October 2010

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ENVIRONMENTAL IMPACT STATEMENT

Kent Breeze Wind Farms

Submitted to:
ecoENERGY for Renewable Power
Renewable and Electrical Energy Division
Natural Resources Canada
615 Booth St., Room 160
Ottawa, ON, K1A 0E9

REPORT

Report Number: 10-1151-0123 EIS R1

Distribution:

1 Copy - Natural Resources Canada
2 Copies - Kent Breeze Corporation
2 Copies - Golder Associates Ltd.

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1.0 PROJECT OVERVIEW

Golder Associates Limited (Golder) was retained by Suncor Energy Products Inc. to complete an Environmental Impact Statement (EIS) for the Kent Breeze Wind Farms. The Kent Breeze Wind Farm is in the process of obtaining a Renewable Energy Approval under Ontario's Regulation 359/09. This EIS has been compiled based on the studies completed by IBI Group, Hatch, Biologic, Golder, and Archaeologix that collectively form the Renewable Energy Approval Application.

This EIS has been prepared in accordance with the *Canadian Environmental Assessment Act* and the requirements of the *EcoEnergy for Renewable Power Program* for a screening-level Environmental Assessment (EA).

Kent Breeze Corporation and MacLeod Windmill Project Inc. (the Proponent) are proposing to develop a wind energy project in the northern portion of the Municipality of Chatham-Kent (Figure 1.3-1). The Kent Breeze Wind Farms Project (the Project) consists of eight wind turbines with a total nameplate generating capacity of 20 megawatts (MW). The Project was divided into two separate Renewable Energy Standard Offer Program (RESOP) contracts, but for the purposes of this environmental screening, it is considered one Project.

The Project will involve the construction of turbines, access roads, and related electrical infrastructure to connect with the Hydro One overhead transmission corridor located on approximately 436 hectares (ha) of land (the Project Site). There are currently no plans to expand the Project beyond its current scope.

1.1 Project Proponent

The Proponent of the Project is Kent Breeze Corporation and MacLeod Windmill Project Inc. The principal contact for the Proponent is:

Teresa Newland, Project Coordinator
7997 Tenth Line, RR #1
Charing Cross, ON, N0P 1G0
Tel: 519-380-9063
Fax: 519-351-2043
Email: tnewland@ciaccess.com

1.2 Project Title

The title of the project is the Kent Breeze Wind Farms Project.

1.3 Project Site

As shown on Figures 1.3-1 and 2.5-1, the Project Site is located in the Township of Camden, Municipality of Chatham-Kent at the following properties comprising the Project Site:

- Parts of Lots 8-11, Concession 1, on the south side of Smoke Line, east of Huffs Side Road; and

- Parts of Lots 4-6, Concession 1 and 2, north and south of Smoke Line, west of Huffs Side Road.

All of the lands on the Project Site are owned by the Proponent or members of the proponent corporation. As such there are no leases registered for the Project on any of the subject lands. More information about the Project location and surrounding land uses can be found in Section 2.4 below.

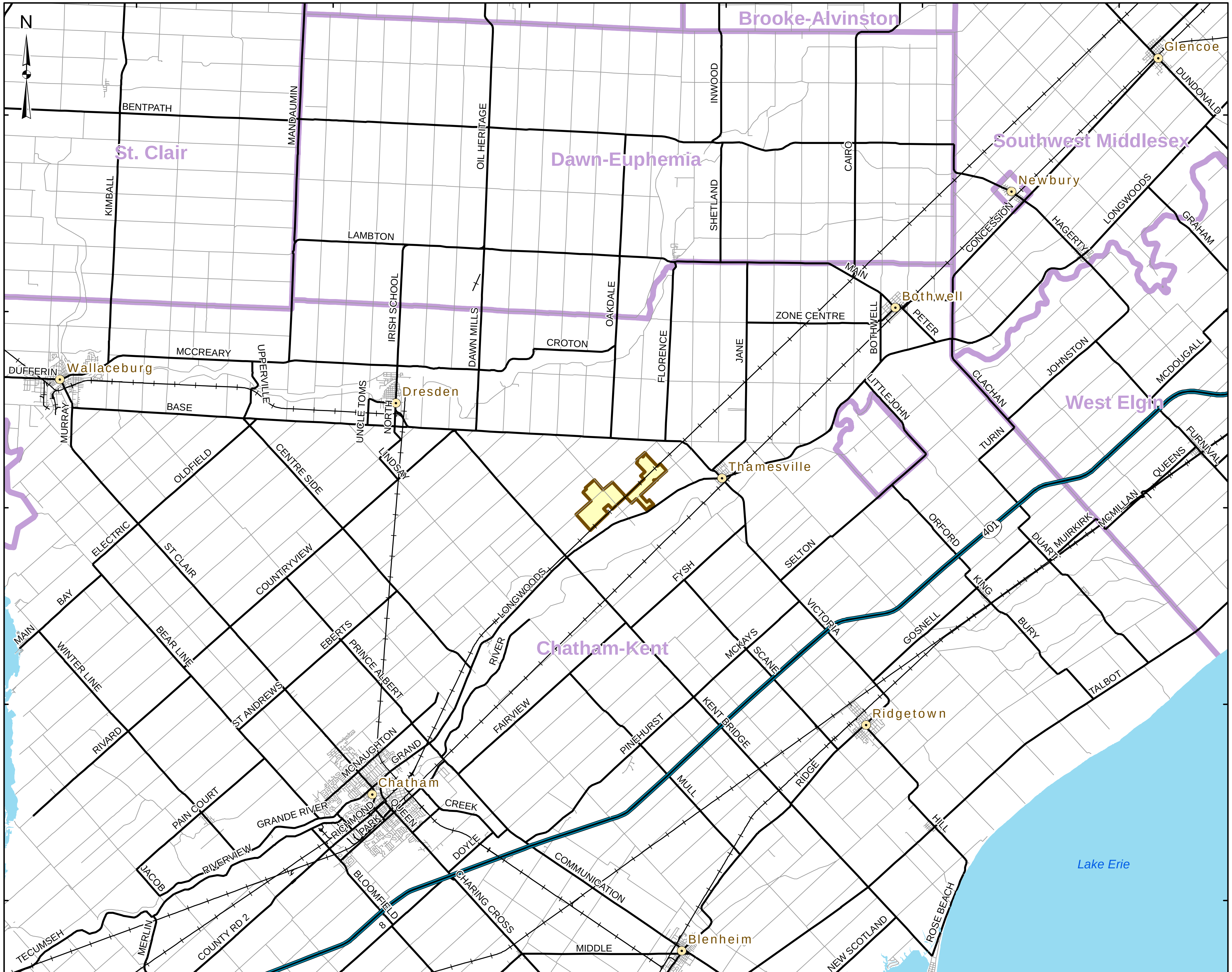
1.4 Summary of Project

The proposed Project is a Class 4 wind facility consisting of eight 2.5 MW General Electric (GE) Energy 2.5xl wind turbines on 85 metre (m) towers, with a total nameplate capacity of 20 MW. The main physical components of the Project are wind turbine structures, concrete foundations, on-site access roads, underground cabling, crane pads (construction only), two electrical switching stations, and a meteorological measurement tower (existing). These components would cover approximately 0.15 square kilometres (km^2), or 3.4% of the total Project Site area.

It is expected that project construction will take approximately nine months to complete. Operation of the project will last approximately 20 years with the expectation to possibly renew or refit the Project based on future policy regimes. Otherwise the Project would be decommissioned over approximately three months, which would include the following:

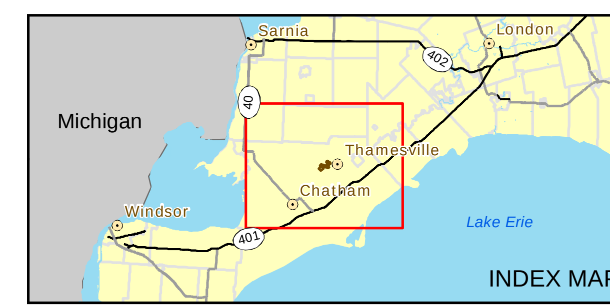
- Removal of wind turbines, meteorological tower and switching stations from site for salvage;
- Removal of foundations and electrical components, to ploughing depth suitable for farming purposes, for salvage; and
- Internal access roads and driveways will be retained for agricultural purposes.

A more detailed description of the Project is provided in Section 2 below.



LEGEND

- Community
- Railway
- Highway
- Major Road
- Project Site



INDEX MAP

REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2008.4
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Ontario Ministry of Natural Resources, © Queens Printer 2010
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17

0 1 2 4 6 8 10

SCALE 1:200,000 KILOMETRE

PROJECT

KENT BREEZE WIND FARM
ENVIRONMENTAL ASSESSMENT

TITLE

PROJECT LOCATION

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0123			SCALE AS SHOWN	REV.
DESIGN	PP	8 Jul. 2010		
GIS	PP	19 Jul. 2010		
CHECK	JO	19 Jul. 2010		
REVIEW	KT	29 Oct. 2010		

FIGURE: 1.3-1

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1.5 Construction Schedule

Construction of the Project will commence as soon as building permits are granted by the Municipality of Chatham-Kent, which is expected in summer 2010. Project construction will take approximately nine months. Therefore the operations phase of the project is expected to begin in spring or summer 2011.

1.6 Natural Resources Canada Involvement

The Proponent is applying to Natural Resources Canada (NRCan)'s EcoEnergy for Renewable Power Program, which necessitated that this EIS has been prepared under the *Canadian Environmental Assessment Act*. NRCan will be become the Responsible Authority (RA) for the Environmental Assessment once a contribution agreement is signed. No other RAs have been identified to date.

NRCan responded to the Notice of Project Application by letter dated January 29, 2009 to state that the Notice met the basic eligibility requirements of the EcoEnergy Program (Reg. #5911-K8-1).

1.7 Other Federal Authorities

Following the submission of the Environmental Impact Statement for the Project, it is anticipated that there will be co-ordination between NRCan and other federal authorities (e.g., Environment Canada, Health Canada). Comments from Federal Authorities will be provided in an Appendix of a subsequent submission of the Environmental Impact statement if required.

The following federal agencies were contacted about the Project as part of the Ontario Ministry of the Environment (MOE)'s Renewable Energy Approvals Process and NRCan's EcoEnergy for Renewable Power Program:

- Canadian Environmental Assessment Agency;
- Canadian Forces – Radio Communication Users;
- Canadian Wildlife Service;
- Department of Fisheries and Oceans;
- Environment Canada;
- Health Canada;
- Indian and Northern Affairs Canada;
- Navigation Canada;
- Parks Canada;
- Radio Advisory Board of Canada;
- Royal Canadian Mounted Police;

- Technical Standards and Safety Authority; and
- Transport Canada.

Written correspondence was received on January 7, 2009 and January 15, 2009 from Canadian Forces divisions indicating that software modeling of proposed turbine locations indicates no conflict with any current radar installations, nor do they have concerns with respect to the effect of the proposed windfarm on the Department of National Defence's telecommunication systems.

Written correspondence was received on January 8, 2009 from the Canada Coast Guard indicating that the proposed turbine locations are approximately 21 km from the nearest Coast Guard communications site and as such will not cause any interference to Coast Guard Communications.

Written correspondence was received on January 28, 2009 from Environment Canada indicating that any impacts to weather radars by the project would be minimal and they have no concerns.

1.8 Provincial Departments and Agencies

An application has been made under the MOE's Renewable Energy Approvals Process. The following provincial ministries, agencies and representatives were contacted about the Project:

- Ministry of Aboriginal Affairs;
- Ministry of Agriculture and Food – Southwestern Region;
- Ministry of Attorney General;
- Ministry of Citizenship and Immigration;
- Ministry of Culture;
- Ministry of Economic Development;
- Ministry of the Environment;
- Ministry of Energy and Infrastructure;
- Ministry of Government Services;
- Ministry of Municipal Affairs and Housing;
- Ministry of Natural Resources;
- Ministry of Northern Development and Mines;
- Ministry of Tourism;
- Ministry of Transportation; and
- Ontario Energy Board.

The Ministry of Aboriginal Affairs responded on February 10, 2009 that the project does not appear to be located in an area where First Nations may have existing or asserted rights that could be impacted by the Project and provided contacts for First Nations in proximity to the project area.

2.0 DETAILED PROJECT DESCRIPTION

2.1 Project Proponent

The Proponents (Kent Breeze Corporation and MacLeod Windmill Project Inc.) are the owners of all the lands and are involved in the day-to-day farming of the Site, and as such have made great efforts to establish good relations with the local community and plan to be a long-term member of the community.

2.2 Background of Project

Wind power generation is completely renewable, does not produce any harmful waterborne emissions, airborne emissions or toxic solid wastes and is one of the most economical sources of new large-scale electricity generation [Weis, et al., 2010]. Wind energy is becoming even more viable to produce as economies of scale are reached and as electricity prices increase. Wind energy is also compatible with other land uses and can serve as a boost for rural economic development.

The Ontario government has made the development of clean, affordable and sustainable sources of electricity a top priority and is at the forefront of wind power generation in Canada with almost 1,100 MW of installed capacity on the transmission system [IESO, 2008]. It is estimated that the Canadian wind power industry employed 3,785 people in 2006 and contributed $1.6 billion to Canada’s Gross Domestic Product (GDP) [CANWEA, 2010]. The implementation of the Ontario Power Authority's Feed-In Tariff (FIT) program will allow the province's power system to integrate thousands of megawatts of additional renewable supply, including more generation from wind facilities.

Kent Breeze Corporation and MacLeod Windmill Project Inc. are utilizing proven and reliable wind turbine technologies developed by General Electric Energy, an internationally recognized leader in wind turbine technology. The Project will contribute towards the Ontario Government’s goal of increasing the amount of renewable power generation feeding the grid as well as provide a boost to the local economy.

2.3 Purpose of the Project

Interest in wind power as a source of electricity has grown significantly over the past few years. In Ontario, the government has demonstrated its commitment to wind energy production by introducing three renewable energy Requests for Proposals, resulting in the first commercial-scale wind projects in the province. According to the Independent Electricity System Operator’s (IESO) December 2007 Ontario Reliability Outlook, wind power is expected to take on an increasingly significant presence in Ontario’s supply mix over the next decade [IESO, 2008]. As of January 31, 2009, the Ontario Power Authority was managing 1,575.7 MW of wind power contracts, 704.3 MW of which were in commercial operation. The remaining contracts are expected to come on-line by 2012 [OPA, 2009].

Increased energy supply from renewable sources is also strongly encouraged in Ontario’s Provincial Policy Statement (PPS) [MMAH, 2005] which states:

> *"Increased energy supply should be promoted by providing opportunities for energy generation facilities to accommodate current and projected needs, and the use of renewable energy systems and alternative energy systems, where feasible".*

The PPS further elaborates that:

> *"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".*

Renewable energy is also encouraged by the Federal Government of Canada. In 2007, the EcoEnergy Renewable Initiative was introduced, which replaced the previous Wind Power Production Incentive (WPPI) program. The EcoEnergy initiative encourages developers, such as Kent Breeze Corporation to develop wind power Projects and to gain experience in this emerging energy market. Through the EcoEnergy program, the Government of Canada is investing more than $1.5 billion to make clean, low-impact renewable energy more available and less expensive. The goal of this initiative is to increase Canada's supply of renewable electricity by 4,000 MW. The EcoEnergy program will provide financial support for the operation of new wind power capacity over the next four years, with an incentive of one cent per kilowatt-hour for up to 10 years. This incentive will also help establish wind power as a competitive energy source in the marketplace.

Provincially, the *Green Energy and Green Economy Act, 2009*, was introduced as a bill in February 2009 and was passed on May 14, 2009. This legislation is aimed at greatly increasing the number of renewable energy projects in the province (using wind as well as solar, hydro, biomass and biogas as energy sources), creating up to 50,000 jobs within the first three years, and supporting the province's plan to make Ontario a leading green economy in North America [MEI, 2009].

The Proponents are interested in developing renewable energy projects in Ontario to provide a source of renewable, emissions-free energy. The purpose of this Project is to provide up to 20 MW of electricity generating capacity from a renewable source that contributes to meeting Ontario's targets for renewable energy use.

2.4 Location of the Project

As discussed in Section 1.3 (Project Site), the proposed location of the Kent Breeze Wind Farms Project is in the Township of Camden within the Municipality of Chatham-Kent, approximately 5 km west of the Town of Thamesville, Ontario. Specifically, the proposed wind farm consists of two adjacent Projects that are located at Part Lots 8-11, Concession 1, in the geographic Township of Camden, in the Municipality of Chatham-Kent, on the south side of Smoke Line, east of Huffs Side Road; and Part Lots 4-6, Concession 1 & 2, in the geographic Township of Camden, in the Municipality of Chatham-Kent, on the north and south side of Smoke Line, west of Huffs Side Road (the 'Project Site').

These properties are zoned for agricultural land use and have been used for agricultural purposes for over 80 years. The majority of the surrounding land uses are agricultural. Agricultural activities are primarily cash crop in nature due to the highly productive soils throughout the region. There is also a large greenhouse operation directly south of the Project Area. In addition, there are a number of non-farm residential lots, generally described as being 4 ha or less in area that have been severed from farm parcels over the past 40 years. An active railway line runs through the Project Site in an east-west direction. This rail line is the Canadian Pacific Rail's mainline between Windsor and Montreal. Three private unregistered airstrips were identified near the Project Site, but will not be affected by any part of the Project installations.

No part of the Project Site is located within a known First Nations Reserve. In addition, there are no known First Nations claims on the Project Site. The closest First Nations Reserve is the 1,285 ha Moravian of the Thames reserve located 8 km east of the Project Study Area along the Thames River. The Ontario Ministry of Aboriginal Affairs has indicated (in a letter dated February 10, 2009 from Pam Wheaton, Director) that the Project Site does "not appear to be located in an area where First Nations may have existing or asserted rights that could be impacted by your Project", and a list of First Nations to contact was provided. Notification and invitation for comments were forwarded to the Bkejwanong Territory (Walpole Island) and Delaware Nation (Moravian of the Thames) by mail, email, and telephone. No comments have been received to-date.

2.5 Project Components

The Project components and infrastructure were selected to optimize the power output while minimizing likely adverse effects. The site layout is shown in Figure 2.5-1. The Project will consist of the following major components:

- Eight 2.5 MW wind turbines;
- Approximately 3 km of new gravel access roads originating at the existing road network and extending to and between turbine sites;
- Approximately 8.8 km of buried 27.6 kV distribution lines primarily located along the access roads between turbines; and
- Two 27.6 kV electrical switching stations.

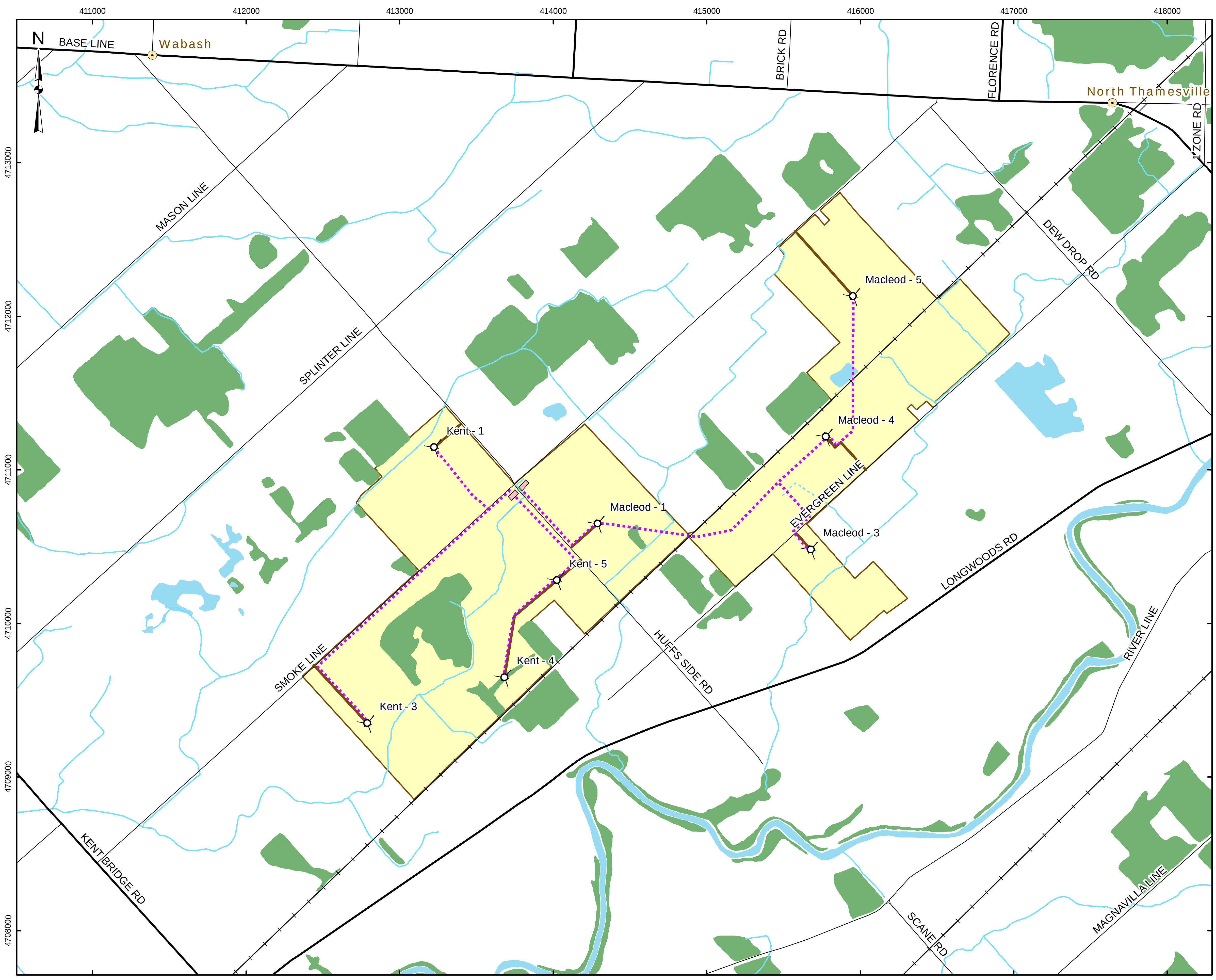
2.5.1 Turbines

The Project will involve the installation of eight wind turbines for a total capacity of 20 MW. The turbines will each have a nameplate capacity of 2.5 MW. The wind turbine specifications are outlined below in Table 2.5-1 and locations are illustrated in Figure 2.5-1.

Table 2.5-1: GE Energy 2.5xl 2.5 MW Turbine Technical Specifications

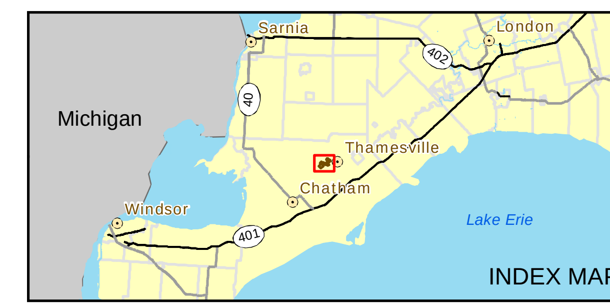
Component	Specification
Rated capacity	2.5 MW
Cut-in wind speed	3.0 m/s
Cut-out wind speed	25 m/s
Rated wind speed	12.5 m/s
Number of blades	3
Rotor Diameter	100 m
Swept area	7,854 m^2
Rotor speed (variable)	5.0 – 14.0 rpm
Rotor speed regulation	Pitch regulated
Tower (hub) height	85 m
Gearbox	Multi-stage planetary/helical stages
Generator	Permanent magnet generator
Converter	Variable output frequency system
Braking system (fail-safe)	Mechanical disc brake
Yaw system	Plain bearing system with built in friction
Control system	Supervisory Control and Data Acquisition System (SCADA) equipped
Noise reduction	Optional noise reduction operation mode
Lightning protection system	Lightning receptors, down conducting system and earthing system consistent with International Electrochemical Commission (IEC) Design Codes.
Tower design	Tapered tubular steel

Modern commercial-scale wind turbines consist of four large main components: a foundation, tower, nacelle (turbine housing), and a 3-bladed rotor (see Figure 2.5-2). Each turbine will be equipped with a step-up transformer inside the tower which will raise the voltage to the appropriate transmission voltage. Due to the large size of the steel tower (85 m height), it is delivered to the Project site in four sections.



LEGEND

- Turbine
- Switching Station
- Cable
- Access Road
- Community
- Railway
- Major Road
- Local Road
- Closed Tile Drain
- Watercourse
- Waterbody
- Wooded Area
- Project Site



REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2008.4
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2010
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17

0 250 500 1,000 1,500

SCALE 1:25,000 METRES

PROJECT

KENT BREEZE WIND FARM
ENVIRONMENTAL ASSESSMENT

TITLE

PROJECT SITE PLAN

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0123			SCALE AS SHOWN	REV.
DESIGN	PP	8 Jul. 2010	FIGURE: 2.5-1	
GIS	PP	19 Jul. 2010		
CHECK	JO	19 Jul. 2010		
REVIEW	KT	29 Oct. 2010		

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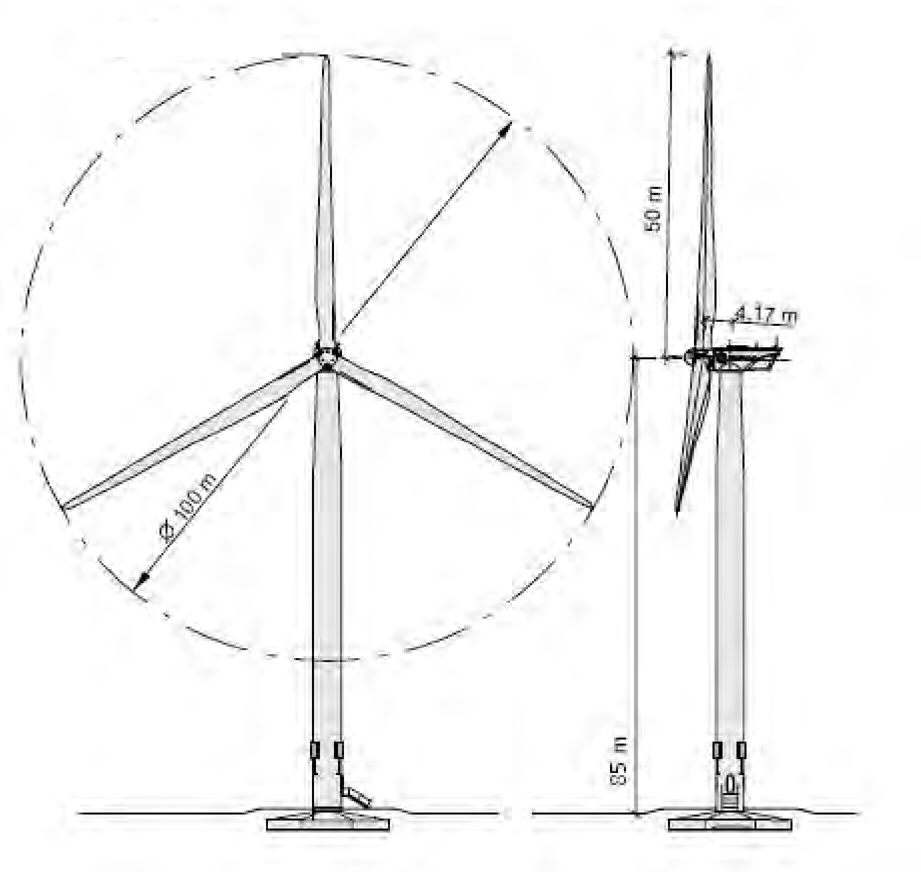


Figure 2.5-2: Dimensions of GE Energy 2.5xl 2.5 MW Turbine

Source: GE Energy, 2009

Most of the equipment used to convert wind energy into electricity is contained in the nacelle of the turbine, which is also sound-insulated to minimize noise emission. In order to maximize production of electricity, modern wind turbines are designed to automatically rotate (yaw) into the wind at all times. Turbines are also able to change the pitch of their blades to capture as much kinetic energy from the wind as possible.

The wind turbine is equipped with lightning protection which protects the entire turbine from the tip of the blades to the foundation. The system enables the lightning current to by-pass all vital components within the blade, nacelle and tower therefore limiting the potential for damage. As an extra safety precaution, the control units and processors in the nacelle are protected by an efficient shielding system. The lightning protection is designed according to IEC 61024 – "Lightning Protection of Wind Turbine Generators".

The geographic coordinates for the eight wind turbines are provided in Table 2.5-2.

Table 2.5-2: Geographic Coordinates of Turbines (UTM Zone 17 NAD 83)

Turbine	Northing	Easting
Kent-1	413230.02	4711135.02
Kent-3	412788.27	4709342.84
Kent-4	413678.98	4709641.03
Kent-5	414023.17	4710275.61
MacLeod-1	414287.67	4710646.25
MacLeod-3	415670.01	4710515.74
MacLeod-4	415773.04	4711215.43
MacLeod-5	415955.06	4712119.07

2.5.2 Access Roads

The Project Site will be accessed via existing road right-of-ways. Access to the turbine sites will require the construction of approximately 3 km of new gravel access roads. For the purposes of this EIS document, all newly created gravel roadways constructed to allow access to turbines are referred to as "access roads". These are not intended to function as permanent or publicly accessible roads, and will only be actively used during construction and for periodic maintenance that will be carried out over the life of the Project.

Depending on ground conditions, final crane selection and crane availability, the access roads for the Project Site will be either 5-6 m wide during construction and for the operational lifetime of the Project, or 10 m wide during construction, then reinstated back to 5-6 m to facilitate maintenance during the lifetime of the Project.

The reason for the difference in road widths is based on final crane selection. A crawler crane requires a wider access track for wind turbine erection, as it is situated on tracks or "crawlers" and relies on these for stability instead of out-riggers (See Figure 2.5-3). This type of crane can be used in poorer ground conditions and can move around site with very little set-up, as it does not require out-riggers. The disadvantage is that moving this type of crane from one cluster of turbines to another is very difficult and usually requires that the crane be dismantled and moved by truck to the next location. This may however be the most suitable crane or the only type available at the time of construction.

Gravel to construct access roads will be sourced from local suppliers to the extent available. The Proponent will also make use of existing roads and laneways wherever possible. Where not possible, construction of new access roads is required. The alignment of access roads will typically be parallel to property boundaries where possible and located in areas that minimize disturbance to agricultural operations and the requirement for watercourse crossings. Locations have been determined, in part, through detailed consultation with land owners in order to minimize disruptions to existing uses.

Figure 2.5-3: Example of a Crawler Crane
Source: KR Wind

2.5.3 Electrical Transmission System

From the base of each turbine, power is transferred through 27.6 kV underground cables to either an adjacent wind turbine (wired in series) or to the switching station. Connection between the individual turbines and the switching station will be achieved through underground transmission lines across the Project Site. A Connection Impact Assessment has been completed by Hydro One, and a Connection Cost Agreement has been executed with Hydro One. Hydro one is currently completing engineering to finalize the system connection arrangements. There are no transformers located in the switching station as the voltage of the Hydro One distribution line is 27.6kV, the same voltage of the wind farm collection system. The switching station simply houses the protection and controls for the wind farm and the electrical meters.

The switching station components include: an isolation switch, circuit breaker, step-up power transformer, distribution switch-gear, instrument transformers, grounding and metering equipment. The switching station design may allow for future expansion of the Project. Switching station grounding will follow Canadian Electrical Code (CEC) standards. The switching station will be fenced and secured based on standard utility practices.

2.6 Detailed Project Activities

Construction and operation of the Project will consist of installing eight 2.5 MW GE Energy 2.5 xl wind turbines, constructing access roads and installing cables and switching stations as part of a wind generation facility to produce electricity for commercial consumption. This section provides details of the Project through the phases of Site Preparation and Construction, Operations and Maintenance, and Decommissioning.

2.6.1 Site Preparation and Construction Phase

The Site Preparation and Construction Phase includes all of the preliminary surveys and planning work required to develop the Project and all works and activities required during construction. Typical construction equipment to be used for site preparation and/or assembly of the turbines, switching stations, access roads and buried lines includes: tracked bulldozers, excavators, compactors, graders, concrete pump or elevator, tippers and dumpers, mobile cranes for general use and an approximately 800-1000 tonne crane for tower section, nacelle and blade erection.

Pre-construction activities include site surveys to be carried out by an Ontario Land Surveyor who will define, on plan, the boundaries of the facilities related to the legal property survey and UTM coordinates, NAD83. Levels will be taken as necessary to fully define changes in site profile and will be used as the vertical and horizontal control points for the Project. The survey will also include the locations of all access roads and cable routing, turbine locations, operations and maintenance building locations, transmission line connections and arrangement and the proximity of overhead lines, natural gas, water, communication, power supply and drainage point connections.

2.6.1.1 Access Roads

Access roads for use during construction will be built using tracked bulldozers and excavators to strip topsoil and subsoil, as required, to create an even travel surface. The travel surface will be compacted to achieve proper load bearing capacity. The travel surface will also be crowned with a grader in order to ensure adequate drainage. Culverts, ditches or other drainage structures, as required, will be installed to maintain adequate road drainage. The wind farm has been designed without any watercourse crossings by access roads. There are two drains which will require directional drilling to install an underground cable beneath the watercourse. In all cases the Department of Fisheries and Oceans procedures will be followed for correct installation while avoiding disturbance of the watercourse. The conveyance function of any existing drainage or tiling that is intercepted will be maintained throughout the Project.

Access road foundations will be constructed of pit run gravel or soil/Portland Cement hardening mixture to an approximate depth of 0.25 to 1 m, as well as a gravel running surface. During the construction process, access road right-of-ways may be up to 10 m wide, with additional width required as needed at turning radii. Access road right-of-ways, if required, will be reduced to a width of 5-6 m within 12 months of completion of the Site Preparation and Construction Phase.

Soil management will be incorporated into the access road construction process to facilitate site reclamation. Existing vegetation (crop stubble) will be stripped with the topsoil, and will be stockpiled separately from subsoil and stabilized to prevent erosion and growth or transfer of noxious weeds. Once Project construction is complete, the gravel from the 5 m wide area along the access roads that will be returned to agricultural use will then be removed.

2.6.1.2 Turbine Foundations

Concrete required for the foundations will be delivered by truck to the Project Site from nearby concrete batching facilities. It is estimated that a total of 600 loads of concrete using 16 m^3 trucks will be required to supply 9,600 m^3 of concrete.

For the wind turbine foundations, it is anticipated that the turbine base will be constructed as a gravity reinforced concrete foundation with pilings. Typical excavation for the turbine base 22 m by 22 m by 2.5 m deep to accommodate the foundation of approximately 19 m by 19 m by 2.0 m and tower turbine inserts. The turbine construction area will be excavated using a tracked excavator. Depending on the detailed engineering design, the foundation may be supported by a number of piles. Formwork and rebar will be installed to construct the foundation. Formwork will be struck after 24 hours and the excavated area will be back-filled and compacted until only the tower base portion of the foundation is left above ground. The turbine tower will be anchored to the foundation by large anchor bolts that are set in the concrete. These stages of turbine foundation construction are illustrated in Figure 2.6-1. Please note, this figure is for illustration purposes only, as it is a series of photographs showing construction of an Enercon turbine foundation (not GE Energy).

Concrete pumps, or elevators, will be used to construct the turbine foundations, and two cranes will be used to erect the turbine towers. A temporary concrete batching plant may be used if the required quantities of material cannot be sourced locally; however it is more likely that concrete will be delivered to the site by truck.

Figure 2.6-1: Example of Turbine Foundation Construction Stages
Photos courtesy of Enercon

2.6.1.3 Turbine Assembly and Erection

The wind turbine towers will be delivered on large tractor trailers in four sections. The towers will be assembled on-site and will be erected using two cranes. The tower section will be bolted to the foundation using holding down bolts that are set in the concrete.

The turbine nacelle and the three turbine blades will also be delivered on large tractor trailers to the temporary workspace adjacent to the turbine foundation. Once the three blades are attached to nose cones on the ground, the assembled rotor is then lifted and assembled to the nacelle. Each turbine will be 85 m high to the hub, with a 100 m diameter rotor.

2.6.1.4 Collector System

The electrical collector system will consist of underground cable lines that will be constructed using ACSR (Aluminum Conductor, Steel Reinforced) conductors. The on-site collector system will consist of buried 27.6 kV standard utility cables, with buried cable between turbines, or junction boxes, that are then directed to a central switching station located on the southwest corners of Huff Side Road and Smoke Line. From here, overhead cable will be used to connect to the main Hydro One distribution line at 27.6 kV. The underground collector system routes will primarily follow the access routes or directly link turbines in some cases where this is more practical.

A combination of ploughing and trenching (either by trenching machine or backhoe) will be used to install the underground cables, depending on terrain. Soil management will be incorporated into this process to facilitate site reclamation. Typically, lines are trenched over short distances where maneuverability of the ploughing equipment is difficult or where it has been identified that ploughing poses an unacceptable hazard to existing tile drainage or other underground services. A plough seam will be excavated to a depth of approximately 1 to 1.5 m and a width of approximately 1 m, into which the cable is placed. The plough seam will be backfilled immediately to prevent soil loss from erosion. Alternatively, a wheel-ditcher or Ditch Witch (a wheel-like or bar-like mechanism similar to a chainsaw) will be used to cut a narrow trench into which the cable is placed. Trenching equipment for underground cable is smaller than that used for pipeline construction, usually mounted on a bobcat or small backhoe. The soil removed from the trench is situated immediately adjacent to the trench. Once the cable has been covered with sand, a backhoe or small bobcat will be used to push the soil back into place to re-contour the disturbed area. Underground cabling will be buried at a depth that will not interfere with normal agricultural practices.

Where the underground cable will cross watercourses, the DFO Operational Statement for High Pressure Directional Drilling will be followed (DFO, 2008), which will avoid disturbance to watercourses within the Project Study Area. All electrical cables will be installed greater than 2.5 m below the bottom of the drainage ditch. Contact with the St. Clair Region Conservation Authority and Lower Thames Valley Conservation Authority prior to directional drilling will be required to obtain permission for drilling if needed.

Where the underground cable must be spliced (e.g., at the end of a reel or to pass underneath another utility cable) a splice pit is typically required. These pits are roughly 1.5 m deep, 1 m wide, and up to 5 m long (but usually 1 to 2 m long). At these locations, the topsoil will be stripped and stockpiled. After the procedure is complete, soil will be replaced and contoured.

2.6.2 Operations and Maintenance Phase

Turbine commissioning will occur once the wind turbines have been fully installed and when the OPA/Hydro One is ready to accept grid interconnection. Testing and inspection of electrical, mechanical, and communications operability will also be required prior to Project commissioning and a detailed set of operating instructions must be followed in order to connect with the electrical grid.

The wind turbines selected for the Project are automated and have few maintenance requirements. The wind turbines require no fuel to produce power; however, oil in the gearbox and hydraulic systems needs to be changed and maintenance completed periodically as per manufacturer specifications. Used oil and other wastes will be disposed of at an approved facility following each maintenance visit. All lubricants that are stored onsite will be stored appropriates with secondary containment. Each wind turbine generator will have regular scheduled preventative maintenance during operations. This maintenance will include a complete inspection of the turbine's components and the tower. Functionality testing, replacement of worn parts, bolt tightening and lubrication of moving parts are the key activities occurring at each scheduled maintenance visit. Corrective maintenance will include the repair and replacement of any damaged or defective parts in the turbine.

If a crawler crane is used, the access roads created for turbine construction will be reduced from 10 m to 5-6 m width post-construction, and will be maintained by the Proponent for the Operations and Maintenance Phase. All site access will follow the approved access routes and will occur in consultation with landowners where appropriate.

Other on-site activities will likely include field monitoring for impacts to bird and bat populations during the first year or two of operations, tours of the facility for educational purposes, and field monitoring of equipment including performance measurements.

2.6.3 Decommissioning Phase

Operation of the Project is estimated to last approximately 20 years with the expectation to possibly renew or refit the Project based on future policy regimes. Otherwise, the Project would be decommissioned over a period of approximately three months. The objective will be to remove any impediments to future use of the land and restore it to the same agricultural function as existed prior to the construction of the wind farms. Decommissioning will involve the following:

- Removal of wind turbines for salvage

  The blade, generator and towers would be disassembled using a crane and removed from the site using a carrier specializing in the transport of wind turbine components. The re-use, reconditioning or disposal of these parts will be in accordance with provincial regulatory requirements applicable at the time of decommissioning. All parts of the turbine are reusable or recyclable except for the blades. Some of the parts (cabling, generator) will have high economic value.

- Removal of electrical equipment

  Electrical equipment will be removed from the site on flatbed trucks for salvage The re-use, reconditioning or disposal of these parts will be in accordance with provincial regulatory requirements applicable at the time of decommissioning.

- Removal of access roads

  All permanent access roads will be maintained for farming purposes if so desired by the owners of the land. All other access roads would be restored as per method used for decommissioning concrete foundations.

- Removal of concrete foundation

  The foundations will be removed to a depth of approximately 1.5 m and filled with subsoil to rebuild the grade. Clean topsoil would be replaced over the area to approximate depth of adjacent horizontal topsoil depths. The areas will be left for cultivation or seeded for grazing, depending on the preference of the landowner.

- Removal of distribution lines

The distribution lines will be terminated and removed from the ground, to a depth of 1.5 m.

- Waste management

  All waste material would be removed from the site and disposed at an appropriately licensed facility.

2.6.4 Future Phases of the Project

There are no future phases of the Kent Breeze Wind Farm Project anticipated.

3.0 SCOPE OF PROJECT AND ASSESSMENT

This section provides information on the scope of the Project, the scope of the environmental assessment (EA) and the methodology for conducting this assessment. This screening is being conducted according to the *Canadian Environmental Assessment Ac*t.

This assessment considers the Project site in the Township of Camden, Ontario and the Project Study Area (most broadly defined as the Municipality of Chatham-Kent for the socio-economic component). Site Preparation and Construction, Operations and Maintenance, and Decommissioning Phase activities associated with the Project will be assessed for direct and indirect potential adverse effects within the Project Study Area. This assessment also considers likely adverse effects from malfunctions and accidents that have a reasonable probability of occurring, as well as effects of the environment on the Project (e.g., extreme weather). Cumulative environmental effects that are likely to result from the Project, in combination with other projects that may be carried-out, are also considered.

The potential adverse effects of the Project have been assessed on physical, biological and socio-economic components of the environment. The physical environment includes the atmospheric environment, physiography and topography, geology, soil quality, seismicity, hydrogeology and groundwater, and surface water. The biological environment comprises aquatic and terrestrial components. The socio-economic environment includes demographics, land use, cultural resources, noise, recreation, safety, visual landscape, and Aboriginal considerations.

This section describes the methodologies used to determine the effects of the Project on the environment. The following general process ensures that the interactions between the Project components and the environment are adequately described, that the likely environmental effects are identified and properly assessed, and that the importance of any residual adverse effects are determined:

- Describe the Project activities (Section 2);
- Identify and describe the environmental component(s) that will be affected (Section 4);
- Describe the effect of any interactions between the environment and the Project (Section 5);
- Describe any mitigation measure(s) (Section 5);
- Identify any residual adverse effects after mitigation measures (Section 5); and
- Determine the significance of residual adverse effects (Section 5).

The evaluation of the significance of likely residual adverse effects of the Project uses the following parameters as identified by CEAA:

- Nature (direct or indirect);
- Magnitude (low, medium or high);
- Spatial Extent (Project Site or Project Study Area);

- Timing (Site Preparation and Construction, Operations and Maintenance, or Decommissioning);
- Duration (short or long, intermittent or continuous);
- Reversibility (low, medium or high extent to which environment could return to pre-existing state); and
- Likelihood of occurrence (low, medium or high).

The significance of residual adverse effects is evaluated based on these parameters and are rated as either minimal, low, medium or high.

Cumulative effects are then assessed to determine if any potential effects may occur as a result of the combined residual adverse effects of the Project in conjunction with any environmental effects of past, present or future projects or activities. Likely effects of the environment on the Project are also evaluated.

In order to verify the predictions of this EIS, and determine the effectiveness of any measures applied to mitigate adverse effects of the Project on the environment, follow-up monitoring programs may need to be conducted. If so, these programs are proposed in this report.

4.0 EXISTING ENVIRONMENTAL CONDITIONS

This section provides a description of the existing environmental conditions relevant to the Project. This characterization of the existing environment serves as the baseline condition against which the environmental effects of the Project are predicted and assessed.

For the purposes of this EA, existing conditions are defined as those generally present during the last decade, supplemented with current information where available.

The description of the existing environment focuses on areas where there are known or likely environmental effects of the Project, based on consideration of the Project Description (Section 2). This focussed approach avoids unnecessary consideration of large amounts of information for potential interactions between the Project and the environment that are weak or remote in time and/or space.

4.1 Physical Environment

4.1.1 Atmospheric Environment

4.1.1.1 Climate

The climate of the Project Study Area, just northwest of Thamesville, Ontario (42°33.2’N, 81°58.4’W, roughly 2 kilometres east of the proposed Project Site) is characterized as continental, with cold winters, warm summers and no dry season. Climate normals reported below are derived from meteorological data collected at the Dresden Meteorological Station (42°35.0’N, 82°11.0’W, roughly 10 km northwest of the proposed Project Site) from 1971 - 2000. The Dresden weather station was used because it is the closest station to the Project Site regulated by Environment Canada that complies with World Meteorological Organization Standards.

The average daily temperature is 8.4 °C, with the coldest month being January (-5.6 °C daily average) and the warmest being July (21.4 °C daily average). The extreme minimum temperature recorded was -30.0 °C (in January 1984), and the extreme maximum was 38.0 °C (June 1988).

Average annual precipitation is 844 mm, with most of it falling as rain (760 mm), predominantly in the summer and fall months. September has the highest average precipitation total of 96.4 mm, while February tends to be the driest month with 45.6 mm of precipitation on average.

4.1.1.2 Air Quality

During the summer months, Southwestern Ontario is typically subject to numerous “smog days”, where concentrations of airborne contaminants reach levels that exceed criteria. The heaviest concentrations of air pollution occur between Windsor and the Greater Toronto Area. Environment Canada estimates that approximately 50% of the air pollution in this area is blown in from the Ohio Valley and other heavily industrialized areas in the United States [MOE, 2010a]. Furthermore, approximately 30% of pollutants in the air are generated from vehicle emissions due to the heavy traffic flows in this region along the 400 series highways. The remainder of pollutants emitted in the region are estimated to come from heavy industry [MOE, 2010a].

