

**PLANNING REPORT
FOR
GRAND VALLEY WIND FARM
AND
ASHTON RIDGE WIND FARM**

Prepared for
Grand Valley Wind Farms Inc.
and Windrush Energy

December 17, 2007

**TOWNSHIP OF EAST LUTHER GRAND VALLEY
COUNTY OF DUFFERIN**



423 Woolwich Street, Suite 201, Guelph, Ontario, N1H 3X3

Phone (519) 836-7526 Fax (519) 836-9568

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1.0 INTRODUCTION

Grand Valley Wind Farms Inc. submitted a Zone Change application (Z13/2007) to the Township of East Luther Grand Valley on August 14, 2007 for two wind farms known as the Grand Valley and Ashton Ridge Wind Farms. On September 25, 2007 the Township held a Public Meeting pursuant to the requirements of the Planning Act for this Zone Change application. The Township also circulated the application to receive agency comments. Notice of the Public Meeting held on September 25, 2007 was provided by the Township in accordance with the Planning Act and related regulations. (Appendix B) Zone Change Notice Signs were posted on the properties subject to this application. (Appendix D)

FIGURE 1 – LOCATION PLAN

Since the submission of the Zone Change application in August 2007, the Environmental Screening Report for the Grand Valley Wind Farm has been completed. This Planning Report will outline the changes made to the Zone Change application (Z13/2007) and summarize the results of the Environmental Screening Report (ESR) for the Grand Valley Wind Farm. The Planning Report submitted in August 2007 had included the results of the Environmental Screening Report for the Ashton Ridge Wind Farm. This updated report includes the results for both the Grand Valley and Ashton Ridge Wind Farms. The Environmental Screening Reports for both wind farms have been provided to the Township of East Luther Grand Valley as supporting reports for the Zone Change application.

As a result of comments received from the public and from circulated agencies, a number of changes have been made to the proposed zone change. Minutes of the Public Meeting held on September 25, 2007 are included in Appendix C to this report.

- Turbine 3 was moved to allow a building envelope on the abutting existing vacant lot.
- Turbine 7 has been moved further from the wetland.
- Turbine 9 has been moved to accommodate the comments from grass air strip owners.
- Turbine 10 has been moved to allow a building envelope on the abutting property which is outside of the Black Creek constraint area.
- Turbine 11 has been removed from the project to accommodate the comments from grass air strip owners and the Black Creek crossing.
- Turbine 16 has been moved further from the wetland.
- Turbine 22 was removed from the project to accommodate the County of Dufferin Thermal Facility.
- Turbine 23 has been moved to not require a crossing of McFarlane Drainage Works.
- Wetlands have been shown on the Conceptual Site Plan.
- Watercourses have been shown on the Conceptual Site Plan.
- Air Strips have been shown on the Conceptual Site Plan.
- A Zoning Compliance analysis has been completed for each proposed turbine location.
- The UTM co-ordinates have been provided for each proposed turbine location.

The Ashton Ridge Wind Farm includes eleven properties with a total of 1,110 acres. This wind farm is located on Concessions 6 to 9 and Lots 26 to 32 in the Township of East Luther Grand Valley, Dufferin County. This wind farm includes the Ashton Ridge Golf Course. Ten wind turbines and two transformers are proposed.

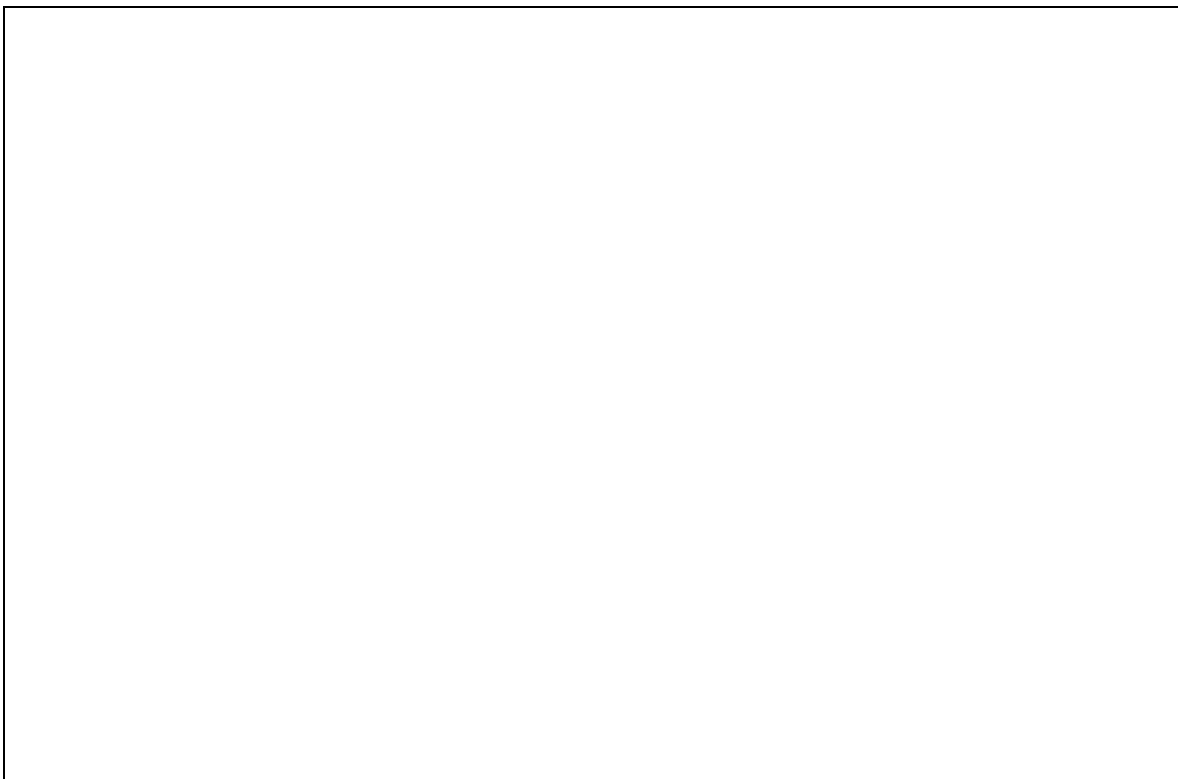
The Grand Valley Wind Farm includes seven properties with a total of 816 acres. This wind farm is located on Concessions 12 to 14 and Lots 24 to 32 in the Township of East Luther Grand Valley, Dufferin County. Ten wind turbines and two transformers are proposed.

