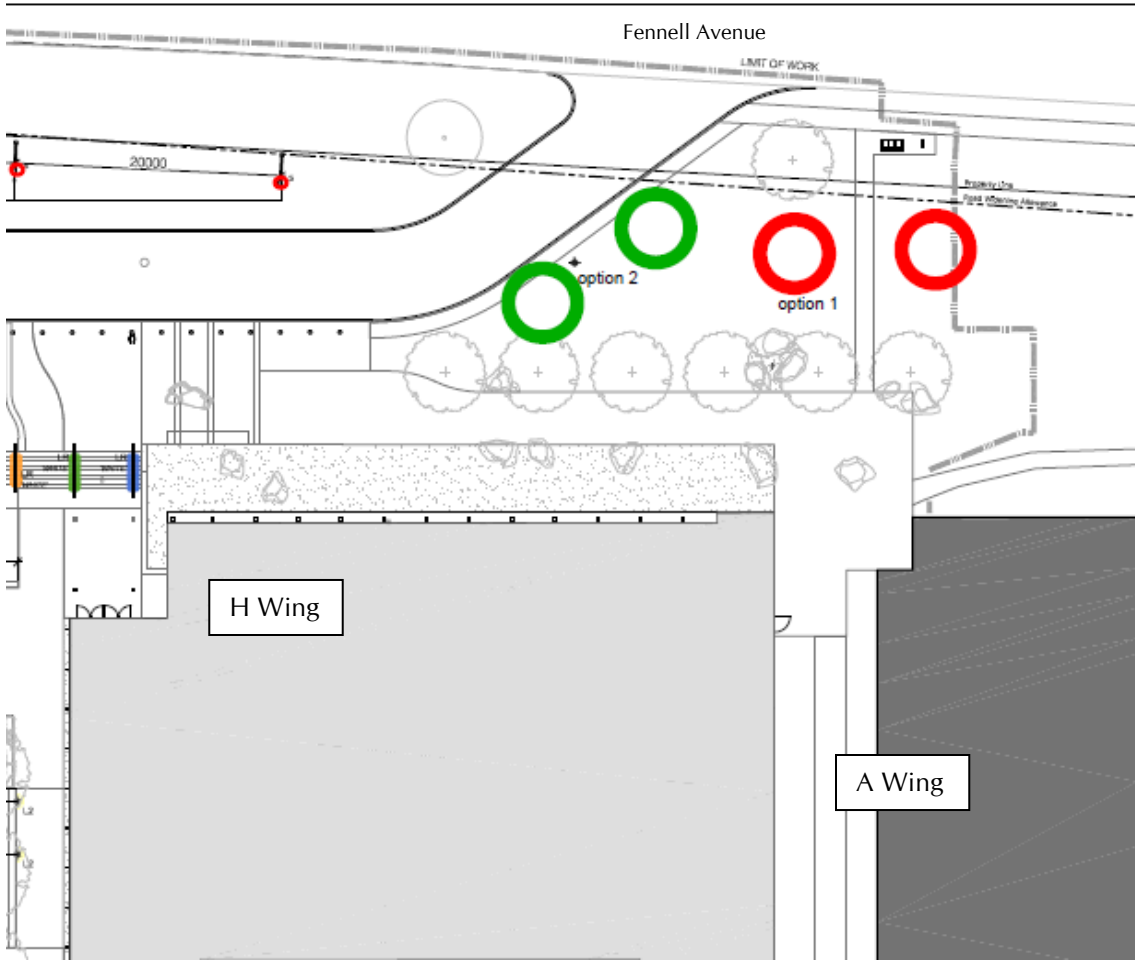
The Project activities involved in the construction, operation and decommissioning phases of the Project are outlined in the following sections. It is anticipated that the time for construction is 1 to 2 months, depending on time of year and various other factors. Prior to construction, the area will be surveyed. Any buried utilities or infrastructure will be located prior to commencing with the site preparation.