Data regarding “smog days” in southwestern Ontario are available from the Ontario Ministry of Environment, and show a great deal of variability from one year to the next. The number of “smog days” recorded for Windsor-

Essex-Chatham-Kent was 17 days in 2003, 16 days in 2004, 46 days in 2005, 14 days in 2006, 38 days in 2007, 12 days in 2008, and 5 days in 2009. The majority of these "smog days" occurred during the summer months of June, July and August [MOE, 2010b].

4.1.2 Physiography and Topography

The topography surrounding the Project Site is generally flat due to glacial and post-glacial lake occupation. Within the Project Study Area there have been poorly formed sand dunes created by aeolian processes [Fitzgerald 1980]. The Project Site lies at an approximate elevation of 187 m above sea level. Overland drainage and shallow groundwater flow directions are inferred to be to the south-southwest towards the Thames River.

4.1.3 Geology

The Project Site lies within the Wallaceburg-St. Clair Flats Area of the Township of Camden, Municipality of Chatham-Kent. The Wallaceburg-St. Clair Flats Area is covered by a considerable thickness of unconsolidated Quaternary material. The area is predominantly underlain by gently southwesterly dipping shales, limestones, and sandstones of Middle and Upper Devonian age. The bedrock units in the area are the Hamilton Group, Kettle Point Formation, and the Port Lambton group. The Project Study Area lies roughly along the interface of the Kettle Point Formation, consisting of black bituminous shale with greenish-grey shale interbeds, and the Hamilton Group's grey argillaceous and cronoidal limestones and shales. The approximate depth to bed rock is estimated to be 15 to 20 m below ground surface.

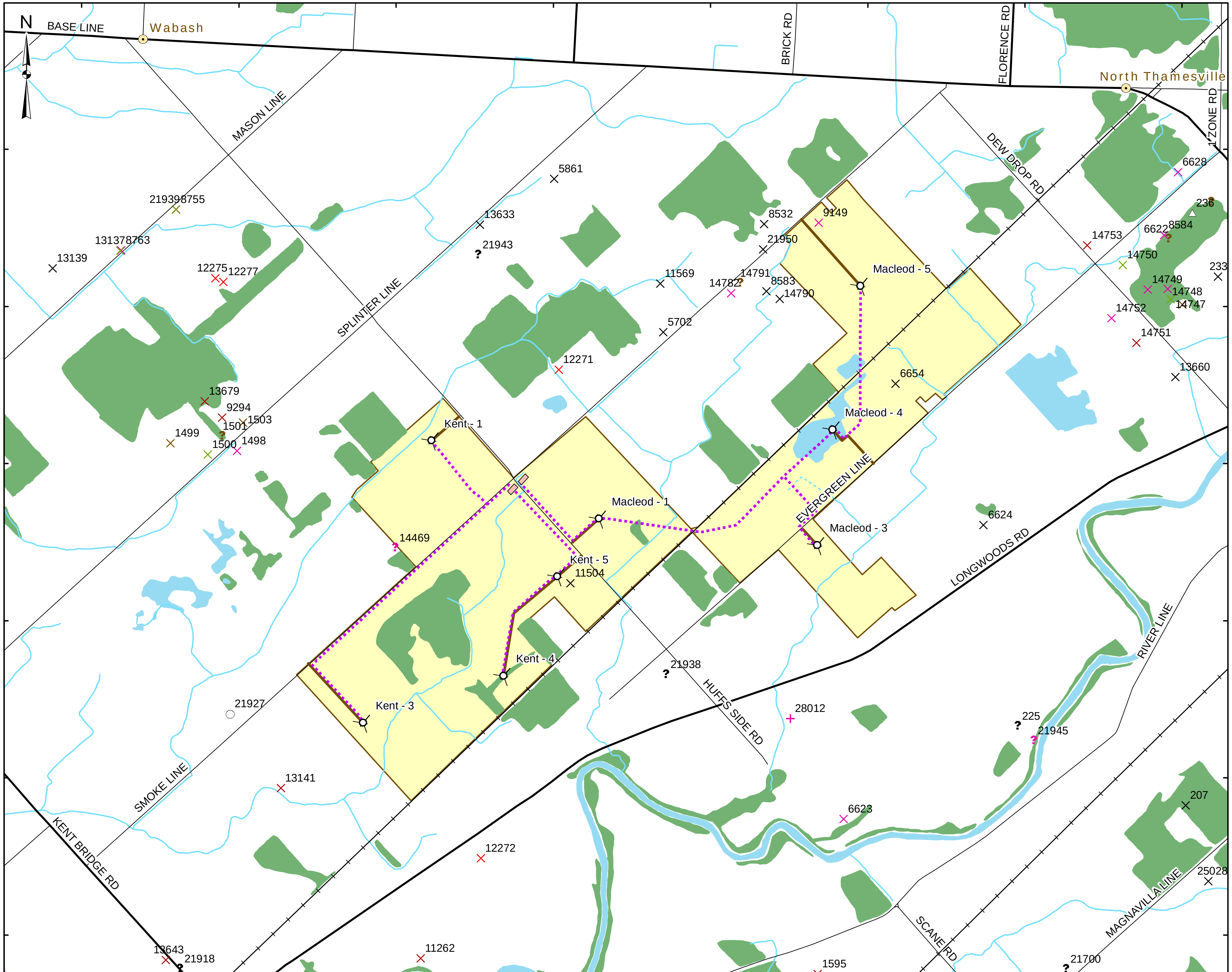
The surficial materials overlying the Project Site consist of glaciolacustrine medium to fine sands and silts of the Bothwell sand plain associated with a delta of the Thomas River in glacial Lake Warren. Much of the area has undergone change due to aeolian processes resulting in poorly developed sand dunes.

MOE water well records indicate that 95 water wells are located on or near the Project Site, however the margin of error on the exact location of any well may be from 100 to 300 m and 25 wells are listed as abandoned. Of the 70 wells reported to remain in the Project Study Area, 44 are registered as domestic supply wells, 20 are listed as domestic and livestock supply wells and 6 are listed as strictly livestock supply wells. The depth to water found in the identified wells ranges from 1.2 m to 32 m, with static water levels reported to range from 1.2 to 21 m below ground surface. Well depths range from 4.3 m to 54 m below ground surface. Reported geology in each well varies but is commonly reported to consist of alternating layers of sand and clay overlying a black or green shale or limestone [MOE, 2010c].

4.1.3.1 Oil and Gas resources

A search of the Ontario Subsurface Database produced by Ontario Oil, Gas & Salt Resources Library under licence with the Ontario Ministry of Natural Resources was conducted for active and abandoned oil and gas wells in the Project Study Area. The locations of all recorded wells within the Project Study Area are graphically represented on Figure 4.1-1. Four abandoned wells were identified on the Project Site and multiple abandoned wells were identified within close proximity of the Project Site. Two oil wells identified to be within the Project

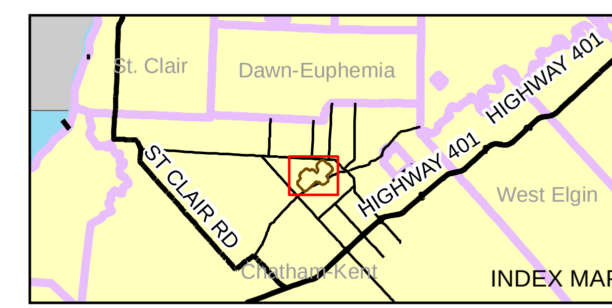
Site are classified as “Oil Show, Abandoned Well,” meaning they were exploratory or developmental wells and oil was encountered but the wells had not been proven or judged to be productive. The two other wells identified are classified as “Dry Hole, Abandoned Well,” meaning no hydrocarbons were encountered during drilling and the borehole is now abandoned. There are no active and producing oil and/or gas wells on the Project Site.



G:\Projects\2010\10-1151-0123_KentBreezeWindFarm\GIS\MXDs\Draft\Working\OilAndGas.mxd

LEGEND

- Dry Hole, Abandoned Well
- Dry Hole, Unknown
- Gas Show, Abandoned Well
- Location, Unknown
- Natural Gas Well, Abandoned Well
- Observation Well, Abandoned Well
- Oil & Gas Show, Abandoned Well
- Oil Show, Abandoned Well
- Oil Show, Suspended Well
- Oil Show, Unknown
- Oil Well, Abandoned Well
- Oil Well, Unknown
- Stratigraphic Test, Abandoned Well
- Turbine
- Switching Station
- Cable
- Access Road
- Community
- Railway
- Major Road
- Local Road
- Closed Tile Drain
- Watercourse
- Waterbody
- Wooded Area
- Project Area



REFERENCE

Base Data - MNR NRVIS, obtained 2004, CANMAP v2008.4
Oil Wells - Oil, Salt and Gas Resources, obtained 2004
Produced by Golder Associates Ltd under licence from
Ontario Ministry of Natural Resources, © Queens Printer 2010
Projection: Transverse Mercator Datum: NAD 83 Coordinate System: UTM Zone 17

0 250 500 1,000 1,500
SCALE 1:25,000 METRES

PROJECT

KENT BREEZE WIND FARM

TITLE

OIL AND GAS WELLS WITHIN PROJECT AREA

Golder Associates
Mississauga, Ontario

PROJECT NO. 10-1151-0123			SCALE AS SHOWN	REV.
DESIGN	PP	8 Jul. 2010	FIGURE: 4.1-1	
GIS	PP	8 Jul. 2010		
CHECK	JO	8 Jul. 2010		
REVIEW	KT	29 Oct. 2010		

4.1.4 Soil Quality

There are no historical records of soil quality sampling on the Site and soil sampling was not conducted as part of this EIS. As the Project Site is located on farmed agricultural land, it is not anticipated that contaminated soil would be present. In the areas near the abandoned oil wells there is the potential for hydrocarbon contamination; however as these locations will not be disturbed by the Project, contamination in not likely.

4.1.5 Seismicity

The potential seismic risk in an area is based on the magnitude, frequency or recurrence and distance of the earthquake to the epicentre to the site. The Project Study Area has a low to moderate level of seismicity when compared to the more active seismic zones to the east, along the Ottawa River and in Quebec. Over the past 30 years, on average, two to three magnitude 2.5 or larger earthquakes have been recorded in the southern Great Lakes region. By comparison, over the same time period, the smaller region of Western Quebec experienced 15 magnitude 2.5 or greater earthquakes per year.

Three moderate sized (magnitude 5) events have occurred in the 250 years of European settlement of this region, all of them in the United States - 1929, Attica, New York, 1986, near Cleveland, Ohio, and 1998, near the Pennsylvania/Ohio border. All three of these earthquakes were widely felt in southern Ontario but caused no damage in Ontario [NRCAN, 2009].

4.1.6 Hydrogeology and Groundwater

The groundwater flow direction in the vicinity of the Project site, based on topographic features and knowledge gained from other sites in the area is expected to be south-southwest towards the Thames River. Locally, however, the shallow groundwater flow may be influenced by agricultural drainage features, underground utility trenches, conduits, and structures, variations in soil type, and minor fluctuations in topography. MOE water wells indicate that static ground water levels range from 1.2 to 21 m below ground surface.

The Ontario Ministry of the Environment Water Resources Branch *Susceptibility of Ground Water to Contamination, Wallaceburg-St.Clair Flats Sheet* describes the Project Study Area to be within an area of high susceptibility of groundwater to contamination. The area is classified as highly susceptible due to the medium to fine sand surface material, inferred high infiltration rate, low to flat relief and variable likely depth of contaminant movement [MOE, 1984].

4.1.7 Surface Water

The main aquatic feature in the area, approximately 600 m south of the Project Study Area, is the Thames River, which flows generally southwestward on a regional scale. The Thames River flows 273 km and drains an area of approximately 5,825 square kilometres. The Thames rises at three distinct points near Mitchell (North Thames), Hickson (Middle Thames) and Tavistock (South Thames). The Middle and South Thames join east of London and the North and South Branches meet at the Forks in London. From there, the river flows southwest passing through several communities including Chatham and four First Nations Reserves before it empties into Lake St. Clair at Lighthouse Cove [CHRS, 2010].

In addition to the Thames River, there are a number of originally untamed tributaries that have been converted to agricultural drains for irrigation purposes which flow through the proposed Project Site. These drains include Shaw Ferguson Drain, Dobson Drain, Courtney Drain, Barnhardt Drain, Mason Drain and Liberty Drain. Background studies indicated that the majority of drains within the Project Site have intermittent flow.

4.2 Biological Environment

Assessment of the biological environment in the Project Study Area was conducted by BioLogic Aquatic and Terrestrial Ecosystem Planners in March, 2009 and update in May, 2010, is summarized in a report titled *Natural Heritage Study Report, Kent Breeze Wind Farm and MacLeod Windmill Project* (Appendix A – BioLogic Report).

4.2.1 Aquatic Environment

Watercourses within the Project Study Area are open and closed agricultural drains, most of which are intermittent or ephemeral. The BioLogic investigation (2010) cited data from the St. Clair Region Conservation Authority (SCRCA) regarding fish and benthic communities. The benthic site is 1.4 km west of the Project Study Area, at the confluence of the Courtney and Shaw Ferguson Drains, both with intermittent flow. The specific Family Biotic Index (FBI) for this benthic site was not provided, but the average for the Lake St. Clair Tributaries is 7.2, reflecting fairly poor water quality conditions [BioLogic, 2010]. Based on the data gathered by the SCRCA further downstream at an electrofishing site near the confluence of the Courtney and Shaw Ferguson Drains, (at Big Creek Drain), there is a warm water fish community at this location with largemouth bass (*Micropterus salmoides*) as a top predator.

4.2.2 Terrestrial Environment

The Project Study Area is situated within the Mixedwood Plains Ecozone and the Carolinian Life zone, both of which are confined to the southwestern portion of Ontario. The widespread alteration of the landscape for agricultural purposes in this part of the province has lead to significant loss of natural forest, wetland and grassland. Greater than 90% of the land in Kent County is classed as “improved” for agricultural purposes. Wabash Woods, located just north of the rail line and east of Huff’s Side Road, is identified as a life science site and by definition is “an area recognized as having ecological features” (NHIC, 2010). Wabash Woods is also recognized as a significant woodland in Schedule C10 of the Community of Chatham Kent Official Plan (Community of Chatham-Kent, 2005). Huff Woodlot south of Smoke Line and approximately 750 m west of Huff’s Side Road is owned by the SCRCA and is operated as a conservation property.

The NHIC database indicates that broad beech fern (*Phegopteris hexagonoptera*, NHIC rank of S3 – Vulnerable in the province due to restricted range, relatively few populations (80), recent and widespread declines, or other factors making it vulnerable to extirpation) and American chestnut (*Castanea dentate*, NHIC rank of S2; Imperilled in the nation or province because of extreme rarity or because of factor(s) such as steep declines making it especially vulnerable to extirpation from the province) are found within 1 km of the Project Study Area. Broad beech fern habitat typically includes dry woods and hillsides as well as rich soil of deciduous forests and is likely found within Wabash Woods. In the vicinity of the NHIC element occurrence, all woodlands are outside the

Project Site. American chestnut is found in dry forests, well-drained sands and gravels, usually mixed with other broadleaf trees. There is a chance it may be present in Huff Woodlot, which had an upland community within the Project Study Area [BioLogic, 2010].

The biological communities found within and adjacent to the Project Site are all common and secure and are listed in the BioLogic report (Appendix A). No site specific floral inventories have been conducted to date, however the wooded areas within the Project Site were classified by a Certified Arborist into plant communities using Ecological Land Classifications (refer to Appendix A for the full classification).

The BioLogic study reported that four S-ranked aquatic species occur in the area, likely in and around the Thames River. Those species are the azure bluet (*Enallagma aspersum,* damselfly), Kidneyshell (*Ptychobranchus fasciolaris*) mollusc, spiny softshell (*Apalone spinifera*, turtle) and gravel chub (*Erimystax x-punctatus*, fish). The NHIC also reported the occurrence of two terrestrial S-ranked species in the Project Study Area; Woodland Vole (*Microtus pinetorum*, Vulnerable – S3) and the tawny emporer (*Asterocampa Clyton*, Imperiled – S2) [BioLogic, 2010].

The eastern fox snake (*Elaphe vulpine gloydi*) was not listed in the NHIC database, however it is widely noted in Chatham-Kent. The eastern fox snake prefers unforested, terrestrial shoreline ecosystems adjacent to marshes and is currently listed as vulnerable (S3) by the NHIC but as threatened by the MNR.

Neil Morris Environmental (NME) was commissioned in 2007 to conduct a study of the avian populations in the Project Study Area and the potential effects of the Project on the populations (refer to Appendix B – Avian Study). Effects of the Project on avian populations are discussion in *Section 5.1.2 Biological Environment*.

A total of 1,012 individual birds were observed during the spring migration monitoring, representing 50 species. The five most frequently observed species were the common grackle (273 individuals observed), the European starling (140 individuals observed), the red-winged blackbird (87 individuals observed), the turkey vulture (55 individuals observed), and the tree swallow (52 individuals observed). A total of 27 species were observed during fall migration monitoring, considerably fewer than observed during the spring monitoring period. In terms of abundance, observations recorded during the fall migratory period were dominated by European starlings, and secondarily by blackbird species (Family Icteridae), including mixed blackbird flocks (red-winged blackbirds, common grackles, brown-headed cowbirds, bobolinks). Combined, the starlings and blackbirds accounted for about 78% of the 2215 individual birds observed during fall monitoring [NME 2007].

The bald eagle was directly observed in the Project Study Area and is ranked globally as “common”. The bald eagle is also classified as endangered at the provincial level and is regulated under the *Endangered Species Act* (ESA). Federally, the bald eagle has been assessed and is determined to be “Not at Risk”. One bald eagle nest was sighted along the north bank of the Thames River along the southern reach of the Project Study Area.

As mentioned above, the bobolink (*Dolichonyx oryzivorus*) was also seen in the Project Study Area. Recent changes to the ESA and more recently the release of O. Reg. 373/10, which revokes Schedules 1 to 3 of O. Reg. 230/08, sees the addition of Bobolink to Schedule 3 Threatened Species. As a result, under this regulation, bobolinks are immediately afforded habitat and individual protection under the ESA. Confirmed use of a habitat is required in order for the habitat protection provisions of the Act to apply, and permanent removal of habitat is prohibited without a permit. However, in the case of bobolink, temporary disturbance of breeding habitat may be permissible if rejuvenated for the next breeding season. If the Project has the potential to cause an adverse effect to bobolink and cannot be avoided, a permit, specific to the activity being undertaken, is required prior to the activity taking place. The application of the permit must demonstrate that an overall net benefit to bobolink will be achieved through conditions imposed by the permit and reasonable alternatives and steps to minimize adverse effects on bobolink have been considered.

In addition to the direct observations recorded during site-specific monitoring in the Project Study Area, there are historic records of bird species at risk in the general area. Among the NHIC element occurrences (EO) for the Project Study Area, the only bird species on record is the Louisiana waterthrush (*Seiurus motacilla*), a species of “Special Concern”, both federally and provincially. In a slightly expanded search of the NHIC EO database within 10 km of the Project Study Area, a single occurrence of northern bobwhite (*Colinus virginianus*) was reported, in addition to the occurrence of the Louisiana waterthrush. It should be noted that NHIC EOs for birds are usually defined as a breeding area or migration staging area, not a location of an isolated sighting. Thus, the two noted EOs indicate that there may have been a meaningful presence of these two species near the Project Study Area at some previous point in time. The likelihood of their presence in the Project Study Area at present is considered to be very low.

4.3 Socio-Economic Conditions

4.3.1 Demographics

The Project is located within the Township of Camden, Municipality of Chatham-Kent in southwestern Ontario. The population of Chatham-Kent grew 0.8% from 2001 (107,341) to 2006 (108,177) [StatsCan 2006]. Camden Township’s population decreased slightly from 2,161 in 2001 to 2,093 in 2006 [Chatham-Kent 2007]. Chatham, located approximately 15 km southwest of the Project Site, is the largest urban centre in Chatham-Kent, with a population of 45,282 [StatsCan 2006]. The Municipality of Chatham-Kent covers 2,458 km^2 and has a population density of 44 persons/ km^2, compared to 13.4 persons/ km^2 for Ontario as a whole. The population of Chatham-Kent does not exhibit high mobility; 88% lived at the same address one year prior to the 2006 census and 68% lived at the same address 5 years prior, compared to 87% and 59% respectively for the province as a whole.

4.3.2 Economic Development

The total population 15 years and over in the labour force in Chatham-Kent in 2006 was 57,240. In 2006, the unemployment rates were 7.1% for males and 7.2% for females, which were slightly higher than the 2006 rates for Ontario of 6.0% and 6.8%, respectively [StatsCan 2006]. Manufacturing (21%), Business Services (15%), Retail Trade (12%), Health Care and Social Services (9%) and Agriculture (9%) occupied the majority of Chatham-Kent’s experienced labour force [StatsCan 2006]. Chatham-Kent’s median income for 2005 was $25,797, compared to $27,258 for Ontario as a whole. Since 2006, unemployment has risen to approximately 14% [SLWDB 2010], primarily due to a downturn in manufacturing, particularly in the automotive sector.

Manufacturing, agriculture, retail and various services dominate the local economy. The largest employers in Chatham-Kent as of 2007 are shown in Table 4.3-1.

Table 4.3-1: Major Employers in Chatham-Kent

Employer	# Employees
Lambton-Kent District School Board	2,300
Municipality of Chatham-Kent	1,400
Chatham-Kent Health Alliance	1,300
International Truck and Engine Corp.	770
Union Gas Limited	706
St. Clair Catholic School Board	500
YA Canada	480
Mahle (Canada)	480
Autoliv Canada	471
Southwestern Regional Centre	400

Source: Chatham-Kent 2007.

Chatham-Kent's economic development strategy was updated in 2007 to include the following target sectors for growth [Chatham-Kent 2007]:

- Agriculture;
- Advanced automotive parts manufacturing;
- Business process outsourcing;
- Next-generation energy;
- Retail/ commercial; and
- Tourism.

4.3.3 Land Use

The subject lands are currently used for agricultural purposes and have been used for such purposes for over 80 years. The majority of the surrounding land uses are agricultural in nature. Agricultural activities are primarily for cash crops due to the highly productive soils throughout the region. There is also a large greenhouse operation directly south of the Project Site. In addition, there are a number of non-farm residential lots, generally described as being 4 hectares or less in area that have been severed from farm parcels over the past 40 years.

During initial public consultation, three (3) private unregistered airstrips were identified within or near the Project Site. In each instance, the owners of the airstrips have verbally indicated that the proposed turbine locations will not interfere with typical take-off or landing routes. None of the proposed turbine locations are positioned in line with the axis of any airstrip [IBI Group, 2009].

An active railway line runs through the Project Site in an east-west direction. This rail line is the Canadian Pacific Rail's main expressway between Windsor and Montreal. CPR has been consulted, and has indicated no concerns with proposed turbine locations [IBI Group, 2009].

According to the Kent Breeze Project Description Report [IBI Group, 2009], There is no reason to believe that there is any past contamination of the sites involved in the Project, based on the owner's knowledge of the properties and past history of land use.

There are no important or designated cultural or natural heritage sites within the Project Study Area. The St. Clair Region Conservation Authority owns a woodlot (Huff's Woodlot) immediately adjacent to the subject lands, which is used for woodlot management purposes, and is not a publicly accessible conservation area.

None of the proposed turbine locations would be located within 550 metres of a noise receptor. In terms of municipally designated settlement areas, the closest turbines would be approximately 1.8 kilometres from the Village of Thamesville, which is located east of the subject lands.

4.3.4 Social/Cultural Resources

A Stage 1 Archaeological Assessment [Archaeologix Inc., 2008] was conducted for the two land parcels located in the Municipality of Chatham-Kent. This Stage 1 archaeological assessment was conducted as part of the environmental assessment. The objective of the Stage 1 assessment was to compile all available information about the known and potential cultural heritage resources within the Project Study Area and to provide specific direction for the protection, management and/or recovery of these resources, consistent with Ministry of Culture guidelines (Government of Ontario 1993). The archaeological potential for precontact Aboriginal and Euro-Canadian sites was deemed to be moderate to high on these properties. For precontact Aboriginal sites this judgement is on account of the nearby water sources, level topography, and sandy soils. The historic Euro-Canadian potential was on account of documentation indicating possible late 18th century and early 19th century occupation plus the continued existence of historic transportation routes.

Accordingly, a Stage 2 Archaeological Assessment [Golder, 2010] was conducted, resulting in the identification of two Euro-Canadian historic locations. Artifacts dating from the mid to late 19th century were recovered from both locations. Due to the potential heritage value of both locations a Stage 3 archaeological assessment is recommended in order to determine their significance and information potential.

4.3.5 Noise

The Project Study Area can be best defined as Class 3 rural as per MOE Publications NPC-232 and NPC-233 [MOE, 1995a and 1995b]. The performance limits for Class 3 areas are listed in MOE Publication NPC-232 [MOE, 1995b]. The noise level limits are also provided in reference to wind induced background sound level in MOE Publication PIBS 4709e "*Noise Guidelines for Wind Turbines: Interpretation for Applying MOE NPC Publications to Wind Power Generation Facilities (October 2008)"*[MOE, 2008].

As defined in these MOE documents, the sound level limit for the residential receptors in a Class 3 area can be described as follows:

- For wind speeds at or below 6 m/s

The sound level limit at a Point of Reception, expressed in terms of the hourly equivalent energy sound level (L_{eq}) is 40.0 dBA or the minimum hourly background sound level established in accordance with requirements in Publication NPC-232/NPC-233, whichever is higher.

- For wind speeds above 6m/s

The sound level limit at a Point of Reception in a Class 3 Area (Rural), under conditions of average wind speed above 6 m/s respectively, expressed in terms of the hourly equivalent energy sound level (L_{eq}), is the wind induced background sound level, expressed in terms of ninetieth percentile sound level (L_{A90}) plus 7 dB, or the minimum hourly background sound level established in accordance with requirements in Publications NPC-232/NPC-233, whichever is higher.

These limits are summarized in Table 4.3-2.

Table 4.3-2: Summary of Class 3 Noise Level Limits Based on Average Wind Speed

Wind Speed at 10 m Height (m/s)	≤ 6	7	8	9	10
Class 3 Criteria (dBA)	40.0	43.0	45.0	49.0	51.0

4.3.6 Recreation

The Project Study Area is predominantly agricultural, with no major recreational features within 550 m.

4.3.7 Visual Landscape

The visual landscape of the Project Study Area is typical of a southwestern Ontario agricultural area with respect to topography and built heritage features.

4.3.8 Aboriginal Considerations

There are no known First Nations Reserve lands within the Project Study Area. In addition, there are no known existing or asserted First Nations rights or claims on the subject lands. The closest First Nations Reserve is the 1,285 ha Moravian of the Thames reserve located 8 km east of the Project Study Area along the Thames River.

The Ontario Ministry of Aboriginal Affairs has indicated (in a letter dated February 10, 2009 from Pam Wheaton, Director) that the Project Site does "not appear to be located in an area where First Nations may have existing or asserted rights that could be impacted by your Project", and a list of First Nations to contact was provided. Notification and invitation for comments were forwarded to the Bkejwanong Territory (Walpole Island) and Delaware Nation (Moravian of the Thames) by mail, email, and telephone on November 9, 2009. Follow-up telephone conversations occurred on February 1, 2010 discussing the status of any forthcoming comments. No comments have been received to date.

The Stage 1 Archaeological Assessment undertaken for the Project indicates that there is a moderate to high potential for pre-contact aboriginal archaeological sites on the subject lands due to the presence of water sources, the level land without areas of steep slope and the moderately drained sandy soils. As mentioned in Section 4.3.4, a Stage 2 Archaeological Assessment was conducted [Golder, 2010], resulting in the identification of two Euro-Canadian historic locations. Artifacts dating from the mid to late 19th century were recovered from both locations.

5.0 ASSESSMENT OF ENVIRONMENTAL EFFECTS, MITIGATION REQUIREMENTS AND RESIDUAL EFFECTS

The following sub-sections identify and describe likely effects of the Project on the environment, mitigation measures and residual adverse effects associated with the Project, as well as likely effects of the environment on the Project and cumulative effects with other projects. The assessment is divided into the following environmental components, as described in section 4, which could potentially be affected by the Project:

- Physical Environment (atmospheric environment, geophysical environment, hydrogeology and groundwater and surface water);
- Biological Environment (aquatic and terrestrial); and
- Socio-Economic Conditions (demographics, economics, social/ cultural resources, land use, recreation, noise, Aboriginal considerations).

5.1 Potential Effects of the Project

5.1.1 Physical Environment

Potential interactions of the Project on the Physical Environment are summarized as follows:

- Construction equipment engines have the potential to result in the minor, temporary emission of pollutants and greenhouse gases to the atmosphere during Site Preparation and Construction and Decommissioning;
- Exposed soil and stockpiles may result in the emission of dust to the atmosphere during Site Preparation and Construction and Decommissioning;
- Use of construction equipment and construction activities that change ground surface cover, including degree of soil compaction, and any necessary short term dewatering could potentially affect groundwater quality, quantity and movement;
- Removal of riparian vegetation during site preparation and construction activities (i.e., watercourse crossings) may increase erosion and sedimentation, which could potentially affect surface water quality and subsequently affect aquatic habitat; and
- Spills or releases of materials used could occur, including small quantities of fuel, lubricating oils and greases or other chemicals that could cause potential negative effects to groundwater quality.

The assessment of the effects of the Project on the environment is based on the following assumptions and limitations:

- A permanent concrete plant will not be located on the Project Site;
- Any water needs during all Project phases will be less than 50,000 L/day and can be met with clean water sources; and

- Fuels or other chemicals stored on-site will be properly contained. Due to the widely dispersed locations of the turbines across the Project Site, it is expected that fuel/chemical storage will be accomplished using one central depot.

Additional mitigation measures to reduce or eliminate potential adverse effects identified below are described in Section 5.2.

The assessment of effects that follows only addresses these likely effect pathways as no other interactions were determined to have a potential effect on the Physical Environment. No potential interactions with surface water were identified, due to the paucity of significant surface water features on the Site. Potential effects on the Aquatic Environment are considered in section 5.2.2 below.

5.1.1.1 Air Quality

Potential interactions of the Project on the Atmospheric Environment are summarized as follows:

- Use of construction and decommissioning equipment could result in the emissions of pollutants, dust and greenhouse gases such as carbon dioxide (CO_2); and
- By temporarily exposing soil and soil stockpiles, there could be an increase in air-borne dust.

Land clearing, road construction/modification, delivery of equipment, foundation construction, tower and turbine assembly and installation, and the interconnection from the turbines to the switching station are activities from the Site Preparation and Construction Phase that have the potential to affect air quality through the increased presence of construction and delivery vehicles and equipment, through the loss of vegetation and the generation of air-borne dust. Construction activities will lead to the emission of greenhouse gases (GHG) and indicator compounds, from vehicles and machinery operating on site.

During the Operations and Maintenance Phase of the Project, maintenance activities have the potential to cause minimal (infrequent and short-term) emissions of low levels of GHGs and indicator compounds from maintenance equipment and vehicles on site, and accordingly are not considered further. The removal of turbines and ancillary equipment, removal of buildings and waste, removal of power lines, and site remediation Project works are activities from the Decommissioning Phase that have the potential to affect air quality through the increased presence of construction and delivery vehicles and equipment, and through the generation of air-borne dust.

Site Preparation and Construction Phase activities as well as Operations and Maintenance and Decommissioning Phase activities will not involve the management or handling of odorous material. Therefore, odour emissions from the Project are not considered further.

Accordingly, effects related to the emission of dust and greenhouse gases during Site Preparation and Construction and Decommissioning are considered further with respect to mitigation measures (Section 5.2.1.1) and likely residual adverse effects (Section 5.4).

5.1.1.2 Soil Quality

Plausible mechanisms or pathways through which soil quality may be affected by the various Project activities include:

- Effects to soil through redistribution of previously affected soil; and
- Effects on soil quality from a spill or leak of fuels, lubricants or other chemicals during the removal of wastes from the Project Site.

Surveying and siting activities, land clearing, road construction/modification, delivery of equipment, temporary storage, foundation construction, tower and turbine assembly and installation and interconnection of turbines to switching stations are the Project works and activities from the Site Preparation and Construction Phase that have the potential to affect Project Site soil quality through redistribution of existing soils. Special care must be taken to identify and avoid any potential stockpiles of soil and/or impacted areas related to oil and gas operations in the area to prevent any distribution of contaminated soils.

Vehicles and equipment will be used for all activities during the Site Preparation and Construction Phase and have been considered as a part of the Project. Inappropriate handling, storage and/or disposal of equipment fuels and lubricants (i.e., antifreeze, transmission oil, hydraulic oil, grease etc.) during the Site Preparation and Construction Phase can result in leaks or spills that may affect soil quality.

During the Operations and Maintenance Phase, maintenance activities on the Project Site may affect soil quality through spills resulting from inappropriate storage, handling or disposal of equipment fuels and lubricants. Spills or leaks may originate from oils, greases and/or other chemicals stored on-site for maintenance of turbines and associated equipment, or from vehicles on the Project Site conducting maintenance (i.e., antifreeze, transmission oil, hydraulic oil or grease from cranes or other vehicles).

During the Decommissioning Phase, all Project works and activities may have an effect on soil quality as a result of redistribution of existing affected soils, erosion of soils during redistribution, or as a result of leaks and/or spills from vehicles. Additionally, the removal of buildings and waste may result in effects to soil quality as a result of a spill during movement of wastes.

Accordingly, effects on soil quality during all phases of the Project are advanced for consideration of mitigation measures (Section 5.2.1.2) and residual adverse effects (Section 5.4).

5.1.1.3 Groundwater Quality

All of the Project works and activities associated with the Site Preparation and Construction Phase have the potential to affect groundwater quality. The main pathways for these effects are via increased potential for infiltration of contaminants to the ground where they may affect groundwater quality. This may happen either by:

- Redistribution of previously impacted soil or introduction of contaminants into excavations;
- Dewatering activities; or
- Spills of oil, grease and vehicle fuels during construction, refuelling or maintenance activities (i.e., malfunctions and incidents).

During construction, temporary dewatering of the areas where turbine foundations are being constructed (e.g., where foundation extends below water table) may be required. As stated in *Technical Bulletin 2: Guidance for preparing the Design and Operations Report* (MOE, 2010d; Section 6.1) and *Technical Bulletin 3: Guidance for Preparing the Construction Plan Report* (MOE, 2010e; Section 2.3) as part of Ontario Regulation 359/09, a Permit to Take Water (PTTW) is not required under the *Ontario Water Resources Act*. However, upon construction, Suncor Energy Products Inc. (Suncor) will follow the guidance for application for a PTTW as published in the *Permit to Take Water Manual* (2005, publication 4932e), as necessary. In addition, if dewatering is anticipated then prior to the Site Preparation and Construction Phase, the characteristics of the near-surface “aquifer” will be assessed through the installation of monitoring wells during the detailed geotechnical assessment.

The main pathway by which the Project activities could affect groundwater quality during maintenance activities in the Operations and Maintenance Phase is through a spill or leak. Operation of the turbines themselves is not expected to create conditions for a spill. A leak or spill may include lubricants or other chemicals stored on the Project Site for turbine maintenance or a spill of oil, grease or vehicle fuels from equipment during routine maintenance activities.

All Decommissioning Phase activities identified have potential effects on groundwater quality either through redistribution of previously impacted soil or leaks or spills of oil, grease and/or vehicle fuels or during movement of wastes as part of decommissioning activities (i.e. malfunctions or failures).

Accordingly, effects on groundwater quality during all phases of the Project are advanced for consideration of mitigation measures (Section 5.2.1.3) and likely residual adverse effects (Section 5.4).

5.1.1.4 Groundwater Infiltration, Recharge and Flow

During the Site Preparation and Construction Phase of the Project, alteration of groundwater infiltration, recharge, and flow from all Site Preparation and Construction Phase activities are considered. This includes survey and siting operations, land clearing, road construction/modification, delivery of equipment, temporary storage facilities, foundation construction, tower and turbine assembly and installation, interconnection from turbine to switching station, fencing and gates, and parking lots. These works and activities may alter groundwater infiltration, recharge and/or flow via the following:

- Compaction, grading, paving and hardening of surfaces (i.e., buildings and roads);
- Redistributing soils; and
- Dewatering as part of foundation construction activities.

Alteration in existing surface cover and/or compaction of soils can potentially affect the degree to which precipitation and surface water can infiltrate into the subsurface. The construction of above-ground structures such as temporary storage facilities, switching stations facilities and turbines, and other hardening of surfaces (i.e., roads and workspace areas), will cause compaction and decrease surface infiltration which could have a minor affect on shallow groundwater flow by reducing recharge to the shallow, near-surface groundwater system.

No additional effects to groundwater infiltration, recharge or flow are predicted beyond those that were identified during Site Preparation and Construction Phase activities that would result due to Operations and Maintenance Phase works or activities. All Decommissioning Phase works and activities have the potential to affect infiltration and recharge, and correspondingly, groundwater flow through change in surface cover, including the removal of structures, and changes to compaction.

Accordingly, Site Preparation and Construction and Decommissioning related effects are considered further with respect to mitigation measures (Section 5.2.1.4) and likely residual adverse effects (Section 5.4).

5.1.2 Biological Environment

5.1.2.1 Aquatic Environment

Plausible mechanisms or pathways through which surface water quality and flow and aquatic habitat may be affected by the various Project activities include:

- Effects to aquatic habitat and species through sedimentation and loss of habitat (watercourse crossings) during Site Preparation and Construction Phase;
- Effects to surface water quality, quantity and aquatic habitat as a result of alterations to runoff patterns by changing the existing surface cover during the Site Preparation and Construction, and Operations Phases; and
- Effects on water quality from a spill or leak of fuels, lubricants or other chemicals during the Site Preparation and Construction Phase or Operations and Maintenance Phase and through the removal of wastes from the Project Site during the Decommissioning Phase.

The removal of vegetation during land clearing may increase the surface runoff thereby creating the potential for soil erosion and sedimentation to watercourses. During the Site Preparation and Construction Phase of the Project, effects on fish and fish habitat through the alteration of riparian and regulated floodplain areas, and watercourse crossings are considered. However no significant habitat loss is identified. The activities that have the potential to affect fish and fish habitat are land clearing, access road construction, temporary storage facilities, foundation construction and the underground cable connection between turbines through erosion and sedimentation.

As stated above, the construction of access roads and turbine foundations may change runoff patterns within the Project Area, which may have a potential to affect surface water quality, quantity and aquatic habitat. The average change in runoff during the Site Preparation and Construction, and Operations Phases across all lots sited with a turbine is 1.1% (Table 5.2-1), which will not be measurable in the drainage ditches. In turn, no potential residual adverse effects on surface water quality, quantity and aquatic habitat. Furthermore, activities such as the interconnection of turbines to the switching stations will only result in short-term changes to runoff patterns as the existing cover will be restored after the underground cabling has been installed and the trenches filled and re-vegetated. Therefore, runoff during the Site Preparation and Construction Phase is considered to be negligible and does not warrant further consideration.

Table 5. 2-1: Anticipated Change in Runoff under Existing and Proposed Conditions

Turbine Location	Approximate Lot Area (m^2)	Access Road and Turbine Foundation Area (m^2)	Existing Runoff (m^3/year)	Proposed Runoff (m^3/year)	Change in Runoff (%)
Kent-1	532,500	1,770	79,000	80,000	1.3
Kent-3	514,500	3,370	77,000	78,000	1.3
Kent-4	384,000	4,970	51,000	53,000	3.9
Kent-5	474,000	1,770	71,000	71,000	0.0
MacLeod-1	554,250	1,770	83,000	83,000	0.0
MacLeod-3	274,500	1,310	41,000	41,000	0.0
MacLeod-4	298,500	2,910	45,000	46,000	2.2
MacLeod-5	641,250	3,930	96,000	97,000	1.0
Total	**3,673,500**	**21,800**	**543,000**	**549,000**	**1.1**

Accidental spills of contaminants in or within a water feature, including hydrocarbons (diesel fuel, oil, etc.) during the Site Preparation and Construction Phase are considered to be potential sources of contamination, which may affect water and sediment quality in watercourses within the Project Area. The occurrence of accidental spills of contaminants during the Operations Phase is significantly lower. However, refuelling of vehicles and lubricating fluids required for the turbines will be used during this phase. During the Decommissioning Phase, diesel fuel and oils will be used for demolishing the Project infrastructure and waste removal from site will also take place. Therefore, accidental spills of contaminants may affect surface water quality and aquatic habitat during all phases of the Project. Since the occurrence and location of the spills cannot be predicted, mitigation measures will be employed (Section 5.2.2.1)

Accordingly, mitigation measures (Section 5.2.2.1) and likely residual adverse effects (Section 5.4) related to effects on the Aquatic Environment are discussed further below.

5.1.2.2 Terrestrial Environment

Plausible mechanisms or pathways through which floral and faunal abundance and distribution may be affected by the various Project activities include:

- Effects to individuals or populations of birds, bats, or other wildlife species during the Site Preparation and Construction, Operations and Maintenance , and Decommissioning Phases, or collisions with turbines during the Operation and Maintenance Phase;
- Effects to individuals or populations of flora, birds, bats, or other wildlife species through habitat loss or alteration, fragmentation, or degradation during the Site Preparation and Construction, and Decommissioning Phases;
- Effects to individuals or populations of birds, bats, or other wildlife species through sensory disturbance during all Project Phases, and dust deposition during the Site Preparation and Construction, and Decommissioning Phases; and

- Potential for adverse effects on wetlands, vegetation, locally important or valued ecosystems or other significant natural areas during all three Project Phases.

Activities associated with the Site Preparation and Construction Phase have the potential to affect floral communities by removing or degrading portions of existing ecosites or increasing the amount of dust and debris deposition. Activities associated with the Site Preparation and Construction and the Decommissioning Phases of the Project, including land clearing, and transport of equipment may also result in an increase in the quantity of dust and debris deposited on vegetation or physical habitat adjacent to roadways.

Habitat loss and alteration, primarily as a consequence of land clearing activities designed to accommodate turbines and ancillary components, may occur in the Project Site. Although land clearing will be limited to agricultural lands, and large trees that may provide roosting/nesting habitat for some species will not be removed, consideration of mitigation measures (Section 5.2.2.2) and likely residual adverse effects (Section 5.4) is provided below.

5.1.2.2.1 Birds

Sensory disturbance (visual and auditory), as a result of Site Preparation and Construction, and Decommissioning activities may result, under exceptional circumstances, in habitat alienation, displacement, or nest desertion. Studies in the Netherlands suggest that landbird, and in particular woodland songbird, population densities begin to decline at an average noise level of 42 dB [Reijnen *et al.,* 1996]. Forman and Hersperger (1996) further suggest that noise associated with traffic can affect bird populations by disrupting vocal communication required for mate selection, mate location, foraging communication, predator detection and avoidance, and parent-nestling communication. However, the noise associated with heavy machinery and construction activities is not expected to be dissimilar from the noise of agricultural machinery that regularly operates in the Project Site.

Bird mortality has been documented at operational wind development projects in North America and in southwestern Ontario. At a wind park along the Lake Erie shoreline in southwestern Ontario, bird mortalities ranged from 0-4 birds/turbine/year, with the highest rate of collision occurring at a turbine sited within 250 m of the shoreline [James, 2008]. The mortalities have often been attributed to in-flight collisions with wind turbine blades and/or the tower structures. The hazard that wind turbines pose to birds varies by season and by species, with spring and fall migration typically being of the highest risk periods. Contrary to previous suggestions, a recent literature review indicates that there is no evidence of a transportation-lighting effect on the collision rates of nocturnally migrating birds at wind turbines [Arnett *et al.,* 2007; Kunz *et al.,* 2007].

Accordingly, consideration of mitigation measures (Section 5.2.2.2) and likely residual adverse effects (Section 5.4) is provided below.

5.1.2.2.2 Bats

There is recent research that suggests that increased ambient noise may adversely affect foraging activity of bats [Schaub *et al.*, 2008], but Site Preparation and Construction, and Decommissioning Phase activities are expected to be limited to the daylight hours when bats are inactive. Therefore, no residual effects associated with sensory disturbance of bats are anticipated.

Although little is known about bat populations and distribution, particularly through the migration period, turbine operations could conceivably displace bats, cause roost or hibernacula abandonment, and result in reduced breeding success. Bat longevity is relatively high and reproduction rates are relatively low compared to birds, which as a result, potentially makes bat populations more vulnerable to effects [GAO, 2005; MNR, 2006]. Bat mortality has been documented at operational wind development projects in southwestern Ontario [James, 2008] and elsewhere [Baerwald et al., 2008]. The mortalities have often been attributed to in-flight collisions with wind turbine blades and/or the tower structures and barotrauma [Baerwald et al., 2008]. The risk that wind turbines pose to bats varies by season, with fall swarming and migration typically being the highest risk periods. For constructed wind power projects in Ontario, mortality rates during fall migration are generally estimated to be <4 bats/turbine/year [e.g., James, 2008] although the potential exists for much higher mortalities (i.e., >50 bats/turbine/year) at some wind parks outside of Ontario [e.g., MNR 2006].

Accordingly, consideration of mitigation measures (Section 5.2.2.2) and likely residual adverse effects (Section 5.3) is provided below.

5.1.3 Socio-Economic Conditions

The following sub-components of Socio-Economic Conditions are identified to have potential interactions with the Site Preparation and Construction, Operations and Maintenance or Decommissioning of the Project and are discussed further below:

- Economics;
- Noise;
- Electromagnetic Interference; and
- Public Health and Safety.

The description of existing conditions in Section 4.3 indicates that no interactions are likely between Site Preparation and Construction, Operations and Maintenance or Decommissioning of the Project and Demographics, Land Use, Cultural Resources, Recreation, Visual Landscape or Aboriginal Considerations. Accordingly, potential effects of the Site Preparation and Construction, and Operations and Maintenance of the Project on Economics, Noise, Electromagnetic Interference and Public Health and Safety Considerations are considered below. Effects of Decommissioning are expected to be bounded by effects during Site Preparation and Construction and Operations and Maintenance and are therefore not considered further.

5.1.3.1 Economics

The scale of capital investment, labour requirements (crew of approximately 10 workers per turbine, moving between turbines), and salaries forecast for the Project are relatively modest. Most employment opportunities on this Project will require specialized skills and training. The limited number of employees and short duration of employment requirements for the Project can most likely be met within the local municipality workforces and economies with negligible effects.

The positive effects of the Project will include a potential modest input of wages/salaries to the local economy if labour requirements are available locally, as well as expenditures for accommodation, meals and minor expenses. Opportunities for local procurement include for example; site preparation services, gravel, aggregate, concrete and sewage disposal services. There are also opportunities for longer term contracts for snow removal and access track, fence maintenance, etc.

The Project will pay annual property taxes to the Municipality and this will be shared with the County and local school board, which is also a beneficial effect of the Project. Landowners will also collect significant annual amounts based on the output of the Project. Evidence, predominantly from the Unites States, indicates that wind farms do not have an adverse effect on property values in the communities in which they are built and/or operate [Hoen et al., 2009].