This Planning Report has been prepared on behalf of Grand Valley Wind Farms Inc. and Windrush Energy in support of the zone change application submitted to allow commercial wind farm as a permitted use within the Rural (A1) Zone.

2.0 DESCRIPTION OF PROPOSAL

A total of twenty wind turbines are proposed in two wind farms. The wind turbines are the Enercon E-82 and consist of the supporting tower, tower foundation, rotor blades, and the nacelle (gearbox/electrical generator housing).

Figure 2 – Enercon E-82 Wind Turbine



The tower will require the construction of a poured in place concrete foundation. Connection to the grid will be by underground transmission lines on the leased properties. Site preparation activities will include preparing a service road, preparation of the site, and mobilization of construction equipment. Excavation will be required for the concrete foundations for the wind turbines. A typical foundation is 7 metres in diameter.

The wind turbine, including tower, will be brought on site by the supplier in sections on flatbed trucks. A small crane will be needed for the assembly of the rotors while a large crane will be needed to put it in place. The nacelle, which contains the gear box, generator and yawing mechanism, will then be placed onto the top of the tower. The next step will be to assemble the rotor (i.e. the blades of the turbine) on the ground. It will then be lifted to the nacelle and bolted in place. The trench for the power cables will be dug 1.5 metres below the surface using standard trenching equipment. (Figure 3 - Conceptual Site Plan)

3.0 BENEFITS OF WIND ENERGY

The Ashton Ridge and Grand Valley Wind Farms, with a total of 20 turbines, will replace 125 gigawatts of coal fired generation powering annually. (enough to power 24,000 homes) Generating this energy from the Nanticoke coal fired power plant on Lake Erie sends 48,000 tonnes of CO₂ emissions into the atmosphere. It would require planting 180,000 trees to create enough oxygen to have the same positive effect on carbon emissions as the proposed wind farms.

The proposed renewable wind energy project is consistent with the Policies of the Federal and Provincial Governments and the beliefs of First Nations to reduce Global Warming. The wind delivers energy to the turbine blades without creating any pollution to provide electricity consumed by the local community. The numerous benefits of generating electricity from wind energy are well documented. Compared to other forms of electricity generation, wind energy offers the following benefits:

- clean and thus does not produce any air pollution,
- renewable, highly reliable, and efficient,
- evolving as an economical source of new large-scale electricity generation,
- associated with few environmental effects in comparison to thermal generation or nuclear generation of electricity,
- demonstrated increase in property values,
- increases farm income,
- increases local employment through construction and long-term maintenance,
- assists in reducing our contributions to global climate change, and
- part of an overall solution to Ontario's forecasted electricity needs.

The positive economic impact on the East Luther Grand Valley Township residents is considerable. When finished it is expected that:

- 1) Township tax revenues will increase by at least \$240,000 per year;
- 2) Landowners will receive additional income of \$264,000 per year;
- 3) There will be 2 to 5 permanent local employment positions created; and between \$8.0 to \$12.0 million will be spent with local retailers, contractors and Six Nations contractors during construction.

4.0 EXISTING CONDITIONS

The area around the proposed Grand Valley and Ashton Ridge Wind Farm is in a rural area. The Ashton Ridge Golf Course (9 hole golf course opened in May 2005) and the Summer Place Trailer Park are located in proximity to the Ashton Ridge Wind Farm. The project area is characterized as having gently undulating till plains and is predominantly active agricultural fields and cultural meadows interspersed with small woodlots and pine plantations. Two Hydro One corridors run through the project area.

The Village of Grand Valley is located approximately 6 km to the south. The Luther Marsh is located approximately 6 km west of the project area. Bowling Green Swamp is located northeast of the study area in Amaranth Township.

Drainage of lands via small watercourses that traverse the study site occurs to the south and southwest towards the Grand River. The drainage network for the Ashton Ridge Wind Farm is shown on the Conceptual Site Plan.

The project area does not include any schools run by the Upper Grand District School Board. The roads that will be used to transport the concrete, turbines, and ancillary equipment will be the same roads that the School Board uses to bus students.

5.0 PLANNING FRAMEWORK

5.1 Provincial Policy Statement 2005

The Provincial Policy Statement (PPS) includes policies which are supportive of renewable energy systems. Renewable energy systems are defined by the PPS as “the production of electrical power from an energy source that is renewed by natural processes including, but not limited to wind, water, a biomass resource or product, or solar and geothermal energy.” The proposed Grand Valley and Ashton Ridge Wind Farms will generate electrical power from the wind.

“1.7.1 Long-term economic prosperity should be supported by:

h) Providing opportunities for increased energy generation, supply and conservation, including alternative energy systems and renewable energy systems.” (PPS)

“1.8.3 Alternative energy systems and renewable energy systems shall be permitted in settlement areas, rural areas and prime agricultural areas in accordance with provincial and federal requirements. In rural and prime agricultural areas, these systems should be designed and constructed to minimize impacts on agricultural operations.” (PPS)

The Grand Valley and Ashton Ridge Wind Farms proposals are consistent with the Provincial Policy Statement which encourages providing opportunities for renewable energy. These wind farms are located within the “Agriculture” designation of the East Luther Grand Valley Official Plan which has been adopted by Council and is at the Ministry of Municipal Affairs and Housing for final approval. The PPS requires that, in agricultural areas the alternative energy systems shall be permitted, and that they should be designed and constructed to minimize impacts on agricultural operations.