#### 2.5.1 Construction

##### 2.5.1.1 Site Preparation

Any vegetation present at the turbine sites will be removed. If necessary to control sediment, erosion and sedimentation control measures will be installed. Any soil waste will be disposed of in accordance with relevant waste management regulations.

**Figure 2.1 Proposed Turbine Location Options (Option 1 – Red Circles, Option 2 – Green Circles)**



### 2.5.1.2 *Installation of Support Structures*

Foundations and/or support structures will be required beneath wind turbines. At this time it is anticipated that a circular concrete pad will serve as the foundation for the wind turbines.

### 2.5.1.3 *Electrical Infrastructure and Underground Cable Installation*

Electricity generated by the turbines is inverted through an inverter within the wind turbine to a voltage suitable for connection to the Fennell Campus. AC cables will run from the wind turbine to Mohawk College. A simple trenching device will be used to install the AC cables, whereby a trench is opened, the cable laid, and the soil replaced.

### 2.5.1.4 *Installation of Wind Turbines*

The 3.5-V vertical axis wind turbine systems will be installed as per manufacture directions. Additionally, these turbines will be mounted on a 29-ft pole to both increase the productivity and reduce the noise level of the turbines. Packaging waste is to be expected and will be handled and disposed of in the appropriate manner.

## 2.5.2 **Operation**

The Project will operate year-round and generate electricity when wind is present. The amount of power generated will depend on daily weather conditions. The Project will be operated remotely and therefore no full-time employees will be on site with the exception of maintenance and inspections. Maintenance of the wind turbines will occur as required.

## 2.5.3 **Decommissioning**

The wind turbines are expected to have a long life, therefore no decommissioning date is anticipated at this time. However, it is expected that at some point, the Project will be decommissioned or refurbished depending on market conditions and/or technological changes.

If the decision is to discontinue renewable energy generation, the process of decommissioning the Project would involve the following:

- removal of the wind turbine and associated infrastructure materials will be recycled wherever possible, with non-recyclables taken to an approved disposal site
- site cleanup and regrading to original contours
- planting of grass or other landscape design.

## 2.6 **Authorizations Required**

A Building Permit from the City of Hamilton may be required to undertake construction. This will be confirmed prior to construction.

## 2.7 **Nameplate Capacity**

The nameplate capacity of the Project will be 6 kW.

## **2.8 Ownership of the Land**

The Project will be located on privately owned lands at 135 Fennell Avenue West, at Mohawk College in the City of Hamilton.

## **2.9 Areas Protected under Provincial Plans and Policies**

As per the Niagara Escarpment Plan maps (available on line at: <http://www.escarpment.org/landplanning/planmaps/index.php>), the Project site is not located within the Niagara Escarpment Plan Area.



### 3. Description of Environmental Effects

#### 3.1 General

This section presents the results of a preliminary assessment of the potential negative environmental effects that may result from the Project.

The following activities were conducted as part of the preliminary assessment of potential negative environmental effects:

- Project Site Description
- Preliminary Records Review
- Preliminary Negative Environmental Effects.

#### 3.2 Project Site Description

The location of the Project site is depicted in Figure 3.1. The site encompasses less than 0.5 ha. The longitude and latitude are 79°53'1"W and 43°14'19"N.

The Project is located in the City of Hamilton on Mohawk College's Fennell Campus. The surrounding roads include Fennell Avenue West, Governors Boulevard and West 5<sup>th</sup> Street.

Adjacent land use includes a hospital, and associated landscaped green space, and residential neighbourhoods, as well as the College itself. The closest environmentally sensitive area is the Niagara Escarpment, located approximately 600 m north of the Project site. There are no waterbodies or natural features located within 300 m of the Project site.