The net effect of the Project on employment, business and the economy would be beneficial and therefore no further assessment is required.

5.1.3.2 Noise

The operation of wind turbines creates audible sound. The Ontario Ministry of the Environment (MOE) requires that wind farm operations undertake a detailed noise impact assessment. The MOE outlines the criteria for such an assessment in its publication *Noise Guidelines for Wind Farms, Interpretation for Applying MOE NPC Publications to Wind Power Generation Facilities*, which was recently updated (October 2008). Wind farms must comply with these guidelines in order to obtain the necessary Certificate of Approval (Air/Noise) under Section 9 of the Environmental Protection Act.

A noise impact assessment on the Kent Breeze Wind Farms was carried-out to determine compliance with Ontario Ministry of Environment “Noise Guidelines for Wind Farms” (MOE 2008). The Noise Assessment Report produced by Hatch is included as Appendix C.

Information on real and potential receptors was gathered by the IBI Group and forwarded to Hatch along with UTM coordinates for each. Wind turbine locations were laid out for noise compliance and also compliance to the setbacks required by Ontario Regulation 359/09. There are no other planned or approved wind farms within a 5 km radius of the Project Site.

Wind turbine noise emissions were adjusted for the site’s summer night-time wind shear which is higher than the manufacturers test site. The result of this adjustment meant that only a single sound power level was applicable for all wind speeds required to be examined by the MOE.

A secondary adjustment was made to the octave band noise emissions provided by the manufacturer so that the A-weighted sound power level met the manufacturer’s noise guarantee. The noise study documented in this report concludes that all receptors are compliant with the Noise Guidelines (MOE 2008). These guidelines require that noise at all receptors, except “participating” receptors be 40 dB or less when wind velocity at 10-m height is 6 m/s, which represents the worst case.

The maximum noise emission for a non-participating receptor at an existing dwelling is 39.8 dB. The maximum noise emission at a future dwelling placed on what is now a vacant lot is 40.0 dB. The sole participating receptor in the Project Study Area will experience 44.9 dB. This receptor is currently a house on a property controlled by Kent Breeze and may be demolished at a future date.

Although no additional mitigated is required for the Operations Phase of the Project, typical construction-related, effects during the Site Preparation and Construction Phase of the Project on Noise are considered further below in Section 5.2.3.1 and Section 5.4.

5.1.3.3 Electromagnetic Interference

The appropriate agencies associated with radio communications, radar, and seismo-acoustic monitoring have been consulted as suggested by the Radio Advisory Board of Canada and the Canadian Wind Energy Association with no concerns raised. In addition, the guidelines associated with siting turbines indicate that no such interference should occur based on the required setbacks. Where unexpected interference occurs, there are suitable mitigation measures which may be undertaken to correct situations.

The operation of the wind turbines may also cause electro-magnetic interference with point-to-point systems, particularly in the form of direct-to-home (DTH) satellite systems. A detailed study of existing DTH satellite systems was not undertaken, but a worst-case scenario analysis was used, assuming all off-site dwellings to potential DTH satellite system locations. Based on past research on wind turbine interference to DTH systems, particularly those in Southern Ontario, a typical satellite angle (20º - 30º) combined with wind turbine height (140m) would produce a setback of 240-385 metres required to not interfere with DTH satellite signals. Accordingly, no further assessment is required.

5.1.3.4 Public Health and Safety

Plausible mechanisms or pathways through which public health and safety may be affected by the various Project activities include:

- Personal injury during the Site Preparation and Construction, and Decommissioning Phases of the Project, including construction equipment and general construction activities; and
- Personal injury during the Operations and Maintenance Phase of the Project, including ice throw, shadow flicker, vibration, electromagnetic fields and structural hazards.

5.1.3.4.1 Construction Hazards

Public safety hazards are present on any construction/decommissioning site and require the implementation of appropriate safety measures to prevent incidents from occurring. One such hazard that exists during Site Preparation and Construction is the proximity to operating heavy machinery. Typical construction equipment to be used for construction of the turbine and switching station sites, roads and buried lines includes: tracked bulldozers, excavators, tippers and dumpers, mobile cranes, turbine and blade erection pads. Excavated trenches could pose a risk of injury to the public and once operational, buried cable could be a safety issue if accidentally encountered during digging or other excavation.

Mitigation measures for the public health and safety during Site Preparation and Construction are described in Section 5.2.3.2.

5.1.3.4.2 Ice Throw and Ice Shed

Under certain meteorological conditions, exposed structures, including wind turbines, can become covered with ice. There are two types of scenarios under these specific conditions: during operation, fragments of ice can be thrown off the blades due to aerodynamic and centrifugal forces ("ice throw") or ice can fall from the turbine when it is shut down or idling without power production ("ice shed") [Seifert *et al.,* 2003; Tammelin and Seifert, 2001].

A predictive modelling study has also been conducted by Garrad Hassan Consultants in May 2007, at the request of the Canadian Wind Energy Association (CanWEA). They examined a generic turbine scenario – a 2 MW capacity turbine with 80 m hub height and 80 m blades [Garrad Hassan, 2007]. The study concluded that ice was unlikely to fall more than 50 m from a stationary turbine. Based on known studies, it is very unlikely that ice throw would pose a significant risk to the public; however, mitigation measures for this potential adverse effect are considered further in Section 5.2.3.2.

5.1.3.4.3 Shadow Flicker

Shadow flicker occurs when wind turbine blades rotate in sunny conditions. This rotation causes moving shadows on the ground that result in alternating light intensity at a given location. About 3 per cent of people with epilepsy are photosensitive, which can produce a sensitivity to flicker frequencies between 5 to 30 Hertz (Hz) [CMOH, 2010]. The proposed wind turbines for the Project rotate at a speed of 5 to 14 m/s (less than 1 Hz); therefore, shadow flicker is not likely to cause injury to the public and this potential effect is not be considered further by the EA.

5.1.3.4.4 Low Frequency Sound and Vibration

Low frequency sound (or "infrasound") vibration from operation of wind turbines has been raised as a concern by members of the public. According to a recent report published by the Chief Medical Officer of Health (CMOH) of Ontario entitled "The Potential Health Effects of Wind Turbines", there is no scientific evidence to indicate that low frequency sound generated from wind turbines causes adverse health effects [CMOH, 2010]. Accordingly, the potential effects from low frequency sound and vibration are not considered further by the EA.

5.1.3.4.5 Electromagnetic Fields

On a daily basis, people are continually exposed to electromagnetic fields (EMF) at extremely low frequencies (3 to 300 Hz). Natural lighting, appliances, fluorescent lighting, power cords, hair dryers or larger outdoor distribution or transmission lines, all represent sources of EMF. At present, there are no Canadian government guidelines for exposure to EMFs at extremely low frequencies. Health Canada considers that the scientific evidence is not strong enough to conclude that typical exposures cause health problems.

The International Commission on Non-Ionizing Radiation Protection has established a continuous, magnetic field exposure limit of 0.833 G, or 833 mG, and a continuous electric field exposure limit of 4.2 kilovolt per metre (kV/m) for members of the general public.

According to the recent CMOH report, wind turbines are not considered a significant source of EMF since emissions levels around wind farms are low [CMOH, 2010]; therefore, the potential adverse effect from EMF is not considered further by the EA.

5.1.3.4.6 Structural Hazards

Although it is considered highly unlikely, there is a very low probability that a turbine could collapse or a blade or blade fragment could become detached and thrown while the turbine is in operation. The maximum reported throw distance in documented turbine failure is 150 m for an entire blade and 500 m for a blade fragment [CMOH, 2010]. It is considered highly unlikely that structural failure could result in the injury or fatality due to structural failure during operation of the wind turbines; however, mitigation measures for this potential adverse effect are considered in Section 5.2.3.2.

Likely residual adverse effects to Public Health and Safety are summarized in Table 5.4-2.

5.2 Mitigation Measures

5.2.1 Physical Environment

5.2.1.1 Air Quality

Best Management Practices (BMPs) for fugitive dust will be implemented at the site during Site Preparation and Construction and Decommissioning. This will help reduce the potential for dust generation and also mitigate emissions. The main items included in the BMP plan are as follows:

- Implementation of a speed limit on access roads within the Project Site, which will lead to reduced disturbance of dust on paved and un-paved surfaces;
- Application of dust suppressants to unpaved areas (i.e., unpaved roads, storage piles), which may include the use of water or chemical dust suppressants;
- Staging of land clearing and heavy construction activities to reduce the number of activities with high potential for dust generation occurring simultaneously. This will be done to the extent that is feasible, based on the Project schedule;
- Re-vegetation of cleared areas, as soon as is possible, and maintenance of the vegetation to ensure growth;
- The installation of wind fences in areas where they may be required; and

- The implementation of a complaint response program, whereby complaints received from the public are recorded and investigated. The investigations should be focused on determining the cause of the complaint and, if necessary, mitigative measures should be implemented.

Emissions of GHGs and indicator compounds will be managed as best as possible by implementing specific measures, as follows:

- Ensure proper maintenance of all vehicles, to reduce the potential for abnormal operation and increases in emissions;
- Implementation of a speed limit on access roads within the Project Site; and
- Implementation of rules regarding idling of engines, to limit idling of vehicles as much as possible.

The likely residual adverse effect of dust and other emissions on air quality is summarized in Table 5.4-2.

5.2.1.2 Soil Quality

Mitigation measures to minimize any effects of a spill on soil quality include the development and effective implementation of an appropriate Site Preparation and Construction Phase Emergency Management Plan (EMP), including a spill contingency plan. Such a spill contingency plan generally includes the following protocols:

- Proper maintenance of vehicles and construction equipment;
- Conducting refuelling and maintenance in designated areas;
- Maintenance of a supply of spill control materials on the Project Site (absorbent material, absorbent booms, etc); and
- Proper training of workers for spill prevention and containment.

The EMP will clearly identify the required measures to provide environmental protection according to the construction activity and the equipment used for the Project. Implementation of the spill contingency plan within the EMP will provide measures to preclude or minimize potential adverse effects related to soil contamination. This will be developed after the detailed engineering design and geotechnical assessment, but prior to applying for the building permits.

All spills to the natural environment need to be reported to the MOE. O. Reg. 675/98 provides exemptions for the reporting of “insignificant” spills. Specifically, spills of petroleum products or mineral oils (excluding PCB liquids) that are less than 100 L (as defined under Class VI and VII) and do not have the potential to cause an adverse effect or enter the water environment and can be remediated immediately, do not have to be reported assuming the conditions for exemption are met. A Class X spill as defined by O. Reg. 675/98 is exempt from reporting if:

  - The spill is not likely to enter any waters, defined in *Ontario Water Resources Act*, directly or through drainage structures; and

- The spill would not have the potential to cause an adverse effect and can be readily remediated (paved, graveled or sodded surfaces); and
- The quantity, quality and circumstances are specified in a spill prevention and contingency plan; and
- Plans are prepared in accordance with the prescribed requirements of O. Reg. 224/07.

If a facility plans to invoke the Class X exemption to avoid reporting a spill to the natural environment, the Site must ensure that all the conditions of this exemption are met. For those spill scenarios that are deemed by the Site to be non-reportable, appropriate documentation must be maintained to support this assertion. O. Reg. 675/98 also requires persons in control of pollutants to record details of spills and maintain those records for a period of two years. In addition, the Technical Standards and Safety Authority must be immediately notified of spills associated with fuel aboveground or underground storage tanks.

Accordingly, the above mitigation measures are deemed appropriate for the spill scenarios identified above and there is a negligible risk to soil quality during the Site Preparation and Construction Phase from spills alone. Nonetheless, the likely residual adverse effect on soil quality is summarized in Table 5.4-2.

5.2.1.3 Groundwater Quality

The assessment of effects to groundwater quality from on-site spills during Site Preparation and Construction is similar to that for soil quality (see the previous section). Development and effective implementation of an EMP, including a spill contingency plan, will provide the necessary mitigation measures to minimize or eliminate potential effects to groundwater quality. As mitigation measures are in place and are deemed appropriate, there is minimal risk to groundwater quality during the Site Preparation and Construction Phase. The likely residual adverse effect on groundwater quality is summarized in Table 5.4-2.

5.2.1.4 Groundwater Infiltration, Recharge and Flow

The construction of roads and structures are estimated to result in less than a 1% change in the surface cover over the leased lots within the Project Site. Also, the workspaces around turbines and storage areas are temporary and the topsoil will be replaced (e.g., surfaces will be re-vegetated) following completion of the Site Preparation and Construction Phase. Roads created for Site Preparation and Construction Phase activities will be reduced from 10 to 5-6 m wide for permanent use, with the remainder having topsoil replaced following completion of the Site Preparation and Construction Phase. This replacement of topsoil following completion of the Site Preparation and Construction, and Decommissioning Phases represents effective mitigation inherent in the Project to minimize potential effects on groundwater infiltration, recharge and flow through changes in surface cover

When temporary workspaces around turbines and storage areas are removed following construction, compaction will be mitigated by ripping subsoils to reduce compaction prior to replacement of topsoil. The deep ploughing of soils to reduce compaction following completion of the Site Preparation and Construction Phase represents an effective mitigation inherent in the Project to minimize effects on infiltration, recharge and groundwater flow though changes in soil compaction. Nonetheless, the likely residual adverse effect on groundwater infiltration recharge and flow is summarized in Table 5.4-2.

5.2.2 Biological Environment

5.2.2.1 Aquatic Environment

The erosion impacts on surface water quality and subsequently on the aquatic environment can be minimized by implementing BMPs for Site Preparation and Construction. There are several guideline documents that outline these BMPs prepared by various conservation authorities (i.e., Toronto Region Conservation Authority, Grand River Conservation Authority) and provincial ministries (MOE, MNR). The following points outline some practices that are commonly included:

- Plan construction activities to minimize the disturbed area at any given time;
- Interception and diversion of storm runoff around disturbed areas;
- Stabilization of disturbed areas through grading and re-vegetation;
- Implanted buffer strips of vegetation between disturbed areas and watercourses;
- Minimization of off-site vehicle tracking of soil;
- Construction of any stormwater and sediment ponds prior to any other construction activities;
- Restriction of water use for dust control only;
- Installation of temporary erosion control fencing prior to any grading or excavation to minimize silt migration from the site and to delineate the limits of stripping and grading;
- Installation of erosion control fencing around all stockpiles, manholes and catch basins;
- Placement of geotextile fabric under catch basin grates;
- Removal of accumulated sediment from control measures (ponds, fencing, etc) at completion of construction or after significant accumulation; and
- Minimize construction during wet weather.

With the implementation of the following mitigation measures, effects on fish and fish habitat during the Site Preparation and Construction Phase will be minimized:

- Ensure proper containment and stabilization of all construction-generated sediment to minimize overland sediment transport;
- Design and install stringent erosion and sediment control measures (i.e., silt fence adjacent to watercourses in the areas in which access roads and/or turbine foundations/temporary storage facilities will be constructed) and maintain these measures throughout construction until disturbed areas are regraded and revegetated;
- Follow existing DFO Operational Statements [DFO, 2009] and acquire the necessary permitting from the conservation authorities for the installation of watercourse crossings (All watercourse crossings are via directional drilling 2.5m beneath the bottom of the watercourse and DFO permits are not anticipated);

- Re-stabilize and re-vegetate exposed surfaces as soon as possible, using native vegetation. It is recommended that any woody riparian vegetation that is removed (trees and shrubs) be replanted with similar native tree and shrub species;
- Ensure a clear delineation of work site vegetation clearing zones and vegetation retention zones to minimize the risk of off-site vegetation impacts and avoid incidental impacts as a result of temporary stockpiling, debris disposal and access during construction. Ensure the use of appropriate vegetation clearing techniques (e.g., trees to be felled away from the retained vegetation);
- Ensure appropriate clearing and disposal of all construction-related debris following construction;
- Employ proper handling of potentially toxic construction materials and adhere to spill management protocols;
- Ensure an adequate number of emergency spill kits are maintained on-site during construction and operation; and
- Implement environmental inspection during construction to ensure that protection measures are implemented, maintained and repaired and remedial measures are initiated where warranted.

The implementation of the above mitigation measures will preclude or minimize any potential negative environmental effects to surface water and subsequently the aquatic environment, associated with erosion and sedimentation, and spills of contaminants during all phases of the Project. Any accidental spills will be dealt with immediately in accordance with the MOE's Spills and Discharges Reporting Protocol as required by the *Ontario Environmental Protection Act* (s. 92 and s. 15). The likely residual adverse effect on aquatic habitat is summarized in Table 5.4-2.

5.2.2.2 Terrestrial Environment

Site preparation and construction, operations and decommissioning activities are not expected to encroach on any significant natural features. However, to mitigate the potential effect of habitat loss and alteration, the layouts for access roads, turbines, and ancillary structures have been designed to minimize alteration of the existing native vegetative cover (e.g., by using existing roadways wherever possible). As appropriate, and prior to Site Preparation and Construction, and Decommissioning, the limits of vegetation clearing will be staked in the field. The construction contractor(s) will be diligent so that no construction or decommissioning disturbance occurs beyond the staked limits and that woodlot edges and other sensitive areas adjacent to the work areas are not disturbed. To minimize the amount of dust and debris that will be deposited on native flora, periodic watering of active construction roads will occur and the number of soil piles and actively disturbed areas will be limited. As a result of these mitigation measures no residual effects to vegetation resulting from dust deposition are anticipated. Implementing these mitigation measures is expected to maintain the existing forest communities and cultivated lands and therefore no residual effects are anticipated.

As stated in Section 4.2.2, the release of O. Reg 373/10 and provisions under the ESA, prohibits the removal of potential habitat utilized by bobolink unless a permit is obtained. Bobolink habitat will not be cleared for the Project; therefore, a permit will not be required. However, ongoing consultation with the MNR will be completed to ensure the Project is in accordance with the ESA and O. Reg. 373/10.

Potential sensory disturbance of birds and bats is expected to be mitigated by restricting activities that remove or alter vegetation outside of the breeding season (April until August) for most bird species. As required under the *Migratory Bird Conventions Act* (1994) or *Fish and Wildlife Conservation Act* (1997), should any construction activities be required on the Project Site during the breeding season, avian nest surveys will be undertaken to identify the presence of nesting birds and appropriate temporary species-specific setbacks will be created in consultation with EC/CWS and MNR and exclusion zones flagged from the work area(s). With the implementation of these mitigation measures, minimal residual effects associated with sensory disturbance to birds are anticipated.

The potential for bird and bat mortality is reduced by following the principle of avoidance (e.g., Project siting considerations) and implementing good planning practices (e.g., lighting and marking selection). All turbines are to be located at least 125 m from all woodlots and in order to reduce the risk of migratory bird fatality and turbines will also not be operated during periods of intense fog. Based on these mitigation measures and publicly available data from other wind power projects in eastern North America, minimal residual effects associated with avian and bat mortality are expected to persist throughout the life of the Project. Nonetheless, likely residual adverse effects on birds and bats are summarized in Table 5.4-2.

5.2.3 Socio-Economic Conditions

5.2.3.1 Noise

Feasible mitigation measures to reduce the effect of noise on Socio-economic Conditions during Site Preparation and Construction include many common best management practices such as restricting construction activities to daytime hours and using modern, well-maintained equipment. Current zoning and land-use indicators suggest that noise due to construction will not affect residential homes near the Project Site and will likely not be much different than the farming machinery sounds common in the area.

Based on the results of the Noise Impact Assessment, operation of the wind turbines and switching stations will result in noise levels that are below the most restrictive noise limit of 40 dBA set by the MOE for wind farms (i.e., the noise limit attributed to a wind speed of 6m/s at a height of 10m). Therefore, no significant adverse effects attributed to noise during the Operations Phase are anticipated. The switching station does not contain noise generating transformer equipment.

5.2.3.2 Public Health and Safety

In order to ensure public safety for the duration of the Site Preparation and Construction Phase, the contractor will ensure that the following safety measures are implemented as appropriate:

- Appropriate warning signage (including locations of underground cable);
- Speed restrictions;
- Road closures;
- Vehicle lighting;

- Safety fencing surrounding trenches, or work space, as necessary;
- Standard cable markers will be installed as appropriate to indicate the presence of underground cable on public lands; and
- Traffic direction.

The setback distances from the turbines will minimize exposure to residents during the Operations and Maintenance Phase. Additional migration measures are listed below:

- In addition to minimum setback distances, the turbines are located on agricultural land where there will be little or no pedestrian traffic under the turbines.
- When icy conditions occur, operators can stop the turbines to minimize risk from ice throw.
- Each turbine has a comprehensive control system to monitor the turbine and wind conditions to determine if conditions are suitable for operation. Turbines may be turned away from the direction of the wind to avoid risk of injury from excessive wind speeds.

5.3 Accidents and Malfunctions

CEAA requires that the potential for environmental effects as a result of accidents and malfunctions be considered. The primary protective measures for accidents and malfunctions are the safe design of the wind turbines and safe work procedures and maintenance for the Site Preparation and Construction, Operations and Maintenance and Decommissioning Phases. A suitable level of training for workers during all phases of the Project will be provided, including safe work procedures to prevent and/or minimize the occurrence of accidents and malfunctions.

Accidents and malfunctions from the Project having the potential to cause adverse effects include the following:

- Leaks/spills of oils, lubricants or fuels from equipment used during all phases of the Project (Section 5.1.1.2 and Section 5.1.1.3);
- Personal injury during the Site Preparation and Construction, and Decommissioning Phases of the Project, including construction equipment and general construction activities (Section 5.1.3.4); and
- Personal injury during the Operations and Maintenance Phase of the Project, including ice throw, shadow flicker, vibration, electromagnetic fields and structural hazards (Section 5.1.3.4).

The mitigation measures for the potential malfunctions and accidents are provided in Section 5.2.

5.4 Residual Adverse Effects

Table 5.4-1 presents the criteria used determining the level of importance of residual adverse effects identified in Table 5.4-2. Potential effects of the Project on the environment, an evaluation of their significance, mitigation measures proposed to reduce or eliminate the effects, and residual adverse effects are summarized in Table 5.4-2 below.

Table 5.4-1: Level of Importance of Residual Adverse Effects

Level	Definition
High	Potential effect could threaten sustainability of the resource and should be considered a management concern. Research, monitoring and/or recover initiatives should be considered.
Medium	Potential effect could result in a decline in resource to lower-than-baseline but stable levels in the study area after project closure and into the foreseeable future. Regional management actions such as research, monitoring and/or recovery initiatives may be required.
Low	Potential effect may result in a slight decline in resource in study area during the life of the project. Research, monitoring, and/or recovery initiatives would not normally be required.
Minimal	Potential effect may result in a slight decline in resource in study area during construction phase, but the resource should return to baseline levels.

Table 5.4-2: Residual Adverse Effects of the Project on the Environment

Environmental Component	Impact Characteristics and Magnitude	Mitigation Summary	Residual Adverse Effects
Air Quality			
Dust and vehicle/equipment emissions could affect local air quality	***Nature:*** Negative ***Magnitude:*** Low ***Spatial:*** Project Study Area ***Timing:*** Site Preparation and Construction, and Decommissioning ***Duration:*** Short-term ***Reversibility:*** High ***Likelihood:*** High	Maintain clean construction site, vegetate or occasionally moisten high dust-producing areas, maintain vehicles and equipment properly.	Minimal
Soil Quality			
Redistribution of potentially contaminated soils and leaks/spills of oils, lubricants or fuels from equipment used during all phases of the Project.	***Nature:*** Negative ***Magnitude***: Low ***Spatial:*** Project Site ***Timing:*** All Phases ***Duration:*** Intermittent ***Reversibility:*** High ***Likelihood:*** Medium	Implement Emergency and Spills Management Plans including: Properly maintain vehicles and construction equipment; Conduct refuelling and maintenance in designated areas; Maintain a supply of spill control materials in the Project Site (absorbent material, absorbent booms, etc); Identification and avoidance of areas of impacted soil.	Minimal
Groundwater Quality			
Potential infiltration of contaminants into groundwater	***Nature:*** Negative ***Magnitude:*** Low	Implement Emergency and Spills Management Plans	Minimal

Environmental Component	Impact Characteristics and Magnitude	Mitigation Summary	Residual Adverse Effects
from redistribution, dewatering and spills/release from machinery or storage locations	***Spatial:*** Project Site ***Timing:*** All Phases ***Duration:*** Intermittent ***Reversibility:*** High ***Likelihood:*** Medium	including: Properly maintain vehicles and construction equipment; Conduct refuelling and maintenance in designated areas; Maintain of a supply of spill control materials in the Project Site (absorbent material, absorbent booms, etc); and Proper training of workers for spill prevention and containment.	
Groundwater Infiltration, Recharge and Flow			
Alteration in existing surface cover and/or compaction of soils can potentially affect the degree to which precipitation and surface water can infiltrate into the subsurface.	***Nature:*** Negative ***Magnitude:*** Low ***Spatial:*** Project Site ***Timing:*** Site Preparation and Construction and Decommissioning ***Duration:*** Intermittent ***Reversibility:*** High ***Likelihood:*** Medium	Reduce compaction of soils via deep ploughing following completion of the Construction Phase (to reduce necessary access road sizes) and after decommissioning. Accordingly, the above mitigation measures are deemed appropriate for mitigating changes to infiltration, recharge and groundwater flow and no residual effects are predicted	Minimal
Aquatic Environment			
Erosion and contaminant spill impacts on water quality may degrade surface water quality and aquatic habitat	***Nature:*** Negative ***Magnitude:*** Low ***Spatial:*** Project Study Area ***Timing:*** Site Preparation and Construction and Decommissioning ***Duration:*** Intermittent ***Reversibility:*** Low ***Likelihood:*** Medium	Implement best management practices (see section 5.2.2.1 for complete list of associated mitigation measures)	Low
Terrestrial Environment			
Sensory disturbance and habitat loss to birds and bats	***Nature:*** Negative ***Magnitude:*** Medium ***Spatial:*** Local ***Timing:*** All Phases ***Duration:*** Intermittent ***Reversibility:*** High	Special care will be taken to not disturb any Bald Eagle nests (avoidance – if found); Restrict activities that remove or alter vegetation outside of the breeding season for most bird species; do not operate turbines	Minimal

Environmental Component	Impact Characteristics and Magnitude	Mitigation Summary	Residual Adverse Effects
	Likelihood: Medium	in thick fog.	
Fatalities of birds and bats due to turbine strikes	***Nature:*** Negative ***Magnitude:*** Low ***Spatial:*** Local ***Timing:*** Operations and Maintenance ***Duration:*** Continuous ***Reversibility:*** Low ***Likelihood:*** Low	Follow the principle of avoidance (e.g., Project siting considerations); implement good planning practices (e.g., lighting and marking selection); do not operate turbines in thick fog.	Low
Noise			
Construction vehicles and equipment may affect noise levels	***Nature:*** Negative ***Magnitude:*** Low ***Spatial:*** Local ***Timing:*** Site Preparation and Construction ***Duration:*** Short-term ***Reversibility:*** High ***Likelihood:*** Likely	Restrict construction activities to daytime hours and use well-maintained equipment.	Minimal
Operation of wind turbines emit noise	***Nature:*** Negative ***Magnitude:*** Low ***Spatial:*** Local ***Timing:*** Operations and Maintenance ***Duration:*** continuous ***Reversibility:*** High ***Likelihood:*** High	Turbines will be set back from noise receptors according to Ontario Regulations Ensure proper maintenance of equipment to minimize noise emitted.	Low
Public Health and Safety			
Personal injury during the Site Preparation and Construction Phase	***Nature:*** Negative ***Magnitude:*** Low ***Spatial:*** Local ***Timing:*** Site Preparation and Construction ***Duration:*** Short-term ***Reversibility:*** low ***Likelihood:*** Low	Training for safe work procedures to prevent and minimize the occurrence of accidents, and proper maintenance to prevent or minimize malfunctions.	Minimal
Personal injury during the Operations and Maintenance	***Nature:*** Negative ***Magnitude:*** Low ***Spatial:*** Local ***Timing:*** Operations and Maintenance ***Duration:*** Short-	Minimum setback of turbines, and operation of the turbines during safe weather conditions.	Minimal

Environmental Component	Impact Characteristics and Magnitude	Mitigation Summary	Residual Adverse Effects
	term ***Reversibility***: low ***Likelihood***: Low		

5.5 Effects of the Environment on the Project

5.5.1 Climatic Fluctuations

Weather is characterized as a non-linear dynamic system. Average climatic conditions tend to be relatively stable and predictable. On the scale of decades, climatic changes can result from interaction between the atmosphere and oceans. Many climatic changes are a result, in part, of the different ways that heat is stored in the oceans and moved between reservoirs. Ocean processes operate on longer time scales and can redistribute heat, dramatically affecting climate. It is generally accepted that global warming is occurring as a result of the emission of greenhouse gases (GHGs) into the atmosphere. Global warming will not only increase the earth's temperatures, but also increase the number of extreme weather events.

The Project Site was chosen because of favourable wind conditions, which are a function of climate. While effects of climatic fluctuations cannot be precisely predicted, they are not anticipated to alter the wind resource beyond required levels during the operational life of the Project (30 years).

5.5.2 Extreme Events

Historically wind project sites have occasionally experienced extreme wind speeds caused by a severe weather situation, such as a hurricane or tornado. Extreme wind events can result in mechanical load levels that can lead to damage or failure of wind turbine components. Failures may not only prohibit the operation of the wind turbine, but could also lead to injury. Public health and safety issues associated with catastrophic failure of the turbine or blade detachment are addressed in Section 5.2.3.2.

In Ontario the potential risks associated with flooding are assessed primarily by local Conservation Authorities. Regulation Limits have been defined for watercourses within the Lower Thames Valley Conservation Authority under Regulation 147/06 and Ontario Regulation 171/06 respectively. The Regulation Limit includes flood limits and hazardous lands that may be susceptible to extreme storm events causing flooding or erosion. Construction within the Regulation Limit requires permission under the Regulation applicable for the CA having jurisdiction. Effects of changes in stream flow rates are considered to be negligible to low. As a result, flood hazard is not further considered in this section.

As shown in Table 5.5-1, the GE Energy 2.5xl wind turbine has been designed to withstand a reasonably foreseeable level of mechanical loading caused by an extreme wind event:

Table 5.5-1: Extreme Design Parameters for the GE 2.5xl 2.5 MW Wind Turbine (Source: GE, 2009)

Wind Climate	IEC 2B	IEC 3A
Ambient temperature interval (normal temperature turbine)	-20 to 40˚C	
Extreme wind speed (10 minute average)	42.5 m/sec	37.5 m/sec
Survival wind speed (3 second gust)	59.5 m/sec	52.5 m/sec

Lightning Strikes

Lightning strikes during storm events also have the potential to damage the turbines and associated infrastructure (such as the switching stations). As mentioned in section 2.5.1, the turbines will be equipped with lightning protection systems designed to route lightning into the ground. The wind turbine is equipped with lightning protection which protects the entire turbine from the tip of the blades to the foundation. The system enables the lightning current to by-pass all vital components within the blade, nacelle and tower therefore limiting the potential for damage. As an extra safety precaution, the control units and processors in the nacelle are protected by an efficient shielding system. The lightning protection is designed according to IEC 61024 – “Lightning Protection of Wind Turbine Generators”.

Icing

Icing events would occur in conditions where there is a period of snow thaw/melt followed by quick periods of sub-zero conditions (i.e., in the winter and spring), or when precipitation may quickly turn from rain to freezing rain or snow. Both of these weather scenarios would create conditions where ice could form on the surface of turbine blades and the nacelle. Commercial wind turbines are equipped with vibration monitors that deactivate the turbine when vibrations exceed a certain level, due to mass and/or aerodynamic imbalance which can be caused by ice (Garrad Hassan, 2007). Based on the location of the Project, it is possible that climatic conditions will occasionally create icing events, and periodically cause turbine shut-down.

Seismicity

As indicated in Section 4.1.5, the Project is located in a zone of low seismic activity considered to be a low hazard zone. Turbine construction will comply with all requirements of the Ontario Building Code and will be subject to inspection from the Canadian Standards Association (CSA). As a result, seismicity is not anticipated to have any effect on the Project.

5.6 Cumulative Effects

Cumulative effects are a combination of residual effects of the Project in conjunction with any environmental effects of past, present and future projects or activities. The approach for this cumulative effects assessment (CEA) has been completed with regard to the *Canadian Environmental Assessment Act* Cumulative Effects Assessment Practitioners Guide [Hegmann *et al*, 1999]. The objective of the CEA is to identify and assess the cumulative effects of this Project in conjunction with other unrelated projects during a period of time that extends into the past and reasonably foreseeable future. There are a number of ways that a cumulative effect may occur, including:

- Physical-chemical transport – physical or chemical material is transported from the Project via a pathway, and then interacts with another action or Project component;
- Nibbling loss – several activities compound the loss of land or habitat;
- Spatial and temporal crowding – effects resulting from too much activity within too small an area or too short an amount of time. Temporal crowding occurs when an element of an environmental component is not allowed enough time to recover from an activity; and
- Growth-inducing potential – where each activity encourages subsequent activities that compound an effect. These actions are often called "spin-off" actions.

5.6.1 Scoping

5.6.1.1 Residual Adverse Effects of the Project

The CEA builds on the results of the assessment of the effects of the Project that are considered to have a likely residual adverse effect on the environmental components. Potential effects of the Project on the environment, an evaluation of their significance, mitigation measures proposed to reduce or eliminate the effects, and residual adverse effects are summarized in Table 5.4-2. As shown in Table 5.4-2, residual adverse effects of the Project were reported for the following environmental components:

- Air quality;
- Soil quality;
- Groundwater quality;
- Birds and bats;
- Aquatic habitat;
- Noise; and
- Public health and safety.

As noted in Table 5.4-2, all residual adverse effects identified as part of the Project were rated as minimal or low after mitigation measures were applied.

5.6.1.2 Spatial Boundaries

The spatial extent of the CEA is limited to the residual adverse effects that are considered. For instance, the extent of noise and dust is limited to the site-vicinity; whereas, potential cumulative effects on birds and bats from several wind farms are assessed in the context of a larger regional setting.

5.6.1.3 Temporal Boundaries

The temporal boundary was chosen to provide a reasonable timeframe to carry out the CEA. Other projects that have the potential to act cumulatively with the Project are identified in three categories:

- Previous and existing projects and activities;
- Certain/planned projects and activities; and
- Reasonably foreseeable projects and activities.

The temporal boundary was chosen to include those existing projects and activities present at the time of the EA studies were carried out (i.e., during surveys and investigations conducted as part of the EA). Since it is difficult to accurately forecast the construction and operation of other projects in the future, the projects and activities considered are those currently planned in the reasonably foreseeable future.

5.6.1.4 Identification of Projects with Similar Types of Effects

The proposed Project is located in an area currently used for agricultural purposes. Agricultural activities are primarily for cash crops due to the highly productive soils throughout the region.

The municipality of Chatham Kent is also an area that includes a range of other industries such as advanced automotive parts manufacturing, alternative energy generation, business process outsourcing, service, and tourism.

The other projects and activities that could act cumulatively with the Project are listed in Table 5.6-1. A brief description and rationale for including the project/activity and the type of effect that could act cumulatively is also provided in Table 5.6-1.

Table 5.6-1: Other Projects and Activities

Project Name/Activity	Project/Activity Description	Type of Effect
Past and Existing Projects and Activities		
Kruger Energy Port Alma	The Kruger Energy Port Alma wind power project is an operating wind farm with a total electricity generating capacity of 101.2 MW. The wind farm is located on 4,800 ha of agricultural land optioned for wind development near Port Alma, Ontario in the municipality of Chatham Kent. The wind farm has 44 Siemens 2.3 MW Mark II wind turbines. The Kruger Energy Port Alma is located approximately 45 km southwest of the Project.	■ Air quality; ■ Birds and bats; and ■ Noise.
Gengrowth Marsh Line	The Gengrowth Marsh Line project is an operating wind farm with a total electricity generating capacity of 10 MW. The wind farm is located on approximately 1 ha of agricultural land in the municipality of Chatham Kent. The wind farm has 5 wind turbines, each rated at 2 MW. The Gengrowth Marsh Line project is located	■ Air quality; ■ Birds and bats; and ■ Noise.

Project Name/Activity	Project/Activity Description	Type of Effect
	approximately 20 km west of the Project.	
Gengrowth Front Line	The Gengrowth Front Line project is an operating wind farm with a total electricity generating capacity of 10 MW. The wind farm is located on agricultural land near the town of Morpeth in the municipality of Chatham Kent. The wind farm consists of 5 wind turbines, each rated at 2 MW. The Gengrowth Front Line project is located approximately 25 km southeast of the Project.	■ Air quality; ■ Birds and bats; and ■ Noise.
Gengrowth Bisnett Line	The Gengrowth Bisnett Line project is an operating wind farm with a total electricity generating capacity of 10 MW. The wind farm is located on agricultural land near the town of Blenheim in the municipality of Chatham Kent. The wind farm consists of 5 wind turbines, each rated at 2 MW. The Gengrowth Bisnett Line project is located approximately 25 km south of the Project.	■ Air quality; ■ Birds and bats; and ■ Noise.
Abandoned Oil and Gas Wells	There are several abandoned oil and gas wells present on the Project site and site-vicinity. The proposed locations of the wind turbines avoid the abandoned wells.	■ Soil quality; and ■ Groundwater quality.
Planned and Approved Projects and Activities		
Kruger Energy Centre Chatham Wind Project	The Kruger Energy Chatham Wind Project is an approved 101.2 MW wind farm being developed by Kruger Energy on agricultural land in municipality of Chatham Kent. The Kruger Energy Chatham Wind Project will be located approximately 50 km southwest of the Project.	■ Air quality; ■ Birds and bats; and ■ Noise.
Raleigh Wind Centre	The Raleigh Wind Energy Centre is an approved 78 MW wind farm being developed by Invenergy on 38 ha of agricultural land in the municipality of Chatham Kent. The project includes 52 1.5 MW GE wind turbines. The Raleigh Wind Energy Centre will be located approximately 35 km southwest of the Project.	■ Air quality; ■ Birds and bats; and ■ Noise.
Talbot Wind Farm	The Talbot Wind Farm is an approved 99 MW wind power project being developed by Renewable Energy Systems Canada Inc. on 44 ha of agricultural land in the municipality of Chatham Kent. The Talbot Wind Farm will be located approximately 25 km southeast of the Project.	■ Air quality; ■ Birds and bats; and ■ Noise.
Wind Prospect Harwich	The Wind Prospect Harwich project is an approved 9.9	■ Air quality;

Project Name/Activity	Project/Activity Description	Type of Effect
	MW wind farm to be developed by Wind Prospect on agricultural land in the municipality of Chatham Kent. The Wind Prospect Harwich project will be located approximately 20 km south of the Project.	■ Birds and bats; and ■ Noise.
SkyPower Solar Farm	The Wind Prospect Harwich project is an approved 9.9 MW wind farm to be developed by Wind Prospect on agricultural land in the municipality of Chatham Kent. The Wind Prospect Harwich project will be located approximately 20 km south of the Project.	■ Air quality; ■ Birds and bats; and ■ Noise.

5.6.2 Assessment of Potential Effects of the Other Projects

Table 5.6-2 contains an assessment and summary of the cumulative effects of this Project.

Table 5.6-2 Assessment and Summary of Cumulative Effects

Ecosystem Component	Residual Adverse Effects from the Project	Other Activities	Assessment of Cumulative Effects	Level of Cumulative Effect
Air Quality	Dust and vehicle/equipment emissions could affect local air quality	■ Use of construction and maintenance equipment by other wind power projects could result in the emissions of pollutants, dust and carbon dioxide (CO2) ■ By temporarily exposing soil and soil stockpiles, there could be an increase in air-borne dust from other wind power projects	The nearest other wind power project is a 10 MW wind farm located approximately 20 km from the Project site. Other wind power projects in the regional area are considered to be located too far away to act cumulatively with the Project.	Minimal
Soil Quality	Redistribution of potentially contaminated soils and leaks/spills of oils, lubricants or fuels from equipment used during all phases of the Project	■ Previously impacted soil from previous oil and gas well operations	Disturbance of potentially contaminated soils could affect soil quality due to previously impacted soil	Minimal
Groundwater Quality	Alteration in existing surface cover and/or	■ Previous hardening of	Increased compaction of soils from previous oil	Minimal

Ecosystem Component	Residual Adverse Effects from the Project	Other Activities	Assessment of Cumulative Effects	Level of Cumulative Effect
	compaction of soils can potentially affect the degree to which precipitation and surface water can infiltrate into the subsurface.	surfaces (i.e., roads) due to oil and gas well operations	and gas well operations could potentially affect infiltration	
	Potential infiltration of contaminants into groundwater from spills/release from machinery or storage locations	■ Previously impacted soil from previous oil and gas well operations	Disturbance of potentially contaminated soils could adversely affect soil quality due to previously impacted soil	Minimal
Birds and Bats	Sensory disturbance and habitat loss	■ Effects to individuals or populations of birds, bats, or other wildlife species through sensory disturbance from other wind power projects, and dust deposition during the Site Preparation and Construction, and Decommissioning Phases from other wind power projects ■ Effects to individuals or populations of flora, birds, bats, or other wildlife species through habitat loss or alteration, fragmentation, or degradation during the Site Preparation and Construction, and Decommissioning Phases of other wind power projects	The nearest other wind power project is a 10 MW wind farm located approximately 20 km from the Project site. Other wind power projects in the regional area are considered to be located too far away to act cumulatively with the Project.	Minimal
	Fatalities due to turbine	■ Effects to	Increased collisions from	Low

Ecosystem Component	Residual Adverse Effects from the Project	Other Activities	Assessment of Cumulative Effects	Level of Cumulative Effect
	strikes	individuals or populations of birds, bats, or other wildlife species from other wind power projects due to collisions with turbines during the Operations and Maintenance Phase	the Project in conjunction with other wind power projects	
Noise	Construction vehicles and equipment may affect noise levels	■ Noise from the site preparation and construction of other wind power facilities	The nearest other wind power project is a 10 MW wind farm located approximately 20 km from the Project site. Other wind power projects in the regional area are considered to be located too far away to act cumulatively with the Project.	Minimal
	Operation of wind turbines	■ Noise from the operation of wind turbines from other wind power facilities	The nearest other wind power project is a 10 MW wind farm located approximately 20 km from the Project site. Other wind power projects in the regional area are considered to be located too far away to act cumulatively with the Project.	Low
Public Health and Safety	Personal injury during the Site Preparation and Site Preparation and Construction Phase	■ Risk of personal injury from other wind power projects	The nearest other wind power project is a 10 MW wind farm located approximately 20 km from the Project site. Other wind power projects in the regional area are considered to be located too far away to act cumulatively with the Project.	Minimal
	Personal injury during the Operations and Maintenance Phase	■ Risk of personal injury from other wind power	The nearest other wind power project is a 10 MW wind farm located	Minimal

Ecosystem Component	Residual Adverse Effects from the Project	Other Activities	Assessment of Cumulative Effects	Level of Cumulative Effect
		projects	approximately 20 km from the Project site. Other wind power projects in the regional area are considered to be located too far away to act cumulatively with the Project.	

5.6.3 Conclusion

Given the large separation distances, it is not expected that other existing and foreseeable wind power projects will act cumulatively with the Project to alter the conclusions on adverse effects of noise, air quality, public health and safety, and bird and bats environmental components. The significance of the adverse effects on soil quality and groundwater quality is not altered due to the cumulative effects of previous oil and gas operations since the specific locations of the abandoned oil and gas wells are not in contact with the Project infrastructure.

6.0 FOLLOW-UP PROGRAMS AND MONITORING

Proposed follow-up programs and monitoring activities associated with the operation of the facility include the following items:

- An Environmental Management Plan will be developed to ensure that the Project maintains compliance with the required regulations and monitors the effectiveness of any mitigation measures proposed in this document. This includes maintaining compliance with the Certificate of Approval for air and noise.
- Future commitments for determining effects to migratory birds, bats and other wildlife include additional field monitoring efforts conducted in the first year of operations. Details of such commitments will be confirmed by the Province, in consultation with the local conservation authorities and/or Environment Canada – Canadian Wildlife Service.

Although no new activities, equipment or structures are proposed at this time, should any of these items be added in the future, further review of the potential impacts may be required.

No other proposed follow-up or monitoring is anticipated as a result of this Project.

7.0 CONSULTATION

IBI Group was hired by the Proponents to assist in the mandatory public consultation process mandated by the Renewable Energy Approvals process under Ontario Regulation 359/09. The IBI consultation report, including copies of communications with the various organizations, ministries and groups is included as Appendix D.

7.1 Public Consultation

The public consultation process is determined by the proponents but must include specific mandatory notifications, and must be designed to give appropriate opportunities and forums for the public to participate in the screening process. A summary of the public consultation actions undertaken for the Project along with the corresponding dates are listed in Table 7.1-1. Government agency consultation is described in Section 1 of this report. Appendix D contains copies of all relevant correspondence records for the Project.

Table 7.1-1: Public Consultation Actions

Action	Date
Notice of Commencement of Environmental Screening	October 8 & 15, 2008 (Newspaper – Thamesville Herald) October 8, 2008 (Canada Post mail)
Informal Discussions with public (phone / email)	October – December 2008
1st Public Information Centre	December 3, 2008
Public Information Centre Formal Follow-ups (email)	January 21 – 23, 2009
Continued consultation	January – March 2009
2nd Public Information Centre / Public Meeting	January 11, 2010

A Notice of Commencement and invitation to the first Public Information Centre was placed in the local newspaper and mailed to a list of 363 recipients. The mailing list included all registered landowners within the geographic Project Study Area. A GIS shape file of the Project Study Area was sent to the Municipal Property Assessment Corporation who identified all of the registered landowners and forwarded the mailing addresses. Several public comments were received after issuing the Notice of Commencement and are summarized in Table 7.1-2.

Table 7.1-2: Notice of Commencement Responses

Comment author	Comment	Response
Landowner within Project Study Area	Doesn't want to see turbines / Stray voltage concerns / Property devaluation	Was invited to public information centre to review actual turbine layout and learn more about the Project.
Landowner within Project Study Area	Wanted more information about Project and to know exact turbine locations.	Was informed that turbine locations were not finalized and invited to public information centre when probable locations of turbines

Comment author	Comment	Response
		would be available.
Two separate landowners outside of Project Study Area	Wanted information on potential impacts to their private airplane landing strips.	The three (3) local private landing strips were mapped and land owners were provided with approximate distances to proposed turbine locations. All were satisfied with expected distances which in each case exceeded 1.5 km.

As part of the Notice of Commencement an invitation to a Public Information Centre (PIC) was mailed out and advertised in the local newspaper. The PIC was held on December 3rd, 2008 from 6-9 pm at the Brunner Community Centre in nearby Thamesville.