The Grand Valley and Ashton Ridge Wind Farms proposals are consistent with the PPS in that the turbine, service roads and transformer locations will minimize impacts on agricultural operations. The turbines will be located a minimum of 440 metres from any residence in the agricultural area. The service roads will be located at the edges of cultivated fields and will be shared with more than one turbine wherever possible to minimize impacts to agriculture. The lines required to convey electricity to the grid will be located under the service roads to minimize potential disruption to agricultural uses. The turbine foundations will take a small amount of land out of agricultural production. (7 metres in diameter) The farmer will be compensated for more than the value of the agricultural capability of this land to allow the agricultural operation to continue. The turbines have a lifespan of 30 to 40 years. After the end of the leases (which are for 21 years, plus a renewal option of an additional 21 years) the location of the turbines may be discontinued and the land brought back into agricultural production.

5.2 Township of East Luther Grand Valley Official Plan

The proposed Grand Valley and Ashton Ridge Wind Farms are located within the “Agriculture” designation of the East Luther Grand Valley Official Plan which has been approved by Council and is at the Ministry of Municipal Affairs and Housing for final approval. The proposed Zone Change application will implement the Alternative and Renewable Energy policies of the new Official Plan.

“7.9 ALTERNATIVE AND RENEWABLE ENERGY

The Township will encourage the development and use of alternative energy such as solar power, wind power, water power and alternative fuels. Notwithstanding policy 4.13, alternative energy systems and renewable energy systems shall be permitted within Rural Settlements, the Urban Area Boundary, Highway Commercial and Agricultural designations. Alternative energy systems and renewable energy systems shall be designed and constructed to minimize impacts on surrounding land uses.

Large scale systems shall be subject to re-zoning and site plan control. Small scale systems shall be subject to site plan control. Applications for wind energy shall also be subject to the policies of section 7.10 of this Plan.”

Section 7.9 of the Official Plan confirms that the Township encourages the development of wind power and that wind farms shall be permitted in Agricultural designations. This section also states that impacts on surrounding land uses should be minimized.

Section 7.10 states that *“subject of the policies of this Plan, the Township supports the development of such (wind energy) facilities as a source of renewable energy.”* This section also states that, *“Large scale commercial operations, involving one or more large wind turbines generating electricity for sale to the electrical grid, may be permitted through a Zoning By-law Amendment. It is intended that (wind farms) shall be sited and regulated so that most of the safety, noise and visual impacts are contained on the subject site.”*

Figure 4 – Official Plan Locational Criteria for Wind Farms

7.10 d) Large scale wind farms shall generally be located in accordance with the following criteria:	
Locational Criteria;	Analysis
i) well separated from communities, residential subdivisions and rural settlements;	The proposed wind farms are well separated from the Village of Grand Valley which is approximately 6 kilometres from the nearest proposed turbine location. The rural settlements of Keldon and Colbeck are more than 1,000 metres from the nearest proposed turbine location. The residences in the Summer Place Trailer Park are more than 440 metres from the nearest turbine locations.
ii) well separated from, or sufficiently screened from sensitive land uses, including residences;	The Conceptual Site Plan shows the 440 metre setback surrounding the proposed turbine locations and the location of existing residences (sensitive receptors). Setbacks for the proposed turbines to existing residences either meet or exceed the 440 metre setback recommended by the Acoustic Report prepared by HGC Engineering on August 7, 2007.
iii) providing sufficient on-site setbacks for noise mitigation and safety relative to such aspects as falling ice or structure collapse;	Setbacks for the proposed turbines to existing residences either meet or exceed the 440 metre setback recommended by the Acoustic Report prepared by HGC Engineering on August 7, 2007. The turbine control system will be programmed to recognize icing through feedback from various conditions. Each turbine has a built-in measurement and control system that receives input on rotor blade balance (which is constantly monitored), vibration, wind speed, temperature, wind direction, and determines if icing conditions exist. As soon as an icing condition is recognized, the control system will perform a safe shutdown of the turbine. The TREC turbine on Lakeshore Blvd. along the shoreline of Lake Ontario in Toronto is 200 feet from a road carrying 30,000 cars a day without any ice incidents in 3 years of operation.

Locational Criteria;	Analysis
v) preferably on lands of lower agricultural capability;	The East Luther Grand Valley Official Plan does not distinguish between areas of high and low agricultural capability. (ie. Rural designation) There are no lands of lower agricultural capability to direct the location of the wind turbines on such lands. In addition, the turbines must be located where wind conditions are suitable.
vi) with access to a public road having the capacity to accommodate construction and maintenance vehicles;	The roads to be accessed by the proposed wind farms are Highway 89, County Road 25, Concession Road 12-13, Side Road 24-25, Concession Road 8-9, and Amaranth/East Luther Grand Valley Townline Road. The bridge on County Road 25 has recently been reconstructed. These roads have the capacity to accommodate the construction and maintenance vehicles.
vii) no wind turbine shall be located closer than 1.0 kilometre from an airstrip unless it can be demonstrated by the applicant that airstrip safety is not an issue;	The known existing grass air strips in the study area have been evaluated and either meet the setbacks as determined by the Amaranth OMB decision or as agreed to with the air strip owner. On this basis air strip safety is not considered an issue.
viii) outside of provincially significant wetlands, the habitat of threatened and endangered species, significant forested lands, significant valley lands, significant wildlife habitat, fish habitat and provincially significant Areas of Natural and Scientific Interest, and	The Natural Resource Solutions Vegetation, Wildlife and Aquatic Habitat Reports dated February 2007 indicate that the proposed turbines within the Ashton Ridge Wind Farm are located outside of any provincially significant wetlands, the habitat of threatened and endangered species, significant forested lands, significant valley lands, and significant wildlife habitat. The Natural Resource Solutions Aquatic Report recommends buffers of 100 metres to the Grand River, 30 metres to a cold/cool watercourse, and 15 metres to a warm water course. The watercourses located in proximity to the Ashton Ridge Wind farm are shown on the Conceptual Site Plan.
ix) preferably on lands of low mineral aggregate suitability.	The proposed Grand Valley and Ashton Ridge Wind Farms are located on lands of low aggregate suitability as shown on Schedule B of the East Luther Grand Valley Official Plan.