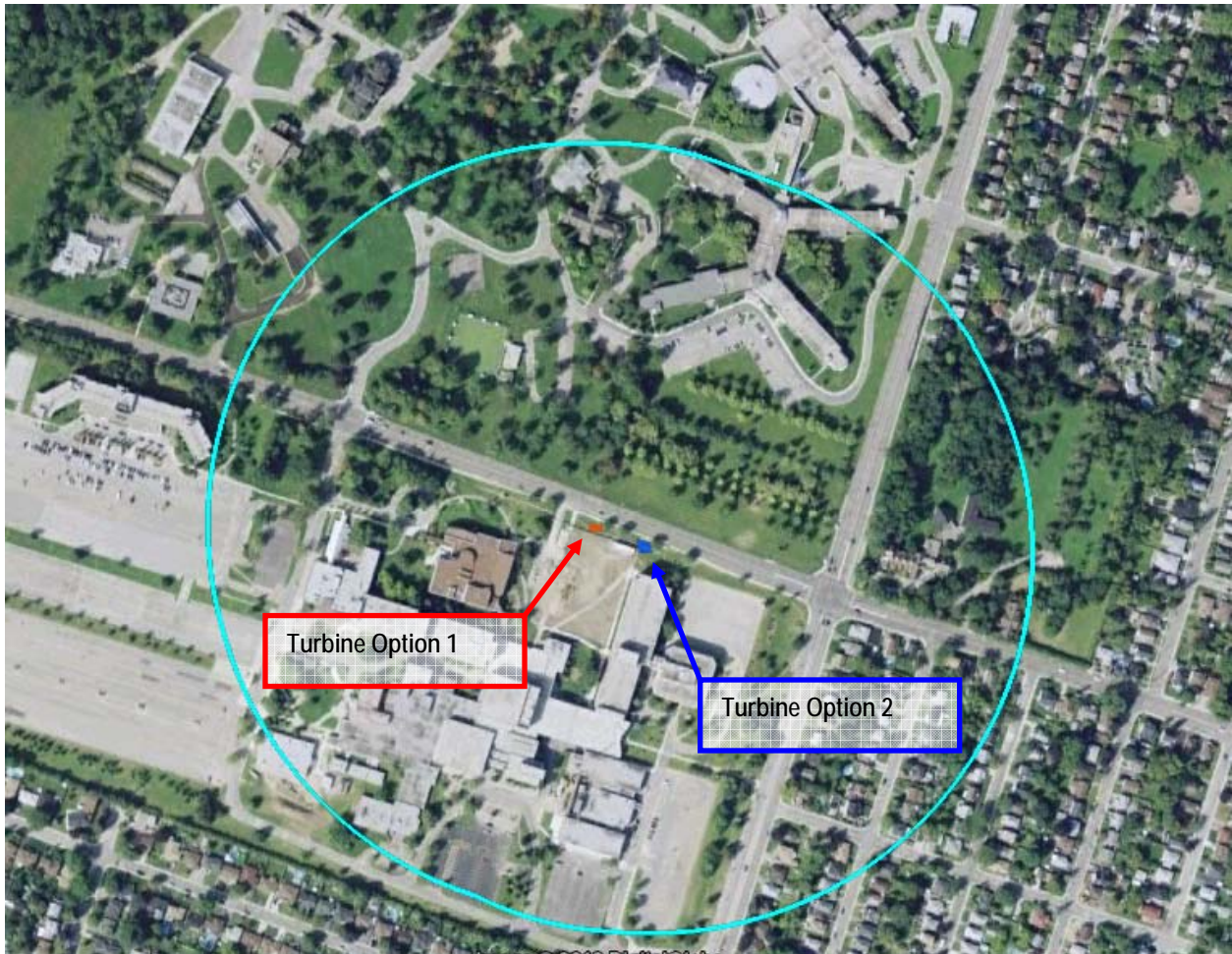
According to Urban Planning Hamilton's Official Plan, Schedule E-1 Urban Land Use (available on-line at:

<http://www.hamilton.ca/CityDepartments/PlanningEcDev/Divisions/StrategicServicesSpecialProjects/Policy+Planning/HamiltonNewOfficialPlan/UrbanArea.htm>) designates the lands on and north of the Project site as institutional and to the east, west and south as neighbourhoods. A review of Official Plan maps Schedule B (Natural Heritage Systems) did not identify any land use constraints pertaining to natural heritage features on the Project site.