The PIC was conducted as an open house allowing members of the public to view displayed Project information and ask questions of various members of the Project team. A sign-in sheet was provided and comment sheets were encouraged to be used to have a document of all identified questions and concerns. A total of 27 persons signed in, and 8 comment sheets were completed. A summary of the key items on the completed comment sheets are as follows:

- 5 requests for a copy of the presentation boards displayed at the PIC to be emailed;
- Concern about interruption to wireless internet signal;
- Sound and infrasound concerns;
- Vibration concerns;
- Potential impacts to water table;
- Stray voltage / grounding standards;
- Shadow flicker;
- Several requests to discuss the Project with Council; and
- Property devaluation.

All of these questions/concerns were replied to individually by e-mails on January 21, 2009.

A second PIC was held on January 11, 2010. Notice was given by the same list used for the first PIC and was advertised in the Thamesville Herald. Information pertaining to the second PIC related to the final layout of the Project as a result of internal changes made based on the results of background environmental studies and changes made by the Green Energy Act and REA process.

Three requests for copies of the Project Description Report were received and provided for prior to the PIC. In addition, one phone call was received prior to the PIC to express concerns over the Project. The phone call raised concerns over noise, stray voltage, impacts to birds, and how the Project could be opposed. The member of the public was informed of what the background studies found in relation to his concerns, where such answers could be found, and what the REA appeals process involved. The member of the public was invited to the PIC but did not attend.

The second PIC was conducted in a similar fashion as the first, as an open house allowing members of the public to view displayed Project information and ask questions of various members of the Project team. This was followed by a sit down question and answer session where team members responded to questions from the public. A total of 16 persons signed in, and 4 comment sheets were completed. A summary of the key items on the completed comment sheets are as follows:

- Effects on property values;
- Expected benefits to community (e.g., local construction personnel, lodging);
- How are health issues addressed?
- How are conflicts and complaints addressed?
- Concern about noise;
- Dust from heavy traffic causing health issues (e.g., Asthma);
- Low level sound concerns; and
- Aesthetic issues in terms of not wanting to see wind turbines.

All of these questions/concerns were replied to during the January 11 meeting during the Q&A session. A summary of responses to questions from the attendees as well as the section(s) of this report where more related information can be found are listed in Table 7.1-3.

Table 7.1-3: Public Information Centre Questions/Comments and Responses

Question/Comment	Response	Report Section
Private airplane landing strips	All operators were satisfied through analysis of distance between facilities which was relayed via telephone conversations.	4.3.3
Interruption to wireless internet signal	The guidelines associated with siting turbines indicate that no such interference should occur based on the required setbacks. Where unexpected interference occurs, there are suitable mitigation measures which may be undertaken to correct situations.	5.1.3.4
Sound and Infrasound concerns	The Ministry of the Environment has developed guidelines to ensure wind turbines are setback appropriately from sensitive land uses to ensure public health and safety associated with wind turbine. Information regarding the development of these guidelines are available from the MOE website under the heading “Development of Noise Setbacks for Wind Farms”.	4.3.5, 5.1.3.2

Question/Comment	Response	Report Section
Vibration Concerns	Studies indicate that there is nothing unique or detectable associated with wind turbines and ground-level vibration that would suggest potential health concerns could be encountered at sensitive land use sites, particularly at setbacks driven by noise safety levels.	5.1.3.4.4
Potential impacts to water table	The majority of turbine foundations are wide and shallow with an average depth of 3 metres (10') below ground level. As such, it is not anticipated that any impact to ground water tables will be encountered.	5.1.1.2, 5.1.1.3
Stray voltage / grounding standards	Stray voltage is caused by changing current patterns in electrical distribution lines and is commonly associated with aging electrical lines. Hydro One and the Ontario Electrical Safety Authority ensure the safety of any new electrical components associated with wind energy generation projects. In addition, this Project is directly connected to existing overhead electrical transmission lines and will not be associated with any local distribution lines.	5.1.3.3, 5.1.3.4.5
Shadow flicker	Indications are that shadow flicker will not be an issue at the Project Site given the required 550 metre setback for noise purposes. However, should unexpected situations arise, common mitigation measure may be employed to avoid flicker nuisances such as window treatments, awnings, or tree planting.	5.1.3.4.3
Requests to discuss the Project with Council	At the time this concern was raised, the public was informed that a municipal public meeting would be scheduled at a future date. Since this time, the REA has exempted renewable energy undertakings from municipal approval. However, Kent Breeze Corporation and MacLeod Windmill Project Inc. are committed to informing the municipality of the Project who will inform Council of the Project as per their standard practices and procedures.	N/A
Property devaluation	There is no evidence to suggest that house prices surrounding wind facilities are consistently, measurably, or significantly affected by the view of, or the distance from, wind turbines. The most recent study was conducted by the US Department of Energy and can be found at: http://eetd.lbl.gov/ea/EMS/reports/lbnl-2829e.pdf.	5.1.3.1

Question/Comment	Response	Report Section
Expected benefits to community	Temporary direct economic benefits could be realized during the construction phase as a result of employing local contractors where possible; the use of local aggregates/sand/cement; and overnight accommodations, meals, etc. Benefits may also be realized through the increased tax assessment to the Municipality combined with the lack of municipal services and facilities. Benefits may also be realized through road improvements where identified as required by the Municipality.	5.1.3.1
How are health issues addressed?	Health issues are addressed through compliance with MOE regulations and appropriate protocols to prevent and/or address potential health concerns. An Emergency Response Protocol and Dispute Resolution Protocol have been developed.	5.2.3.2., 5.3
How are conflicts and complaints addressed?	An Emergency Response Protocol and Dispute Resolution Protocol are being developed.	N/A
Dust from heavy traffic causing health issues (i.e. Asthma)	The Construction Plan Report outlines methods for reducing dust which will be standardized through an agreement with the Municipality.	5.1.1.1

Although all comments and questions received from the public were considered with respect to project design and potential mitigation measures, no changes were made to the Project as a result of any comments or concerns from the PICs.

7.2 Aboriginal Engagement

7.2.1 Bkejwanong Territory (Walpole Island First Nations)

A draft REA package was hand delivered to Bkejwanong Territory on November 9, 2009 to the attention of Chief Joseph Gilbert and Dr. Dean Jacobs. This package included a Project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed Project.

Follow up telephone conversations occurred on February 1, 2010 discussing the status of any review or forthcoming comments. No comments have been provided to date by this community.

7.2.1.1 Stage 2 Archaeological Assessment

On November 30, 2009, Stage 2 Archaeological fieldwork was conducted by Golder Associates with the assistance of Leroy Altiman, a Bkejwanong observer.

7.2.2 Moravian of the Thames First Nations

A draft REA package was hand delivered to Moravian of the Thames First Nation on November 9, 2009 to the attention of Chief Gregory Peters. This package included a Project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed Project. A follow up phone call and message was left on February 2, 2010. No comments have been provided to date by this community.

7.2.3 Munsee-Delaware Nation

A draft REA package was couriered to Munsee-Delaware Nation on December 21, 2009 to the attention of Band Council and Chief Patrick Waddilove. This package included a Project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed Project.

Follow up telephone conversations occurred on February 2, 2010 discussing the status of any review or forthcoming comments. Chief Patrick Waddilove stated that they would probably not review based on time constraints, but directed the request to Paul Henry for possible review. No comments have been provided to date by this community.

7.2.4 Chippewas of the Thames First Nation

A draft REA package was couriered to Chippewas of the Thames First Nation on December 21, 2009 to the attention of Band Council and Chief Vaughn Albert. This package included a Project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed Project. A follow up phone call and message was left on February 1, 2010. No comments have been provided to date by this community.

7.2.5 Oneida Nation of the Thames

A draft REA package was couriered to Oneida Nation of the Thames on December 21, 2009 to the attention of Band Council and Chief Joel Abram. This package included a Project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed Project.

A follow up phone call and message was left on February 3 and February 25, 2010. No comments have been provided to date by this community.

7.2.6 Caldwell First Nation

A draft REA package was couriered to Caldwell First Nation on December 21, 2009 to the attention of Band Council and Chief Louise Hillier. This package included a Project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed Project.

A follow up phone call and message was left on February 2, 2010. No comments have been provided to date by this community.

Based on the aboriginal consultation undertaken to date, there are no outstanding concerns that have not either been fully addressed through correspondence or proposed mitigation measures.

8.0 CONCLUSION

Based on the results of the Environmental Impact Study conducted and detailed in this report, four potential environmental impacts were identified including noise, air quality, soil quality, surface and groundwater quality, aquatic habitat and bird and bat disturbance and mortality. Economic analysis of the Project provided a positive impact by providing local and municipal employment opportunities and increased revenue to the area.

The maximum noise emission for a non-participating receptor at an existing dwelling is 39.8 dB, which is below the MOE regulation value of 40 dB. The sole participating receptor in the Project Study Area will experience 44.9 dB. This receptor is currently a house on a property controlled by Kent Breeze and may be demolished at a future date. The Noise Assessment conclusions imply that no mitigation measures are required after construction of the turbines is complete.

Air emission sources associated with the construction of the Project include dust and vehicle/equipment emissions. Impacts to air quality from construction and maintenance vehicle emissions and dust are to be mitigated through the implementation of best management practices and represent a minimal residual effect on the environment.

Potential impacts to soil quality may arise from spills or leaks from machinery or from redistribution of previously impacted soils. Mitigation measures to minimize any effects of a spill on soil quality include the development and effective implementation of an appropriate Construction Phase EMP, including a spill contingency plan. Mitigation measures to minimize any impacts related to redistribution of existing affected soils include identifying and avoiding areas of contaminated soil or where avoidance is not possible, handling and disposing of contaminated soil according to provincial and federal regulations. The above mitigation measures are deemed appropriate and there is a minimal risk to soil quality during the lifetime of the Project.

Alteration in existing surface cover and/or compaction of soils can potentially affect the degree to which precipitation and surface water can infiltrate into the subsurface. Potential infiltration of contaminants into groundwater from spills/release from machinery or storage locations may also affect groundwater quality. Implementation of a Construction Phase EMP to mitigate the effects of any spills and deep ploughing of compacted areas after their use is no longer required are deemed appropriate and there is minimal risk to groundwater quality during the lifetime of the Project.

Riparian vegetation removal and land clearing, as well as accidental spills of contaminants may potentially affect surface water quality and aquatic habitat. A number of BMPs will be employed, as necessary, into the project design in order to minimize the effects from site preparation and construction activities on watercourses in the Project Area (i.e., silt fencing, revegetation after construction, areas designated for refuelling, etc.)

The potential exists for birds and bats to be struck and killed by turbine blades and for birds and bats to be subject to sensory disturbance leading to habitat loss from the sound of the turbines. Special care will be taken to not disturb any nesting areas and not to remove vegetation outside of the breeding season for most birds. Careful Project siting consideration, implementing good planning practices (e.g., lighting and marking selection) and not operating turbines in thick fog will result in the Project having a low to minimal effect on birds and bats in the Project Study Area.

Monitoring and follow-up programs include the creation and implementation of an Environmental Management Plan to ensure continued compliance with the required regulations and effectiveness of mitigation measures proposed. Future commitments for determining effects to migratory birds, bats and other wildlife include additional field monitoring efforts conducted in the first year of operations. Details of such commitments will be confirmed by the Province, in consultation with the local conservation authorities and/or Environment Canada – Canadian Wildlife Service.

No significant environmental effects were identified to likely result from the Project during the Site Preparation and Construction, Operations and Maintenance or Decommissioning Phases.

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Report Signature Page

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APPENDIX A

BioLogic Report

NATURAL HERITAGE ASSESSMENT REPORT
for Renewable Energy Approval

Kent Breeze and MacLeod Windfarm

Prepared for Kent Breeze Corp.

By BioLogic
May 2010

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Natural Heritage Assessment Report for Renewable Energy Approval - Kent Breeze and McLeod Wind Farm

1.0 Introduction

Kent Breeze Corp. is contemplating the construction and operation of a wind power renewable energy generation facility. The facility has two sites termed the Kent Breeze Wind Farm and the MacLeod Windmill Project in the Municipality of Chatham-Kent [Figure 1]. BioLogic was retained by Kent Breeze Corp. to undertake a natural heritage study for a broader study area which would provide an analysis and recommendations for wind farm design and wind turbine placement in relation to sensitive natural heritage features (BioLogic, March 2009). The background report also evaluated a preliminary wind farm design which was since altered to the present configuration [Figure 2].

In August, 2009, Ontario Regulation 359/09 was approved which guides the review process for the Ontario Ministry of Natural Resources with respect to Renewable Energy Approvals.

This Natural Heritage Assessment Report for a Provincial Renewable Energy Approval (REA) utilizes the information contained in the background report (BioLogic, March 2009) along with site specific field investigations based on the finalized Wind Farm design and construction plans [Figure 2]. Vegetation communities are based on ELC classification described in Figure 9 later in this report.

1.1 Purpose and Objectives

The purpose of this Natural Heritage Assessment Report is to assess all natural features within 120 m of the project location (described in Section 2.0).

Acts, guidelines, and land use plans reviewed as part of this evaluation process include:

- Environmental Protection Act - Renewable Energy Approval Regulation: Ontario Regulation 359/09 Section 1, 25, 26, 27 (MOE 2009),
- Conservation Authorities Act: Ontario Regulation 171/06 (2006),
- Conservation Authorities Act: Ontario Regulation 152/06 (2006),
- Municipality of Chatham-Kent Official Plan (2005),
- Approval and Permitting Requirements Document (MNR 2009),

- Provincial Approvals for Renewable Energy Projects Guide (MOE 2010),
- Wind Turbines and Birds. A Guidance Document for Environmental Assessment (MOE, 2006),
- Guideline to Assist in the Review of Wind Power Proposals Potential Impacts to Bats and Bat Habitat Developmental Working Draft (MNR, 2007),
- Natural Heritage Reference Manual (MNR, 1999),
- Significant Wildlife Habitat Technical Guide (MNR, 2000).

1.2 Report Format

The following sections provide an assessment of natural heritage features and functions, determining the boundaries of natural features, and evaluating significance of these features.

Section 2.0 Project Location: Describes the project location**.**

Section 3.0 Records Review: In accordance with Section 25 of the Renewable Energy Approvals Regulation (O.Reg. 359/09), this section reviews existing information to identify any natural heritage features within 120 m of the project location.

Section 4.0 Site Investigation: In accordance with Section 26 of the Renewable Energy Approvals Regulation (O. Reg. 359/09) this section provides a summary of site specific investigations and/or reconnaissance to update information obtained through the records review. Natural heritage features or functions no longer present or not previously identified are noted in this section.

Section 5.0 Evaluation of Significance: In accordance with Section 27 of the Renewable Energy Approval Regulation (O.Reg. 359/09), any natural heritage features identified within 120 m of the project location following the site investigation are evaluated for significance based on the Natural Heritage Reference Manual (MNR, 1999) and Appendix Q of the Significant Wildlife Habitat Technical Guide (MNR, 2000).

Section 6: Natiural Heritage Considerations: This section provides an overview of additional recommendations and considerations during construction activity.

Section 7: Approvals and Permitting Requirements

2.0 Project Location

The proposed wind energy generation facilities, named Kent Breeze Wind Farm and MacLeod Windmill Project are within the Municipality of Chatham-Kent, Kent County west of the Town of Thamesville [Figure 1]:

Kent Breeze Wind Farm

- Concession 1, Part Lot 4, Part Lot 5, Part Lot 6, Part Lot 8 and Concession 2 Part Lot 5, Part Lot 6

MacLeod Windmill Project

- Concession 1, Part Lot 8, Part Lot 9, Part Lot 10, and Concession A, Part Lot 8

The Kent Breeze Wind Farm lease holdings covers an area of approximately 242ha while the MacLeod Windmill Project occupies approximately 194ha [Figure 1].

2.1 Wind Energy Generation Facility (Windfarm) Description

Each facility contains four (4), 2.5 MW turbines. Underground cable connections are planned to link the turbines along a 10m wide working width. Directional drilling is planned under the active rail line that bisects the lower portion of the MacLeod Windmill Project site, as well as at any crossings of open water ways. Roadway access is from municipal roads. Storage of turbines upon delivery will be at the individual sites with construction activity confined to the access road and turbine base. [Figure 2].

There are no barns or buildings between proposed turbines and woodlands. Navigation lighting required for the wind farm projects are based on current standards for safety and protection of avian species (colour of light, flash duration and interval).

2.2 Terms and Requirements

For the purposes of this report, project location means a part of the land, water or air space that any component (construction activity, drive way, cable, turbine) of the renewable energy project will occupy.

In accordance with O. Reg. 359/09, the project location is evaluated to determine whether provincially significant features including wetlands, woodlands, valleylands, wildlife habitat, provincial park, conservation reserve and life science ANSI's are within 120 m [Figure 3]. Earth Science ANSI's area evaluated within a 50 metres of the project location. Any of the above features within the prescribed distances would require further review in an Environmental Impact Study (EIS).

3.0 Records Review

Existing records were reviewed to identify provincial park, conservation reserve or natural features within 120m of the project location which may be considered of provincial significance.

Records reviewed include the following:

- Natural Heritage Information Centre Database (MNR)
- Lower Thames Valley Conservation Authority Regulated Areas
- St. Clair Region Conservation Authority Regulated Areas
- Local Official Plan (Municipality of Chatham-Kent Official Plan, 2005 - Community of Camden Township
- St.Clair Region Watershed Report Card 2001-2005, www.scrca.on.ca
- Natural Heritage Background Report (BioLogic, 2009)

3.1 Official Plan Review

3.1.1 Environmental Designations

Woodlands greater than 2 hectares are considered significant within the Municipality of Chatham-Kent (Schedule C10 Natural Heritage Features, Municipality of Chatham -Kent Official Plan, 2005). There are no significant woodlands within 120m of the project location [Figures 3 and 4].

There are discrepancies between Schedule C10 - Natural Heritage Features of the Chatham-Kent Official Plan (2005) and current air photos. Noted discrepancies include missing woodlots (i.e. Wabash Woods - MNR Life Science Site) from Schedule C10, and differences in woodlot size, shape and location. In these instances, the aerial photo is used as the basis for the natural heritage review.

The Official Plan identified a flood prone area which is discussed under the Conservation Authority Regulatory Designations (Section 3.2).

3.1.2 Land Use Designations

The land use within 120m of the project location is designated Agriculture Area (Land Use Schedule A10 of the Chatham-Kent Official Plan - Community of Camden Township, 2005) [Figures 3 and 5]

3.2 Regulatory Designation Review

The boundary between St. Clair Region Conservation Authority (SCRCA) and Lower Thames Valley Conservation Authority (LTVCA) lies generally between the two sites [Figure 6].

<u>Kent Breeze Wind Farm</u>

The SCRCA Generic Regulation Limits - Ontario Regulation 171/06, identifies a 30m regulation limit associated with two watercourses (Shaw Ferguson Drain and Dobson Drain Branch in the south and Courtney Drain in the north) both within the Kent Breeze Wind Farm [Figure 6].

The Mason Drain, within the LTVCA jurisdiction, traverses the lower part of the Kent Breeze Wind Farm [Figure 6].

<u>MacLeod Windmill Project</u>

The LTVCA Generic Regulation Limits - Ontario Regulation 152/06, identifies a 30m regulation limit associated with four open watercourses (Mason Drain and three unamed tributaries of the Cryderman Drain), plus a flood hazard associated with the Thames River within the MacLeod Windmill Project [Figure 6].

There are differences noted between the flood hazard line associated with the Thames River on the LTVCA mapping and the Environmental Designations in Schedule C10 - Natural Heritage Features of the Chatham-Kent Official Plan - Community of Camden Township, 2005. For this report, the flood line shown on the LTVCA mapping is used to reflect Thames River flood hazard.

3.3 Physical Setting Records Review

3.3.1 Physiography

The Kent Breeze Wind Farm and the MacLeod Windmill Project are located on the Bothwell Sand Plain physiographic region (Chapman and Putnam, 1984). Bedrock geology consists primarily of the Hamilton Group (limestone) with pockets of Kettle Point Formation (shale) (Chapman and Putnam, 1984). Typically, bedrock is located more than 30m below the surface (Dillon, 2004). The areas are located on till plain overlaying the Cincinnati Arch (low swell in bedrock) (Chapman & Putnam, 1984). The geological surficial setting is primarily Huron Lobe Till consisting of clayey silt to silt overlain by glaciolacustrine silty clay to silt and pockets of glaciolacustrine silty sand and sand (Cooper and Baker, 1978).

3.3.2 Topography

Generally, watercourses drain west, to the Thames River or to Big Creek which ultimately flows to Lake St. Clair. Topography is flat with faint relief and imperfect drainage. As a result the landscape is dotted with dredged ditches and tile drains to provide suitable conditions for crop growth (Chapman & Putnam, 1984). The Thames River valley lies over 600m to the south of the Wind Farm Project Area and is well defined and confined, with elevation changes of 10 to 20m from top of bank to water's edge. Lake St. Clair is more than 30km to the west, and Lake Erie is more than 30km to the south.

3.3.3 Soils

Soil types within the Kent Breeze Wind Farm and the MacLeod Windmill Project Area are primarily Berrien Sand, with areas of Granby Sand and smaller areas of Brookston Sandy Loam. (Soil Map County of Kent, 1936). The Berrien Sand soil type is imperfectly drained sand over clay, and is low in organic matter. The Granby Sand soil type is a member of the Fox soils and is poorly drained, dark grey to black sand, underlain by grey water-soaked sand and impervious clay. It is high in organic matter and neutral to alkaline. Brookston Sandy Loam soil type is primarily shallow sand knolls, but also occurs in low areas where it is similar to Brookston silt and clay loam, and sand knolls similar to Berrien sandy loam (Soil Map County of Kent, 1936).

In general the site is imperfectly to poorly drained because it is underlain by impermeable clay which slows infiltration. This creates a seasonally high water table as water collects in the sand above the impermeable material (Soil Map County of Kent, 1936).

There are no identified Earth Science ANSI's within 120m (or the required 50 m) of the project location.

3.4 Biological Records Review

3.4.1 Fisheries

Watercourses and agricultural drains within the larger Wind Farm Project Area flow either south to the Thames River, or west to Big Creek and Lake St. Clair..

SCRCA provided data which indicated intermittent flow for all tributaries within the larger Wind Farm Project Area [Figure 7]. The closest monitoring station is located 1.4 km downstream of the larger Project Area. It indicates fairly poor water quality conditions, as is for most of the St. Clair Tributaries.

3.4.2 Floral Records Review

The NHIC database and additional lists provided by SCRCA (H. MacKenzie, 2008) reports that Broad Beech Fern (*Phegopteris hexagonoptera*, S3, SC) and American Chestnut (*Castanea dentata*, S2, END) are found within 1 km [Figure 8] of the larger Project Area (MacLeod Windmill and Kent Breeze Wind Farm).

Broad Beech Fern habitat typically includes dry woods and hillsides (Britton and Brown, 1970) as well as rich soil of deciduous forests (www.rom.on.ca/ontario/risk ROM website) and is likely within Wabash Woods [Figure 8].

American Chestnut is found in dry forests, well-drained sands and gravels, usually mixed with other broadleaf trees (Farrar, 1995). There is a chance it may be present in Huff Woodlot, which has an upland community [Figure 8].

Additionally, the NHIC Wabash Woods report suggests there is a wetland associated with this feature.

3.4.3 Birds Records Review

Of primary concern for wind farm applications is the impact of turbines on birds.

Neil Morris Environmental (NME) (2007) prepared the Avian Study for Kent Breeze Wind Farm and MacLeod Windmill Project Areas. This study included a review of Ontario Breeding Bird Atlas (OBBA) squares (100 km^2) which included squares 17MH10 and 17MH12 of the OBBA grid system. In total there are 91 species for which breeding evidence has been recorded in either of these two squares. The avian study area (3 km^2) represents a very small fraction of this OBBA review.

The following were noted from the OBBA:

There is confirmed breeding status of the Bald Eagel (*Haliaeetus leucocephalus*) within OBBA square 17MH10. The Bald Eagle is listed as Special Concern (at the time of the reported findings in NME (2007), the Bald Eagle was listed as Endangered).

- The confirmed presences (OBBA squares 17MH10 and 17MH11) of grassland species with aerial flight display including Horned Larks and Bobolinks.

According to Low Sensitivity Table 1 (Environment Canada, 2006), the area is a low sensitivity site. The only exceptions are the potential presence of the Bald Eagle and grassland species with aerial displays (NME, 2007).

3.4.4 Bat Records Review

Decisions on potential bat considerations are based on the MNR Guideline document (MNR, 2007) and a local study of post monitoring construction near Lake Erie (James, 2008).

MNR (2007) report factors that may contribute to impacts to bats include:

1. Bat species and abundance in the area;
2. Time of year;
3. Habitat/landscape features of the area.

Collision fatality appears to be high during fall migration and low during spring migration (Wildlife Society, 2007). Many species of bats use linear landscape elements for successful foraging or commuting, echo-orientation, and protection from predators or wind (Wildlife Society, 2007). In eastern North America current evidence indicates that bat mortality is lowest in open grassland and farmland away from forests (MNR, 2007). Loss of habitat quality and quantity may cause declines of bat populations (MNR, 2007).

James (2008) found that turbines less than 250m from a shoreline had the highest mortality, and found that the influence of woodlands on bat mortality was not significant. Evidence from James (2008) indicate that turbines placed at least 50m away from woodlands was sufficient to avoid bat impact with turbines. Continuous lighting that may contribute to bat mortality include barnyard lighting set between wind turbines and woodlots (James, 2008).

There is no conclusive data to support or refute noise generated by wind turbines influences roosting bats, or that increased human activity at wind facilities could disturb roosting bats (Wildlife Society, 2007). Recent investigations for wind farms suggest the reduction of barometric pressure near moving turbine blades may help to explain high bat fatality rates (Baerwald *et al.*,2008). Even if echolocation allows bats to avoid moving turbine blades, they may be killed by internal injuries caused by rapid change in pressure, which they cannot detect (Baerwald *et al.*,2008).

The topography in the area of the Kent Breeze Wind Farm and the MacLeod Windmill Project Area is relatively flat, with small watercourses that have been greatly altered for agricultural purposes. The closest major shoreline is Lake St. Clair 30km to the west and Lake Erie 30km to the south. To the south, the Thames River is over 600m away at its closest point. Most of the vegetation communities have been altered by clearing and draining the land for agriculture. There are no known bat hibernacula, potential hibernacula habitat, or linear habitat features in the area.

While topography and features of the area suggest bat concentrations would not be expected, lighting and turbine proximity to woodlots warrant further consideration.

3.4.5 Other Faunal Records Review

A review of the NHIC website found the following provincially ranked aquatic species or species with aquatic life cycles.

- Azure Bluet (*Enallagma aspersum*, S3) - damselfly (aquatic lifecycle),
- Kidneyshell (*Ptychobranchus fasciolaris*, S1, END) - mollusc,
- Spiny Softshell (*Apalone spinifera*, S3, THR) - turtle, and
- Gravel Chub (*Erimystax x-punctatus*, SX, EXP) - fish no longer present.

It is likely these species are found south of the site in and around the Thames River based on their habitat requirements (www.rom.on.ca/ontario/risk ROM website). However, the Azure Bluet damselfly can also be found in and around shallow ponds where fish are not present (www.bugguide.net Bug Guide Website).

The NHIC website reports occurrence of two terrestrial S-ranked species in the area; Woodland Vole (*Microtus pinetorum*, S3, SC) and the Tawny Emperor *(Asterocampa clyton*, S2S3). These species are found in mature deciduous forest with the Woodland Vole preferring deep litter layers (www.rom.on.ca/ontario/risk ROM website) and the Tawny Emperor in wooded riparian areas (www.butterfliesandmoths.org. Butterflies and Moths of North America website) likely near the Thames River.

Although not reported on the NHIC database, the Eastern Fox Snake (*Elaphe vulpina gloydi*) has been widely noted in Chatham-Kent, as confirmed by the Ministry of Natural Resources. The Eastern Fox Snake prefers unforested, terrestrial shoreline ecosystems adjacent to marshes (Environment Canada, 2008). The Eastern Fox Snake is currently listed as S3 by the Province (80 or fewer populations) but as threatened by the OMNR and COSEWIC (NHIC, 2007). With the vast amount of agricultural drains in the area, there may occasionally be some Eastern Fox Snake individuals within the Wind Farm project location along the drainage ditches.

3.5 Records Review Summary

Based on the records review, **habitat associated with regulated drains**, as defined in O. Reg. 359/09 Section 1 (1) and Section 25 (2) are located in or within 120 metres of the project location. [Table 1].

Table 1: Natural Features Records Review within 120m

Nature Feature	Records Searched
Provincial Parks/Conservation Reserves - none	NHIC Official Plan Schedules
Significant Features - none	NHIC Official Plan Schedules
Conservation Authority Regulated Areas - Shaw Ferguson Drain, Courtney Drain and Dobson Drain (SRCA) - Tributaries to Cryderman Drain (LTVCA) - Mason Drain (LTVCA)	Regulation Maps

4.0 Site Investigation

Site investigations were completed to collect data and to confirm:

- whether the results of the records review required correction,
- whether additional natural features exist,
- the boundaries of any natural feature within 120 metres of the project location

Natural features include all or part of the following:

- an area of natural or scientific interest (earth science)
- an area of natural or scientific interest (life science)
- a coastal wetland
- a northern wetland
- a southern wetland
- a valleyland
- a wildlife habitat
- a woodland

Field investigations conducted for the larger Study area and final project location included:

- Fisheries habitat review by Dave Hayman, MSc. with site visit December 3, 2008 and subsequent focussed fisheries habitat site investigation by Robyn Arts, BSc., May 28, 2010,
- Ecological Land Classification by Will Huys, ISA Certified Arborist (data sheets attached), and subsequent focussed site visit May 25, 2010, and
- Avian investigations by Neil Morris, Principal, NME Ltd with site visits on July 5-7 2006, October 2-6, 2006 and in May 2007.

4.1 Biological Setting

The biological setting is described based on field work completed for the background natural heritage report (Biologic, March 2009) and site specific field investigations related to the finalized project location.

4.1.1 Fisheries Site Investigation

Fisheries site investigations were conducted by Dave Hayman Msc, on December 3, 2008, 3:00 p.m. to 5:00 p.m. as part of the background review and by Robyn Arts, Bsc May 28 2010 10:00 a.m. to 12:00 p.m., to review areas where channel crossings are proposed [Appendix A].

All drains were confirmed to be ephemeral to intermittent based on observations on December 3, 2008. Mason, Shaw Ferguson, and Cryderman Drains all contained water during the site investigation on May 28, 2010. Mason and Shaw Ferguson Drains at the proposed crossing areas were covered in terrestrial grasses, which helps slow water flow. All other watercourses appeared intermittent with closed tile drains for Barnhart Drain (along Huff Side Road) and no defined flow paths for the regulated tributaries of the Cryderman Drain north of Evergreen Line [Figure 6].

4.1.2 Floral Site Investigation

Field work for Ecological Land Classification (ELC) information was conducted on August 12, 2008 from 9:30 a.m. until 6:00 p.m. by Will Huys, Certified Arborist. Ecological Land Classifications (ELC) are based on Lee *et al.* 1998 [Figure 9]. Vegetation Communities are found in Table 2. ELC data sheets are attached in Appendix B. All biological communities are common and secure in Ontario (Oldham, 1994).

Community 7 and 15 are both woodlands greater than 2 ha. These communities, however, were not identified in the Municipality of Chatham -Kent Official Plan, 2005, as part of the significant woodland records review.

Community 15 lies more than 120m away from the project location.

Community 16 is a small old field meadow less than 2 ha.

Table 2: Vegetation Communities for Kent Breeze Wind Farm and MacLeod Windmill Project

Community Type	Polygon	ELC Code	Description
Terrestrial Communities			
Natural Successional	2	FOD3-1	Dry-Fresh Poplar Deciduous Forest Type
	3	FOD5-3	Dry-Fresh Sugar Maple-Oak Deciduous Forest Type
	4	FOD6-1	Fresh-Moist Sugar Maple-Lowland Ash Deciduous Forest Type
	5	FOD7-2	Fresh-Moist Ash Lowland Deciduous Forest Type
	6	FOD6-1	Fresh-Moist Sugar Maple-Lowland Ash Deciduous Forest Type
	7	FOD8	Fresh-Moist Poplar-Sassafras Deciduous Forest Ecosite
	9	FOD7-2	Fresh-Moist Ash Lowland Deciduous Forest Type
	10	FOD7-2	Fresh-Moist Ash Lowland Deciduous Forest Type
	13	FOD9-2	Fresh-Moist Oak-Maple Deciduous Forest Type
	14	FOD7-2	Fresh-Moist Ash Lowland Deciduous Forest Type
	15	FOD7-2	Fresh-Moist Ash Lowland Deciduous Forest Type
Cultural Communities	11	CUW1	Mineral Cultural Woodland Ecosite
	12	CUW1	Mineral Cultural Woodland Ecosite
	16	CUM1-1	Dry-Moist Old Field Meadow Type
Wetland Communities			
Natural	1	SWD2	Green Ash Mineral Deciduous Swamp Type
	8	SWD3-3	Swamp Maple Mineral Deciduous Swamp Type

4.1.3 Faunal Site Investigation

<u>Azure Bluet</u>

As determined in the records review, the Azure Bluet damselfly are found in and around shallow ponds where fish are not present. A site investigation confirmed no ponds were found within 120 m of the project location (W. Huys field notes/Appendix D).

<u>Eastern Fox snake</u>

There are open drains in the area where there may be water at times of the year. As a result there may be an individual Eastern Fox Snake observed occasionally.

Birds - Site Specific Investigations

The Avian Study was prepared by NME (2007), with an overview of the findings below. The Avian Study point count and transect locations plus field notes from NME (2007) are found in Appendix C.

Spring, summer and fall monitoring (July 2006 to May 2007) results for the avian study area are summarized below. Further details on study methodologies and findings are described fully in the avian study report prepared by NME (2007). Thirty-one surveys were conducted during the field-level monitoring.

Field-level monitoring was conducted to refine the understanding of bird presence in the avian study area. To confirm and expand upon the findings and conclusions of the initial review, site specific monitoring efforts included:

- Spring migration monitoring with 12 searches (May, 2007)
- A breeding bird survey with 10 searches (July 5 and 7, 2006)
- Fall migration monitoring with 9 searches (October 2 and 6 2006)

The breeding bird survey (BBS) was designed to identify those species of birds breeding within or in close proximity to the avian study area. The BBS also focused specifically on grassland species with aerial displays, as these were identified in advance as sensitive elements that might occur within the Wind Farm project location.

There are no known staging areas within the avian study area, however habitat was evaluated for migration stop-over, either annually or during poor weather conditions. The BBS identified the species that regularly use the study area during the breeding season, including those that regularly nest, raise young, or forage in the area.

The number of species noted on the 31 surveys were:

Spring migrants	50 species
Breeding birds	53 species
Fall migrants	27 species

In total, 3,866 birds were counted during the surveys.

Spring Migrants

A total of 1012 individual birds were observed during the spring migration monitoring, representing 50 species. The five most frequently observed species were the Common Grackle (273 individuals observed), the European Starling (140 individuals observed), the Red-winged Blackbird (87 individuals observed), the Turkey Vulture (55 individuals observed), and the Tree Swallow (52 individuals observed). The number of species, an indicator of diversity, tended to be highest at monitoring stations that encompassed the wooded riparian zone of the Thames River. Overall bird abundance did not exhibit any clear trends with respect to monitoring location.

The vertical distribution of bird observed during the spring migration period was heavily skewed to low level activity, below the anticipated blade-sweep height of the wind turbines. Greater than 93% of all birds observed were perched or in flight at a height considerably lower than 40m [Table 3]. Only 4.8% of birds, representing four species, were observed in flight at heights between 40 and 120 m (i.e. in the blade-sweep height). Three species were observed at heights exceeding 120 m, accounting for only 1.8% of all observed individuals. Turkey Vultures accounted for approximately 70% of all birds observed in flight at 40 m or higher.

Very few of the birds observed during the spring migratory period appeared to be engaged in concerted migratory flight. Most observation consisted of perched birds or birds engaged in short local flights remaining in the study area. Much of the local activity was associated with trees, either as isolated trees, tree-lines, woodlots or the wooded riparian zone of the Thames River. It was the opinion of NME (2007) that some of the localized activity may have been associated with migratory stop-over, but there is no capacity to confirm or refute this possibility.

Table 3 - Summary of Spring Monitoring Results

	Species	**Individual Observed**			**Total**	**SCTE CAN ON**	**SRank**	**Notes**
		0-40m	**40-120m**	**>120m**				
1	American Crow	11	3		14		S5	overflights and local flights

	Species	Individual Observed			Total	SCTE CAN ON	SRank	Notes
		0-40m	40-120m	>120m				
2	American Goldfinch	13			13		S5	mix of overflights and local flights
3	American Robin	43			43		S5	low local flights, incl. chase flights
4	Bank Swallow	5			5		S5	foraging along river
5	Barn Swallow	14			14		S5	foraging flights and overflights
6	Black-capped Chickadee	5			5		S5	short flights to/from trees
7	Black-throated Green Warbler	1			1		S5	foraging in riparian woods
8	Blue Jay	3	14		17		S5	overflights (various directions)
9	Bobolink	2			2		S4	overflights N and E
10	Brown Thrasher	5			5		S5	low local flights
11	Brown-headed Cowbird	32			32		S5	local flights
12	Canada Goose	3			3		S5	overflights W and N
13	Chipping Sparrow	13			13		S5	short local flights
14	Common Grackle	273			273		S5	mostly short local flights
15	Downy Woodpecker	2			2		S5	overflight and local flight
16	Eastern Meadowlark	2			2		S5	singing at ground level in field

	Species	Individual Observed			Total	SCTE CAN ON	SRank	Notes
		0-40m	40-120m	>120m				
17	European Starling	150			150		SE	mostly short local flights
18	Field Sparrow	2			2		S5	short local flights
19	Gray Catbird	3			3		S5	perched, short local flight
20	Greater Yellowlegs	1			1		S4	low flight following river
21	Hairy Woodpecker	1			1		S5	calling from treeline
22	Horned Lark	25			25		S5	ground-level activity, overflights S and SE
23	House Finch	1			1		SE	perched, singing
24	House Sparrow	1			1		SE	short flight into tree
25	House Wren	2			2		S5	singing from trees
26	Indigo Bunting	2			2		S5	local flights
27	Killdeer	23			23		S5	low local flights and overflights
28	Mallard	1			1		S5	overflight NW
29	Mourning Dove	27	2		29		S5	local flights and overflights
30	Northern Cardinal	11			11		S5	perched, very low local flights
31	Northern Flicker	4			4		S5	calling from trees

	Species	Individual Observed			Total	SCTE CAN ON	SRank	Notes
		0-40m	40-120m	>120m				
32	Northern Oriole	13			13		S5	short local flights into trees
33	Northern Rough-winged Swallow	21			21		S5	over-flights westward, foraging over river
34	Red-bellied Woodpecker	3			3		S4	short local flights
35	Red-eyed Vireo	4			4		S5	calling from treeline
36	Red-tailed Hawk			1	1	NAR	S5	circling and drifting ~ W
37	Red-winged Blackbird	87			87		S5	mostly local flights
38	Rock Dove	22			22		SE	short local flights near buildings
39	Rose-breasted Grosbeak	3			3		S5	foraging in riparian woods
40	Ruby-crowned Kinglet	4			4		S5	foraging in riparian woods
41	Savannah Sparrow	1			1		S5	very short, low flight in field
42	Sharp-shinned Hawk			1	1	NAR	S5	circling and drifting SW
43	Solitary sandpiper	3			3		S4	foraging and overflight along river valley
44	Song sparrow	27			27		S5	short local flights

	Species	Individual Observed			Total	SCTE CAN ON	SRank	Notes
		0-40m	40-120m	>120m				
45	Spotted sandpiper	1			1		S5	foraging at river's edge
46	Tree Swallow	52			52		S5	foraging flights, mostly along river edge
47	Turkey Vulture	9	30	16	55		S4	circling and soaring, various directions
48	Yellow-rumped Warbler	3			3		S5	foraging in riparian woods
49	Yellow Warbler	2			2		S5	singing in shrub
50	Unidentified shorebird	9			9		-	small flock, overflight along river valley
	Totals	**945**	**49**	**18**	**1012**			
	percent of total	**93.4 %**	**4.8%**	**1.8%**				

Breeding Birds

In total, avian surveys found a total of 53 species at the established monitoring stations [Table 4] within the study area. The breeding status, according to the OBBA squares in this area, of these species were as follows:

- 5 species "confirmed" breeding status
- 22 species "probable" breeding status
- 21 species "possible" breeding status
- 5 species simply "observed"

There was a total of 639 individual bird observations recorded during the 10 transect monitoring events. The 5 most frequently observed species were:

1. American Robin (66 observations - confirmed breeder)
2. Red-winged Blackbird (64 observations - confirmed breeder)
3. Common Grackle (48 observations - probable breeder)
4. Tree Swallow (40 observations - probable breeder)
5. Northern Cardinal (32 observations - probable breeder)

The majority of birds observed during the BBS were perched or engaged in short, low-level flights. Flight activity often had woodlots, tree-lines or isolated trees as the point of origin or destination. Over-flights were not frequent and not in any consistent direction.

Bald Eagle (*Haliaeetus leucocephalus*) was the only Provincially ranked (Special Concern) species with confirmed breeding status within the larger Avian Study area. However, this nest is located more than 1 km away from either project location.

No grassland species with aerial displays were observed breeding in the avian study area.

Table 4: Summary of Breeding Bird Monitoring Results

Species	**Number Observed**	**SCTE CAN/ON**	**SRank**	**Breeding Status**	**OBBA Status**
American Crow	8		S5	b	x
American Godlfinch	23		S5	b	x
American Robin	66		S5	x	x
Bald Eagle	**1**	**SC**	**S4**	**x**	**x**
Barn Swallow	11		S5	b	x
Belted Kingfisher	4		S5	b	I
Black-billed Cuckoo	1		S4	I	I
Black-capped Chickadee	16		S5	b	b
Blue Jay	28		S5	b	x
Brown-headed Cowbird	11		S5	b	x

Species	**Number Observed**	**SCTE CAN/ON**	**SRank**	**Breeding Status**	**OBBA Status**
Canada Goose	13		S5	x	x
Cedar waxing	9		S5	I	b
Chipping Sparrow	11		S5	b	x
Common Grackle	48		S5	b	x
Downy Woodpecker	9		S5	b	x
Eastern Kingbird	7		S5	b	x
Eastern Phoebe	1		S5	I	x
Eastern Wood-Peewee	3		S5	I	I
European Starling	9		SE	x	x
Field Sparrow	3		S5	I	b
Gray Catbird	26		S5	b	x
Great Blue Herron	5		S5	I	I
Great Horned Owl	1		S5	o	x
Horned Lark	9		S5	I	x
House Sparrow	2		SE	b	x
House Wren	14		S5	b	x
Indigo Bunting	9		S5	I	x
Killdeer	9		S5	b	x
Mourning Dove	26		S5	b	x
Northern Cardinal	32		S5	b	x
Northern Flicker	16		S5	b	x
Northern Oriole	18		S5	b	x
Northern Rough-winged Swallow	4		S5	I	x
Ovenbird	1		S5	I	I
Pileated Woodpecker	1		S4S5	I	I
Red-eyed Vireo	7		S5	I	x

Species	Number Observed	SCTE CAN/ON	SRank	Breeding Status	OBBA Status
Red-tailed Hawk	4	NAR	S5	I	b
Red-winged Blackbird	64		S5	x	x
Rose-breasted Grosbeak	9		S5	b	x
Savannah Sparrow	4		S5	I	b
Scarlet Tanager	1		S5	I	b
Song Sparrow	30		S5	b	x
Spotted Sandpiper	1		S5	o	b
Tree Swallow	40		S5	b	x
Turkey Vulture	10		S4	I	b
Veery	1		S4	I	I
Warbling Vireo	1		S5	I	x
White-breasted Nuthatch	1		S5	I	I
Wood Duck	1		S5	o	x
Wood Thrush	3		S5	I	x
Yellow Warbler	3		S5	I	x
Yellow-bellied Sapsucker	1		S5	o	-
Yellow-billed Cuckoo	3		S4	I	x
Total	**639**				

x - confirmed, o - observed, b - probable, I- possible

Fall Migrants

A total of 27 species were observed during all migration monitoring [Table 5], considerably fewer than observed during the spring monitoring period. In terms of abundance, observations recorded during the fall migratory period were dominated by European Starlings, and secondarily by black bird species (Family Icteridae), including mixed blackbird flocks (Red-winged Blackbirds, Common Grackles, Brown-headed Cowbirds, Bobolinks). Combined, the starlings and blackbirds accounted for about 78% of the 2215 individual birds observed during fall point-counts or transects. The Tree Swallow (151 observations), Canada Goose (62 observations), and American Robin (60 observations) were the next most frequently observed species.

The vertical distribution of birds observed during the fall migratory period was more variable than observed during the spring. About 75% of all birds observed were perched or in flight at heights below 40 m. Including mixed blackbirds as a species group, there were 12 species observed within the blade-sweep height (i.e. 40 to 120 m). These observations accounted for about 22% of all individual birds observed. There were 5 species observed at heights greater than 120 m, representing 3% of all periods observed during the fall migratory period.

Table 5: Summary of Fall Monitoring Results

	Species	**Individual Observed**			**Total**	**SCTE CAN, ON**	**SRank**	**Notes**
		0-40m	**40-120m**	**>120m**				
1	Accipiter Hawk Species	1	1	2	4		-	drifting W and S
2	American Crow	29	13		42			perched
3	American Goldfinch	30	1		31		S5	short local flights
4	American Robin	48	12		60		S5	individuals and sm. flocks, local flights
5	Blue Jay	40			40		S5	overflights ~westward, along the river
6	Brown-headed Cowbird	7			7		S5	several perched on transmission lines

	Species	Individual Observed			Total	SCTE CAN, ON	SRank	Notes
		0-40m	**40-120m**	**>120m**				
7	Buteo Hawk Species			3	3		-	circling and drifting
8	Canada Goose		9	53	62		S5	flock overflights N and W
9	European Starling	889	317		1206		SE	large flocks and individual, local flights
10	Golden-crowned Kinglet	1			1		S5	in tree
11	Gull species			12	12		-	circling and slowly drifting N
12	Horned Lark	3			3		S5	ground-level activity
13	House Sparrow	3			3		SE	foraging along roadside
14	Killdeer	1			1		S5	calling at groundlevel
15	Mallard	7			7		S5	flew up from field
16	Mixed blackbird flocks	386	91		477		-	moving N or NW
17	Mourning Dove	16	1		17		S5	local flights

	Species	Individual Observed			Total	SCTE CAN, ON	SRank	Notes
		0-40m	**40-120m**	**>120m**				
18	Northern Cardinal	1			1		S5	calling and singing from trees
19	Northern Harrier	1			1	NAR	S4	low hunting fligh over field
20	Red-tailed Hawk		1		1	NAR	S5	continuous glide north
21	Red winged Blackbird	31			31		S5	short local flights
22	Ruby-crowned Kinglet	6			6		S5	moving through treeline
23	Sharp-shinned hawk	1	2		3	NAR	S5	circling and drifting westward
24	Song sparrow	21			21		S5	short local flights
25	Tree Swallow	127	24		151		S5	foraging flights and overflights
26	Turkey Vulture	7	24	4	35		S4	circling and drifting
27	Wild Turkey	6			6		S4	foraging in field
	Total	**1662**	**496**	**74**	**2232**			
	percent of total	**74.5 %**	**22.2%**	**3.3%**				

Species at Risk

Species at Risk are those designated as Extirpated, Endangered, Threatened or of Special Concern in Canada and/or Ontario. One Species at Risk, Bald Eagle, has a nest more than 1km from the southern limits of either project area (650m south of the larger Project Area) along the Thames River corridor. This distance is beyond the 800m tertiary buffer zone for bald eagle nest trees as described by the Ontario Ministry of Natural Resources (MNR 1987). No other species at risk were found either breeding or migrating within the avian study area.