The Official Plan in section 7.10 e) lists studies which may be required by Council prior to making a decision on a zone change application to permit a wind farm. These studies have been prepared as part of the required Environmental Assessment process.

5.3 Township of East Luther Grand Valley Zoning By-law

The Township of East Luther Grand Valley Zoning By-law zones the subject properties within the Rural (A1) Zone. In August 2005 the Council of the Township of East Luther Grand Valley approved By-law 2005-30, a by-law to authorize a Temporary Use. The Temporary Zoning By-law is found in Appendix A to this report. This Temporary use By-law permits a maximum of 12 wind turbines as a temporary use for properties within the Ashton Ridge Wind Farm for 3 years ending on August 9, 2008. This temporary zoning was granted by Council to allow Grand Valley Wind Farms Inc. to pursue a Standard Offer Contract with the Province of Ontario. The zoning was required to be temporary since the Township Official Plan had not yet been updated to be consistent with the Provincial Policy Statement 2005 which permits wind farms in agricultural areas. The new East Luther Grand Valley Official Plan has been adopted by Council and is at the Ministry of Municipal Affairs and Housing for final approval.

The proposed zone change for the Ashton Ridge and Grand Valley Wind Farms will be a Specialized Rural (A1) Zone to permit a commercial wind farm operation. Permitted uses within this zone will include wind turbines, transformers, service roads, underground and above ground lines, services required for a wind farm and accessory uses to the wind farm, in addition to the uses permitted within the Rural (A1) Zone.

The proposed Specialized Rural (A1) Zone will include special regulations related to setbacks from public roads, setbacks from property lines, setbacks from sensitive noise receptors (residences) and maximum height provisions for wind turbines.

Minimum wind turbine setback from a public road	- 60 metres
Minimum wind turbine setback from a property line	- 45 metres
Minimum wind turbine setback from an existing off-site residence	- 430 metres
Minimum wind turbine setback from an existing on-site residence	- 400 metres
Minimum wind turbine setback from an existing vacant off-site lot	- 400 metres
Minimum distance from wind turbine to a settlement area	- 600 metres
Maximum height of a wind turbine (measured at top of nacelle hub)	- 115 metres
Minimum setback from wind turbine to a wetland watercourse	- 40 metres

The setback recommended in the Acoustic Study by HGC Engineering is 440 metres from the centre of a residence. The setback from a wetland or watercourse is recommended to be 30 metres. 40 metres has been proposed as the minimum setback in the zoning by-law to permit a temporary small area of disturbance during wind turbine base construction and assembly.

A Conceptual Site Plan has been prepared in support of the Zone Change application. (see Figure 3) The implementing Zoning By-law is intended to have a Holding Zone (H) applied to the subject lands. This H would be lifted from the property(ies) once a site plan has been approved and the associated agreement is in place.

Zoning Compliance Charts have been prepared for both the Ashton Ridge and Grand Valley Wind Farms. (Figures 5 and 6) The proposed zoning regulations for the wind farm are met in all cases. In many cases the zoning setbacks are far exceeded by the proposed turbine locations. The Draft Zoning By-law for the wind farms includes the UTM co-ordinates for the proposed wind turbine locations. The by-law would allow minor shifts in the turbine locations as approved within the site plan which will be required for each property. The Draft Zoning By-law is included as Appendix E to this report.

6.0 ENVIRONMENTAL ASSESSMENT

The Notice of Commencement for both the Grand Valley Wind Farm and the Ashton Ridge Wind Farm were published on November 16, 2006. The Public Meeting was held for the Ashton Ridge Wind Farm on November 27, 2006. The Notice of Completion for the Environmental Assessment for the Ashton Ridge Wind Farm was published on March 1, 2007.

The Environmental Screening Report (ESR) for the Ashton Ridge Wind Farm, prepared to address the requirements of the Environmental Assessment Act included the following technical studies:

- Environmental Screening Report, Environmental Business Consultants, March 1, 2007
- Vegetation & Wildlife Environmental Report, Natural Resource Solutions, February 2007
- Aquatic Habitat Characterization Report, Natural Resource Solutions, February 2007
- Socio-Economic Report, Environmental Business Consultants, September 2005
- Acoustic Assessment, HGC Engineering, August 7, 2007
- Magnetic Field Survey, Iravani/Graovac/Dewan, October 2004
- Archaeological Assessment Stage 1, Fisher Archaeological Consulting, 2006
- Property Value Study, Blake, Matlock and Marshal Ltd., September 2006
- Geotechnical Report, Shaheen & Peaker Limited, February 23, 2007

The Environmental Screening Report (ESR) for the Grand Valley Wind Farm has been completed. There will be a Public Meeting held early in 2008 to review the results of this report.

The Environmental Screening Report (ESR) for the Grand Valley Wind Farm, prepared to address the requirements of the Environmental Assessment Act included the following technical studies:

- Environmental Screening Report, Environmental Business Consultants, August 30, 2007
- Vegetation & Wildlife Environmental Report, Natural Resource Solutions, 2007
- Aquatic Habitat Characterization Report, Natural Resource Solutions, 2007
- Socio-Economic Report, Environmental Business Consultants, September 2005
- Acoustic Assessment, HGC Engineering, October 23, 2007
- Magnetic Field Survey, Iravani/Graovac/Dewan, October 2004
- Archaeological Assessment Stage 1, Fisher Archaeological Consulting, 2007.
- Pinpointing Your Environmental Risks, Ecolog ERIS, August 24, 2007
- Property Value Study, Blake, Matlock and Marshal Ltd., September 2006
- Geotechnical Report, Shaheen & Peaker Limited.