#### 3.3 Potential Negative Environmental Effects

The potential negative environmental effects, and associated mitigation measures for the Project are provided in Table 3.1.

**Figure 3.1 Project Location**  
The light blue circle identifies a distance of 300 m from the Project



**Table 3.1 Potential Negative Environmental Effects**

Environmental Component		Potential Environmental Effect	Proposed Mitigation	Residual Effect
Natural Environment	Physiography/ Topography	During construction, regrading of excavated soils and some minor alterations to local topography may occur.	Landscaping to include regrading to original conditions, to the extent possible prior to operation	No residual effect to topography/ physiography.
	Soils	Reductions in soil quality/ loss of soils as a result of accidental spills, erosion, during construction.	Erosion sedimentation control measures, as required, will limit the impact due to erosion. Spill control measures will limit impact on quality of soils. No soil will be removed off site.	No residual effect on soil quality/quantity is expected.
	Aggregate Resources	Not applicable.	Not applicable.	Not applicable.
	Groundwater	Impairment of groundwater quality by contamination could occur due to accidental spills during construction.	Spill response measures will mitigate/prevent any accidental spills.	No residual effect is anticipated for groundwater.
	Surface Water/ Aquatic Habitats/Biota	No negative effects to surface water, aquatic habitats or biota are anticipated as the Project is not located within 300 m of any watercourses.	Not applicable.	Not applicable.
	Areas of Natural and Scientific Interest (ANSI)	No negative effects for ANSI are expected as the Project is not located within 300 m of any ANSI.	Not applicable.	Not applicable.
	Wetlands	Not applicable, as there are no wetlands within 300 m of the Project site.	Not applicable.	Not applicable.
	Valleylands	Not applicable, as there are no valleylands within 300 m of the Project site.	Not applicable.	Not applicable.
	Woodlands	Not applicable, as there are no woodlands within 300 m of the Project site.	Not applicable.	Not applicable.
	Vegetation	Minimal vegetation loss of grassed landscaped areas is anticipated.	Landscaping and replanting of vegetation will occur.	Minimal loss of vegetation in the immediate footprint of the turbines.
	Terrestrial Wildlife/ Wildlife Habitat (including species at risk)	Negligible loss of wildlife habitat. Negligible increase in potential for wildlife fatality as a result of collision with wind turbines, risk is no greater than existing buildings/vehicle traffic in area.	Not possible to mitigate.	Negligible impacts to wildlife communities.
	Air Quality	Negligible, short-term reductions in local air quality from operation of construction equipment.	Through the use of standard best management practices and mitigation measures, emissions will	Temporary, negligible decline in air quality during construction.

Environmental Component	Potential Environmental Effect	Proposed Mitigation	Residual Effect
		be suppressed to maintain good air quality during construction, in accordance with provincial requirements and regulations.	
<b>Social Environment</b>	Land Use	Current land use will be discontinued within the Project footprint.	Not possible to mitigate.
	Tourism and Recreation	No impact on tourism or recreation uses of the area will occur	Not applicable.
	Telecommunication Networks	Due to the limited height of the Project, there will be no impact on telecommunication networks.	Not applicable.
	Archaeological and Cultural Heritage Resources	Prior to construction, the Ministry of Tourism and Culture and the local heritage association for the City of Hamilton will be contacted as per O. Reg. 359/09. Given the extent of works that have already been undertaken at this location, no impact to archaeological or heritage resources is anticipated.	Not applicable.
	Sound Levels	No disturbance is anticipated during construction or operation given existing major arterial roads which traverse past the construction site and distance to nearest sensitive receptors.	Not applicable.
	Visual Landscape	Installation of the Project will be consistent with local landscape conditions.	Not applicable.
	Community Safety	Construction of the Project will result in a risk to community and workforce safety. During operation, potential risks to public safety are limited.	Safety procedures will be followed to ensure both worker and public safety. The public will not be allowed access to the site during construction.
	Local Traffic	Construction of the Project may result in a negligible increase in local area traffic and minor, temporary delays.	Construction activities will be planned to minimize the impact on local traffic.
Waste Management and Disposal Sites	Construction and operation of the Project will likely result in the generation of recyclable and waste material.	The disposal and proper storage of wastes and recyclables will occur in accordance with municipal and provincial requirements and regulations.	