Conservation Priority

The bird species found during the avian study were checked against the municipal list of priority species for Kent County [Table 6].

Table 6 - Priority Bird Species found within or adjacent to Kent Breeze Wind Farm and MacLeod Windmill Project

Forest	**Marsh**	**Open Country**
Level One	**Level One**	**Level One**
Bald Eagle Red-bellied Woodpecker Red-shouldered Hawk		Bank Swallow Brown Thrasher Savannah Sparrow
Level Two	**Level Two**	**Level Two**
Black-billed Cuckoo Black-throated Green Warbler Scarlet Tanager Yellow-bellied Sapsucker	Purple Martin	Bobolink Northern Rough-winged Swallow

Conservation priority species that prefer open country (Grassland) habitat that were observed in the avian study area include Horned Lark (Level 3), Bobolink (Level 2) and Savannah Sparrow (Level 1) (NME, 2007). These species and other Level 1 or 2 species were not abundant or widely distributed in the avian study area (NME, 2007).

4.2 Summary of Corrections to the Records Review

There is one additional woodland feature (Vegetation Community 7) that is larger than 2 ha, identified within 120 m of the project location. This woodlot is not identified in the Municipality of Chatham -Kent Official Plan, 2005. The edge of the woodlot is 40 metres from construction activity. Further investigation of this woodland was required to determine its significance as per Section 27 of Regulation 359/09 (see Section 5.1 of this report). Barnhardt Drain and at least two tributaries to the Cyderman Drain have no defined surface channels.

Table 7: Features Changes Based on Site Investigation

Natural Feature	**Feature Identification**
Provincial Parks/Conservation Reserves	none
Woodland Features	woodland greater than 2 ha - Vegetation Community 7 [Figure 7]
Conservation Authority Regulated Areas	Barnhardt Drain and at least 2 tributaries to the Cryderman Drain are closed tiles

5.0 Evaluation of Significance

This section reviews the provincial and Conservation Authority regulatory policies within the project location with respect to Natural Heritage considerations. Features which warrant further evaluation for significance or require guidance with respect to construction activity are discussed in more detailed in Section 6.

5.1 Natural Heritage Reference Manual Evaluation

The natural heritage considerations are based on O. Reg. 359/09. and reviewed using attachments A1-A12 as outlined by the Natural Heritage Reference Manual (MNR, 999).

Significant Portions of the Habitat of Endangered and Threatened Species

Attachment A.1: *Identification of Significant Portions of Habitat of Endangered and Threatened Species*
There was no habitat for Endangered or Threatened Species in the records review or site investigations. However, individual Eastern Fox Snake may occasionally be seen particularly along the open drains. Wind farm construction activities should consider this species with recommendations provided in Section 6.

Fish Habitat

Attachment A2: *Fish Habitat – Broad Scale,*

Attachment A3: *Fish Habitat – Detailed Scale*

There is no significant fish habitat within 120m of the project location. Standard sediment and erosion control measures in place will adequately protect downstream fish habitat..

Significant Woodlands

Attachment A4: *Evaluation of Significant Woodlands*

There are no significant woodlands within 120 m of the project location.

There is one woodland which is greater than 2 ha which was not considered significant in the municipal Official Plan. However, there is no interior habitat, it is separated from other nearby woodlands by an active railway and active agriculture with limited opportunity for effective linkage, has no uncommon characteristics. This feature would not be considered significant based on the criterion of Attachment 4.

This woodland feature plus other smaller features are reviewed in more detail under Significant Wildlife Habitat later in this section.

Attachment A5: *Wildlife Uses of Various Habitat Sizes*
Within the vegetation patches on and adjacent to the Kent Breeze Wind Farm and the MacLeod Windmill Project Area, common wildlife species and common edge species were noted.

Attachment A6: *Information sources for Areas with High Diversity*
Information sources used for evaluation of High Diversity have been identified in Section 1 of this report.

Significant Valleylands

Attachment A7: *Significant Valleylands*
There are no valleylands within the 120 m of the project location. At the closest point the Thames River valleylands are approximately 650m to the south.

Significant Wildlife Habitat

Ecological Land Classification did not indicate any rare or significant vegetation communities that would be considered areas of habitat for particularly important wildlife species.

Attachment A8: *Seasonal Concentration Areas for Significant Wildlife*
The avian study determined that spring and fall migrations through the project location are not significant when compared to other areas within southwestern Ontario (NME, 2007). The area is not considered a significant site for bats and bat migration. Post construction monitoring is discussed further in Section 6.

Attachment A9: *Rare Vegetation Communities or Specialized Wildlife Habitat*
Grassland species with aerial flight displays (Horned Lark and Bobolink) did not breed within the project location (or the entire larger Avian Study Area). Only low numbers these species were observed in spring and fall migration. The project location is not significant for these species.

Appendix Q: *Evaluation Criterion for Significant Habitat*
Smaller woodland features (Communities 6, 10, 11and 12) as well as Community 7 which was greater than 2 ha were not identified as significant in the records review. These sites were reviewed for the presence of significant habitat [Appendix D] based on Appendix Q of the Significant Wildlife Habitat

Technical Guide (MNR, 2000). No features or functions were of sufficient size or quantity to be significant.

A small meadow (Community 16), less than 2 ha, which is within 120m of the project location was not a significant site for grass land species which might be susceptible to wind turbines.

There were a few animal dens and fallen trees which provide some local overwintering habitat and there is the presence of some forage species (berry and mast producers) although quantity or size were not significant. Restoration of the areas where servicing passes through woodland features should consider restoration with native forage plants. This is discussed in Section 6.

Attachment A10: *Evaluation of Species of Concern*
No Species of Concern were identified within 120 m of the project location.

Attachment A11: *Wildlife Corridors*
There are no wildlife corridors within 120 m of the project location. Any wildlife corridors in the surrounding area would be associated with the Thames River, approximately 650m south.

Attachment A12: *Information Sources for Significant Wildlife Habitat*
Information sources used for to evaluate significant habitat have been identified in Section 1 of this report and in the background Natural Heritage Study (BioLogic, March 2009).

5.2 SCRCA and LTVCA Policies

Conservation Authority Regulation Limit
While crossing of open water will be accomplished through directional drilling, some work will occur within the regulated areas of the Mason and Shaw Ferguson Drain. A permit from the LTVCA and SCRCA will be required for these activities.

Hazard Lands
Flood hazards associated with the Thames River extend to the Cyderman Drain. The project location is more than 120m from this flood hazard.

5.3 Summary

Based on the analysis in Section 5.1, there are no significant features within 120m of the project location. [Table 8].

Table 8: Evaluation of Significance

O. Reg. 359/09 Item	Data Sources	Feature Identification within 120m	Significance	Mitigation
Provincially Significant Features	MNR Municipality Site Review	possible woodland	not significant	none required
Provincially Significant Wildlife Habitat	MNR Site Review	none	no change	none required
Additional Considerations				
Regulated Areas	Conservation Authority	Mason Drain Shaw-Ferguson Drain	30m Regulation limit	Directional drill to avoid impacts to channel
Eastern Fox Snake	MNR	none	individuals may be encountered although no significant habitat will be disrupted	construction timing near banks of drains consult with MNR if species encountered
Birds and Bats	Environment Canada and MNR protocols	low numbers	low sensitivity	post construction monitoring
Fish Habitat	CA Site Review	Mason Drain Shaw-Fergusion	not significant	sediment and erosion control
Forage	Site Review	scattered mast tress and berry shrubs	not significant	replant with native species where trees are removed for cable services

6.0 Natural Heritage Considerations

Based on our records review, site investigation and evaluation of significance, there are no significant features or habitat within 120m of the project location.

However, our review did identify some habitat considerations which should be incorporated into the wind farm design.

6.1 Eastern Fox Snake - Threatened Species

Based on the layout and construction design of the wind farm, all new crossings of open drains will be directional drilled. Eastern Fox Snake habitat will not be disrupted.

However, to further limit possible disruption to Eastern Fox Snake individuals, any work within 5m of the top of bank of drains will occur between June and mid-September when temperatures are sufficiently warm that Fox Snake can readily escape any disturbance activity (pers. comm. R. Gould, MNR, August 2008). Work can then occur following fall freezeup when snakes are in hibernation.

6.2 Wildlife Habitat

While project location is 120m away from any significant feature, cable services are proposed through the north part of Community 6 and a turbine will be in Community 12. Site specific studies of the areas to be cut and 10m either side found only common trees. Tree replacement, including mast producers and berry shrubs, will be planted within the disturbance zone following construction.

<u>Birds</u>
The relative abundance and diversity of breeding birds in project location was low. The majority of bird activity during the breeding season was associated with wooded areas, and within the height of the canopy of these wooded areas. There is low concern regarding the effects of turbines on the local breeding bird populations.

NME (2007) report that these grassland species were found to be not abundant nor widely distributed in the Avian Study Area although this area was not used as a breeding site for either aerial display species.

Because the wind farm is well inland and away from the Lake Erie and Lake St. Clair shoreline, the wind farm would pose a low risk to birds. No significant adverse effects are expected. Based on the low site sensitivity rating, a one year post construction monitoring effort for bird mortality is be recommended.

Bats

The Kent Breeze Wind Farm and the MacLeod Windmill Project are not in an area known to be a migration corridor for bats, nor are they close to shorelines or any linear habitat. The wind turbine bases are located greater than 120 m from any significant woodlot. This distance is sufficient considering recent research (James, 2008) indicates turbine distance to woodlots have no significant impact on bat mortality. Currently there is no barnyard lighting located between the proposed turbine locations and woodland edge. Navigation lighting only will be associated with the wind turbines proposed for this site.

MNR (2007) site sensitivity criteria for bats rate the area with a low sensitivity. Based on MNR (2007) site sensitivity guidelines, a one year post construction monitoring effort which is concentrated during the summer and fall bat activity season would be recommended. However, there is a draft guideline document "Bats and Bat Habitat Monitoring Guidelines (March 2010 - Draft) which suggests 3 years of post construction monitoring for all projects. Therefore the proposed single season post construction monitoring for bats may be revised once the guideline document is finalized.

6.3 Fish Habitat

There is no significant fish habitat within 120m of the project location. Crossings of Shaw Ferguson Drain and Mason Drain completed by directional drilling under the water. Construction procedures should follow the High Pressure Direction Drilling Operational Statement (DFO) which provides class authorization for this activity.

There is potential for construction related sediment deposition and loss of habitat through nearby construction. Adequate sediment and erosion control during construction along with re-vegetation of disturbed areas will be necessary to avoid potential effects of construction to downstream habitat.

Sediment and erosion control systems will be monitoring throughout the construction process. Removal of these systems will not occur until these systems are stabilized.

All equipment for culvert installation must arrive on site in a clean condition and maintained to prevent fluid leaks (gas, oil, lubricants, hydraulic fluids). All equipment will operate on the land with minimal disturbance to the ditch banks. Refueling, servicing, equipment maintenance and associated materials for equipment operation will be stored away from the ditch bank with appropriate containment systems in the event of accidental spills.

Work within 30m of the Shaw Ferguson Drain and Mason Drain is regulated by LTVCA and SCRCA and will require a permit from the corresponding conservation authorities.

7.0 Approvals and Permitting Requirements

Applicable Regulations and Policies most relevant to renewable energy projects are included in Table 9. Applicable to the Kent Breeze Wind Farm project is the Endangered Species Act (2007).

Table 9: Applicable Ontario Statutes

Applicable Ontario Statutes	Consideration	Permit Required
Ministry of Natural Resources Act	Ministry of Environment's Ontario Regulation 359/09	confirmation on the natural heritage assessment
Public Lands Act	no	
Lake and Rivers Improvement Act	no	
Fish and Wildlife Conservation Act	yes	
Endangered Species Act, 2007	possible for E. Fox Snake	MNR Liaison
Crown Forest Sustainability Act	no	
Forest Fire Prevention Act	no	
Aggregate Resources Act	no	
Oil, Gas and Salt Resources Act	no issues identified in Project Description Report (pg 7).	
Provincial Parks and Conservation Reserves Act	no	
Conservation Authorities Act	possibly if existing crossing need upgrades.	Possible
Niagara Escarpment Planning and Development Act	no	

There are no significant features within 120m of the project location. Some addtional wildlife considerations are recommended during construction. Formal comments should be submitted in writing to BioLogic on behalf of the client.

Dave Hayman, M.Sc.

/lm

8.0 General References

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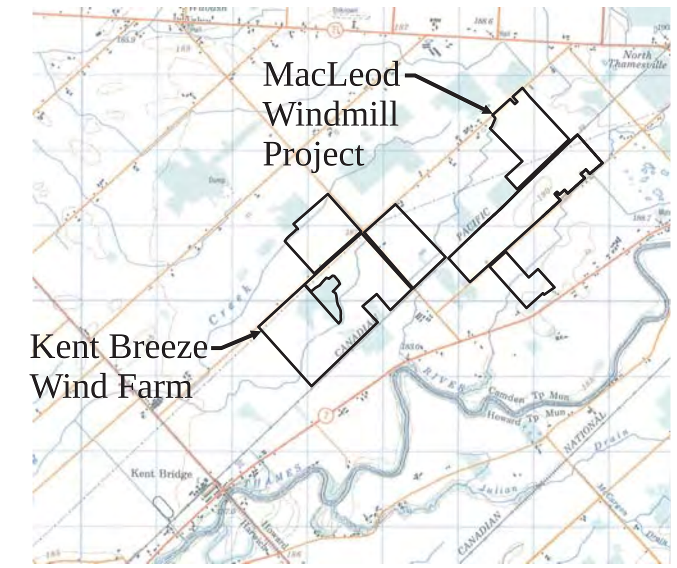
Figure 1: Site Location



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Key Plan

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May 2010

BioLogic
AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

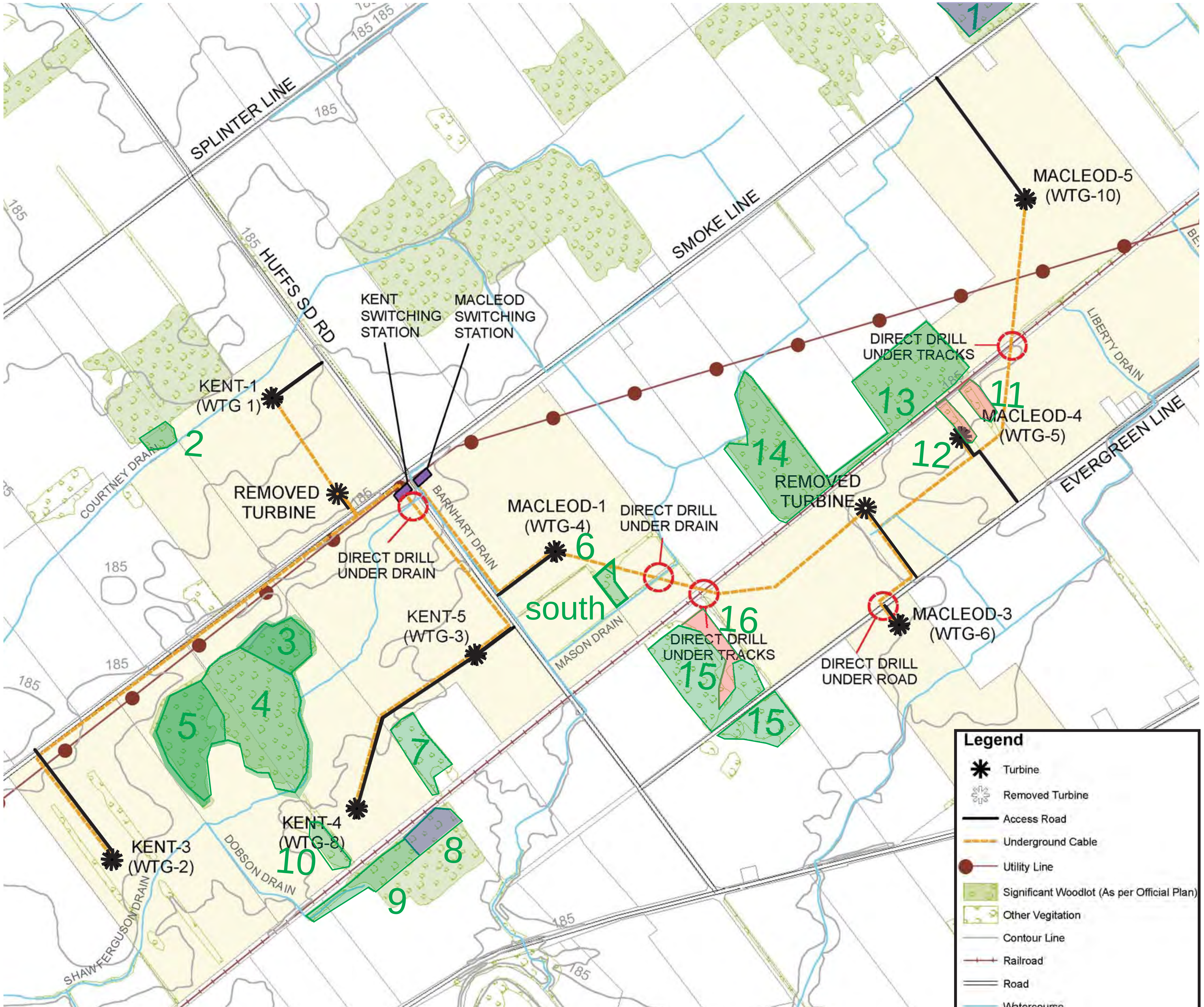

Figure 2: Wind Farm Project

Legend:

1 SWD2 Green Ash Mineral Deciduous Swamp Type
2 FOD3-1 Dry - Fresh Poplar Deciduous Forest Type
3 FOD5-3 Dry - Fresh Sugar Maple - Oak Deciduous Forest Type
4 FOD6-1 Fresh - Moist Sugar Maple - Lowland Ash Deciduous Forest Type
5 FOD7-2 Fresh - Moist Ash Lowland Deciduous Forest Type
6 FOD6-1 Fresh - Moist Sugar Maple - Lowland Ash Deciduous Forest Type
7 FOD8 Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite
8 SWD3-3 Swamp Maple Mineral Deciduous Swamp Type
9 FOD7-2 Fresh - Moist Ash Lowland Deciduous Forest Type
10 FOD7-2 Fresh - Moist Ash Lowland Deciduous Forest Type
11 CUW1 Mineral Cultural Woodland Ecosite
12 CUW1 Mineral Cultural Woodland Ecosite
13 FOD9-2 Fresh - Moist Oak - Maple Deciduous Forest Type
14 FOD7-2 Fresh - Moist Ash Lowland Deciduous Forest Type
15 FOD7-2 Fresh - Moist Ash Lowland Deciduous Forest Type
16 CUM1-1 Dry - Moist Old Field Meadow Type

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AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

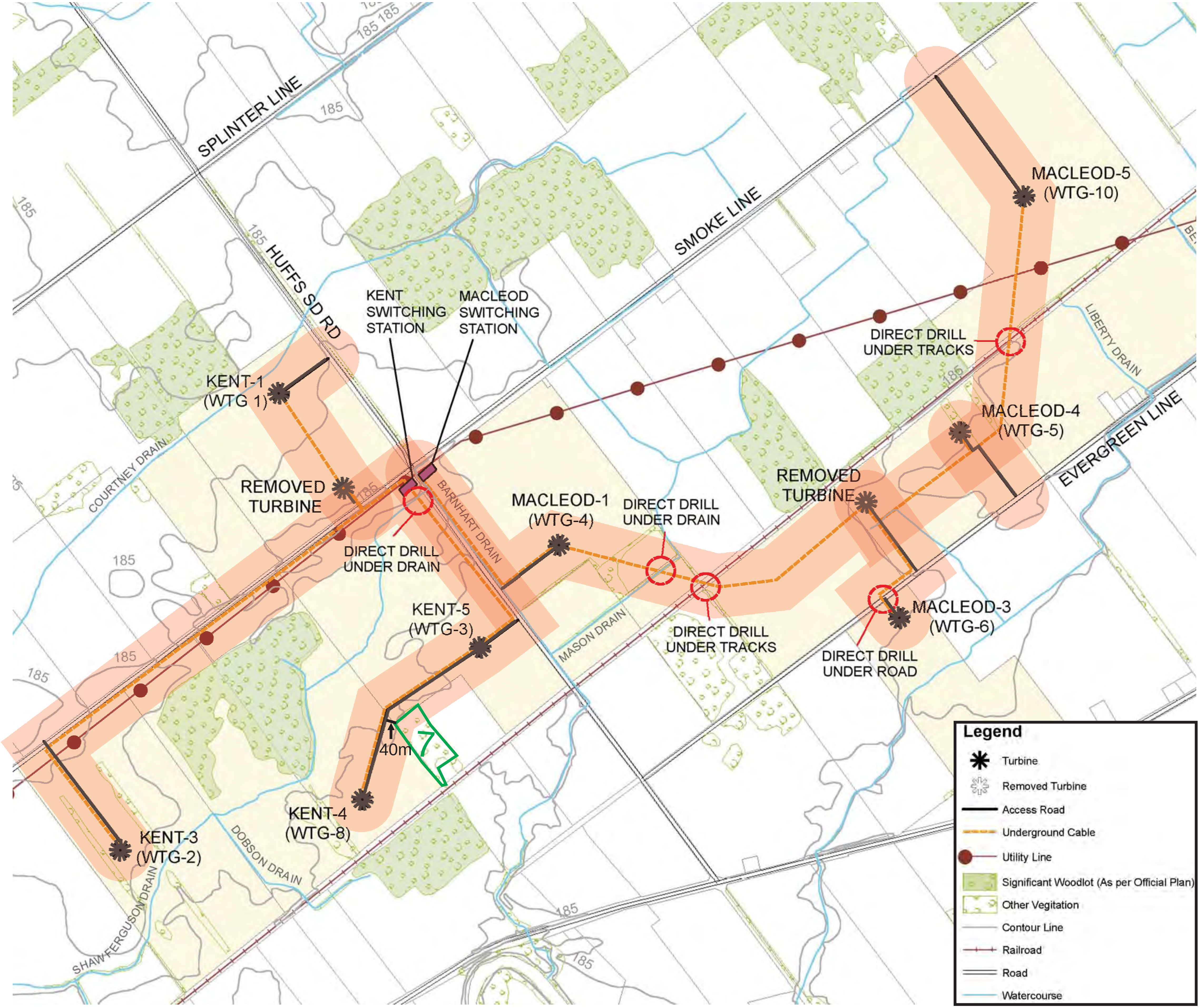

Figure 3: Wind Farm Project with 120m Setback

Legend:

7 FOD8 Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite

Project Location including 240m wide Project Area

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May 2010

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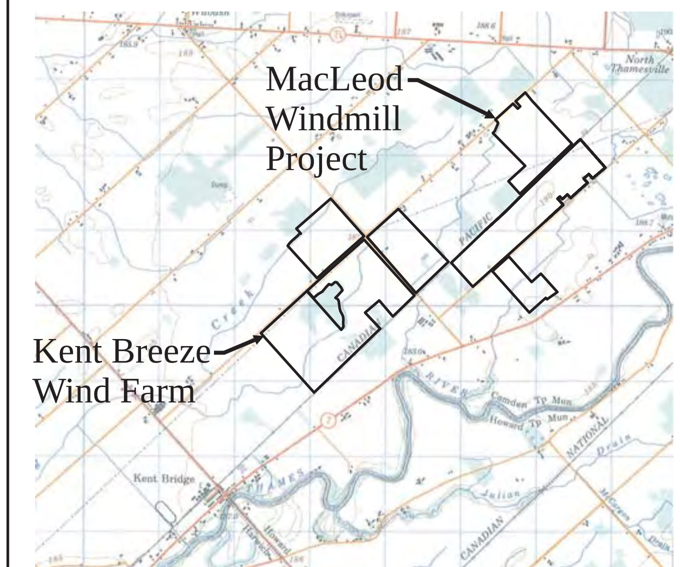
AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

Figure 4: Schedule C10 - Natural Heritage Features

Chatham-Kent Official Plan (2005) - Community of Camden Township



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Key Plan

Wind Farm Subject Boundary

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May 2010

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AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

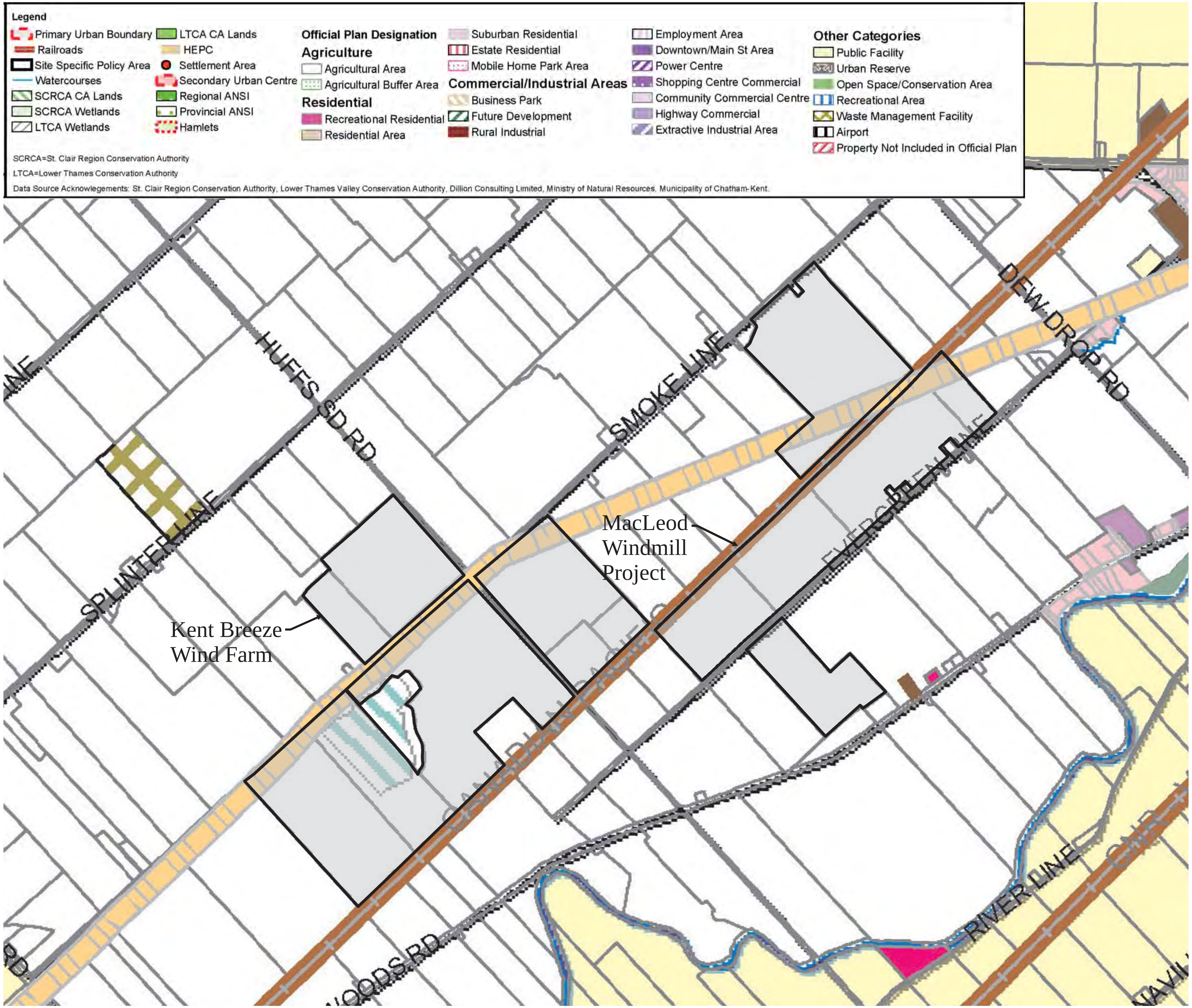
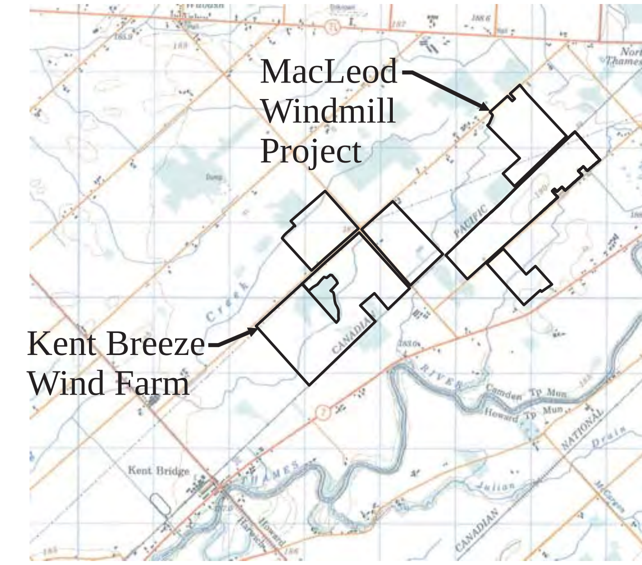


Figure 5: Schedule A10 - Land Use

Chatham-Kent Official Plan (2005) - Community of Camden Township



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Key Plan

Wind Farm Subject Boundary

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AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

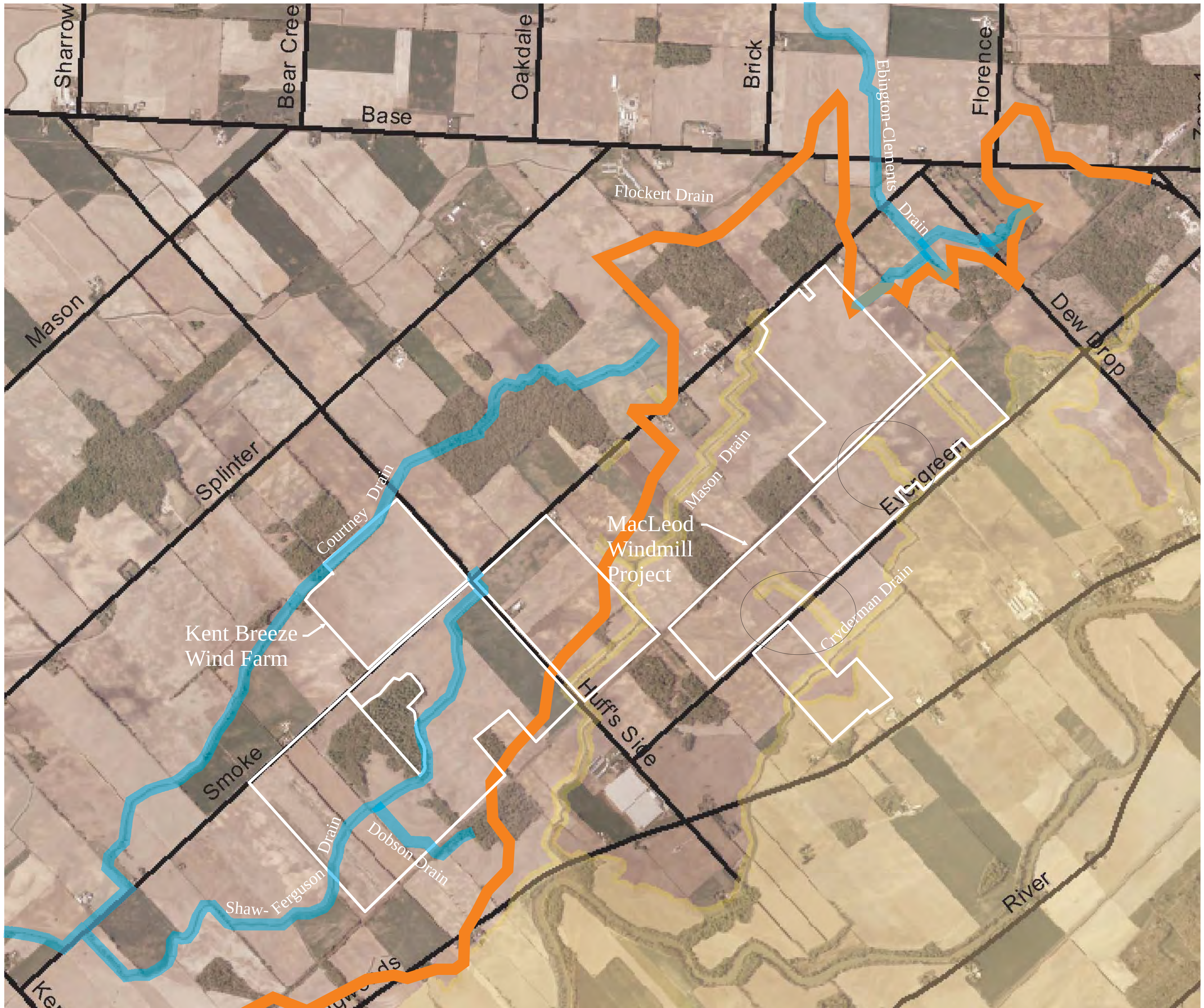
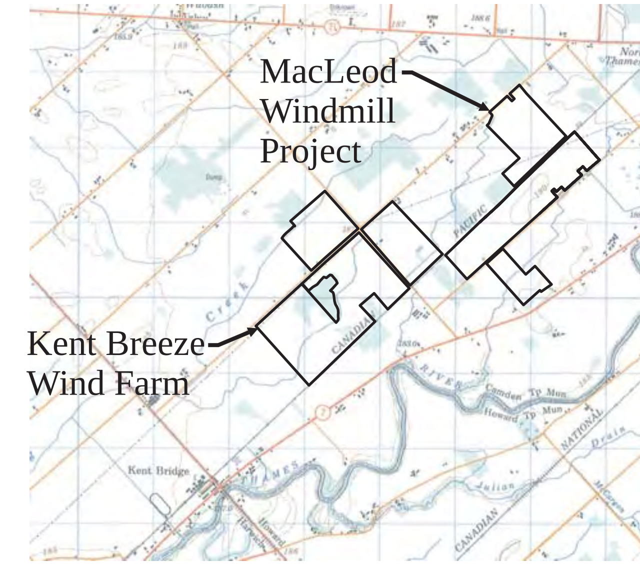


Figure 6: LTVCA / SCRCA Regulated Areas



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Key Plan

Legend

- Roads
- LTVCA Regulated Area
- SCRCA / LTVCA Boundary
- SCRCA Regulated Area

*Tributaries of Cryderman Drain are not confined to any defined channels.

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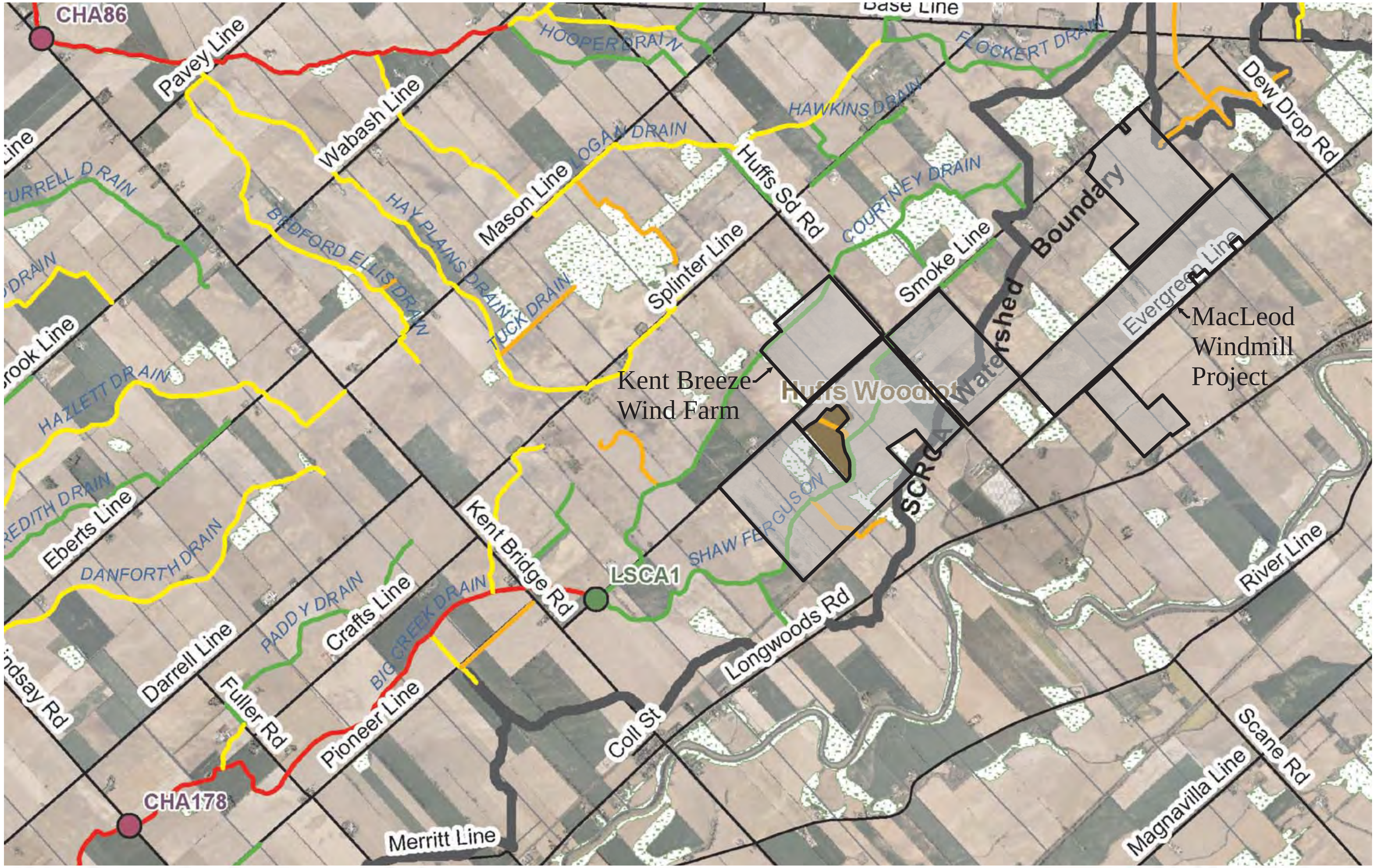
AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

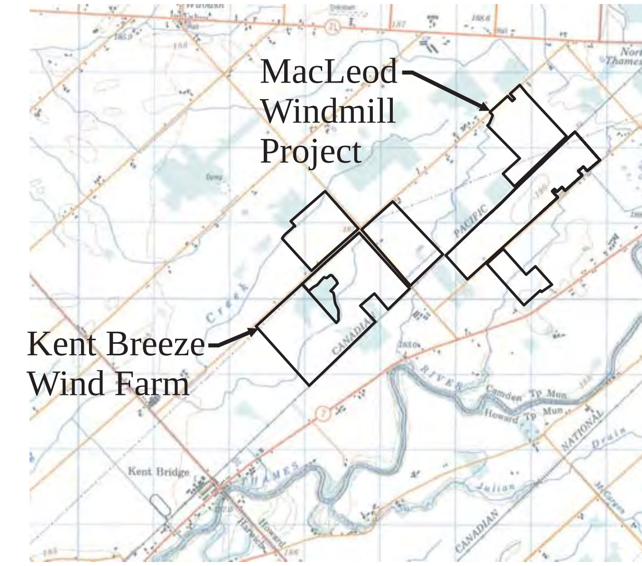
Figure 7: SCRCA Regulated Areas with Fish Survey Locations



CA-DFO Classification Scheme

- Type A -Cold/Cool Water With No Trout/Salmon Present
- Type B- Warm Water Top Predators Present, Channelization Within 10 Years
- Type C - Warm Water With No Top Predators
- Type D - Cold/Cool Water With Trout/Salmon Present
- Type E -Warm Water, Top Predators Present, No Channelization Within 10 Years
- Type F - Intermittent
- Natural
- Tiled
- Unclassified

- SCRCA Properties
- Wetland
- Woodlands
- Electrofishing Site
- Benthic Site



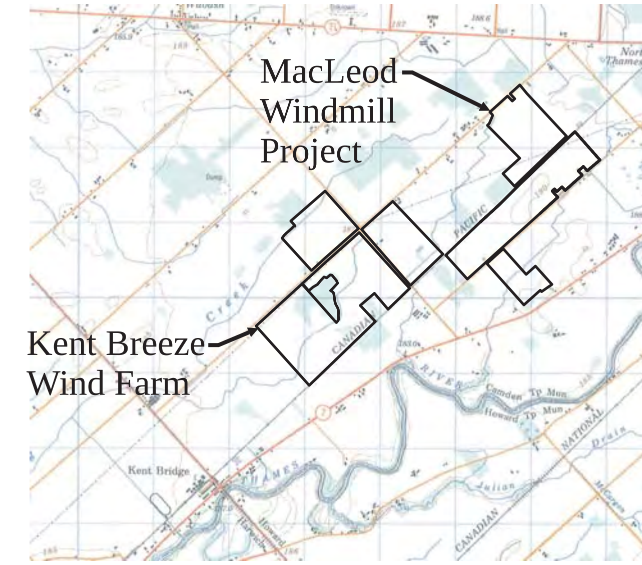
0 2,000
Scale 1:100,000
Key Plan

Wind Farm Subject Boundary

0 500
Scale 1:25,000
May 2010

BioLogic
AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

Figure 8: NHIC Species Locations



0 2,000

Scale 1:100,000
Key Plan

Legend:

#	Name	MNR	SRANK
1	*Phegopteris hexagonoptera* Broad Beech Fern	SC	S3
2	*Castenea dentata* American Chestnut	END	S2

0 500

Scale 1:25,000
May 2010

N

BioLogic
AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

Figure 9: Vegetation Communities

Legend:

1	SWD2	Green Ash Mineral Deciduous Swamp Type
2	FOD3-1	Dry - Fresh Poplar Deciduous Forest Type
3	FOD5-3	Dry - Fresh Sugar Maple - Oak Deciduous Forest Type
4	FOD6-1	Fresh - Moist Sugar Maple - Lowland Ash Deciduous Forest Type
5	FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type
6	FOD6-1	Fresh - Moist Sugar Maple - Lowland Ash Deciduous Forest Type
7	FOD8	Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite
8	SWD3-3	Swamp Maple Mineral Deciduous Swamp Type
9	FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type
10	FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type
11	CUW1	Mineral Cultural Woodland Ecosite
12	CUW1	Mineral Cultural Woodland Ecosite
13	FOD9-2	Fresh - Moist Oak - Maple Deciduous Forest Type
14	FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type
15	FOD7-2	Fresh - Moist Ash Lowland Deciduous Forest Type
16	CUM1-1	Dry - Moist Old Field Meadow Type

0 500

Scale 1:25,000

May 2010

N

BioLogic

AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

Appendix A

Fisheries Habitat Field Notes

Logic

AQUATIC HABITAT FIELD NOTES

Project: Kent Breeze
Date: May 28 2010
Collectors: R Arts

Time Started: 10:53am
Time Finished: 11:05 am

GENERAL INFORMATION

Weather Conditions: Clear sky, sunny, no breeze
no rainfall in last week

Air Temp	Water Temp	Cond	pH
25 °C	21.7 °C	850 uS/cm	8.78

LAND USE & POLLUTION

Surrounding Landuse: some residential to west, agriculture to the north, south & east

Sources of Pollution: could potentially be tile drainage, road, leachate from septic, farm run offs
· no evidence of current pollution

BANK STABILITY

	Stable	Slight	Moderate	Unstable
Left Bank	X			
Right Bank	X			

LOCATION

Station Name: Station #1

Name of Waterbody: Liberty Drain/Cryderman Drain

Drainage System: Cryderman Drain (Liberty drains into Cryderman)

Station Location: on Evergreen Line ~1 km east of Huffs Rd, just east of small area of residential houses (see map)

TYPE OF STREAM

Natural Channel		Permanent	? see notes
Channelized	X	Intermittent	X *
		Ephemeral	X *

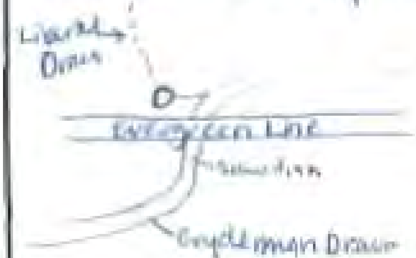
Notes: Liberty Drain most likely ephemeral since it is tiled; Cryderman Drain was flowing @ time of visit but maybe intermittent

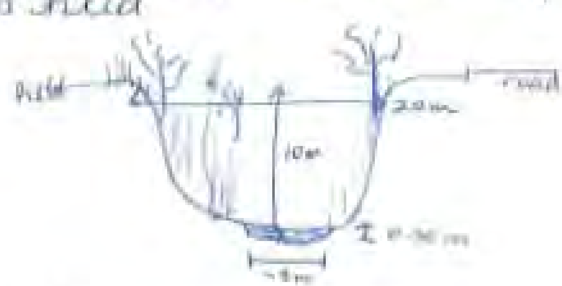
STREAM MORPHOLOGY

Mean Wetted Width:	2 - 3.75 m wide	Mean Wetted Depth:	0.30 m
Mean Bankfull Width:	~20 m	Mean Bankfull Depth:	~10 m

Substrate: 100% muck

Sketches & Other Notes:
* note that upstream of Evergreen Line Cryderman Drain maybe intermittent however Liberty Drain is tiled





trapizoidal shape
Steep banks

Station #1

HABITAT

In-Stream Cover (%)	None	Undercut Banks	Boulders	Cobble	Organic Debris	Woody Debris	Macrophytes
	30%	0%	0%	0%	5%	2%	63%

Shore Cover (% stream shaded)

- 100-90% ☐
- 90-60% ☐
- 60-30% ☒
- 30-1 % ☐
- 0% ☐

Type of Macrophytes: there was some arrowhead mostly along banks or wetted edge
lots of phragmites

Algae: moderate
majorty of stream had green fillimentous & green floating algae

Migratory Obstructions:
possibly intermittent to permenent flow (depends on year)

Other Comments:
devoid of pool riffle structure
bottom is relatively flat w some deeper sections
some riparian vegetation along the banks. but sparse
saw tiny minnows, lots of green frogs,
saw 1 large carp (TL ≈ 0.6m or 60cm)

Logic

AQUATIC HABITAT FIELD NOTES

Project: Kent Breeze
Date: May 28 2010
Collectors: R. Arts

Time Started: 11:11 am
Time Finished: 11:15 am

GENERAL INFORMATION

Weather Conditions: clear sky, sunny, no breeze. no rainfall in last week

Air Temp	Water Temp	Cond	pH
25°C	—	—	—

LAND USE & POLLUTION

Surrounding Landuse: Agriculture

Sources of Pollution: Agriculture, road. no evidence of pollution occurring

BANK STABILITY

N/a

	Stable	Slight	Moderate	Unstable
Left Bank	☐	☐	☐	☐
Right Bank	☐	☐	☐	☐

LOCATION

Station Name: Station #2

Name of Waterbody: un-named Drain

Drainage System: flows to Crylerman Drain

Station Location: Drain is located just east of Turbine MAKEOU # (WTG 6). on Evergreen Line

TYPE OF STREAM

Natural Channel	☐	Permanent	☐
Channelized	☐	Intermittent	☐
NONE	☒	Ephemeral	☐

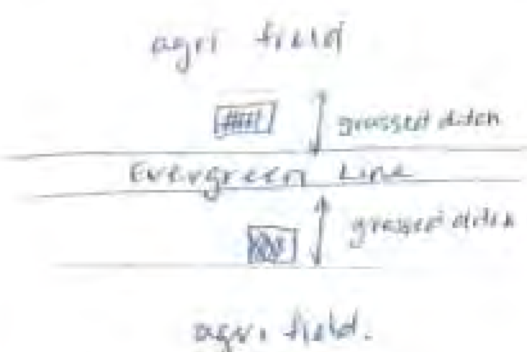
Notes: drain is tiled u/s & d/s of Evergreen Line

STREAM MORPHOLOGY

Mean Wetted Width:	n/a	Mean Wetted Depth:	n/a
Mean Bankfull Width:	n/a	Mean Bankfull Depth:	n/a

Substrate: N/a

Sketches & Other Notes:



- no evidence that drain resurfaces u/s or d/s of Evergreen Line

- NO HABITAT!