6.1 Birds

On-site field investigations were undertaken in 2005, 2006, and 2007 for the Ashton Ridge Wind Farm. Further field surveys were conducted in Natural Resource Solutions biologists in 2005, 2006, and 2007.

No species at risk were encountered by NRSI biologists within the project area during the monitoring periods. Of the raptor (birds of prey) species observed in the vicinity of the project area during site investigations, only the Rough-legged Hawk is provincially rare. Rough-legged Hawks were observed on three separate occasions foraging within the project area (NRSI, 2007).

Owls are nocturnal raptors (birds of prey). One Great-horned Owl was observed on a single occasion in the project area during NRSI field investigations (2007).

A primary concern with the operation of wind turbines is the potential for avian mortality. The maximum rate of avian mortality at any wind farm site in North America is 1.9 birds per year per turbine. Collisions with wind turbines are statistically rare events (Curry 1994). Migratory bird deaths due to collision with the turbines are anticipated to be negligible given the absence of known migratory flight paths in the project area.

Figure 7 - Avian Mortality Rates

Tall communications towers in Canada	1,000 birds each per year
Tall buildings in Toronto	10,000 birds per year
House cats in Canada	140 million birds a year
Wind Turbines in North America	1.9 birds per year, per turbine

Source: Environmental Screening Report, E B Consultants, March 1, 2007

Avian mortality related to wind turbines is dependant on a number of factors:

- Location of turbines in migratory flight paths due to birds flying in large tight flocks.
- Design of the turbine with perching and nesting sites. ie. a trellis construction provides more potential for bird deaths.
- Variable speed turbines present more risk than fixed speed turbines.
- Poor weather causing visibility problems.
- Nocturnal fliers.
- Bird species that fly within the range of the turbine blades. Some species predominately fly higher or lower than this range.
- Turbines placed directly in a confined flight corridor.
- Wooded areas where birds nest close to and right below operating turbines
- Avoidance response of the species.
- Turbines in areas providing rich food sources.
- Microhabitat where large numbers of birds are confined by topography or structures.
- Towers with guy wires or overhead transmission lines.

Avian mortality is not anticipated to be serious with the proposed placement of turbines at the project area. Unless turbines are placed directly in a confined flight corridor for birds, which will not be case, mortality will be low. There are no structures around the project area that will confine birds, or direct them toward the turbines. Towers will not be located in areas providing rich food sources, and are not located close enough to feeding sites. Unless turbines are placed in a microhabitat where large numbers of birds are confined by topography or structures, avian mortality is going to be rare. The proposed site does not exhibit characteristics likely to enhance avian mortality. The tubular type of turbine to be used, with no guy wires or overhead transmission lines (far more deadly as they are much less visible (Bevanger 1994) is the safest design, and a fixed slow speed of blade rotation that make them easily visible, are the least likely to cause mortality to flying animals.

The minimum red or strobe lights needed to meet Transport Canada regulations will also have minimal impact to nocturnal migrants (Evans Ogden 1996). No additional precautions are needed to mitigate against bird strikes.

A pre-construction point count and area bird search study will be conducted in the spring of 2007 and three years of post-construction bird studies will be performed to confirm that the wind turbines are not impacting bird populations.

6.2 Bats

During the 2005 monitoring period for the Ashton Ridge Wind Farm, a total of 93 passes were documented during the 6 nights of bat monitoring. The total monitoring period consisted of 645 minutes of observation. Bats tend to frequent forested areas and since the proposed site is mainly a wide-open golf course and farmers fields, the frequency of bat flights is lower than average at a measured rate of 8.65 passes per hour (NRSI 2007).

6.3 Natural Environment

Natural Resource Solutions have completed a review of the environmental features within the wind farm study area. The proposed wind turbine locations, service roads and underground and above ground lines have been evaluated by Natural Resource Solutions in the context of any potential impacts to natural features within the study area. The standard buffer from a wetland or watercourse is 30 metres. 40 metres has been proposed as the minimum setback in the zoning by-law from a wetland or watercourse to permit a temporary small area of disturbance during wind turbine base construction and assembly which is outside of the 30 metre buffer.

6.4 Archaeological Stage 1 Assessment

Grand Valley Wind Farms Inc. contracted Archaeological Services Inc. (ASI) in 2006 to undertake the Stage 1 archaeological assessment. The Stage 1, Background Research, archaeological assessment determines the existence of documented cultural heritage resources and the potential for undocumented cultural heritage resources on the subject lands. The Ministry of Culture search of the Ontario Archaeological Sites Database has confirmed that there are no registered sites within a 2 kilometre radius of the subject property.

The subject property is characterized by gently undulating till plain. The plain is also characterized by swamps or bogs, and the original surveyor of East and West Luther simply entered them on his map as “all swamp”. The surveyor chose the leaders of the Protestant Reformation as his pool of names, and hence Luther Township (Chapman & Putnam 1984).

The Land Registry entries, indicate that the Township was settled at quite a late date in Ontario’s history by Euro-Canadians. The patents for the Lots were granted in the 1870’s, roughly 20 years after the Township had been surveyed. The 1937 topographic map shows a number of structures on the subject lots, but they are fronting the roads, and are not in the areas of the proposed wind turbine construction.

For the Euro-Canadian archaeological potential, there are a number of factors to consider. There is a late settlement date for these lots. The use of the land for mostly agricultural purposes (pasture and crops), therefore, few structures would have been required. Farmhouses were mostly constructed along the main roads and the older structures are still extant. The location of the proposed wind turbines and construction access roads are not adjacent to the main roads. Given these factors, the Euro-Canadian archaeological potential is low for all of the wind turbine locations and construction access roads.