# Appendix A

## Wind Turbine Specifications Sheet



# V3.5

## Vertical Axis Wind Turbine



**CLEANFIELD ENERGY**

# V3.5 Specifications

## OVERALL

Rated Wind Speed . . . 12.5m/s (28mph)  
 Survival Wind Speed . 45m/s (100mph)  
 Rated RPM . . . . . 160  
 Maximum RPM . . . . . 190

## TURBINE

Overall Height . . . . . 3.11m (10.2ft)  
 Weight . . . . . 245kg (540lbs)  
 Rotor Height . . . . . 3m (9.84ft)  
 Rotor Diameter . . . . . 2.75m (9.02ft)  
 Number of Blades . . . 3  
 Blade Composition . . Reinforced Fibreglass  
 Number of Spokes . . . 6  
 Standard Colour . . . . White

## GENERATOR

Type . . . . . 3-phase PMG  
 Nominal Voltage . . . . 100VAC  
 Nominal Current . . . . 10A  
 Nominal Speed . . . . . 170 RPM  
 Maximum Speed . . . . 250 RPM  
 Rated Power . . . . . 3.0kW  
 Maximum Power . . . . 4.5kW  
 Brake (fail-safe) . . . . Built-in

## CONVERTER/INVERTER\*

### 4 quadrant AC-DC-AC

(with turbine start-up operation)

Line Voltage . . . . . 240VAC 1Phase  
 . . . . . 208VAC 3Phase  
 Line Frequency . . . . . 60Hz/50Hz  
 Nominal Power . . . . . 3.5kW  
 Peak Power . . . . . 5kW

\*Certified to: CSA 22.2 No.107.1-01

\*Designed to: IEC 61400-2, UL 1741, IEEE 1547

## FEATURES:

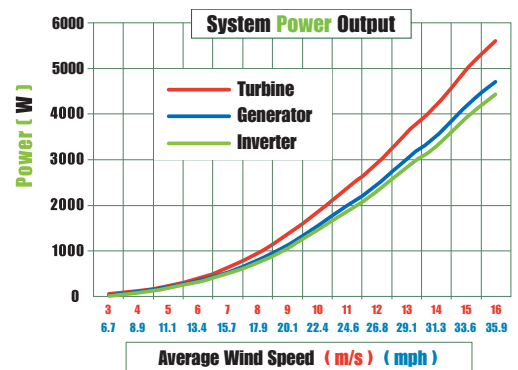
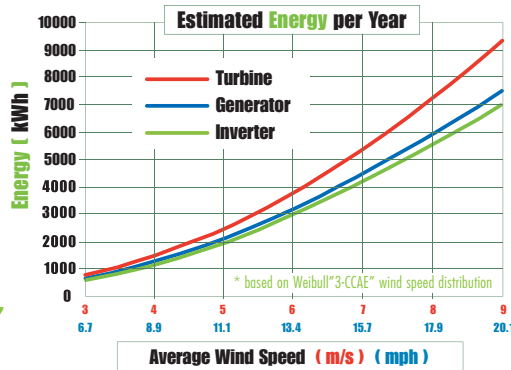
- Operates in Turbulent Wind
- Roof or Ground Mount
- On-Grid Connection
- Integrated System Design
- Low Maintenance
- Quiet



Above left: V3.5 Installation at Virginia Tech University Above right: V3.5 Installation at HIT Hamilton Incubator of Technology, Hamilton, Ontario, Canada



V3.5 Installation at Kenora, Ontario, Canada



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