Station #2

HABITAT							
In-Stream Cover (%)	None	Undercut Banks	Boulders	Cobble	Organic Debris	Woody Debris	Macrophytes

Shore Cover (% stream shaded)		Type of Macrophytes	Algae:
100-90%	☐		
90-60%	☐		
60-30%	☐		
30-1 %	☐		
0%	☐		

Migratory Obstructions:

Other Comments:

No Habitat

AQUATIC HABITAT FIELD NOTES

Logic

Project: Kent Breeze
Date: May 28, 2010
Collectors: R. Arts

Time Started: 11:22 am
Time Finished: 11:56 am

GENERAL INFORMATION			
Weather Conditions: clear sky, sunny, no wind, no rain last week			
Air Temp	Water Temp	Cond.	pH
25°C	21.7°C	686 uS/cm	8.04

LAND USE & POLLUTION

Surrounding Landuse: agriculture

Sources of Pollution: agriculture — no evidence of sources polluting

BANK STABILITY

	Stable	Slight	Moderate	Unstable
Left Bank	X			
Right Bank	X			

LOCATION

Station Name: Station #3

Name of Waterbody: Mason Drain

Drainage System: Mason Drain

Station Location: ~600 m east of Huffs Sd Rd. just north of the CN railway crossing

TYPE OF STREAM

Natural Channel		Permanent	X ?
Channelized	X	Intermittent	X
		Ephemeral	

Notes: maybe perment? flow @ time of survey but flow is very slow to not existent

STREAM MORPHOLOGY

Mean Wetted Width:	1.25 to 1.5 m	Mean Wetted Depth:	0.1 to 0.3 m
Mean Bankfull Width:	~ 20 m	Mean Bankfull Depth:	~ 8-10 m

Substrate: 100% muck

Sketches & Other Notes

flowing @ time of survey

*had to take WT/pH/cond @ a deep section

Channel is overgrown c̄ phragmites & terrestrial grasses

Water in channel flows very slow (or not at all in sections) due to heavily vegetated stream

devoid of pool riffle structure

flat bottom

trapezoid shape

shallow sections have more veg instream

Station #3

HABITAT							
In-Stream Cover (%)	None	Undercut Banks	Boulders	Cobble	Organic Debris	Woody Debris	Macrophytes
	10%	2%	0%	0%	3-5%	1%	85%

Shore Cover (% stream shaded)		Type of Macrophytes	Algae: Moderate
100-90%	☐	terrestrial grasses phragmites overhanging in some spots. Some arrowroot.	green floating throughout green filimentous throughout
90-60%	☒		
60-30%	☐		
30-1 %	☐		
0%	☐		

Migratory Obstructions:

intermittent / dry near end of summer.

Other Comments:

- lots of green frogs
- no fish were observed.
- limited fish habitat

Logic

AQUATIC AND TERRESTRIAL RESOURCE MANAGEMENT SERVICES

AQUATIC HABITAT FIELD NOTES

Project: Kent Breeze

Date: May 28, 2010

Collectors: R. Arts

Time Started: 12:11 pm

Time Finished: 12:23 pm

GENERAL INFORMATION

Weather Conditions:
clear sky, sunny, no breeze.
no rainfall over last week

Air Temp	Water Temp	Cond.	pH
25°C	18.3°C	529 uS/cm	7.84

LAND USE & POLLUTION

Surrounding Landuse:
agriculture

Sources of Pollution:
agriculture

BANK STABILITY

	Stable	Slight	Moderate	Unstable
Left Bank	X			
Right Bank	X			

LOCATION

Station Name: Station #4

Name of Waterbody:
Shaw-Ferguson Drain

Drainage System:
Shaw-Ferguson Drain

Station Location:
just south of Smoke Rd on
Huff's SD Rd

TYPE OF STREAM

Natural Channel		Pemanent	
Channelized	X	Intermittent	X
		Ephemeral	

Notes:
trapizoid shape

STREAM MORPHOLOGY

Mean Wetted Width:	1 - 1.5 m	Mean Wetted Depth:	0.06 - 0.1 m
Mean Bankfull Width:	~15 m	Mean Bankfull Depth:	~5 - 6 m

Substrate: 100% muck

Sketches & Other Notes:

- trapizoid shape
- steep banks
- slow flow due to stream completely vegetated w phragmites.

tiled u/s on east side of Huff's SD Rd

Station #4

HABITAT							
In-Stream Cover (%)	None	Undercut Banks	Boulders	Cobble	Organic Debris	Woody Debris	Macrophytes
							100%

Shore Cover (% stream shaded)		Type of Macrophytes	Algae: slight
100-90%	☐	phragmites all through channel some sm trees & shrubs allong banks	Some floating near culvert @ Huff's SD Rd.
90-60%	☒		
60-30%	☐		
30-1 %	☐		
0%	☐		

Migratory Obstructions:

intermittent, some debris (garbage) in nature

Other Comments:

- very shallow
- heavily vegetated w phragmites
- flat bottom
- no pool/riffle structure
- a few green frogs
- very limited fish habitat

Fish Habitat Field Investigation Locations

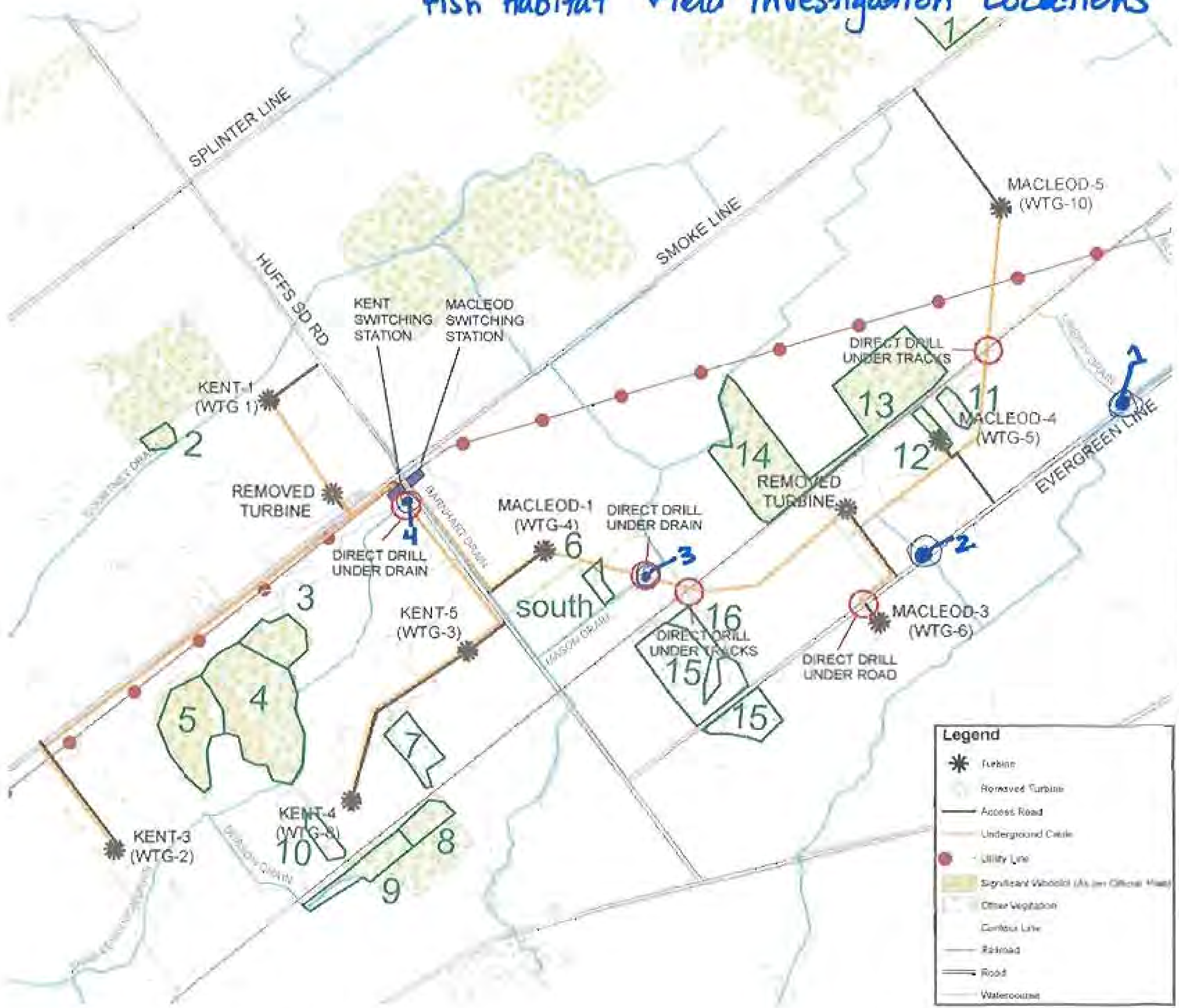


Figure 10: Vegetation and Proposed Work

Legend:

1 SWD2 Green Ash Mineral Deciduous Swamp Type
2 FOD3-1 Dry - Fresh Poplar Deciduous Forest Type
3 FOD5-3 Dry - Fresh Sugar Maple - Oak Deciduous Forest Type
4 FOD6-1 Fresh - Moist Sugar Maple - Lowland Ash Deciduous Forest Type
5 FOD7-2 Fresh - Moist Ash Lowland Deciduous Forest Type
6 FOD6-1 Fresh - Moist Sugar Maple - Lowland Ash Deciduous Forest Type
7 FOD8 Fresh - Moist Poplar - Sassafras Deciduous Forest Ecosite
8 SWD3-3 Swamp Maple Mineral Deciduous Swamp Type
9 FOD7-2 Fresh - Moist Ash Lowland Deciduous Forest Type
10 FOD7-2 Fresh - Moist Ash Lowland Deciduous Forest Type
11 CUW1 Mineral Cultural Woodland Ecosite
12 CUW1 Mineral Cultural Woodland Ecosite
13 FOD9-2 Fresh - Moist Oak - Maple Deciduous Forest Type
14 FOD7-2 Fresh - Moist Ash Lowland Deciduous Forest Type
15 FOD7-2 Fresh - Moist Ash Lowland Deciduous Forest Type
16 CUM1-1 Dry - Moist Old Field Meadow Type

Scale 1:15,000
May 2010

BioLogic

●—1 • Stations for field investigation

Appendix B

Ecological Land Classification Field Notes

ELC COMMUNITY DESCRIPTION & CLASSIFICATION	SITE: Kent Breeze		POLYGON: 1	
			Field #:	Final #:
	SURVEYOR(S): WH	DATE: August 12, 2008		UTME:
	START: 9:30	END: 9:45	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	*NATURAL*	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	*MINERAL SOIL*	BOTTOMLAND	CULTURAL	FLOATING-LVD.	*SWAMP* *MARSH*
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		*DECIDUOUS*	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			FOREST
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	*TREED*		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	FRApenn>ACEsilv>ACErubr>ULMamer
2	SUB-CANOPY	2	3	FRApenn>ACEsilv>ACErubr
3	UNDERSTORY	3	3	RHUtyph=CORrace
4	GRD. LAYER	5	2	IMPcapa>ONOsens>SYMfoe

HT CODES. 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0 5<HT<1 m 6=0 2<HT<0 5 m 7=HT<0.2 m
CVR CODES 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 45% Ash 40% Maple 15% Other	BA: 44

SIZE CLASS ANALYSIS.	O	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	O	> 50 cm
STANDING SNAGS.	O	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	R	> 50 cm
DEADFALL/LOGS:	O	< 10 cm	A	10 - 24 cm	O	25 - 50 cm	O	> 50 cm

ABUNDANCE CODES N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE	X	MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 4-5	DEPTH OF ORGANICS.		(cm)
	DEPTH TO BEDROCK.		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: SWAMP		SW
COMMUNITY SERIES: DECIDUOUS SWAMP		SWD
ECOSITE: ASH MINERAL DECIDUOUS SWAMP ECOSITE		SWD2
VEGETATION TYPE: GREEN ASH MINERAL DECIDUOUS SWAMP TYPE		SWD2-2
INCLUSION		
COMPLEX		

Notes: reviewed from road
light rain and cool

ELC

ELC COMMUNITY CLASSIFICATION	SITE: Kent Breeze			POLYGON: 2	
				Field #:	Final #:
	SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
	START: 9:20	END: 9:30		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	**COVER**	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			***FOREST***
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE (GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	POPtrem>ACEnegu>FRApenn
2	SUB-CANOPY	2	3	POPtrem>ACEnegu>FRApenn
3	UNDERSTORY	3	3	CORrace=RHUtyph
4	GRD. LAYER	4	4	GRASSES>SOLDspp>RASPBERRY

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 85% POPLAR 15% OTHER	BA: 22

SIZE CLASS ANALYSIS:	A	< 10 cm	A	10 - 24 cm	O	25 - 50 cm	N	> 50 cm
STANDING SNAGS:	O	< 10 cm	O	10 - 24 cm	R	25 - 50 cm	N	> 50 cm
DEADFALL/LOGS:	O	< 10 cm	O	10 - 24 cm	N	25 - 50 cm	N	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 3	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: FOREST	FO
COMMUNITY SERIES: DECIDUOUS FOREST	FOD
ECOSITE: DRY-FRESH POPLAR-WHITE BIRCH DECIDUOUS FOREST ECOSITE	FOD3
VEGETATION TYPE: DRY - FRESH POPLAR DECIDUOUS FOREST TYPE	FOD3-1

	INCLUSION		
	COMPLEX		

Notes: did not cross creek into community. assessed from a distance
light rain and cool

ELC COMMUNITY CLASSIFICATION	SITE: Kent Breeze			POLYGON: 3	
				Field #:	Final #:
	SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
	START: 9:35	END: 9:55		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			***FOREST***
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE (> GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	ACEsacc>QUErubr>FRAamer>FAGgran
2	SUB-CANOPY	2	3	ACEsacc>>OSTvirg>FRAamer
3	UNDERSTORY	3	3	OSTvirg>CARcaro>CORalte
4	GRD. LAYER	5	2	RHUradi=TRILLIUM>GRASSES>JACK-IN-THE-PULPIT

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 35% MAPLE 30% OAK 35% OTHER	BA: 44

SIZE CLASS ANALYSIS:	O	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	O	> 50 cm
STANDING SNAGS:	R	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	O	> 50 cm
DEADFALL/LOGS:	O	< 10 cm	O	10 - 24 cm	A	25 - 50 cm	O	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE	X	MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 1-2	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: FOREST	FO
COMMUNITY SERIES: DECIDUOUS FOREST	FOD
ECOSITE: DRY-FRESH SUGAR MAPLE DECIDUOUS FOREST ECOSITE	FOD5
VEGETATION TYPE: DRY-FRESH SUGAR MAPLE-OAK DECIDUOUS FOREST TYPE	FOD5-3

	INCLUSION		
	COMPLEX		

Notes: light rain and cool

ELC COMMUNITY CLASSIFICATION	SITE: Kent Breeze			POLYGON: 4	
				Field #:	Final #:
	SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
	START: 9:55	END: 10:15		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			***FOREST***
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	ACEsacc>FRAamer>>QUErubr
2	SUB-CANOPY	2	3	FRAamer>>ACErubr
3	UNDERSTORY	3	2	CORalte=RIBcyno
4	GRD. LAYER	4	5	RHUradi>GRASSES>STINGING NETTLE>TRILLIUM

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 35% MAPLE 30% ASH 15% OAK 20% OTHER	BA: 40

SIZE CLASS ANALYSIS:	O	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	O	> 50 cm
STANDING SNAGS:	R	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	R	> 50 cm
DEADFALL/LOGS:	O	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	O	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE	X	MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 2-3	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: FOREST	FO
COMMUNITY SERIES: DECIDUOUS FOREST	FOD
ECOSITE: FRESH-MOIST SUGAR MAPLE DECIDUOUS FOREST ECOSITE	FOD6
VEGETATION TYPE: FRESH-MOIST SUGAR MAPLE LOWLAND ASH DECIDUOUS FOREST	FOD6-1

	INCLUSION		
	COMPLEX		

Notes: light rain and warming

ELC COMMUNITY CLASSIFICATION	SITE: Kent Breeze			POLYGON: 5	
				Field #:	Final #:
	SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
	START: 10:15	END: 10:30		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			***FOREST***
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

LAYER		HT	CVR	DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	FRApenn>>ULMamer>ACEsilv
2	SUB-CANOPY	2	3	FRApenn>>ULMamer>ACEsilv
3	UNDERSTORY	3	3	FRApenn>>ULMamer>ACEsilv
4	GRD. LAYER	4	3	RASPBERRY>CORrace>>SOLspp>ASTspp

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 70% ASH 30% OTHER	BA: 38

SIZE CLASS ANALYSIS:	A	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	O	> 50 cm
STANDING SNAGS:	A	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	O	> 50 cm
DEADFALL/LOGS:	A	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	O	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE	X	MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 2-3	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: FOREST	FO
COMMUNITY SERIES: DECIDUOUS FOREST	FOD
ECOSITE: FRESH-MOIST LOWLAND DECIDUOUS FOREST ECOSITE	FOD7
VEGETATION TYPE: FRESH-MOIST ASH LOWLAND DECIDUOUS FOREST TYPE	FOD7-2

	INCLUSION		
	COMPLEX		

Notes: rain ending and warming

ELC	SITE: Kent Breeze		POLYGON: 6	
			Field #:	Final #:
COMMUNITY	SURVEYOR(S): WH	DATE: August 12, 2008		UTME:
CLASSIFICATION	START: 10:45 END: 11:00		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	NATURAL	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	MINERAL SOIL	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		DECIDUOUS	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			FOREST
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	TREED		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE (> GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	3	FRAamer>POPbals>ACEsacc>>QUEmacr
2	SUB-CANOPY	2	3	ACEsacc=FRAamer>POPbals
3	UNDERSTORY	3	3	RHUtyph>LONspp.>CORalte
4	GRD. LAYER	4	4	SOLspp>GRASSES>ASTspp>RHUradi

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:	O	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	R	> 50 cm
STANDING SNAGS:	O	< 10 cm	O	10 - 24 cm	R	25 - 50 cm	N	> 50 cm
DEADFALL/LOGS:	A	< 10 cm	A	10 - 24 cm	O	25 - 50 cm	R	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG	X	MID-AGE		MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 1	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: CULTURAL	CU
COMMUNITY SERIES: CULTURAL WOODLAND	CUW
ECOSITE: MINERAL CULTURAL WOODLAND ECOSITE	CUW1
VEGETATION TYPE:	

	INCLUSION		
	COMPLEX		

Notes: outside of subject land and surveyed from a distance
clearing and warm

ELC	SITE: Kent Breeze			POLYGON: 7	
				Field #:	Final #:
COMMUNITY	SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
CLASSIFICATION	START: 11:10	END: 11:30		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			***FOREST***
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	LIRtuli>SASalbi>>FRAamer>POPtrem
2	SUB-CANOPY	2	4	LIRtuli>SASalbi>>FRAamer
3	UNDERSTORY	3	3	SASalbi>FRAamer
4	GRD. LAYER	5	3	RHUradi>GRASS>>SOLspp

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 40% TULIP TREE 35%SASSAFRAS 25% OTHER	BA: 26

SIZE CLASS ANALYSIS:	A	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	R	> 50 cm
STANDING SNAGS:	O	< 10 cm	O	10 - 24 cm	R	25 - 50 cm	N	> 50 cm
DEADFALL/LOGS:	A	< 10 cm	A	10 - 24 cm	O	25 - 50 cm	O	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER	X	YOUNG		MID-AGE		MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 1	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: FOREST	FO
COMMUNITY SERIES: DECIDUOUS FOREST	FOD
ECOSITE: FRESH-MOIST POPLAR-SASSAFRAS DECIDUOUS FOREST ECOSITE	FOD8
VEGETATION TYPE:	

	INCLUSION		
	COMPLEX		

Notes: clear, sunny and warm

ELC COMMUNITY CLASSIFICATION	SITE: Kent Breeze			POLYGON: 8	
				Field #:	Final #:
	SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
	START: 11:30	END: 11:40		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	***SWAMP*** ***MARSH***
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			FOREST
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	ACEsilv>ACErubr>FRAamer>>ULMamer
2	SUB-CANOPY	2	3	ACEsilv>FRAamer>ACErubr
3	UNDERSTORY	3	3	FRAamer>CORrace>RHAcath>RIVgrape
4	GRD. LAYER	5	2	IMPcape>>RASPBERRY>ONEsens>SYMfoet

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 80% MAPLE 20% OTHER	BA: 35

SIZE CLASS ANALYSIS:	O	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	O	> 50 cm
STANDING SNAGS:	O	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	R	> 50 cm
DEADFALL/LOGS:	A	< 10 cm	A	10 - 24 cm	O	25 - 50 cm	R	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG	X	MID-AGE	X	MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 4-5	DEPTH OF ORGANICS:		15 (cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: SWAMP	SW
COMMUNITY SERIES: DECIDUOUS SWAMP	SWD
ECOSITE: MAPLE MINERAL DECIDUOUS SWAMP ECOSITE	SWD3
VEGETATION TYPE: SWAMP MAPLE MINERAL DECIDUOUS SWAMP TYPE	SWD3-3

	INCLUSION		
	COMPLEX		

Notes: clear, sunny and warm
outside of subject lands, surveyed from edge only

ELC

COMMUNITY CLASSIFICATION

SITE: Kent Breeze		POLYGON: 9	
		Field #:	Final #:
SURVEYOR(S): WH	DATE: August 12, 2008		UTME:
START: 11:45	END: 11:55	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	**COVER**	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			***FOREST***
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	FRApenn>>TILamer>CELocci
2	SUB-CANOPY	2	3	FRApenn>>TILamer>CELocci
3	UNDERSTORY	3	3	CORrace>LONspp=RHAcath
4	GRD. LAYER	4	3	GRASSES=RASPBERRY>SOLcana>ASTERspp

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 70% ASH 30% OTHER	BA: 30

SIZE CLASS ANALYSIS:	A	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	R	> 50 cm

STANDING SNAGS:	O	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	R	> 50 cm
DEADFALL/LOGS:	A	< 10 cm	A	10 - 24 cm	O	25 - 50 cm	R	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG	X	MID-AGE		MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 2-3	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: FOREST	FO
COMMUNITY SERIES: DECIDUOUS FOREST	FOD
ECOSITE: FRESH-MOIST LOWLAND DECIDUOUS FOREST ECOSITE	FOD7
VEGETATION TYPE: FRESH-MOIST ASH LOWLAND DECIDUOUS FOREST TYPE	FOD7-2

	INCLUSION		

	COMPLEX		

Notes: clear, sunny and warm
outside of subject lands, surveyed from edge only

ELC	SITE: Kent Breeze			POLYGON: 10	
				Field #:	Final #:
COMMUNITY	SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
CLASSIFICATION	START: 12:00	END: 12:20		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			***FOREST***
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	FRApenn>>TILamer>CELocci
2	SUB-CANOPY	2	3	FRApenn>>TILamer>CELocci
3	UNDERSTORY	3	3	CORrace>LONspp=RHAcath
4	GRD. LAYER	4	3	GRASSES=RASPBERRY>SOLcana>ASTERspp

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 70% ASH 30% OTHER	BA: 30

SIZE CLASS ANALYSIS:	A	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	R	> 50 cm

STANDING SNAGS:	O	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	R	> 50 cm
DEADFALL/LOGS:	A	< 10 cm	A	10 - 24 cm	O	25 - 50 cm	R	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG	X	MID-AGE		MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 2-3	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: FOREST	FO
COMMUNITY SERIES: DECIDUOUS FOREST	FOD
ECOSITE: FRESH-MOIST LOWLAND DECIDUOUS FOREST ECOSITE	FOD7
VEGETATION TYPE: FRESH-MOIST ASH LOWLAND DECIDUOUS FOREST TYPE	FOD7-2

	INCLUSION		

	COMPLEX		

Notes: clear, sunny and warm

ELC

COMMUNITY CLASSIFICATION

SITE: Kent Breeze			POLYGON: 11	
			Field #:	Final #:
SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
START: 1:15	END: 1:35		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	NATURAL	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	***CULTURAL***	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	***WOODLAND***
SHALLOW WATER	CARB. BEDRK.	ALVAR			FOREST
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	POPbals>>FRApenn>ULMamer
2	SUB-CANOPY	3	3	POPbals>ACEngu>ROBpseu
3	UNDERSTORY	3	3	RHUtyph>>CORrace
4	GRD. LAYER	4	3	SOLspp.=GRASSES+ASTERspp>RHUradi

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: N/A	BA:

SIZE CLASS ANALYSIS:		< 10 cm		10 - 24 cm		25 - 50 cm		> 50 cm

STANDING SNAGS:		< 10 cm		10 - 24 cm		25 - 50 cm		> 50 cm
DEADFALL/LOGS:		< 10 cm		10 - 24 cm		25 - 50 cm		> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:	X	PIONEER		YOUNG		MID-AGE		MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 1-2	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: CULTURAL	CU
COMMUNITY SERIES: CULTURAL WOODLAND	CUW
ECOSITE: MINERAL CULTURAL WOODLAND ECOSITE	CUW1
VEGETATION TYPE:	

	INCLUSION		

	COMPLEX		

Notes: clear, sunny and warm

ELC

COMMUNITY CLASSIFICATION

SITE: Kent Breeze		POLYGON: 12	
		Field #:	Final #:
SURVEYOR(S): WH	DATE: August 12, 2008		UTME:
START: 1:40	END: 2:00	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	NATURAL	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	***CULTURAL***	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	***WOODLAND***
SHALLOW WATER	CARB. BEDRK.	ALVAR			FOREST
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	2	3	POPbals>>FRApenn>ULMamer
2	SUB-CANOPY	3	3	POPbals>ACEngu>ROBpseu
3	UNDERSTORY	3	3	RHUtyph>>CORrace
4	GRD. LAYER	4	3	SOLspp.=GRASSES+ASTERspp>RHUradi

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: N/A	BA:

SIZE CLASS ANALYSIS:		< 10 cm		10 - 24 cm		25 - 50 cm		> 50 cm

STANDING SNAGS:		< 10 cm		10 - 24 cm		25 - 50 cm		> 50 cm
DEADFALL/LOGS:		< 10 cm		10 - 24 cm		25 - 50 cm		> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:	X	PIONEER		YOUNG		MID-AGE		MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 1-2	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: CULTURAL	CU
COMMUNITY SERIES: CULTURAL WOODLAND	CUW
ECOSITE: MINERAL CULTURAL WOODLAND ECOSITE	CUW1
VEGETATION TYPE:	

	INCLUSION		

	COMPLEX		

Notes: clear, sunny and warm

ELC COMMUNITY CLASSIFICATION	SITE: Kent Breeze		POLYGON: 13	
			Field #:	Final #:
	SURVEYOR(S): WH	DATE: August 12, 2008		UTME:
	START: 2:05	END: 2:20	UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			***FOREST***
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE (GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	QUErubr>ACEsacc>FRAamer>FAGgran
2	SUB-CANOPY	2	3	ACEsacc>FRAamer=OSTvirg>CARcaro
3	UNDERSTORY	3	3	OSTvirg>CARcaro>ACEsacc
4	GRD. LAYER	5	2	RHUradi>FRAamer>BLACKcurrant

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 30% OAK 25% MAPLE 15% ASH 10% BEECH	BA: 42

SIZE CLASS ANALYSIS:	O	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	O	> 50 cm
STANDING SNAGS:	R	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	O	> 50 cm
DEADFALL/LOGS:	A	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	O	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE	X	MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 1	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: FOREST	FO
COMMUNITY SERIES: DECIDUOUS FOREST	FOD
ECOSITE: FRESH-MOIST OAK-MAPLE-HICKORY DECIDUOUS FOREST	FOD9
VEGETATION TYPE: FRESH-MOIST OAK-MAPLE DECIDUOUS FOREST TYPE	FOD9-2

	INCLUSION		
	COMPLEX		

Notes: outside of subject lands, surveyed from edge only
clear, sunny and warm

ELC COMMUNITY CLASSIFICATION	SITE: Kent Breeze			POLYGON: 14	
				Field #:	Final #:
	SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
	START: 2:30	END: 2:40		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			***FOREST***
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	SPECIES IN ORDER OF DECREASING DOMINANCE (>> MUCH GREATER THAN; > GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	FRApenn>>TILamer>CELocci
2	SUB-CANOPY	2	3	FRApenn>>TILamer>CELocci
3	UNDERSTORY	3	3	CORrace>LONspp=RHAcath
4	GRD. LAYER	4	3	GRASSES=RASPBERRY>SOLcana>ASTERspp

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 70% ASH 30% OTHER	BA: 38

SIZE CLASS ANALYSIS:	A	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	O	> 50 cm
STANDING SNAGS:	O	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	R	> 50 cm
DEADFALL/LOGS:	A	< 10 cm	A	10 - 24 cm	O	25 - 50 cm	R	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG		MID-AGE	X	MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 2-3	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: FOREST	FO
COMMUNITY SERIES: DECIDUOUS FOREST	FOD
ECOSITE: FRESH-MOIST LOWLAND DECIDUOUS FOREST ECOSITE	FOD7
VEGETATION TYPE: FRESH-MOIST ASH LOWLAND DECIDUOUS FOREST TYPE	FOD7-2

	INCLUSION		
	COMPLEX		

Notes: outside of subject lands, surveyed from edge only
clear, sunny and warm

ELC	SITE: Kent Breeze			POLYGON: 15	
				Field #:	Final #:
COMMUNITY	SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
CLASSIFICATION	START: 2:55	END: 3:15		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	***NATURAL***	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	CULTURAL	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		FORB	BARREN
		TABLELAND		LICHEN	MEADOW
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		***DECIDUOUS***	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	OPEN	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			***FOREST***
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	***TREED***		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE (> GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY	1	4	FRApenn>ACEsilv
2	SUB-CANOPY	2	2	FRApenn>ACEsilv
3	UNDERSTORY	3	3	RHUtyph=FRApenn>CORrace
4	GRD. LAYER	5	3	BEDSTRAW=FRApenn>GRASSES>RHUradi

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m

CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION: 60%Ash 30% Maple 10%other	BA: 38

SIZE CLASS ANALYSIS:	A	< 10 cm	A	10 - 24 cm	O	25 - 50 cm	R	> 50 cm
STANDING SNAGS:	O	< 10 cm	A	10 - 24 cm	A	25 - 50 cm	O	> 50 cm
DEADFALL/LOGS:	A	< 10 cm	O	10 - 24 cm	O	25 - 50 cm	O	> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:		PIONEER		YOUNG	X	MID-AGE		MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE: SAND	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE: 2-3	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: FOREST	FO
COMMUNITY SERIES: DECIDUOUS FOREST	FOD
ECOSITE: FRESH-MOIST LOWLAND DECIDUOUS FOREST	FOD7
VEGETATION TYPE: FRESH - MOIST ASH LOWLAND DECIDUOUS FOREST TYPE	FOD7-2

	INCLUSION		
	COMPLEX		

Notes: outside of subject lands, surveyed from edge only
clear, sunny and warm

ELC COMMUNITY CLASSIFICATION	SITE: Kent Breeze			POLYGON: 16	
				Field #:	Final #:
	SURVEYOR(S): WH		DATE: August 12, 2008		UTME:
	START: 3:20	END: 3:35		UTMZ:	UTMN:

POLYGON DESCRIPTION

SYSTEM	SUBSTRATE	TOPOGRAPHIC FEATURE	HISTORY	PLANT FORM	COMMUNITY
TERRESTRIAL	ORGANIC	LACUSTRINE	NATURAL	PLANKTON	POND LAKE
		RIVERINE		SUBMERGED	STREAM RIVER
WETLAND	***MINERAL SOIL***	BOTTOMLAND	***CULTURAL***	FLOATING-LVD.	SWAMP MARSH
		TERRACE		GRAMINOID	BOG FEN
AQUATIC	PARENT MIN.	VALLEY SLOPE		***FORB***	BARREN
		TABLELAND		LICHEN	***MEADOW***
	ACIDIC BEDRK.	ROLL. UPLAND		BRYOPHYTE	PRAIRIE
		CLIFF		DECIDUOUS	THICKET
SITE	BASIC BEDRK.	TALUS	COVER	CONIFEROUS	SAVANNAH
OPEN WATER		CREVICE/CAVE	***OPEN***	MIXED	WOODLAND
SHALLOW WATER	CARB. BEDRK.	ALVAR			FOREST
SURFICIAL DEP.		ROCKLAND	SHRUB		PLANTATION
BEDROCK		BEACH/BAR			
		SAND DUNE	TREED		
		BLUFF			

STAND DESCRIPTION:

	LAYER	HT	CVR	DECREASING DOMINANCE (> GREATER THAN; = ABOUT EQUAL TO)
1	CANOPY			
2	SUB-CANOPY			
3	UNDERSTORY			
4	GRD. LAYER	5	4	GRASSES=SOLDcana=ASTERspp=DAUcaro

HT CODES: 1=>25 m 2=10<HT<25 m 3=2<HT<10 m 4=1<HT<2 m 5=0.5<HT<1 m 6=0.2<HT<0.5 m 7=HT<0.2 m
CVR CODES: 0=NONE 1=0%<CVR<10% 2=10<CVR<25% 3=25<CVR<60% 4=CVR>60%

STAND COMPOSITION:	BA:

SIZE CLASS ANALYSIS:		< 10 cm		10 - 24 cm		25 - 50 cm		> 50 cm
STANDING SNAGS:		< 10 cm		10 - 24 cm		25 - 50 cm		> 50 cm
DEADFALL/LOGS:		< 10 cm		10 - 24 cm		25 - 50 cm		> 50 cm

ABUNDANCE CODES: N=NONE R=RARE O=OCCASIONAL A=ABUNDANT

COMM. AGE:	X	PIONEER		YOUNG		MID-AGE		MATURE		OLD-GROWTH

SOIL ANALYSIS

TEXTURE:	DEPTH TO MOTTLES / GLEY	g =	G =
MOISTURE:	DEPTH OF ORGANICS:		(cm)
	DEPTH TO BEDROCK:		(cm)

COMMUNITY CLASSIFICATION

COMMUNITY CLASS: CULTURAL	CU
COMMUNITY SERIES: CULTURAL MEADOW	CUM
ECOSITE: MINERAL CULTURAL MEADOW ECOSITE	CUM1
VEGETATION TYPE: DRY - MOIST OLD FIELD MEADOW TYPE	CUM1-1

	INCLUSION		
	COMPLEX		

Notes: outside of subject lands, surveyed from edge only
clear, sunny and warm

Appendix C

Avian Monitoring Field Notes
(is Appendix B in Avian Study)

Appendix B – Detailed Results of Site-Specific Monitoring

B1 – Monitoring Transect Descriptions

Transect 1:

General Description: Riparian - Steep wooded banks of Thames River, leading to a narrow herbaceous zone at waters edge. Wooded area with scattered deciduous trees in spots, discontinuous canopy overall. Uneven aged, with some trees very large, potentially suited to nest sites for birds of prey.

Common Tree Species: Eastern cottonwood (*Populus deltoides*), Balsam poplar (*Populus balsamifera*), Black willow (*Salix nigra*), Manitoba maple (*Acer negundo*)

Common Understory Plants: Staghorn sumac (*Rhus typhina*), Choke cherry saplings (*Prunus virginiana*), wild grape (*Vitis sp*.), Nannyberry (*Viburnum lentago*), Wild raspberry (*Rubus* sp.). Reeds (*Phragmites* sp.) at waters edge.

Transect 2:

General Description: Riparian - Wooded banks of Thames River, not as steep as Transect 1. Fairly solid upper canopy composed primarily of mature deciduous trees.

Common Tree Species: Basswood (*Tilia Americana*), Black walnut (*Juglans nigra*), numerous dead elms (*Ulmus* sp.) a few Manitoba maple (*Acer negundo*), and large Sycamores (*Platanus occidentalis*)

Common Understory Plants: Virginia creeper, Wild grape (*Vitis sp*.), Wild raspberry (*Rubus* sp.), a few Hawthorns (*Crataegus* sp.), Poison ivy (*Rhus radicans*), Jewelweed (*Impatiens capensis*), Hemlock-parsley (*Conioselinium chinense*), Wood nettle (*Laportea cabadensis*), Goldenrod (*Solidago* sp.)

Transect 3:

General Description: Variable width (~25 – 50 m) wooded riparian zone, and adjacent pasture and field crops. Steep sloped banks. Inconsistent canopy, shrub-dominated stretches.

Common Tree Species: Eastern cottonwood (*Populus deltoides*), Black walnut (*Juglans nigra*), Ashes (*Fraxinus* sp.), Elms (*Ulmus* sp.), a few sugar maple (*Acer saccharum*).

Common Understory Plants: Wild grape (*Vitis sp*.), Wild raspberry (*Rubus* sp.), Hawthorns (*Crataegus* sp.), Wood nettle (*Laportea cabadensis*), stinging nettle (Urtica dioica), goldenrod (*Solidago* sp.), False Solomon’s seal (*Smilacima racemosa*).

Transect 4:

General Description: Wooded riparian zone on west side of River, and adjacent cultivated lands. Cultivated to top of bank on west. Steep sloped banks. Inconsistent canopy on west bank, completely open in spots. Opposite bank is fairly evenly wooded with a closed canopy.

Common Tree Species: Eastern cottonwood (*Populus deltoides*), Black walnut (*Juglans nigra*), Black willow (*Salix nigra*), Rock Elm (*Ulmus thomasii*), Manitoba maple (*Acer negundo*), Basswood (*Tilia Americana*), and very large Sycamores (*Platanus occidentalis*).

Common Understory Plants: Wild grape (*Vitis sp*.), Wild raspberry (*Rubus* sp.), Staghorn sumac (*Rhus typhina*), Goldenrod (*Solidago* sp.), various asters.

Transect 5:

General Description: Deciduous woodlot (interior an exterior) and adjacent field crops. Mature hardwoods dominate a closed canopy.

Common Tree Species: Sugar maple (*Acer saccharum*), Silver maple (*Acer saccharinum),* Eastern cottonwood (*Populus deltoides*), Black walnut (*Juglans nigra*), Elms (*Ulmus spp.*), Basswood (*Tilia Americana*), Ashes (*Fraxinus* sp.), Black cherry (*Prunus serotina*), Shagbark hickory (*Carya ovata*), a few Mulberry (*Morus* sp.)

Common Understory Plants: Sassafras saplings (*Sassafras albidum*), Virginia creeper, Wild raspberry (*Rubus* sp.), Poison ivy (*Rhus radicans*), Canada lily (*Lilium canadense*), Trilliums (*Trillium grandiflorum*), various wood ferns.

Transect 6:

General Description: Deciduous woodlot (interior an exterior) and adjacent field crops. Mature hardwoods dominate a closed canopy.

Common Tree Species: Sugar maple (*Acer saccharum*), Silver maple (*Acer saccharinum),* Elms (*Ulmus spp.*), Basswood (*Tilia Americana*), Ashes (*Fraxinus* sp.),

Common Understory Plants: Sassafras saplings (*Sassafras albidum*), Wild raspberry (*Rubus* sp.), Wild grape (*Vitis sp*.), Goldenrod (*Solidago* sp.), Wood nettle (*Laportea cabadensis*).

Transect 7:

General Description: Deciduous woodlot (interior an exterior) and adjacent field crops. Mature hardwoods dominate a dense, even canopy.

Common Tree Species: Sugar maple (*Acer saccharum*), Rock Elm (*Ulmus thomasii*), Ashes (*Fraxinus* sp.), Black cherry (*Prunus serotina*), Ironwood (*Ostrya virginiana*), a few Red Oak (*Quercus Rubra*).

Common Understory Plants: Wild raspberry (*Rubus* sp.), Wild grape (*Vitis sp*.), Goldenrod (*Solidago* sp.), Trilliums (*Trillium grandiflorum)*, a few spots of wet soil occupied by various reeds and sedges.

Transect 8:

General Description: Deciduous woodlot (interior an exterior) and adjacent field crops. A very dense stand of mature hardwoods with a closed canopy. Many Carolinian species.

Common Tree Species: Dominated by Ashes (*Fraxinus* sp.), also Sugar maple (*Acer saccharum*), Silver maple (*Acer saccharinum),* Elms (*Ulmus spp.*), Red Oak (*Quercus Rubra*), large (~70-80 cm DBH) White Oak (*Quercus alba*), Blue beech (*Carpinus caroliniana*), Beech (*Fagus grandifolia*). Several very large (60-80 cm DBH) Tulip trees (Liriodendron tulipifera). Eastern cottonwood (*Populus deltoides*) found mostly along perimeter.

Common Understory Plants: Mostly shade-tolerant species. Sassafras saplings (*Sassafras albidum*), Witch-hazel (*Hamamelis virginiana*), May apple (*Podophyllum peltatum*), Jack-in-the-pulpit (*Arisaema tryphyllum*), gooseberries (*Ribes* sp.), False Solomon's seal (*Smilacima racemosa*), Trilliums (*Trillium grandiflorum).*

Transect 9:

General Description: Deciduous woodlot (interior an exterior) and adjacent field crops. Mid-aged and hardwoods dominate an uneven and patchy canopy. Patches of mature hardwoods with closed canopy.

Common Tree Species: Rock Elm (*Ulmus thomasii*), Ashes (*Fraxinus* sp.), Sugar maple (*Acer saccharum*), Red Oak (*Quercus Rubra*), Eastern cottonwood (*Populus deltoides*), Balsam poplar (*Populus balsamifera*). Isolated patches of Tulip tree (*Liriodendron tulipifera*), Sassafras saplings (*Sassafras albidum*) and Basswood (*Tilia Americana*).

Common Understory Plants: Staghorn sumac (*Rhus typhina*) common along edge. Alternate-leaved dogwood (*Cornus alternifolia*), Wild grape (*Vitis sp*.), Goldenrod

(*Solidago* sp.), Jewelweed (*Impatiens capensis*), several spots of wet soil occupied by various reeds, sedges and cattails (*Typha* sp.).

Transect 10:

General Description: Mixed woodlot (interior an exterior) and adjacent field crops. Mixed-aged, uneven and patchy canopy. Primarily deciduous interior, with Carolinian species scattered. Also patches of conifers, esp. along eastern perimeter. Evidence of logging.