The various creeks, rivers and wetlands of the area are sources of water that would have provided people with major north-south transportation routes. The Native archaeological potential is variable.

Therefore, as a result of the Stage 1, Background Research, it is recommended that no further archaeological work is recommended for areas identified as having low archaeological potential. A Stage 2 Assessment should be conducted on all areas indicated as having high archaeological potential. As a *caveat* it should be noted that during construction, there is always a slight chance of encountering deeply buried archaeological material.

6.5 Property Values

A property value study was commissioned to determine the relationship between wind farm development and market value of properties. The study, performed by the real estate appraisal firm of Blake, Matlock and Marshal Ltd., was specifically focused on the Townships of Melancthon, East Luther Grand Valley and the County of Dufferin, covering the period from January 2002 to September 2006, both before and after the construction of the Melancthon wind farm in the summer of 2005.

The intention of the property value study was to determine if the development of the recent wind farm in the Melancthon area has had an impact on property values when compared to East Luther Grand Valley where wind farm development has not been implemented.

The study performed by of Blake, Matlock and Marshal Ltd. found that the Township of Melancthon has demonstrated superior growth (38% during the study period) to the Township of East Luther Grand Valley (29% during the same period) which is devoid of wind farm development and produced inferior growth to Dufferin County statistics. The study concluded that the large scale wind farm in the Township of Melancthon did not diminish property values but rather nourished property values by its presence and the resulting increased economic activity in Melancthon.

A major study conducted for the U.S. government in ten states determined that in 9 out of 10 states when comparing the view shed of wind farms over 10 MW and a control community in the same state, real estate values rose faster in the areas surrounding the wind farms. In the 10th instance, there was no appreciable difference between the control community and the wind farm community. The report, the Renewable Energy Policy Project (REPP), was issued in May 2003.

6.6 Visual Impacts

There will be visual impacts from the wind turbines. The turbines are set back from major roads and in a rural setting will be visible to local residents and motorists. In accordance with Canadian aviation regulations, objects taller than 91 metres require lighting under Transport Canada Aviation Regulations. In accordance with this Regulation a flashing red beacon mounted on the top of the tower. It is expected that about half of the turbines will require this lighting. In order to reduce any visual impact, they will be equipped with ground shields and be synchronized to operate together throughout the project.

6.6.1 Cemmaes Wind Farm, Wales

One study surveys the attitudes of people living near the 24 wind turbine Cemmaes Wind farm in Wales both immediately after construction (Phase 1) and one year later (Phase 2). When asked the question “broadly speaking, are you for or against the Cammaes Wind farm?”, the majority of respondents (86%) were in favour in both Phase 1 and Phase 2 of the survey.

With respect to the visual impact of the Cemmaes Wind farm, visual appearance was the potential effect most commented on before the wind farm had been constructed. Of the respondents who could see the wind turbines from their house, 75% made favourable statements about the wind farm. The study summary states, that being able to see wind turbines did not bother the majority of people and led in some cases to respondents expressing increased interest and even pride in the machines.

6.6.2 Taff Ely Wind Farm

A residents survey carried out in homes near the Taff Ely wind farm, indicated that 71% of residents couldn't identify any drawbacks to the wind farm. When asked if they thought the wind farm fit into the scenery, many residents thought it made the scenery more interesting. Hence, once the wind farm had been constructed and was in operation, the majority of local residents were either neutral or supportive of it.

6.6.3 Delabole Wind Farm

An opinion survey in proximity to the Delabole Wind Farm found that 84% of residents living in the area approve of the wind farm.

6.7 Safety Issues

Questions of safety arise in respect to those who maintain and operate wind turbine equipment as well as the members of the general public who come into the vicinity of the equipment. Safety issues potentially arise if anyone is in the vicinity of a wind turbine when ice falls off, which may under rare conditions, accumulate on the tower or the blades and subsequently slide or be thrown off by the rotating blades. Icing is the predominant safety concern expressed by the public with respect to wind turbines. Since there have been no recorded incidents in Canada of injury by ice from an operating wind turbine, this aspect of safety has not been regulated.

Ice may accumulate under conditions of freezing rain, sleet or melting snow. Operators of the Tacke turbine installation at Kincardine, on the Bruce Peninsula, report a frequency of three such icing events every year. Ice accumulation events should be similar at the subject site.

The three-year old TREC turbine on Lakeshore Blvd. in the City of Toronto is immediately adjacent to the Liberty Grand banquet centre, approximately 100-feet from Lakeshore Blvd., and approximately 500-feet from Lake Ontario. Lakeshore Blvd. has a traffic flow 1,000 vehicles/lane/hour in rush hour. There is a considerable amount of moist, cold air at that site that would normally cause icing. The local authorities have not reported any damage from falling ice since the wind turbine was commissioned.

The Ashton Ridge and Grand Valley Wind Farm will implement the following safety protocol:

- The turbine control system will be programmed to recognize icing through feedback from various conditions. As soon as an icing condition is recognized the control system will perform a safe shutdown of the turbine. The turbine will remain shut down until an operator travels to the site to inspect the condition of the turbine blades.

6.8 Magnetic Fields

Magnetic fields occur where any electric conductor exists with an electrical current flowing through it. All alternating currents generate magnetic fields.

The connection with the existing grid will be made above ground and be no different from any other power line within the network. The Magnetic Field levels are comparable to typical household appliance, i.e. negligible.

The magnetic field from the wind turbine transformer has been measured for Grand Valley Wind Farms Inc. by the University of Toronto Faculty of Electrical Engineering who found that inside the base of the Toronto TREC turbine, magnetism of 0.5m_u as

compared to a hair dryer which is $0.8m_u$ and residential electrical switches at $60.0m_u$ and florescent lights at $102m_u$, or roadside power lines at $844m_u$. The measurement 10 feet outside the transformer and tower was zero. The electrical generator windings are close together and surrounded by conductive metal so that the magnetic fields around the wind turbine from the generator is effectively zero as the tower absorbs all of the magnetic energy.

The collector network which connects the wind turbine generators will operate at typical distribution voltage of 34.5 kV and is buried below ground level under the access roads. Because of the closeness of the phase conductors within the cables magnetic fields are balanced out to zero.

6.9 Noise

HGC Engineering was retained to undertake the acoustical assessment for the Ashton Ridge Wind Farm. The Ministry of the Environment publication [NPC-232 Sound Level Limits for Stationary Sources in Class 3 Areas \(Rural\)](#) and the MOE publication [NPC Technical Publication to Wind Turbine Generation](#) were considered in the acoustic assessment. The proposed wind turbine locations are setback a minimum of 440 metres from the centre of surrounding residences (which are considered sensitive receptors).

6.10 Infrasound

Recently, there have been concerns expressed about the emissions of infrasound at wind farms. Specifically, infrasound was reported as an issue at the Pubnico Point Wind Farm in Nova Scotia. A study conducted prepared by HGC Engineering for the Canadian Federal Department of Natural Resources at the Pubnico Point Wind Farm concluded that the infrasound emitted from the wind turbines was below internationally accepted human perception limits. The nearest receptor at the Pubnico Wind Farm is 330 metres.

The nearest setback from a wind turbine for the proposed Ashton Ridge and Grand Valley Wind Farms is 440 metres to the centre of a residence. (this minimum setback from the centre of each residential dwelling considers the noise requirements for the windows to the building and property use around the residence). Based on the findings from the Pubnico Point Wind Farm study, the distance will be far enough such that the infrasound will be well below internationally accepted human perception limits (90 dBA for sound frequencies of less than 20 Hz).

6.11 Public Input

Opportunities for public input will be provided through the planning process to rezone the properties to permit the wind farm use. The public have also already been involved in the Environmental Assessment process.

- In 2005, the first formal meeting was held by Grand Valley Wind Farms Inc. for the land owners of the leased properties. The meeting was held at the Grand Valley Library.
- In 2005, a series of individual and group meetings and negotiations with land owners were held to secure lease arrangements for the use of their properties for the wind farms.
- In 2005 and 2006, a series of meetings were held with the local Council with respect to land use and zoning on the properties. Meetings were held during council meetings and were open to the public.
- The Notice of Commencement was published in the Grand Valley Vidette on November 16, 2006 to satisfy the Ontario *Environmental Assessment Act* (EAA) requirements for Electricity Projects.
- The Notice of Commencement for the Grand Valley and Ashton Ridge Wind Farms was mailed on November 16, 2006 to adjacent neighbours and the following government Ministries, agencies, and groups:

Ontario Native Affairs Secretariat
 Ontario Ministry of Natural Resources
 Ontario Ministry of Energy
 Ontario Ministry of the Environment
 Ontario Ministry of Agriculture, Food and Rural Affairs
 Ontario Ministry of Municipal Affairs and Housing
 Ontario Ministry of Transportation
 Ministry of the Attorney General
 Ontario Government Mobile Communications Office
 Ontario Secretary for Aboriginal Affairs
 Environmental Commissioner of Ontario
 Niagara Escarpment Commission
 Grand River Conservation Authority
 Ontario Energy Board
 Upper Grand District School Board
 Natural Resources Canada
 Environment Canada
 Township of East Luther Grand Valley
 Land Stewardship Network of Dufferin South Simcoe
 Grand Valley & District Fire Department
 Grand Valley Agricultural Society
 Greater Dufferin Area Chamber of Commerce
 County of Dufferin
 Canadian Environmental Assessment Agency
 Fisheries and Oceans Canada
 Health Canada
 Federal Department of Indian and Northern Affairs

- An Open House was held on November 27, 2006. The notice of this Open House was published in local newspapers, mailed to lease holders and the adjacent neighbours and sent to appropriate government agencies.
- The Notice of Completion for the Ashton Ridge Wind Farm was published in the Grand Valley Vidette on March 1, 2007 to satisfy the Ontario *Environmental Assessment Act (EAA)* requirements for Electricity Projects. The Notice of Completion was also mailed to adjacent neighbours and government Ministries, agencies, and groups.
- An Open House for landowners in the Grand Valley and Ashton Ridge Wind Farms was held on July 24, 2007 at the Grand Valley Community Centre.
- A Public meeting was held for the Zone Change application for the Grand Valley and Ashton Ridge Wind Farms on September 25, 2007 at the Grand Valley Community Centre.

6.12 First Nation and Aboriginal Communities

6.12.1 Consultation

Grand Valley Wind Farms Inc. has undertaken discussions with Six Nations and Aboriginal Groups that have a potential interest in the Haldimand Tract. The First Nations and Aboriginal communities that have potential interest in the Haldimand Tract include the following:

- 1) Six Nations Confederacy Council (Land claim and archaeological interests)
- 2) Six Nations Band Council (Land claim and archaeological interests)
- 3) Saugeen First Nation No. 29 (Archaeological interests)
- 4) Huron Wendat (Archaeological interests)
- 5) Wahta Mohawks (Archaeological interests)

An initial meeting at the Six Nations Confederacy Council (SNCC) was held on February 3, 2007. Further meetings are contemplated including meetings with the Six Nations Land & Resource Department in March 2007 with Chief David General and elected band Council representatives. Grand Valley Wind Farms Inc. has received a formal letter to consult from Chief General. An "Application for Permission to Develop" and the requested fee has been submitted to the Haudenosaunee Development Authority of the SNCC.