Common Tree Species: Elms (*Ulmus sp.*), Ashes (*Fraxinus* sp.), Sugar maple (*Acer saccharum*), Red Oak (*Quercus Rubra*), Eastern cottonwood (*Populus deltoides*), Balsam poplar (*Populus balsamifera*). Patches of White spruce (*Picea glauca*), White pine (Pinus strobus), Eastern white cedar (*Thuja occidentalis*). Scattered White Oak (*Quercus alba*), Blue beech (*Carpinus caroliniana*), Beech (*Fagus grandifolia*), and Ironwood (*Ostrya virginiana*)

Common Understory Plants: Staghorn sumac (*Rhus typhina*) common along edge. Wild raspberry (*Rubus* sp.), Witch-hazel (*Hamamelis virginiana*), scattered Sassafras saplings (*Sassafras albidum*), Poison ivy (*Rhus radicans*), wood ferns, Trilliums (*Trillium grandiflorum).*

B2 – Spring Monitoring Data

Project: Kent Breeze and MacLeod Project - Spring Migration Survey
Station: PC-1
Date: 11-May-07
Start Time: 7:20
Wind (Beaufort): 1
Sky: light fog (lifting)
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m		
American Robin	Turdus migratorius	8			8	low local flights, incl. chase flights
American Goldfinch	Carduelis tristis	3			3	short local flights
Blue Jay	Cyanocitta cristata	2	11		13	over-flights eastward, following river
Black-capped Chickadee	Parus atricapillus	3			3	calling from tree-line
Bobolink	Dolichonyx oryzivorus	1			1	over-flight eastward
Brown-headed Cowbird	Molothrus ater	9			9	
Canada Goose	Branta canadensis	1			1	over-flight westward along river
Common Grackle	Quiscalus quiscula	30			30	mostly short local flights
Downy Woodpecker	Picoides pubescens	1			1	low over-flight to NE
European Starling	Sturnus vulgaris	4			4	
Horned Lark	Eremophila alpestris	2			2	calling at ground level in field
Killdeer	Charadrius vociferus	5			5	low local flights and over-flights
Northern Cardinal	Cardinalis cardinalis	4			4	calling from tree-line
Northern Oriole	Icterus galbula	4			4	short local flights into trees
Northern Rough-winged Swallow	Stelgidopteryx serripennis	1			1	over-flight westward at 10 to 30 m
Red-bellied Woodpecker	Melanerpes carolinus	1			1	calling from tree-line
Red-winged Blackbird	Agelaius phoeniceus	27			27	low local flights, incl. chase flights
Solitary sandpiper	Tringa solitaria	1			1	over-flight to ENE
Tree Swallow	Tachycineta bicolor	12			12	forage flights along river edge
Totals:		119	11	0	130	

Total species observed: 19

Project:	Kent Breeze and MacLeod Project - Spring Migration Survey
Station:	PC-2
Date:	11-May-07
Start Time:	12:30
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	Turdus migratorius	3			3	low local flights
American Goldfinch	Carduelis tristis	1			1	flight from tree to tree
Brown Thrasher	Toxostoma rufum	4			4	low local flights, often very vocal
Brown-headed Cowbird	Molothrus ater	5			5	short local flights
Eastern Meadowlark	Sturnella magna	2			2	calling at ground level in field
European Starling	Sturnus vulgaris	48			48	short local flights, carrying food to nest
House Wren	Troglodytes aedon	1			1	calling from trees
Killdeer	Charadrius vociferus	2			2	short flight to NW
Northern Cardinal	Cardinalis cardinalis	1			1	very low (<5 m) and short flight
Red-tailed Hawk	Buteo jamaicensis			1	1	circling and drifting SW
Red-winged Blackbird	Agelaius phoeniceus	5			5	short local flights
Song Sparrow	Melospiza melodia	5			5	short local flights
Turkey Vulture	Cathartes aura		1		1	soaring SW
Totals:		77	1	1	79	

Total species observed: 13

Project:	Kent Breeze and MacLeod Project - Spring Migration Survey
Station:	PC-3
Date:	11-May-07
Start Time:	10:20
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Crow	Corvus brachyrhynchos	4			4	short local flight
American Goldfinch	Carduelis tristis	1			1	over-flight to the SE
Barn Swallow	Hirundo rustica	1			1	over-flight to the north
Canada Goose	Branta canadensis	2			2	over-flight to the north
Chipping Sparrow	Spizzela passerina	2			2	singing from trees
Common Grackle	Quiscalus quiscula	23			23	mostly short local flights
European Starling	Sturnus vulgaris	11			11	mostly short local flights
Gray Catbird	Dumetella carolinensis	1			1	singing from trees
Killdeer	Charadrisu vociferus	2			2	calling at ground level in field
Northern Cardinal	Cardinalis cardinalis	1			1	very low (<5m) and short flight westward
Northern Flicker	Colaptes auratus	1			1	calling from trees
Northern Oriole	Icterus galbula	2			2	singing from trees
Northern Rough-winged Swallow	Stelgidopteryx serripennis	2			2	overflight to the SW
Red-winged Blackbird	Agelaius phoeniceus	11			11	short local flights, various directions
Song Sparrow	Melospiza melodia	2			2	ground-level movement
Turkey Vulture	Cathartes aura	3	5	5	13	soaring and drifting, mainly northward
Yellow Warbler	Dendroica petechia	1			1	singing from shrubs
Totals:		70	5	5	80	

Total species observed: **17**

Project:	Kent Breeze and MacLeod Project - Spring Migration Survey
Station:	PC-4
Date:	11-May-07
Start Time:	13:42
Wind (Beaufort):	3
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	Turdus migratorius	2			2	short, low local flights
American Goldfinch	Carduelis tristis	1			1	very low (<5m) local flight
Brown-headed Cowbird	Molothrus ater	1			1	low local flight
Chipping Sparrow	Spizzela passerina	8			8	short local flights to/rom trees
Common Grackle	Quiscalus quiscula	37			37	short local flights - various directions
European Starling	Sturnus vulgaris	21			21	short local flights - various directions
Field Sparrow	Spizzela pusilla	1			1	short local flight eastward
House Finch	Carpodacus mexicanus	1			1	singing from tree
Killdeer	Charadrius vociferus	3			3	short local flight
Mourning Dove	Zenaida macroura	3			3	short local flight
Northern Cardinal	Cardinalis cardinalis	1			1	singing from tree
Northern Rough-winged Swallow	Stelgidopteryx serripennis	5			5	low foraging flights
Red-tailed Hawk	Buteo jamaicensis			1	1	circling and drifting to the west
Red-winged Blackbird	Agelaius phoeniceus	3			3	short local flight
Rock Dove	Columba livia	6			6	short local flights near buildiings
Song Sparrow	Melospiza melodia	4			4	short local flight
Tree Swallow	Tachycineta bicolor	17			17	foraging flights near farm buildings
Turkey Vulture	Cathartes aura		1	1	2	circling and soaring ~westward
Totals:		114	1	2	117	

Total species observed: **18**

Project:	Kent Breeze and MacLeod Project - Spring Migration Survey
Station:	PC-5
Date:	11-May-07
Start Time:	9:05
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m		
American Crow	Corvus brachyrhynchos	2	2		4	short local flights and an overflight
American Goldfinch	Carduelis tristis	1			1	overflight to the east
Barn Swallow	Hirundo rustica	1			1	overflight to the NW
Blue Jay	Cyanocitta cristata		3		3	overflight to the east
Brown-headed Cowbird	Molothrus ater	4			4	short local flights
Common Grackle	Quiscalus quiscula	9			9	short local flights and a few overflights
European Starling	Sturnus vulgaris	2			2	short local flights
Hairy Woodpecker	Picoides villosus	1			1	calling from treeline
Horned Lark	Eremophila alpestris	4			4	overflights S and SE
Indigo Bunting	Passerina cyanea	1			1	local flight from transmission lines
Killdeer	Charadrius vociferus	1			1	short local flight
Mallard	Anas platyrhynchos	1			1	overflight NW
Mourning Dove	Zenaida macroura	3			3	local flight from transmission lines
Northern Flicker	Colaptes auratus	1			1	calling from treeline
Red-eyed Vireo	Vireo olivaceus	2			2	calling from treeline
Red-winged Blackbird	Agelaius phoeniceus	3			3	short local flights
Song Sparrow	Melospiza melodia	5			5	calling from treeline
Turkey Vulture	Cathartes aura		15	6	21	kettling and moving slowly northward
Totals:		41	20	6	67	

Total species observed: 18

Project: Kent Breeze and MacLeod Project - Spring Migration Survey
Station: PC-6
Date: 11-May-07
Start Time: 11:25
Wind (Beaufort): 2
Sky: clear
Observer: Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	Turdus migratorius	2			2	calling from trees
Bobolink	Dolichonyx oryzivorus	1			1	overflight to the north
Brown-headed Cowbird	Molothrus ater	3			3	short local flights
Common Grackle	Quiscalus quiscula	85			85	flock of ~50 and individuals, foraging
European Starling	Sturnus vulgaris	5			5	short local flights
Horned Lark	Eremophila alpestris	4			4	short local flights
Killdeer	Charadrius vociferus	6			6	short local flights
Mourning Dove	Zenaida macroura	4			4	short local flights and an overflight N
Red-winged Blackbird	Agelaius phoeniceus	3			3	short local flight and overflights N
Sharp-shinned Hawk	Accipiter striatus			1	1	circling and drifting SW
Tree Swallow	Tachycineta bicolor	3			3	overflight to the north
Turkey Vulture	Cathartes aura	2	4	4	10	circling and soaring NW and S
Totals:		116	4	5	125	

Total species observed: 12

Project:	Kent Breeze and MacLeod Projects - Spring Migration Survey
Station:	PC-1
Date:	19-May-07
Start Time:	6:20
Wind (Beaufort):	2
Sky:	partly cloudy
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	*Turdus migratorius*	8			8	
American Crow	*Corvus brachyrhynchos*	1			1	short local flight, ~5m height
American Goldfinch	*Carduelis tristis*	1			1	
Barn Swallow	*Hirundo rustica*	5			5	low (<5m) foraging flights
Brown-headed Cowbird	*Molothrus ater*	4			4	short local flights, <10m height
Chipping Sparrow	*Spizzela passerina*	2			2	singing in tree-line
Common Grackle	*Quiscalus quiscula*	23			23	local flights, foraging
European Starling	*Sturnus vulgaris*	3			3	low over-flights
Gray Catbird	*Dumetella carolinensis*	1			1	calling from tree-line
Horned Lark	*Eremophila alpestris*	3			3	calling at ground level
Killdeer	*Charadrius vociferus*	3			3	short local flights, <10m height
Northern Cardinal	*Cardindalis cardinalis*	2			2	singing in tree-line
Northern Flicker	*Colaptes auratus*	1			1	singing in tree-line
Northern Oriole	*Icterus galbula*	1			1	local flight to tree
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	6			6	low foraging flights near river edge
Red-bellied Woodpecker	*Melanerpes carolinus*	2			2	calling and foraging
Red-eyed Vireo	*Vireo olivaceus*	1			1	singing in tree-line
Red-winged Blackbird	*Agelaius phoeniceus*	6			6	short local flights, 5 - 20m height
Savannah Sparrow	*Paserculus sandwichensis*	1			1	very short, low flight in field
Song Sparrow	*Melospiza melodia*	1			1	short local flight, <5m height
Tree Swallow	*Tachycineta bicolor*	3			3	low foraging flights near river edge
Turkey Vulture	*Cathartes aura*	2	1		3	circling
Yellow Warbler	*Dendroica petechia*	1			1	singing in tree-line
Unidentified shorebird	F. Scolopacidae	9			9	small flock, overflight along river
Totals:		90	1	0	91	

Total species observed: **24**

Project:	Kent Breeze and MacLeod Projects - Spring Migration Survey
Station:	PC-2
Date:	19-May-07
Start Time:	11:15
Wind (Beaufort):	3
Sky:	mainly cloudy
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
Brown-headed Cowbird	*Molothrus ater*	1			1	short local flight into tree canopy
Common Grackle	*Quiscalus quiscula*	4			4	short local flight into tree canopy
European Starling	*Sturnus vulgaris*	15			15	frequent local movement of small local flock
Horned Lark	*Eremophila alpestris*	5			5	count is approx. - calling at ground level
Mourning Dove	*Zenaida macroura*	1			1	low overflight southward
Northern Oriole	*Icterus galbula*	1			1	short local flight into trees
Red-winged Blackbird	*Agelaius phoeniceus*	9			9	short and low local flights, incl. chase flights
Song Sparrow	*Melospiza melodia*	2			2	very low (<5m) intraspecific chase flight
Turkey Vulture	*Cathartes aura*		2		2	circling and drifting south to north
Totals:		38	2	0	40	

Total species observed: **9**

Project: Kent Breeze and MacLeod Projects - Spring Migration Survey
Station: PC-3
Date: 19-May-07
Start Time: 8:45
Wind (Beaufort): 3
Sky: cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Crow	*Corvus brachyrhynchos*	3	1		4	1 overflight N at ~100 m
American Goldfinch	*Carduelis tristis*	5			5	overflights SE and N
Barn Swallow	*Hirundo rustica*	5			5	low foraging flights
Black-capped Chickadee	*Parus atricapillus*	2			2	short flights to/from trees
Blue Jay	*Cyanocitta cristata*	1			1	overflight W
Common Grackle	*Quiscalus quiscula*	14			14	short local flights
Downy Woodpecker	*Picoides pubescens*	1			1	flight to tree
European Starling	*Sturnus vulgaris*	11			11	short local flights
Mourning Dove	*Zenaida macroura*	3	2		5	oveflights W
Red-winged Blackbird	*Agelaius phoeniceus*	7			7	overflights northward
Tree Swallow	*Tachycineta bicolor*	2			2	low foraging flights
Turkey Vulture	*Cathartes aura*	2	1		3	circling and drifting N and W
Totals:		56	4	0	60	

Total species observed: **12**

Project:	Kent Breeze and MacLeod Projects - Spring Migration Survey
Station:	PC-4
Date:	19-May-07
Start Time:	12:35
Wind (Beaufort):	3
Sky:	cloudy
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	*Turdus migratorius*	15			15	short, low local flights, incl. chase flights
Barn Swallow	*Hirundo rustica*	2			2	foraging flights in proximity to farm buildings
Brown-headed Cowbird	*Molothrus ater*	1			1	short flight from field to river ede
Chipping Sparrow	*Spizzela passerina*	1			1	short flight into tree
Common Grackle	*Quiscalus quiscula*	33			33	short local flights in various directions
European Starling	*Sturnus vulgaris*	26			26	short local flights in various directions
House Sparrow	*Passer domesticus*	1			1	short flight into tree
Indigo Bunting	*Passerina cyanea*	1			1	short flight into tree
Killdeer	*Charadrius vociferus*	1			1	short flight into field
Mourning Dove	*Zenaida macroura*	6			6	short local flights to and from various features
Northern Oriole	*Icterus galbula*	2			2	short flight into tree
Red-winged Blackbird	*Agelaius phoeniceus*	5			5	short local flights to and from various features
Rock Dove	*Columba livia*	16			16	short flights in proximity to farm buildings
Song Sparrow	*Melospiza melodia*	1			1	short local flight
Totals:		111	0	0	111	

Total species observed: **14**

Project: Kent Breeze and MacLeod Projects - Spring Migration Survey
Station: PC-5
Date: 19-May-07
Start Time: 10:00
Wind (Beaufort): 4
Sky: cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Crow	*Corvus brachyrhynchos*	1			1	low over-flight to the south
Brown-headed Cowbird	*Molothrus ater*	4			4	short, low local flights
Common Grackle	*Quiscalus quiscula*	11			11	low over-flights and local flights
European Starling	*Sturnus vulgaris*	4			4	short, low local flights
Field Sparrow	*Spizzela pusilla*	1			1	flight between adjacent fields
Horned Lark	*Eremophila alpestris*	9			9	very short, low flights in field
Mourning Dove	*Zenaida macroura*	3			3	low over-flights and local flights
Red-winged Blackbird	*Agelaius phoeniceus*	8			8	short, low local flights
Song Sparrow	*Melospiza melodia*	3			3	short, low local flights
Totals:		44	0	0	44	

Total species observed: **9**

Project:	Kent Breeze and MacLeod Projects - Spring Migration Survey
Station:	Transect 1
Date:	19-May-07
Start Time:	7:30
Wind (Beaufort):	2
Sky:	partly cloudy
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	5			5	foraging in riparian woods
Bank Swallow	*Riparia riparia*	5			5	foraging along river
Black-throated Green Warbler	*Dendroica virens*	1			1	foraging in riparian woods
Brown Thrasher	*Toxostoma rufum*	1			1	foraging in riparian woods
Gray Catbird	*Dumetella carolinensis*	2			2	calling in riparian woods
Greater Yellowlegs	*Tringa melanoleuca*	1			1	flying NW, low along river
House wren	*Troglodytes aedon*	1			1	singing in riparian woods
Mourning Dove	*Zenaida macroura*	4			4	perched, calling
Northern Cardinal	*Cardindalis cardinalis*	2			2	calling and foraging in riparian woods
Northern Flicker	*Colaptes auratus*	1			1	calling in riparian woods
Northern Oriole	*Icterus galbula*	3			3	foraging in riparian woods
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	7			7	foraging along river
Red-eyed Vireo	*Vireo olivaceus*	1			1	singing in riparian woods
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	3			3	foraging in riparian woods
Ruby-crowned Kinglet	*Regulus calendula*	4			4	foraging in riparian woods
Song Sparrow	*Melospiza melodia*	4			4	calling and foraging in riparian zone
Solitary Sandpiper	*Tringa solitaria*	2			2	foraging at river's edge
Spotted sandpiper	*Actitis macularia*	1			1	foraging at river's edge
Tree Swallow	*Tachycineta bicolor*	15			15	foraging along river
Yellow-rumped warbler	*Dendroica coronata*	3			3	foraging in riparian woods
Yellow Warbler	*Dendroica petechia*	2			2	singing and foraging in riparian shrubs
Totals:		68	0	0	68	

Total species observed: **21**

B3 – Fall Monitoring Data

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-1
Date:	4-Oct-06
Start Time:	17:00
Wind (Beaufort):	3
Sky:	cloudy
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	15			15	mixed flock with blackbirds, following river
American Crow	*Corvus brachyrhynchos*	15			15	perched
American Goldfinch	*Carduelis tristis*	12			12	short local flights
Canada Goose	*Branta canadensis*			47	47	4 separate flocks in V-formation, moving ~ westward
European Starling	*Sturnus vulgaris*	250			250	large flock perched on transmission lines
Mourning Dove	*Zenaida macroura*	2			2	local flight
Red-winged Blackbird	*Agelaius phoeniceus*	15			15	mixed flock with robins following river
Tree Swallow	*Tachycineta bicolor*	87			87	individual and clustered overflights at 20 - 40 m
Wild Turkey	*Meleagris gallopavo*	6			6	foraging in field
Mixed blackbird flocks	F. Icteridae	175			175	a few lare flocks, moving generally eastward
Totals:		577	0	47	624	

Total species observed: 10

Project: Kent Breeze and MacLeod Projects - Fall Migration Survey
Station: PC-2
Date: 4-Oct-06
Start Time: 18:15
Wind (Beaufort): 3
Sky: partly cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	19	1		20	individuals and sm. flocks, various directions
Horned Lark	*Eremophila alpestris*	1			1	low flight along roadside
Mallard	*Anas platyrhynchos*	7			7	flew up from field
Mourning Dove	*Zenaida macroura*	3			3	individual flights ~northward
Northern Cardinal	*Cardinalis cardinalis*	1			1	Auditory only
Ruby-crowned Kinglet	*Regulus calendula*	6			6	moving through treeline
Song Sparrow	*Melospiza melodia*	6			6	landed in field
Tree Swallow	*Tachycineta bicolor*	35			35	individuals and small flocks
Accipiter hawk	*Accipiter* sp.	1			1	along top of treeline
Mixed blackbird flocks	F. Icteridae	14	23		37	various directions
Totals:		93	24	0	117	

Total species observed: 10

Project: Kent Breeze and MacLeod Projects - Fall Migration Survey
Station: Transect 1
Date: 4-Oct-06
Start Time: 15:25 PM
Wind (Beaufort): 2
Sky: partly cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
Northern Cardinal	*Cardinalis cardinalis*	5			5	foraging
Golden-crowned Kinglet	*Regulus satrapa*	2			2	foraging
Song Sparrow	*Melospiza melodia*	3			3	understory
Northern Flicker	*Colaptes auratus*	1			1	foraging
Blue Jay	*Cyanocitta cristata*	1			1	through flight
Yellow-bellied Sapsucker	*Sphyrapicus varius*	1			1	foraging
Totals:		13	0	0	13	

Total species observed: 6

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-1
Date:	5-Oct-06
Start Time:	14:30
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	3	1		4	1 overflight W @~40m, along river
American Crow	*Corvus brachyrhynchos*	6	2		8	associated with river
Blue Jay	*Cyanocitta cristata*	21			21	overflights ~westward, along river
European Starling	*Sturnus vulgaris*	5			5	landed along river
Mourning Dove	*Zenaida macroura*	6			6	most perched on utility lines
Red-winged Blackbird	*Agelaius phoeniceus*	4			4	short local flights
Tree Swallow	*Tachycineta bicolor*		20		20	facing into east wind, drifting west
Accipiter Hawk	*Accipiter* sp.			1	1	steady glide to the WNW
Buteo Hawk	*Buteo* sp.			1	1	weastward
Mixed blackbird flocks	F. Icteridae	61	60		121	higher flights generally the west, lower flights to the east
	Totals:	106	83	2	191	

Total species observed: 10

Project: Kent Breeze and MacLeod Projects - Fall Migration Survey
Station: PC-2
Date: 5-Oct-06
Start Time: 13:10
Wind (Beaufort): 2
Sky: clear
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Crow	*Corvus brachyrhynchos*	2	8		10	circling above woodlot @ ~40-50 m
American Goldfinch	*Carduelis tristis*	1			1	short local flight
Blue Jay	*Cyanocitta cristata*	3			3	short local flights
Horned Lark	*Eremophila alpestris*	1			1	short ground-level flight
Northern Harrier	*Circus cyaneus*	1			1	low hunting flight over field
Turkey Vulture	*Cathartes aura*	1	6	2	9	most circling, 2 gliding ~S @ >120m
Totals:		9	14	2	25	

Total species observ 6

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-3
Date:	5-Oct-06
Start Time:	9:15
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	*Turdus migratorius*	7			7	overflights eastward
American Crow	*Corvus brachyrhynchos*	6			6	southward
American Goldfinch	*Carduelis tristis*	13			13	small flock mixed with starlings
Blue Jay	*Cyanocitta cristata*	9			9	local flights to/from woodlots
Canada Goose	*Branta canadensis*			2	2	overflight northward
European Starling	*Sturnus vulgaris*	320	300		620	some individual local flights, 2 separate lg. flocks of ~300
Golden-crowned Kinglet	*Regulus satrapa*	1			1	Auditory only
Horned Lark	*Eremophila alpestris*	1			1	Auditory only
Sharp-shinned Hawk	*Accipiter striatus*	1	2		3	circling and drifting westward
Song Sparrow	*Melospiza melodia*	4			4	short local flights
Tree Swallow	*Tachycineta bicolor*		3		3	overflight NW
Turkey Vulture	*Cathartes aura*	5	7		12	mostly circling over woodlots
Gull species	*Larus* sp.			12	12	circling and slowly drifting N
Buteo hawk	*Buteo* sp.			1	1	drifting with Accipiter at ~ 300 m
Accipiter hawk	*Accipiter* sp.	1	1	1	3	drifting W and S
Mixed blackbird flock	F. Icteridae	43			43	moving N or NW
Totals:		411	313	16	740	

Total species observed: 16

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-4
Date:	5-Oct-06
Start Time:	10:03
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	*Turdus migratorius*	1	10		11	flock of 10 overflight ~W along river
American Crow	*Corvus brachyrhynchos*		2		2	overflight eatsward along river
American Goldfinch	*Carduelis tristis*	3	1		4	
Blue Jay	*Cyanocitta cristata*	3			3	local flights from tree to tree
Brown-headed Cowbird	*Molothrus ater*	7			7	several perched on transmission lines
Canada Goose	*Branta canadensis*		9	4	13	overflight to the West
European Starling	*Sturnus vulgaris*	57			57	small flocks and individuals, local flights
Killdeer	*Charadrius vociferus*	1			1	calling at ground level
Mourning Dove	*Zenaida macroura*	5	1		6	local flights
Red-winged Blackbird	*Agelaius phoeniceus*	9			9	perched on transmission lines
Song Sparrow	*Melospiza melodia*	11			11	small flocks, local flights
Turkey Vulture	*Cathartes aura*		1	1	2	moving East
Mixed blackbird flocks	F. Icteridae	93	8		101	various directions
Totals:		190	32	5	227	

Total species observed: 10

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-5
Date:	5-Oct-06
Start Time:	11:50
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	3			3	overflight ENE
American Goldfinch	*Carduelis tristis*	1			1	calling from treeline
Blue Jay	*Cyanocitta cristata*	1			1	
European Starling	*Sturnus vulgaris*	250			250	large flock, continuous short movements
House Sparrow	*Passer domesticus*	3			3	foraging along roadside
Tree Swallow	*Tachycineta bicolor*	5	1		6	mostly foraging flights
Turkey Vulture	*Cathartes aura*		4	1	5	circling and drifting
Buteo hawk	*Buteo* sp.			1	1	circling and drifting
Totals:		263	5	2	270	

Total species observed: **8**

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-5
Date:	5-Oct-06
Start Time:	15:45
Wind (Beaufort):	3
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Crow	*Corvus brachyrhynchos*		1		1	overflight SE at ~ 40 m
American Goldfinch	*Carduelis tristis*	1			1	short local flight
Blue Jay	*Cyanocitta cristata*	3			3	short flights into trees
European Starling	*Sturnus vulgaris*	7			7	
Red-winged Blackbird	*Agelaius phoeniceus*	5			5	short local flight
Turkey Vulture	*Cathartes aura*	1	6		7	circling over woodlot
Red-tailed Hawk	*Buteo jamaicensis*		1		1	continuous glide north
Totals:		17	8	0	25	

Total species observed: **7**

B4 – Breeding Bird Survey Data

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 1
Date:	5-Jul-06
Start Time:	10:00
Finish Time:	12:00
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	6	singing, male chase flights
Belted Kingfisher	*Ceryle alcyon*	4	2 pairs
Brown-headed Cowbird	*Molothrus ater*	5	males and females
Common Grackle	*Quiscalus quiscula*	11	males and females, vocal and active
Eastern Phoebe	*Sayornis phoebe*	1	singing
Great Blue Herron	*Ardea herodias*	1	lone bird foraging along river
Horned Lark	*Eremophila alpestris*	9	calling, in field adjacent to river
House Wren	*Troglodytes aedon*	2	singing
Killdeer	*Charadrius vociferus*	3	adjacent field and river shore,calling
Northern Cardinal	*Cardinalis cardinalis*	5	males and females, singing
Northern Oriole	*Icterus galbula*	9	males and females, singing
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	4	foraging
Red-winged Blackbird	*Agelaius phoeniceus*	19	singing
Song Sparrow	*Melospiza melodia*	5	singing, perched
Spotted Sandpiper	*Actitis macularia*	1	lone bird, foraging
Tree Swallow	*Tachycineta bicolor*	21	males and females, foraging and perched
Turkey Vulture	*Cathartes aura*	1	overflight
Wood Duck	*Aix sponsa*	1	male, flew up from river

Total Birds Observed:	18
Species count:	108

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 2
Date:	5-Jul-06
Start Time:	12:10
Finish Time:	13:40
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	11	males and females, singing and chase flights
American Goldfinch	*Carduelis tristis*	3	males and females, males singing
Barn Swallow	*Hirundo rustica*	3	associated with nearby buildings
Black-capped Chickadee	*Parus atricapillus*	6	calling and singing
Blue Jay	*Cyanocitta cristata*	5	calling and foraging
Chipping Sparrow	*Spizzela passerina*	3	foraging and calling
Common Grackle	*Quiscalus quiscula*	13	calling and displaying
Downy Woodpecker	*Picoides pubescens*	4	males and females, calling
Eastern Kingbird	*Tyrannus tyrannus*	3	territorial displays
European Starling	*Sturnus vulgaris*	9	carrying nest material
Gray Catbird	*Dumetella carolinensis*	3	calling from understory
House Wren	*Troglodytes aedon*	5	male singing
Mourning Dove	*Zenaida macroura*	8	singing, pairing display
Northern Flicker	*Colaptes auratus*	2	male and female
Northern Cardinal	*Cardinalis cardinalis*	5	males and females, singing
Northern Oriole	*Icterus galbula*	7	males and females, singing
Pileated Woodpecker	*Dryocopus pileatus*	1	excavation in dead elm
Red-winged Blackbird	*Agelaius phoeniceus*	15	territorial displays
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	2	pair
Turkey Vulture	*Cathartes aura*	2	overflight
White-breasted Nuthatch	*Sitta carolinensis*	1	foraging and calling
Yellow-bellied Sapsucker	*Sphyrapicus varius*	1	holes observed in basswood tree

Total Birds Observed:	22
Species count:	112

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 3
Date:	5-Jul-06
Start Time:	14:30
Finish Time:	16:00
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	8	calling, singing, foraging, chasing
American Goldfinch	*Carduelis tristis*	3	in flight, calling
Barn Swallow	*Hirundo rustica*	3	foraging flights
Black-capped Chickadee	*Parus atricapillus*	4	calling, singing
Blue Jay	*Cyanocitta cristata*	6	calling and foraging
Canada Goose	*Branta canadensis*	13	2 pairs with 9 young in total
Common Grackle	*Quiscalus quiscula*	6	calling and foraging
Gray Catbird	*Dumetella carolinensis*	2	singing
Great Blue Herron	*Ardea herodias*	1	foraging
House Wren	*Troglodytes aedon*	3	singing
Indigo Bunting	*Passerina cyanea*	1	singing male
Killdeer	*Charadrius vociferus*	4	adjacent field, calling
Mourning Dove	*Zenaida macroura*	5	perched, calling
Northern Flicker	*Colaptes auratus*	2	pair
Red-winged Blackbird	*Agelaius phoeniceus*	7	territorial behaviour
Savannah Sparrow	*Paserculus sandwichensis*	4	associated with adjacent field
Song Sparrow	*Melospiza melodia*	5	singing and calling
Tree Swallow	*Tachycineta bicolor*	15	males and females, foraging and perched
Turkey Vulture	*Cathartes aura*	4	overflights

Total Birds Observed:	19
Species count:	96

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 4
Date:	5-Jul-06
Start Time:	17:30
Finish Time:	18:30
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	14	calling, singing, foraging - nest found
American Crow	*Corvus brachyrhynchos*	3	perched, calling
American Goldfinch	*Carduelis tristis*	6	males and females in flight, calling
Bald Eagle	*Haliaeetus leucocephalus*	1	circling at ~100 m, over river valley
Barn Swallow	*Hirundo rustica*	5	small flock, foraging flight
Cedar waxwing	*Bombycilla cedrorum*	5	calling and foraging
Chipping Sparrow	*Spizzela passerina*	4	male and female, foraging and calling
Common Grackle	*Quiscalus quiscula*	11	both sexes, males displaying
Gray Catbird	*Dumetella carolinensis*	2	calling
Great Blue Herron	*Ardea herodias*	2	overflight, foraging
House Sparrow	*Passer domesticus*	2	male and female foraging
Indigo Bunting	*Passerina cyanea*	2	singing males
Mourning Dove	*Zenaida macroura*	3	perched, calling
Northern Flicker	*Colaptes auratus*	2	pair
Northern Cardinal	*Cardinalis cardinalis*	1	male singing
Ovenbird	*Seiurus aurocapillus*	1	singing
Red-winged Blackbird	*Agelaius phoeniceus*	9	males and females, calling and displaying
Song Sparrow	*Melospiza melodia*	5	singing and calling
Tree Swallow	*Tachycineta bicolor*	4	males and females, foraging and perched

Total Birds Observed:	19
Species count:	82

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 5
Date:	5-Jul-06
Start Time:	18:40
Finish Time:	19:40
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	3	
Black-billed Cuckoo	*Coccyzus erythropthalamus*	1	calling
Field Sparrow	*Spizzela pusilla*	3	foraging in adjacent field
Gray Catbird	*Dumetella carolinensis*	6	singing from understory
House Wren	*Troglodytes aedon*	3	singing
Mourning Dove	*Zenaida macroura*	1	perched, calling
Northern Cardinal	*Cardinalis cardinalis*	2	males singing
Song Sparrow	*Melospiza melodia*	5	singing and calling
Veery	*Catharus fuscescens*	1	singing

Total Birds Observed:	9
Species count:	25

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 6
Date:	5-Jul-06
Start Time:	19:55
Finish Time:	20:55
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	5	males and females, chase flights
Brown-headed Cowbird	*Molothrus ater*	4	males and females
Common Grackle	*Quiscalus quiscula*	7	males and females, calling and displaying
Gray Catbird	*Dumetella carolinensis*	2	calling
Great Horned Owl	*Bubo virginianus*	1	perched, calling
House Wren	*Troglodytes aedon*	1	singing
Indigo Bunting	*Passerina cyanea*	1	male singing
Killdeer	*Charadrius vociferus*	2	calling
Northern Flicker	*Colaptes auratus*	2	pair
Northern Cardinal	*Cardinalis cardinalis*	4	males and females, male singing
Northern Oriole	*Icterus galbula*	2	male singing
Red-winged Blackbird	*Agelaius phoeniceus*	9	carrying nest material
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	2	pair
Wood Thrush	*Hylocichla mustelina*	1	singing

Total Birds Observed:	14
Species count:	43

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 7
Date:	6-Jul-06
Start Time:	9:00
Finish Time:	10:00
Wind (Beaufort):	0
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	4	calling, territorial chase flights
Blue Jay	*Cyanocitta cristata*	8	perched and flying, calling
Brown-headed Cowbird	*Molothrus ater*	2	male and female
Downy Woodpecker	*Picoides pubescens*	2	male and female
Gray Catbird	*Dumetella carolinensis*	5	singing from understory
Indigo Bunting	*Passerina cyanea*	1	male singing
Northern Flicker	*Colaptes auratus*	2	males singing
Northern Cardinal	*Cardinalis cardinalis*	7	singing
Red-eyed Vireo	*Vireo olivaceus*	2	perched, calling
Red-tailed Hawk	*Buteo jamaicensis*	1	circling and calling
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	3	males and females
Song Sparrow	*Melospiza melodia*	3	
Turkey Vulture	*Cathartes aura*	1	overflight
Warbling Vireo	*Vireo gilvus*	1	singing
Wood Thrush	*Hylocichla mustelina*	1	singing
Yellow Warbler	*Dendroica petechia*	3	males, singing
Yellow-billed Cuckoo	*Coccyzus americanus*	1	calling

Total Birds Observed:	17
Species count:	47

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 8
Date:	6-Jul-06
Start Time:	10:10
Finish Time:	11:40
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Goldfinch	*Carduelis tristis*	4	males and females in flight, calling
Black-capped Chickadee	*Parus atricapillus*	6	calling, singing, foraging
Blue Jay	*Cyanocitta cristata*	7	perched and in flight, calling
Downy Woodpecker	*Picoides pubescens*	3	males calling
Eastern Wood-Peewee	*Contopus virens*	2	singing
Gray Catbird	*Dumetella carolinensis*	2	singing
Indigo Bunting	*Passerina cyanea*	1	male singing
Mourning Dove	*Zenaida macroura*	3	perched, calling
Northern Flicker	*Colaptes auratus*	4	males and females
Northern Cardinal	*Cardinalis cardinalis*	3	males singing
Red-eyed Vireo	*Vireo olivaceus*	2	singing
Red-tailed Hawk	*Buteo jamaicensis*	3	1 circling and calling over woodlot, 2 perched
Red-winged Blackbird	*Agelaius phoeniceus*	5	males (calling) and females
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	2	pair, foraging
Scarlet Tanager	*Piranga olivacea*	1	male
Yellow-billed Cuckoo	*Coccyzus americanus*	1	singing

Total Birds Observed: 16

Species count: 49

Project: Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:
Date: 6-Jul-06
Start Time: 12:35
Finish Time: 13:35
Wind (Beaufort): 1
Sky: clear
Observer: Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	5	males and females, territorial behaviour
Blue Jay	*Cyanocitta cristata*	2	calling, foraging
Chipping Sparrow	*Spizzela passerina*	2	singing
Gray Catbird	*Dumetella carolinensis*	4	singing
Indigo Bunting	*Passerina cyanea*	1	male singing
Mourning Dove	*Zenaida macroura*	6	perched and flying, calling
Northern Flicker	*Colaptes auratus*	2	calling
Northern Cardinal	*Cardinalis cardinalis*	4	singing
Red-eyed Vireo	*Vireo olivaceus*	3	singing
Song Sparrow	*Melospiza melodia*	7	calling and singing
Turkey Vulture	*Cathartes aura*	2	circling over woodlot
Wood Thrush	*Hylocichla mustelina*	1	singing

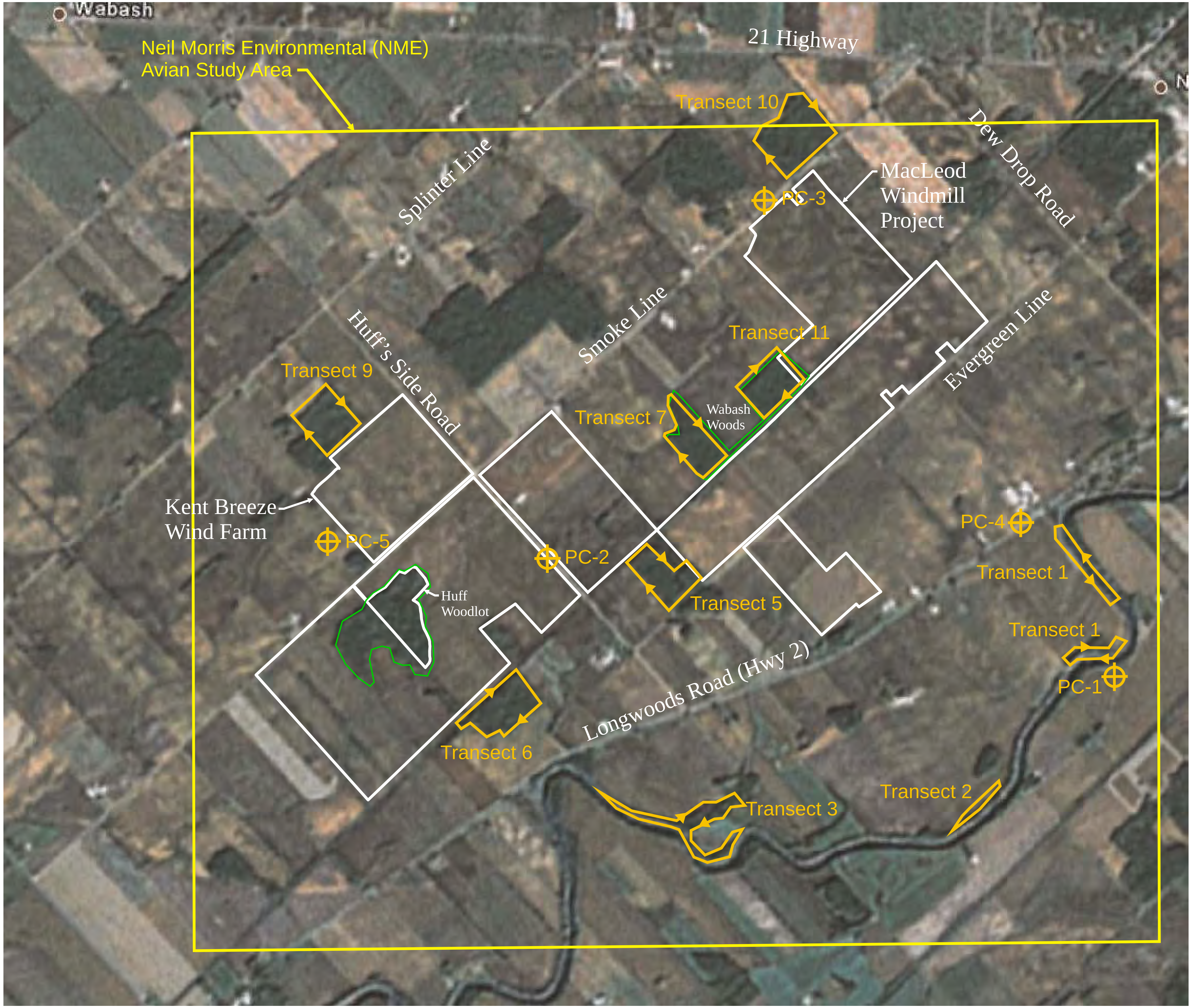
Total Birds Observed: 12
Species count: 39

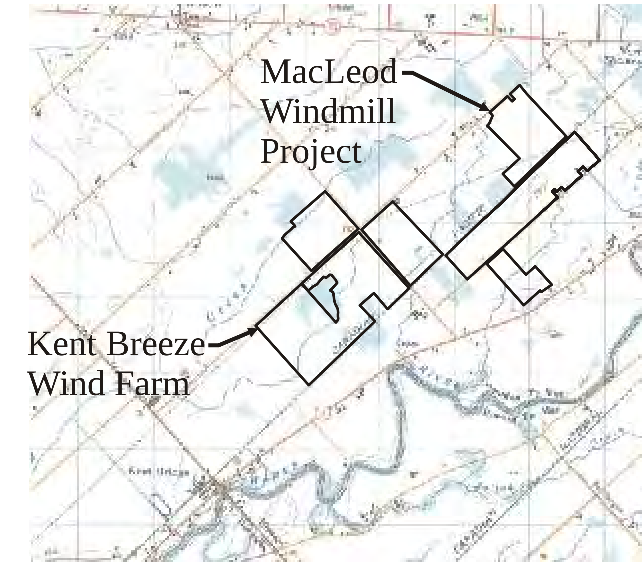
Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 10
Date:	6-Jul-06
Start Time:	13:55
Finish Time:	15:25
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	11	both sexes, territorial behaviour by males
American Crow	*Corvus brachyrhynchos*	5	perched, calling
American Goldfinch	*Carduelis tristis*	7	males and females, males singing
Cedar waxwing	*Bombycilla cedrorum*	4	foraging and calling
Chipping Sparrow	*Spizzela passerina*	2	perched, singing
Eastern Kingbird	*Tyrannus tyrannus*	4	calling, chasing
Eastern Wood-Peewee	*Contopus virens*	1	singing
Indigo Bunting	*Passerina cyanea*	2	males singing
Northern Cardinal	*Cardinalis cardinalis*	1	male singing
Yellow-billed Cuckoo	*Coccyzus americanus*	1	perched, singing

Total Birds Observed:	10
Species count:	38

Figure 1: Bird Studies Mapping





0 2,000
Scale 1:100,000
Key Plan

0 500
Scale 1:25,000
June 2010

AQUATIC AND TERRESTRIAL ECOSYSTEM PLANNERS

Appendix D

Habitat Evaluation from the Significant Wildlife Habitat Technical Guide

Appendix D

Habitat within the Project Area considered for significance, as per Significant Wildlife Habitat Technical Guide (Appendix Q) (OMNR, 2000).

Table 1: Significant Wildlife Habitat Review

Issue	**Comment**	**Field Verified**	**Followup**
Winter Deer Yards	no conifer areas for cover	2, 4	
Moose Late Winter Habitat		1,2 3, 4	
Colonial Bird Nesting	not found in avian study	3	
Waterfowl Stopover and Staging	not found in avian study	3	
Waterfowl Nesting Sites	not found in avian study	3	
Shorebird Migratory Stopover	not found in avian study	3	
Landbird Migratory Stopover	not found in avian study	3	
Raptor Winter Feeding and Roosting Areas	no features present and no winter study required	3	
Bald Eagle Winter Feeding and Roosting Areas	no features present and no winter study required	3	
Wild Turkey Winter Range	no features present and no winter study required	3	
Turkey Vulture Summer Roosting Areas	none observed	3	
Reptile Hibernacula	no abandoned buildings no large fallen trees with exposed root wads in south part of Community 6 some animal dens	4	
Bat Hibernacula	no caves attics of residential houses present	4	Yes (attics possible)
Migratory Butterfly Stopover Areas	no identified sites site 30 km away from lakes grassland area Community 16 too small and not near lake	2, 4	
Bullfrog Habitat	no permanent >1m pools	4	

Site specific field investigations conducted for this project included:

1 Fisheries habitat review by Dave Hayman, MSc. with site visit on December 3, 2008 and by Robyn Arts, BSc. with site visit on May 28, 2010.

2 Ecological Land Classification by Will Huys, ISA Certified Arborist August 12 2008,

3 Avian investigations by Neil Morris, Principal. NME Ltd with site visits on July 5-7, 2006; October 2-6, 2006 and in May 2007 (monitoring field notes are in Appendix B).

4 Followup confirmation field visit by Will Huys, Certified Arborist, May 25, 2010.

Table 2: Rare Vegetation Communities or Specialized Habitat

Issue	Criterion	Field Verified	Followup
Rare Vegetation Communities			
Rarity in Area	ELC's all common and secure	2	
Presence of rare or uncommon species	no S1 to S3 fauna within 1 km (NHIC data review) all bird species secure in turbine area	3	
Diversity of Site	all common communities	1	
Condition of Community	Community 6 north third open canopy (old fence row) Community 12 (old fence row) lots of clearing, dirt movement and invasive species (mostly garlic mustard) Community 7 with old tires and metal.debris	4 4 4	
Size and Location of Site	common species use the woodlands	3	Yes (significant woodlands)
Potential for Long Term Protection	significant woodlands protected in Official Plan	2, 4	Yes
Provision of Significant Wildlife Habitat	-raptor hunting observed but graass land areas is too small for significance -no aerial display grass land species observed in transect (transect 5) -not an area for shorebirds, waterfowl	3 3 2,4 3	
Area Sensitive Species			
rare bird species present	all birds common and secure	3	
overall area of site	typical size or smaller	2,3	
forest interior	none in smaller communities	4	
age and composition	rare or occasional trees >40cm in Community 6 rare in Community 12	4	
vertical stratification	canopy is stratified	4	Yes (maintain age class diversity)

Issue	Criterion	Field Verified	Followup
contiguous closed canopy	disjunct woodland only joined by active railway	2, 4	
degree of disturbance	see Rare Communities above	2, 4	
adjacent residential development	farm land	2, 4	
specialized habitat	none observed	3, 4	
significant species habitat	- no species of concern observed - no stick nests observed - common tree species in area of proposed disturbance (Community 6 poplar and maple; Community 12 poplar manitoba maple and sumac	3 3, 4 4	
long term protection	significant woodlands protected in Official Plan	2, 4	Yes
Forest Stands			
Cavity Size and Abundance	Community 12 - none Community 6 - some snags/cavities in south portion of wood	4 4	
Proximity to Water	no permanent water near smaller woodland features. soils moist and may support forest amphibians (toads, redback salamander)	4 2, 4	
Amphibian Breeding Ponds			
vernal pools to mid July	none observed in May 2010 except some shallow water in Community 8 across the tracks	4	
Old Growth or Mature Stands	no old growth mature stands may support terrestrial amphibians	2, 4	Yes (significant woodlands)
Foraging Areas			
fruit shrubs or mast producers	some berry producers at all woodland edges a few mast producers (oak in particular) in Community 6 (south part) and Community 7 area and supply is not abundant and not considered significant	2, 3 and 4	Opportunity (replant disturbed areas with berry shrubs and mast producing trees)

Issue	Criterion	Field Verified	Followup
size	oak trees greater than 45 cm is rare	2, 4	
diversity	variety of mast and berry producers	2, 3, 4	Opportunity (see above)
foraging areas	along rail line is poor location for secure foraging	2, 4	
Osprey, Bald Eagle Nesting			
nesting sites	closest nest > 1km away	3	
Turtle Nesting Habitat	no permanent open water areas	4	
Moose aquatic feeding areas		1,2,3,4	
Mink and otter areas		1,2,3,4	
Areas of High Diversity	not diverse or rare	2, 4	
Seeps/springs	Shaw Ferguson intermittent rest of drainage ephemeral no observed seepage in woodlands	1, 4	
Cliffs	none	2	
Caves	none	2, 3	

Site specific field investigations conducted for this project included:

1 Fisheries habitat review by Dave Hayman, MSc. with site visit on December 3, 2008 and by Robyn Arts, BSc. with site visit on May 28, 2010.

2 Ecological Land Classification by Will Huys, ISA Certified Arborist August 12, 2008.

3 Avian investigations by Neil Morris, Principal. NME Ltd with site visits on July 5-7, 2006; October 2-6, 2006 and in May 2007 (monitoring field notes are in Appendix B).