Initial discussions between representatives of Grand Valley Wind Farms Inc. and Saugeen Nation have been held. The initial view of Chief Randall Kahgee is that the project area is not part of the Saugeen watershed. Discussions will continue with the David McLaren of Nawash First Nation with whom Saugeen Nation has a

collaborative relationship. David McLaren is the joint Environmental Office Coordinator for both first nations.

Grand Valley Wind Farms Inc. placed a full-page advertisement in Turtle Island News, the largest First Nations newspaper in Canada. The purpose of the advertisement is to communicate with the aboriginal community and make them aware of the company's web site.

6.12.2 Land Claims

There are no First Nation communities situated in the project area. The nearest First Nation community is over 30 km away. The properties being leased by Grand Valley Wind Farms Inc. from private landowners are within the Haldimand Tract land claim. Purportedly, in 1784 land that lay six miles on each side of the Grand River from Lake Erie to the river's source was granted to the Six Nations Iroquois Confederacy. The leased lands are located within six miles of the Grand River. The Government of Canada contends that the north end of the Haldimand Tract (which includes the proposed Ashton Ridge and Grand Valley Farms) was not granted due to the Simcoe Patent. Indian and Northern Affairs (INAC) have indicated that there is litigation pending (*Six Nations of the Grand River Band of Indians v. Attorney General for Canada and Her Majesty the Queen in Right of Ontario*) that may impact the proposed Project.

6.12.3 Compensation for Use of Wind

In preliminary discussions with the First Nations communities, the utilization of the wind to produce electricity was viewed as a positive environmental activity. However, the ownership of the wind was voiced as a concern. To address the concern, Grand Valley Wind Farms Inc. is in discussions to lease the air-rights at the project sites.

Grand Valley Wind Farms Inc. has retained Paul Chaput, a Métis and leader in the Aboriginal Restorative Justice Movement and Paul Frits, LLB, a Mohawk attorney to reach an agreement with Six Nations. Grand Valley Wind Farms Inc. intends to negotiate in good faith with Six Nations for 21 year leases, with an option to renew, for the air-rights at the project sites.

6.12.4 Archaeological Interests

Archaeological interests were expressed by all First Nation groups identified. Grand Valley Wind Farms Inc. contracted Archaeological Services Inc. (ASI). The Stage I Archaeological Assessment has already been completed.

Representatives from the Six Nations, the Six Nations Confederacy Council and the Huron-Wendat Nation will be invited to observe the Stage II Archaeological

Assessment and the findings will be shared with the other Aboriginal and First Nations groups.

6.13 Air Strips

Transport Canada has issued manual TP 312. The specifications contained within this manual TP 312 are applicable to land airports which are certified. To my knowledge, none of the grass air strips within the study area for these proposed wind farms have been certified. In addition, there are limitations regarding any possible future certification of these grass air strips since they do not meet the specifications of TP 312. There are existing Hydro One Towers which are greater than 45 metres tall within 4,000 metres of the centre of these grass air strips. The inability of these grass air strips to meet the TP 312 criteria would presumably preclude them from being certified or registered.

“Application of TP 312

The specifications contained in this manual are applicable to land airports which are **certified** pursuant to the Air Regulations Part III.”

The recent Amaranth Ontario Municipal Board decision provides guidance regarding appropriate setbacks between turbines and uncertified air strips or unregistered aerodromes. The OMB member, Mr. Jackson found that CHD had dealt satisfactorily with aerodromes. Mr. Jackson was satisfied with a 2.5 kilometre setback from each end of unregistered air strip, plus 600 metres on both sides of the airstrip.”

Figure 8 - Air Strips

Owner	Location	Comment
Vander Ploeg Grass Air Strip	114520 Sideroad 27 Concession 8, East Luther Grand Valley	Turbine 9 has been moved.
Welch Grass Air Strip	075034 Sideroad 24/25 East Luther Grand Valley	Turbine 12 has been removed from the project.
Kuusisto Grass Air Strip	075224 Sideroad 24/25 East Luther Grand Valley	Turbine 12 has been removed from the project.
J & T Luxemburger No current Air Strip	194127 Amaranth East Luther Townline, Amaranth Township	Property is undersized to accommodate an air strip.
C Luxemburger Grass Air Strip	294437 8 th Line Amaranth Township	Air strip is located more than 5 kilometres from the closest proposed turbine.

The Zone Change application has been modified to move Turbine 9 (Rutledge Property). In addition, Turbine 12 (Orr Property) has been removed from the project. On this basis, the proposed turbine locations appear to be in compliance with the

setbacks established by the Amaranth OMB decision or agreements with the air strip owner.

8.0 CONCLUSION

The proposed Grand Valley and Ashton Ridge Wind Farm rezoning application is consistent with the Provincial Policy Statement 2005. This zone change application is in conformity with the new Township of East Luther Grand Valley Official Plan. The wind farms meet the locational criteria of the Official Plan and any potential impacts have been mitigated through careful planning. The technical reports prepared for the Environmental Assessment process also address the locational criteria and potential impact policies included in the Official Plan. The proposed zoning by-law includes setbacks and maximum height regulations which will implement the recommendations of the various reports prepared for the Environmental Assessment and summarized within this Planning Report. The proposed zoning also includes a Holding Zone on the lands to permit the municipality to ensure that their requirements are met through site plan approval. The Conceptual Site Plan prepared for this zoning application will be refined at the time of final detailed engineering of the wind farms. The proposed Grand Valley and Ashton Ridge Wind Farms are a positive step to provide clean, renewable energy in the Township of East Luther Grand Valley.

APPENDIX A

TEMPORARY USE ZONING BY-LAW 2005-30

APPENDIX B NOTICE OF PUBLIC MEETING - SEPTEMBER 25, 2007

APPENDIX C

MINUTES OF PUBLIC MEETING –SEPTEMBER 25, 2007

APPENDIX D ZONE CHANGE NOTICE SIGN (EXAMPLE WORDING)

APPENDIX E DRAFT ZONING BY-LAW FOR THE WIND FARMS