4 Followup confirmation field visit by Will Huys, Certified Arborist, May 25, 2010.

Table 3

Issue	Criterion	Field Verified	Followup
Species of Conservation Concern	none in surveys or NHIC data	3	

Table 4

Issue	Comment	Field Verified	Followup
Movement Corridors	none present	2, 3	

Site specific field investigations conducted for this project included:

1 Fisheries habitat review by Dave Hayman, MSc. with site visit on December 3, 2008 and by Robyn Arts, BSc. with site visit on May 28, 2010.

2 Ecological Land Classification by Will Huys, ISA Certified Arborist August 12, 2008.

3 Avian investigations by Neil Morris, Principal. NME Ltd with site visits on July 5-7, 200; October 2-6, 2006 and in May 2007 (monitoring field notes are in Appendix B).

4 Followup confirmation field visit by Will Huys, Certified Arborist, May 25, 2010.

APPENDIX B

Avian Study

KENT BREEZE CORP. and MACLEOD WINDMILL PROJECT INC. - AVIAN STUDY

Report prepared for:
Green Breeze Energy Systems
Toronto, Ontario

Report prepared by:
Neil Morris Environmental (NME)
Report Reference # 06-1005.1

October 2007

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Acronyms and Abbreviations

ANSI	Area of Natural or Scientific Interest
BBS	Breeding Bird Survey
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
EA	Environmental Assessment
EC-CWS	Environment Canada – Canadian Wildlife Service
EO	Element Occurrence (NHIC Database)
ESA	Endangered Species Act (Provincial)
ESR	Environmental Screening Report
IBA	Important Bird Area
LPBO	Long Point Bird Observatory
MNR	Ministry of Natural Resources (Ontario)
MOE	Ministry of Environment (Ontario)
NHIC	Natural Heritage Information Centre (Ontario MNR)
OBBA	Ontario Breeding Bird Atlas
SARA	Species at Risk Act (Federal)
SARO	Species at Risk in Ontario (Ontario MNR)
VTE	Vulnerable, Threatened or Endangered

1.0 INTRODUCTION

The Kent Breeze and MacLeod wind power projects (hereafter simply “the Projects”), initiated under Ontario’s Standard Offer Contract, are currently in the preliminary planning stage. The property in consideration for the Projects lies within the Municipality of Chatham Kent, County Kent, Town of Thamesville, and includes:

- Concession 1, Lot 6, and Concession 2, Part Lot 6, of Macleod Township.
- Concession 1, Lot 11 and Part Lot 10, Township of Camden.

This property is referred to hereafter simply as the Subject Lands. These Subject Lands are situated adjacent to Hwy 2 (Longwoods Rd.), approximately 4 to 5 km west of the Town of Thamesville (refer to Figure 1).

Each of the two Projects is anticipated to have up to a 10-MW generating capacity. The number of turbines that will be installed to serve each project’s capacity is yet to be determined, but a total of five self-standing 2-MW turbines per project is being considered. The exact location of turbines for each project is also yet to be determined, and citing may be partly dependent on the findings of this Avian Study. For current purposes, a single Study Area has been established which encompasses all Subject Lands on which turbines associated with either of the proposed Projects could be placed (refer to Figure 1).

As with all electricity projects in Ontario, the Projects will be subject to an Environmental Assessment (EA), to be conducted in accordance with Provincial EA Guidelines (MOE, 2001). Through the EA process, an Environmental Screening Report (ESR), is required for any wind project with >2MW capacity. The ESR will need to address environmental issues of concern related to wind power projects in general, and any issues that might be identified as site-specific concerns relating to the currently proposed Projects. One of the general issues of concern relating to wind power projects is the potential for adverse impacts on birds (see Section 5.1 of this report for an overview of this general concern).

In anticipation of the need to address bird impacts in completing an ESR within the Provincial EA process, an Avian (bird) Study was initiated for the Projects. The results of this study will also meet the needs of the Federal EA process, in the event that the Federal process is triggered.

The two main objectives of this Avian Study are:

1. To characterize the bird resources in the area of the proposed Projects, and
2. To provide a basis of understanding of potential constraints on wind turbine installation and operation related to the avian community.

The current Avian Study also provides data that may be used as baseline data. These baseline data provide a pre-construction basis of comparison for future evaluation of avian monitoring data that might be obtained during the operational phase of the Projects.

This Report also includes information related to the general ecology and non-avian biota of the Study Area, which may be of relevance to other issues raised in the Projects' ESRs.

2.0 WORK-SCOPE AND METHODS

The organization, chronology and specific tasks of this Avian Study reflect the specified study objectives (see Section 1.0). The study design was developed in consideration of a general understanding of the subject matter (i.e., wind turbine impacts on birds – see Section 5.1) as well as the intent and specifications of pertinent guidance and background documents (e.g. EC-CWS, 2004, 2005, 2007a, 2007b).

The work undertaken as part of this Avian Study has included three main tasks:

1. an initial review of available information regarding the abundance and distribution of bird species in the Study Area, and regarding the presence of avian habitat in the Study Area,
2. completion of focused field monitoring in the Study Area, including migratory monitoring (fall and spring) and breeding bird monitoring (early summer), and
3. a general assessment of the likelihood of adverse impacts of wind turbine installation and operation on the identified avian community in the Study Area.

The initial review provides a general understanding of the types and numbers of birds that might be encountered in the Study Area through all seasons. The scope of the site-specific field monitoring is, in part, dependent on the findings of the initial review. The assessment of potential adverse effects collectively considers the findings of the initial review and the on-site monitoring in a weight-of-evidence manner.

2.1 Review of Existing information

The first step in the current Avian Study was a review of existing information of relevance to bird presence in the immediate Study Area and the surrounding region. Available information regarding abundance and distribution of local and regional bird species, as well as their conservation status, was sought and reviewed. Information regarding potentially significant bird habitat and migratory flyways within or near the Study Area was also reviewed.

Several sources were consulted to identify and characterize natural aspects of the Project area. The main sources included;

- The Natural Heritage Information Centre (NHIC), Natural Area Reports and Element Occurrence (EO) databases, maintained by the Ontario Ministry of Natural Resources (MNR),
- The Lower Thames River Conservation Authority,
- Bird Studies Canada (BSC),

- Important Bird Areas (IBA) Canada,
- The Long Point Bird Observatory (LPBO), and
- The Ontario Breeding Bird Atlas (OBBA).

Information obtained from these and other sources was used to identify and characterize features of interest such as ANSIs (Areas of Natural and Scientific Interest), ESAs (Environmentally Significant Areas), Provincially Significant Wetlands, Important Bird Areas (IBAs), and other areas of interest identified by government agencies, local naturalist groups, planning departments, etc.. The information regarding natural areas provides an understating of avian habitat availability, and can also be used to describe the broader ecology of the Study Area in support of the overall EA process.

In addition to this desktop information review, an initial on-site field reconnaissance was conducted (July 2006) to characterize the Study Area. Incidental bird observations, local land-use, and the presence of natural features (woodlots, wetlands, grasslands) were recorded during this reconnaissance.

The existing records of bird presence near the Study Area (e.g. local OBBA data), coupled with the local and regional land-use and habitat information, provides a reasonable understanding of the likely presence of birds within the Study Area. This initial understanding, on its own, allows a preliminary assessment of the potential for adverse impacts of the proposed Projects on birds. It further allows a determination of the level of site-specific avian monitoring required to address possible gaps and uncertainties in the final assessment of Project-related impacts on birds.

Based on the findings of the initial review (see Section 3), there are two potentially significant aspects of the local avian community that affect its relative sensitivity. These are:

1. The confirmed breeding status of the Bald Eagle (*Haliaeetus leucocephalus*) in OBBA square 17MH10 (see Appendix A4), which overlaps the Study Area. The Bald Eagle is Provincially Endangered and Regulated under the *Endangered Species Act*, and is considered a Species at Risk in Ontario (SARO).
2. The recorded presence (OBBA squares MH1710 and 17MH11) of grassland species with aerial flight displays (Horned Larks, Bobolinks).

The presence of breeding Bald Eagles would confer “Very High” sensitivity under Federal EA Guidance (EC-CWS, 2007a). The presence of species with aerial displays would confer “High” sensitivity. Aside from these two factors, existing information indicates that the Study Area does not contain sensitive elements, and would be of “low” sensitivity. Under that same Federal EA Guidance, small wind power projects (i.e., with <10 turbines) where the sensitivity is “low” warrant the least effort to examine local avian resources.

2.2 Field Monitoring

Following completion of the initial review of existing information, field-level monitoring was conducted to refine the understanding of bird presence in the Study Area. To confirm and expand upon the findings and conclusions of the initial review, site-specific monitoring efforts included:

- Spring migration monitoring,
- Fall migration monitoring, and
- A breeding bird survey.

These field studies serve to "ground-truth" the findings of the initial review. They also provide pre-construction baseline data with respect to avian abundance and distribution in the Study Area through major seasonal periods of activity (i.e., spring, summer and fall). Based on initial review of existing information, including Christmas bird counts for the nearest location of record (i.e., Blenhiem, ~20 km south of Study Area - see Appendix A6 for data summary), the general abundance and diversity of birds during winter months was expected to be relatively low. Further, there were no identified physical or biological features in the Study Area that might function as significant habitat or food supplies and subsequently result in local concentrations of winter birds. For these reasons, direct monitoring of winter birds was not included in the field monitoring program.

The first phase of field monitoring was a breeding bird survey (BBS), completed over the period of 05 – 07 July, 2006. The BBS was designed to identify those species of birds breeding within or in close proximity to the Subject Lands. The BBS also focused specifically on the site-specific status of Bald Eagles and grassland species with aerial displays, as these were identified in advance as sensitive elements that might occur within the Study Area.

Monitoring of fall migration was conducted during the week of October 2 to 6, 2006. The spring migration was the final component of the Avian Study, and was conducted in May, 2007. A general reconnaissance of the Study Area was also conducted at the onset of both the July and September survey periods, including surveys and characterization of local woodlots.

Overall, the field monitoring program followed an "Area Search" strategy, in which efforts were directed at determining all species present in the Study Area, and providing some measure of their relative abundance and distribution. Within the Area Search strategy, there was focus on the natural habitat that was present in the Study Area (i.e., mainly woodlots). A total of 16 monitoring stations (10 irregular transects and 6 point-count stations) were established in the Study Area to facilitate this strategy.

The location of all monitoring stations is depicted in Figure 5. Table 3 provides a general description of all monitoring stations (transects and point-counts) established within the Study Area. The Study Area was established to encompass all Subject Lands, and also adjacent natural and cultivated lands, and measures ~30 km^2 (see Figure 1). The Subject

Lands themselves occupy a relatively small area, about 700 ha (7 km^2) in combined area, simply reflecting the fact that the two proposed wind power projects are small (~5 turbines each). The number and location of monitoring stations and the duration of individual monitoring events were designed to provide effective avian characterization within the relatively small potential footprint of the Projects.

The location of monitoring stations was determined systematically to provide data representative of major habitat types throughout the Study Area. Monitoring stations were located in both open areas (forage and field crops) and wooded areas (deciduous woodlots and wooded riparian areas) distributed throughout the Study Area.

At 10 monitoring locations, a wandering transect approach was followed. Each monitoring event was completed by walking a route that effectively traversed the habitat unit of interest. For woodlots, the interior and edge were traversed in a pattern that minimized the likelihood of replication of any individual birds in the observation record. All birds visually observed or heard were recorded. When traversing the edge of wooded areas, observations of birds in adjacent open areas were also recorded. Total transect length at each location was in the order of 1 to 2 km.

A total of six unlimited radius point-count stations were also established. These stations were established in areas with a relatively wide and open view, primarily for monitoring of migratory birds. At each of these stations, all birds observed or heard from a fixed point of reference were recorded. Some birds (e.g. Canada Goose, Turkey Vulture) are readily observed and identified at distances of several kilometers. For such species, observations were recorded only if it was judged that the birds were within ~1 km of point of observation.

Monitoring events were completed over a standardized unit of time. Typically, the duration of standardized monitoring events is relatively short (e.g. 10 minutes) when the number of stations is relatively large. In the current Avian Study, the monitoring events at the point-count stations were standardized to 1 hr. At the transect monitoring stations, used mainly during the breeding bird survey, the total time to complete the transect was recorded (typically 1 - 2 hrs per transect).

During all monitoring events (transects and point-counts), additional information regarding each bird observation was also recorded. This information included estimated height above ground (whether perched or in flight), and the characteristics of flight (direction, duration, origin and destination), if applicable. Specific activities of birds were also noted, including foraging, territorial behaviour, or courtship behaviour. Wind (Beaufort scale) and sky conditions were also recorded for each monitoring event.

Breeding Bird Survey (BBS)

The BBS was conducted to identify the species that regularly use the Study Area during the breeding season. This includes species that regularly nest, raise young, or forage in the area.

A total of 10 transect monitoring events (see Figure 2) were completed during the BBS on July 05 and 06, totaling 13 hrs of monitoring time. In addition to the information routinely record at transect locations, evidence specific to breeding status was also recorded, following the evidence system used for the Ontario Breeding Bird Atlas (OBBA).

During travel through the Study Area between the established monitoring stations, incidental observations of birds were also recorded.

Migration Monitoring

Migration monitoring efforts were intended to identify birds within the study area engaged in either migratory passage or stop-over. Monitoring was designed to provide an understanding of the relative abundance and distribution of any migratory species within the Study Area.

In North America, most fall migration occurs between late August and November (Sibley, 2001). Records from established bird observatories (e.g. LPBO) suggest that the passage of fall migrants through southern Ontario is relatively heavy in the month of October. A relatively high percentage of the spring migratory passage through Ontario occurs in May. Migration monitoring events in the current Study Area were scheduled for what were likely to be periods of peak migratory activity (i.e., May and October). Monitoring events were spread over the full course of the day to enhance the likelihood of observing species with different daily chronology of migratory activity (e.g. morning departures vs. mid-day soaring migrants).

All species seen or heard were recorded during each migration monitoring event, with best estimates of numbers of each species observed also recorded. These efforts were aimed at identifying both passage migrants (i.e., migratory birds in the process of migratory passage through the area) and stop-over migrants (i.e., birds resting or feeding in the immediate area between legs of their migratory journey). For this reason, all bird activity was recorded, both on ground and in air.

Spring migration was subject to 12 separate monitoring events, encompassing all six point-count stations (11 events in total) and one event at Transect 1. Total monitoring time was 12 hrs.

Monitoring of fall migration included one event at Transect 1, and 8 events among the 6 point count stations, totaling 9 hrs of monitoring time.

3.0 STUDY AREA CHARACTERISTICS

The physiography, ecology and general land-use patterns in and around the Study Area are described below. Specific natural features in close proximity to the Study Area are also identified and described. This information provides necessary context for both the design and interpretation of the avian monitoring efforts comprising this study.

3.1 Physiography and Land-Use

The Study Area lies within a low relief clay plain. The only occurrence of sloped terrain in the Study Area is within the immediate confines of the Thames River valley. In the Study Area, the valley is well defined and confined, with elevation change from top of bank to water's edge in the order of 10 to 20 m.

The Study Area and surrounding region are within a largely agricultural landscape, with row crops (corn, soybean) making up the majority of use. Grains, forage and pasture are also present to a lesser extent. In most locations, lands immediately adjacent to the Thames River are cleared and cultivated within a few meters of the top of bank.

Other than the Thames River, the nearest major water bodies to the Study Area are Lake St. Clair, about 30 km to the west, and Lake Erie, about 30 km to the south at the closest points.

3.2 Regional Ecology

The Study Area is situated within the Mixedwood Plains Ecozone and the Carolinian Life zone, both of which are confined to the southwestern portion of Ontario. The widespread alteration of the landscape for agricultural purposes in this part of the province has lead to significant loss of natural forest, wetland and grassland. Greater than 90% of the land in Kent County is classed as "improved" for agricultural purposes. Various sources (e.g. Cadman et al., 1987, Couturier, 1999) note that the remaining area of natural vegetation cover in the Chatham-Kent area totals approximately four to five per cent of all land. Most of the remaining natural landscape is fragmented, and the individual features are typically small relative to what might constitute significant areas of habitat for birds or other fauna.

3.3 Local Ecology and Natural Features

A search of the Natural Heritage Information Centre (NHIC) Database has revealed only seven Natural Areas within 10 km of the Study Area. These NHIC Natural Areas are summarized in Table 1, and depicted in Figure 3. Detailed profiles of these Natural Areas are also provided in Appendix A1.

The NHIC Natural Areas include one woodlot, three wetlands, and three small areas of unique ecology owing to sand-based soils. The profiles for these Natural Areas (Appendix A1) contain no direct mention of birds or bird habitat, although all are described as containing regionally uncommon habitat that could, in turn, support uncommon birds. The Thamesville Moor is large enough (80 ha) that it may support a significant number of birds that prefer or require wooded swamp or wet grassland as habitat. Wabash Woods is also relatively large and in very close proximity to the Subject Lands (see Figure 3). This area may afford habitat to relatively small numbers of birds with a requirement or preference for mature Carolinian forest habitat.

In addition to the significant features identified by the NHIC, there are four small wetlands within or adjacent to the Study Area (see Figure 3). These wetlands are not Provincially Significant, and are no more than 15 ha in size. There is no indication that these wetlands function as significant bird habitat, although they may certainly support limited numbers of birds that might use small wetlands for breeding, foraging, or staging.

During the Avian Study, the plant community composition of natural areas was also examined and recorded. Specifically, the dominant tree and under-storey species encountered along monitoring transects 1 to 10 were recorded. These monitoring transects traversed four sections of the wooded riparian zone of the Thames River, and six woodlots (see Figure 3). General descriptions of each transect and brief inventories of dominant flora are provided in Appendix B1. In summary, the dominant plant species observed in the woodlots included deciduous trees and under-storey plants typical of the region and of the Carolinian zone. The riparian zone also contained some Carolinian plant cover, but there appears to have been a greater degree of alteration of the native plant community in this zone, relative to the remnant pockets of intact Carolinian woodlots.

During avian monitoring efforts, incidental observations of non-avian wildlife in the Study Area were also recorded. The mammal species observed within the Study Area are as follows:

- Eastern Gray Squirrel (*Sciurus carolinensis*)
- White-tailed Deer (*Odocoileus virginianus*)
- Raccoon (*Procyon lotor*)
- Muskrat (*Ondatra zibethica*)
- Skunk (*Mephitis mephitis*)
- Coyote (*Canis latrans*)
- Little Brown Myotis (*Myotis lucifugus*)
- Eastern cottontail (*Sylvilagus floridanus)*
- Groundhog (*Mormota monax*)

Because of limited occurrence in Ontario and Canada, the remnant pockets of Carolinian habitat in Kent County may contain native plant and wildlife species that are themselves uncommon in the Province. A search of the NHIC database has revealed a number of relatively rare and/or sensitive Carolinian plant and animal species within or near the Study Area. The NHIC occurrences of "Elements of Biodiversity" are presented in Appendix A2. These Element Occurrences (EO) are simply localized areas of land/water where the specified element (e.g. species or ecological community) has been recorded as meaningfully present. Within a 10-km radius of the Study area, there are 126 EOs on record. Of the 52 species identified among these EOs, the majority are plants, both woody and herbaceous. Among the relatively few animal EOs, there are two fish, an insect, several freshwater mussel species, one mammal, and two birds. The bird species EOs are discussed further in Sections 4.3 and 5.2 of this report.

3.4 Significant Avian Habitat

As noted, natural features in or near the Study Area are limited in number and area, and none of the identified natural areas appears to function as significant bird habitat. This local condition is consistent with the broader regional trend. Overall, the Chatham-Kent area has relatively low diversity and abundance of birds, likely a consequence of the relatively sterile lands resulting from intensive agriculture (Cadman et al., 1987).

Despite this overall regional condition, there area a number of isolated areas in the region that are considered to be significant in terms of bird resources. Southern Ontario is one of four areas in Canada with a relatively high concentration if “Important Bird Areas” (IBAs). The large marsh systems and associated peninsulas on Lakes Erie and Ontario qualify as IBAs on the basis of waterfowl numbers and/or migrating landbirds (CEC, 1999). An interim directory of IBAs in Canada identifies five key IBAs in southern Ontario, along both Lake Erie and Lake Ontario (CEC, 1999). In the southwest region of the Province, the key IBAs include Long Point and Point Pelee.

Point Pelee National Park is located near the Town of Leamington, ~ 75 km SW of the Study Area. Owing to its location (the southern most point of mainland Canada) and its landform (a narrow peninsula extending into Lake Erie) Point Pelee is renowned for its concentration of migratory birds. In particular, the Park witnesses an astounding number of migrant songbirds during both the spring and fall. It is likely that several million songbirds pass through the narrow confines of the park each year. Among the masses of migrants are several threatened species (e.g. Hooded Warbler, Louisiana Waterthrush, Henslow’s Sparrow). Extensive land clearing in southwestern Ontario has isolated this park from other natural lands of the same ecosystem.

The Long Point Peninsula and Marshes are located near Port Rowan on the north shore of Lake Erie - ~90 km ESE of current Study Area. This IBA is ~100,000 ha in area and encompasses shoreline, marshes, and sandspits. Long point is particularly important for the globally significant numbers of waterfowl that use the area during spring and fall migration. It is also an important feature for numerous shorebirds and landbirds, both migrant and resident. In total, it is estimated that about 2.5 million migratory birds use Long Point during the spring, and about 7 million use the area during fall migration. For some species (e.g. Canvasbacks), counts at Long Point suggest that as much as 8% of the total North American population are present at certain times (CEC, 1999).

In somewhat closer proximity to the Study Area, there are a number of smaller and less significant IBAs. A summary description of these IBAs is provided in Table 2, and more detailed descriptions are provided in Appendix A3. The location of these IBAs relative to the Study Area is also depicted in Figure 4. While these IBAs are closer to the Study Area than Point Pelee or Long Point, they are all at least 20 km away. At such distances, there is a very low likelihood that any Project activities within the Study Area would have any significant influence on birds associated with these IBAs.

3.5 Migration Routes

Limited information exists on migratory flight paths of individual bird species which traverse southwestern Ontario. Further, migratory routes for a given species may shift from year to year, and often differ between the spring and fall migrations. However, there is some general information available to broadly approximate migratory flight paths in the region of the Study Area.

Southwestern Ontario, including the Study Area, lies within what is broadly defined as the “Atlantic Flyway” (see Figure 5). The flyway is a simplification of what is a complex series of migratory flight paths, differing among species, and among broader groups of birds (e.g. ducks, shorebirds, etc.). For most bird species that migrate through southern Ontario, the flight paths are fairly broad, with a few well-known focal points (e.g. Point Pelee, Long Point, and much of the northern shore-line of Lake Erie) where birds converge on the migratory route.

Migration is often guided to some extent by topographical features. Migrants often use major physical features such as mountain ranges, rivers, and shorelines (oceans or large lakes) as direct navigation cues. Features such as peninsulas, mountain passes, and shorelines also tend to physically concentrate a number of birds species owing to their flight limitations. For example, birds that rely on overland thermals to allow soaring flight during migration tend to avoid protracted flights over large bodies of water, and end up concentrated along shorelines and peninsulas. The shoreline of Lake Erie and associated peninsulas (e.g. Point Pelee, Long Point) are well known for their influence and importance to the migratory birds passing through Ontario. Local to the Study Area, the Thames River is the only feature that is considered to potentially have some degree of influence on the migratory flight paths of some birds passing through the area.

During both spring and fall migration, birds often land in significant numbers for rest and refueling prior to continuing with the next stage of the migration. This “staging” behavior is exhibited by most species, as few birds undertake non-stop migratory journeys. The likelihood of encountering staging birds at any location along a migratory route is dependent on proximity of that location to major barriers (large water bodies, mountain ridges) and the availability of appropriate habitat for resting and feeding. In relatively close proximity to the Study Area, the natural landscape is sparse and affords limited staging grounds. The Study Area is also a considerable distance from Lake Erie, which is the nearest feature that might function as a barrier, resulting in concentration of certain bird species.

4.0 AVIAN COMMUNITY

4.1 Migratory Birds

To gain an understanding of the likelihood of wind turbine impacts on birds that might traverse the Study Area during migration, characterization of migratory flight paths is required. From the review of existing information (see Section 3.5), it is understood that southwestern Ontario is traversed by the broadly defined Atlantic Flyway. In closer consideration of the major physical features and natural habitat of the Study Area, and general aspects of avian migratory behavior, there is a low likelihood of regular occurrence of significant numbers of migratory birds at turbine height in the Study Area. Site-specific monitoring has been conducted during both the spring and fall migratory periods to ground-truth this general conclusion.

It is important to note that the spring and fall migratory periods are each protracted over several months when the full list of migrant bird species in Ontario is considered. The migratory periods overlap with the periods of both summer and winter residency. Thus, the birds observed during the migratory monitoring conducted in the Study Area were not necessarily engaged in migration at the time of observation. Many of the records of observation may reflect resident birds, or possibly migrant birds that are initially gathering and not necessarily part of concentrated migratory flocks.

Spring Migration

The results of the spring migratory bird monitoring conducted in the Study Area are summarized in Table 4 (by species) and Table 5 (by station). The detailed monitoring results for individual point-counts and transects are provided in Appendix B2.

A total of 1012 individual birds were observed during the spring migration monitoring, representing 50 species. The five most frequently observed species were the Common Grackle (273 individuals observed), the European Starling (140 individuals observed), the Red-winged Blackbird (87 individuals observed), the Turkey Vulture (55 individuals observed), and the Tree Swallow (52 individuals observed). The number of species, an indicator of diversity, tended to be highest at monitoring stations that encompassed the wooded riparian zone of the Thames River. Overall bird abundance did not exhibit any clear trends with respect to monitoring location.

The vertical distribution of birds observed during the spring migration period was heavily skewed to low level activity, below the anticipated blade-swept height of 2-MW wind turbines. Greater than 93% of all birds observed were perched or in flight at a height considerably lower than 40 m (see Table 4). Only 4.8% of birds, representing four species, were observed in flight at heights between 40 and 120 m (i.e., in the blade-swept height). Three species of birds were observed at heights exceeding 120 m, accounting for only 1.8% of all observed individuals. Turkey Vultures accounted for ~70% of all birds observed in flight at 40 m or higher.

Very few of the birds observed during the spring migratory period appeared to be engaged in concerted migratory flight. Most observations consisted of perched birds or birds engaged in short local flights, remaining in the Study Area. Much of the local activity was associated with trees, either as isolated trees, tree-lines, woodlots or the wooded riparian zone of the Thames River. Some of the localized activity may have been associated with migratory stop-over, but there is no capacity to confirm or refute this possibility.

Fall Migration

The results of the fall migratory bird monitoring conducted in the Study Area are summarized in Table 6 (by species) and Table 7 (by station). Appendix B3 contains the detailed results for each individual monitoring event.

A total of 27 species were observed during fall migration monitoring, considerably fewer than observed during the spring monitoring period. In terms of abundance, observations recorded during the fall migratory period were dominated by European Starlings, and secondarily by blackbird species (Family Icteridae), including mixed blackbird flocks (Red-winged Blackbirds, Common Grackles, Brown-headed Cowbirds, Bobolinks). Combined, the starlings and blackbirds accounted for about 78% of the 2215 individual birds observed during fall point-counts or transects. The Tree Swallow (151 observations), Canada Goose (62 observations), and American Robin (60 observations) were the next most frequently observed species.

The vertical distribution of birds observed during the fall migratory period was more variable than observed during the spring. About 75% of all birds observed were perched or in flight at heights below 40 m. Including mixed blackbirds as a species group, there were12 species observed within the blade-swept height (i.e., 40 to 120 m). These observations accounted for about 22% of all individual birds observed. There were 5 species observed at heights greater than 120 m, representing 3% of all periods observed during the fall migratory period.

4.2 Summer Resident or Breeding Birds

<u>Existing Information</u>

The Ontario Breeding Bird Atlas (OBBA) provides multi-year compilations of breeding bird surveys conducted on a 10-km by 10-km (i.e., 100 km^2) grid system throughout Ontario. Most recent data from the OBBA have been reviewed and summarized to provide a general understanding of breeding bird distribution in the vicinity of the Kent Breeze Study Area. The Study Area (30 km^2) occupies small fractions of adjacent squares 17MH10 and 17MH12 of the OBBA grid system. Data for those two squares are not necessarily reflective of the breeding bird distribution specifically within the Study Area, but those data are representative of breeding bird activity in the general vicinity of the Study Area. Summary tables of the latest OBBA data for squares 17MH10 and 17MH11 are provided in Appendix A4. In total, there are 91 different species for which breeding evidence has been recorded in either of these two squares (86 species in Square 17MH10 and 80 species in Square 17MH11). The European Starling is the most abundant breeding species recorded in both OBBA squares, and there are a few other species that are typically among the five most abundant (i.e., American Robin, Common Grackle, Red-winged Blackbird, and the Mourning Dove).

OBBA status in these local squares has been contrasted with the results of the breeding bird survey (BBS) conducted within the Study Area (see the following discussion and Table 8).

Site-Specific Monitoring

The results of the BBS conducted specifically for this Avian Study are summarized in Tables 8 and 9. Detailed monitoring data for individual stations is provided in Appendix B4.

In total, breeding bird evidence was obtained for a total of 53 species at the established monitoring stations within the Study Area. The breeding status of these species was as follows:

- 5 species "Confirmed" breeding status
- 22 species "Probable" breeding status
- 21 species "Possible" breeding status
- 5 species simply "Observed"

Among the five species of confirmed breeding status was the Bald Eagle, with a single nest recorded within the Study Area. Information provided by local landowners indicates that this nest has been active for several years. The presence of this and other special status species in the Study Area is discussed in Section 4.3.

There was a total of 639 individual bird observations recorded during the 10 transect monitoring events. The 5 most frequently observed species were:

1. American Robin (66 observations – confirmed breeding status)
2. Red-winged Blackbird (64 observations - confirmed breeding status)
3. Common Grackle (48 observations - probable breeding status)
4. Tree Swallow (40 observations - probable breeding status)
5. Northern Cardinal (32 observations - probable breeding status)

Incidental observations of birds at locations in the Study Area, other than the established monitoring locations, were also recorded during the BBS. The following is a summary of such incidental observations of species that were not otherwise recorded at the fixed stations:

- Green Heron (*Butorides virescens*) – single observation, overflight along Thames River valley.
- Brown Thrasher (*Toxostoma rufum*) – several individuals observed at edge of roadside woodlots.
- Chimney Swift (*Chaetura pelagica*) – several individuals foraging in flight near residential pond.
- Mallard (*Anas platyrhynchos*) – several observations of individuals or pairs in flight or on local ponds.
- Cliff Swallows (*Hirundo pyrrhonota*) – a small colony (~15 birds) with nests under a small bridge on Longwoods Rd. (Hwy 2), in the southwest portion of the Study Area.
- Rock Dove (*Columba livia*) – small colony associated with roadside farm buildings in the eastern portion of the Study Area.
- Solitary Sandpiper (*Tringa solitaria*) – a single bird observed foraging along small tributary to Thames River.
- Purple Martin (*Progne subis*) - a small colony (~20 birds) at an artificial nesting house at a rural residence on Longwoods Rd. (Hwy 2), west of the Study Area.

These incidentally observed species bring the total species count for the breeding season to 61.

The Yellow-bellied Sapsucker (*Sphyrapicus varius*) is the only species observed during the current BBS for which no local evidence is reported in the OBBA. This species is reported as a relatively uncommon nesting species in southwestern Ontario, owing to the relative absence of preferred tree species for nesting (i.e., members of the poplar group) in Carolinian forests (Cadman et al., 1987). It is likely that the Yellow-bellied Sapsucker is not a common breeding species in the Study Area.

The majority of birds observed during the BBS were perched or engaged in short, low-level flights. Flight activity often had woodlots, tree-lines or isolated trees as the point of origin or destination. Over-flights were not frequent and not in any consistent direction.

4.3 Priority Species

An assessment of the potential effects of any development on bird populations needs to consider, among other things, those species of birds that have been determined to be at some level of risk, or are otherwise considered a priority in the broader conservation context.

Table 10 provides a summary of all species observed during site-specific monitoring efforts within the Study Area. Species observed incidentally outside established monitoring stations are also included. Table 10 also provides various indices of the risk or conservation status of each of the observed species.

Of the 75 species that have been directly observed in the Study Area (excluding the unspecified species of hawk, gull, and shorebird), all but one are globally ranked (GRANK) as “very common”. The Bald Eagle is the sole species in Table 10 that is ranked globally at the slightly lower status of “common”. The Bald Eagle is also classified as endangered at the Provincial level and is regulated under the *Endangered Species Act* (ESA). Federally, the Bald Eagle has been assessed and is determined to be “Not at Risk”. The Bald Eagle is one of the thirteen species listed in Table 10 that is Provincially ranked (SRANK) as “apparently secure”. In contrast, the other 58 native bird species (this excludes the four noted “exotic” species) that have been recorded in the Study Area are ranked as “secure”. In general, these rankings indicate that the populations of the bird species observed during this Avian Study are not currently at risk. None of the species listed in Table 10 is included in Schedule 1 of the Federal *Species at Risk Act* (SARA). The Bald Eagle is the sole species observed in the Study Area that is on the MNR’s Species at Risk in Ontario (SARO) list.

Table 10 also identifies Conservation Priority Levels that have been assigned to a number of the species that have been observed in the Study Area. The Priority Levels are as reported by Couturier (1999), and these levels are specific to Kent County. The full listing of Conservation Priority Levels developed for Kent County is provided in Appendix A5. This ranking process considers several factors (abundance, breadth of range, population trends, productivity, area sensitivity) and has been designed to help planning authorities set priorities for conservation efforts by targeting bird species (and their associated habitats) that are significant within their region. This prioritization scheme is intended for use by municipalities when developing Official Plans (e.g., identifying significant wildlife habitat, environmentally Sensitive Areas, etc.) or when evaluating proposed developments. In total, 30 of the 75 species listed in Table 10 have been assigned a priority level of 1 (highest) to 4 (lowest). This includes five Level 1 species and seven Level 2 species. Grassland species with aerial displays are among the conservation priority species that have been observed in the Study Area, including the Bobolink (Level 2), the Horned Lark (Level 3) and the Savannah Sparrow (Level 1). These grassland species and all other Level 1 or 2 species were not found to be abundant or widely distributed in the Study Area.

Other than the direct observations recorded during site-specific monitoring in the Study Area, there are historic records of bird species at risk in the general area. Among the NHIC element occurrences (EO) for squares 17MH10 and 17MH11 (see Appendix A2), the only bird species on record is the Louisiana Waterthrush (*Seiurus motacilla*), a species of “Special Concern”, both Federally and Provincially. In a slightly expanded search of the NHIC EO database within 10 km of the Study Area, a single occurrence of Northern Bobwhite (*Colinus virginianus*) was reported, in addition to the occurrence of the Louisiana Waterthrush. It should be noted that NHIC EOs for birds are usually defined as a breeding area or migration staging area, not a location of an isolated sighting. Thus, the two noted EOs indicate that there may have been a meaningful presence of these two species near the Study Area at some previous point in time. The likelihood of their presence in the Study Area at present is considered to be very low. Both EOs date back to the early 1950's, and there is no record of either species in the area in the last 50 years. Recent Ontario records for the Bobwhite (a grassland species) are restricted to Lambton County. The Louisiana Waterthrush typically breeds in swampy woodlands, which are generally absent within the Study Area.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Canadian bird populations are subject to a series of well-known threats, including natural threats (predation and brood parasitism, disease) and threats associated with human activity (habitat loss and fragmentation, exposure to environmental contamination, overexploitation, competition from invasive or species, collisions with manmade structures, and road mortality). Climate change also poses a potential threat, perhaps occurring as a result of both natural and human-related causes (CESSC, 2006).

The installation and operation of wind turbines for power production is recognized as an increasingly common human activity that has the potential to adversely affect birds (EC-CWS, 2006). There have been a number of site-specific studies (e.g. Johnson et al., 2000, Kerns and Kerlinger, 2004) and general reviews (e.g. CEBC, 2005; EC-CWS, 2005; Erickson et al., 2001; Kingsley and Whittam, 2001) of the potential impacts of wind power facilities on birds. These studies and reviews provide a general understanding of the types of impacts, their causes, and their likelihood of occurrence. Site-specific characteristics of any proposed wind power facility can be coupled with such an understanding to assess the risk that the facility may pose to local bird populations.

5.1 Wind Power and Birds - General Concerns

The three main problems for birds are habitat loss or damage, disturbance, and collision.

Habitat Loss

The installation of turbine platforms, access and maintenance roads, and transmission facilities may all result in the loss or alteration of natural areas (woodlands, wetlands, grasslands) and also agricultural lands (pasture in particular) that serve as habitat for resident or migratory bird species.

Impacts related to habitat loss are one-time in occurrence, although the effects are permanent. Habitat loss is fully predictable and preventable if habitat assessments are conducted and considered in the planning stages. In general, wind turbines and supporting infrastructure should not be placed directly within existing local areas of avian habitat (woodlands, wetlands, natural grasslands)

Disturbance

Birds may be frightened away from breeding, roosting or foraging locations by noise and movement that occur during both construction and maintenance, or by the presence of operating turbines themselves. The ultimate effect of bird disturbance at wind power facilities is not as well-researched or understood as turbine collisions. However, there is some general understanding that can be drawn from the currently available information related to this phenomenon.

In a four-year study of avian abundance and distribution at a wind power site in Minnesota, Johnson et al. (2000) reported a decline in the abundance of grassland species in proximity to a large-scale wind power development. Although the cause of the decline is subject to some uncertainty, it is potentially attributable to slight habitat reduction, turbine noise, and maintenance activity. Regardless of cause, the decline was determined to be relatively minor, and it was not expected to have any consequences to the regional population of the noted species.

Madders and Whitfield (2006) report that most studies of wind facility effects on raptors indicate that the potential for disturbance or displacement of members of this group of birds is low. In reviewing available literature, Kingsley and Whittam (2001) report that wind turbines do not appear to disturb migratory flight, foraging or breeding in most instances studied.

Regardless of ultimate mechanism and effect, the potential for adverse effects associated with disturbance can be minimized by;

- Citing turbines so they are not close to local areas of avian habitat (woodlands, wetlands, grasslands).
- Citing turbines so they are not close to known nesting sites of sensitive species or species at risk.
- Scheduling the timing of construction activities so that they do not coincide with critical periods of sensitive species or species at risk.
- Cessation of operational activities at the wind power facility during critical periods (e.g. nesting, fledging) for sensitive species or species at risk.

Collision

Birds in flight may be injured or killed if they collide with the supporting towers or the blades of wind turbines, or with supporting cables or transmission lines associated with the turbines. The likelihood of such collision is affected by a few major factors, including:

- Turbine placement, relative to locations of bird activity.
- Turbine size and design.
- The local abundance and distribution of birds.
- The behaviour of the birds which are present.

Generally, the frequency of bird collisions at wind power facilities throughout the world has been low, and the associated risks to bird populations are not significant. However, there have been isolated instances in which wind turbine installations have had significant impacts on birds as a result of turbine collisions. Major impacts associated with bird-turbine collision have been observed in Spain (Tarifa and Navarra), and the Altamont Pass in California. At these sites, large numbers of turbines had been placed in important feeding and migrating areas for birds of prey, resulting in many fatalities from this group of birds.

Based on post-operational monitoring conducted at the Altamont Pass Wind Resource Area (APWRA) annual mortality rate estimates are ~1300 raptors and ~4700 for all birds species combined. This translates to a fatality rate of more than 7 birds per turbine per year. About 40 bird species and 1 bat species are represented in the list of recorded fatalities. This site has an extremely large number of turbines (over 7,000 during earlier years of operation). The turbines are also of older design, being shorter and much faster moving than turbines being deployed at modern wind power facilities. Further, the APWRA occupies elevated terrain which has been determined to lie within critical migratory corridors and hunting grounds for various birds of prey. Overall, the Altamont Site exhibits many poor characteristics that greatly enhance the likelihood of occurrence of turbine collisions, particularly for birds of prey.

Various sources site a typical mortality rate owing to turbine strike in the order of 2 birds per turbine per annum (Whittam and Kingsley, 2003, Johnson et al., 2000, Erickson et al., 2001, NRC, 2007). At some locations, bird fatality rates of zero birds per turbine per year have been reported. For a few reasons (e.g. carcass scavenging), the available direct measures of bird fatalities at wind power facilities may be underestimates. The measures also do not account for the relative abundance of birds at any given site. However, the available measures are not likely in error by more than some percentage, and can be taken as reasonable indicators of the general order of magnitude of collective bird fatalities at most sites. Overall, it is generally expected that when the location of turbines at modern facilities is properly considered, collision with turbines is not likely to occur at rates that translate to significant impacts on local or migratory bird populations. Inappropriate locations for turbines include areas known to be especially important to birds (e.g. IBAs, Migratory Bird Sanctuaries) and any area that provides critical habitat to species at risk.

In terms of mitigation, the same measures that can serve to lower the likelihood of disturbance can also serve to reduce the potential for bird-turbine collisions. Also, a number of characteristics of the turbines themselves are subject to adjustments to reduce the likelihood of collisions. This includes turbine height, lighting, rotation speed, and the pattern of placement within a site. The specific alterations that can be made are in part dependent on the species of concern and other factors.

Species Susceptibility

The potential for adverse effects on birds is not solely a function of the various characteristics of the turbines. Bird behaviour, which can be species-specific, is also a potential key factor. The research and monitoring that has been conducted over the years has revealed that the behavior and ecology of certain groups of birds may affect the likelihood that they will be subject to adverse effects at a given wind power facility.

The obvious and unfortunate events at Altamont indicate that raptors (hawks, eagles, owls) are particularly susceptible. Various reviews indicate that a concern for raptors is widespread (NWCC, 2004, Kingsley and Whittam, 2005).

Waterfowl and shorebirds also appear to be subject to population reductions near wind turbines (CEBC, 2005). Disturbance effects are the most important factor to consider when citing wind turbines near significant waterfowl areas (Kinglsey and Whittam, 2005)

North American grassland birds are widely experiencing population declines, and wind power developments are identified as one of a number of current threats to grassland bird species (McCracken, 2005). Several sources report that grassland birds with aerial flight displays (bobolinks, horned larks, savannah sparrows) have been among the species more frequently recorded as fatalities at wind power facilities.

Passerines (songbirds) represent more than 70% of recorded fatalities at wind power facilities (NRC, 2007), but these birds are also often the most abundant group at a given location. Although vultures and crows are among the most frequently observed birds at blade-swept height, they are disproportionately low among fatality records.

These generalities can be considered in the assessment of potential impacts of wind power facilities on various components of local bird populations.

Summary

In response to demands for clean renewable energy, the number of operating wind power facilities has increased substantially in the past decade. These facilities have been subject to direct operational monitoring. The monitoring has revealed some occurrence of impacts as a result of disturbance or collisions with turbines and/or supporting infrastructure. Certain groups of birds may be more susceptible to adverse effects than others. However, most existing wind power facilities have been found to have no significant impacts on any groups of birds. Most available research indicates that wind turbines have low impacts on bird populations if they are cited properly, as follows:

- Away from migratory flight paths,
- Away from significant foraging, roosting or breeding habitat, and
- Away from habitats that are frequented by species of high conservation priority.

5.2 Potential Impacts in the Study Area

Migratory Birds

The potential for collisions of migratory birds with wind turbines is partly dependent on location of the migratory routes relative to the location of the turbines. It is also in part a function of bird behaviour, particularly the height at which the birds fly when passing through an area.

Generally, the height at which birds fly during migration is that which makes sense for the stage of their journey. Maximum heights may at times exceed several thousand meters for a number of migrant species, particularly when traversing significant mountain ranges (Perrins and Elphick, 1990). Nocturnal migrants typically fly at heights well above the heights of turbines (Kingsley and Whittam, 2001). Height at any given time is dependent on the topography of the ground below and wind conditions (speed and direction). Birds flying into a headwind over elevated land features (e.g. mountain passes) may only be several meters above ground at the peak of ground elevation. Over regions of low relief (e.g. southern Ontario) significant numbers of migratory birds are only likely to be found at heights within 100 m of ground level when strong headwinds are encountered, or when in close proximity to points of landing or departure near staging areas.

Based on the existing understanding of general migratory behaviour, and the location and features of Study Area, there is no obvious reason to expect significant occurrence of migratory birds, particularly at turbine height, in the Project Area. This expectation is corroborated by the migratory monitoring conducted on-site. Overall, there is nothing to suggest that migratory birds would be exposed to significant risk of collision with turbines in the Study Area.

Despite the low risk, efforts to reduce the potential for turbine collisions or disturbance of migratory birds at the Project site(s) are still worthwhile and advised. To this end, turbines should be placed as far away as practical from the Thames River. The birds that do migrate through the area may follow the river corridor, or stage along the river shore or riparian zone. Consideration could also be given to restrictions on turbine operations during periods of low visibility (e.g. at times of fog or heavy mist).

Breeding Birds

The relative abundance and diversity of breeding birds in the Study Area was found to be somewhat low, typical of the region and owing to a relative absence of natural habitat. The assemblage of breeding birds was also typical for the region, including many common species and some species unique to Carolinian habitat.

The majority of avian activity observed during the breeding season was associated with wooded features, and confined within a height roughly equivalent to the top of canopy of nearby woodlots or tree lines. Flights were largely short in duration and distance, at ground level or within the canopy. There were no observations that would indicate significant daily movement of summer resident birds to/from major local features. The area is largely devoid of significant tracts of natural habitat (woodlands, wetlands, grasslands). Overall, these general conditions would suggest a relatively low level of concern regarding the effects of a small wind power facility on local breeding bird populations.

Species of Concern

There were a few specific observations that warrant focused attention. Grassland and open-habitat species (e.g. Savannah Sparrow, Bobolink, Horned Lark) were recorded in the Study Area, most likely as breeding birds. Although none of these species is considered as a species at risk, they have been identified as potentially susceptible to the adverse effects of turbines, and in some cases are considered as conservation priorities in the study region (Kent County). For this reason, it is suggested that turbines be placed in locations away from forage or pasture lands in the Study Area, to the extent practical.

There are also three species at risk that have been reported in or near to the Study Area. As discussed, there are historical records of Louisiana Waterthrush and Northern Bobwhite at locations within a few km of the Study Area. There is low likelihood of occurrence of either species on the Subject Lands at present. Placement of turbines at distance from wetlands and grasslands will further lower the likelihood of adverse affects of wind turbine construction or operation on either species, should they actually be present. Placement of wind turbines away from natural areas (woodlands, wetlands, grasslands) is a broadly warranted practice to reduce the overall likelihood of occurrence of environmental impacts of any form.

The only factor that raises the potential for significant adverse effects of the currently proposed Projects on birds is the presence of breeding Bald Eagles in the Study Area. A single nest is situated on the southern edge of the westernmost parcel of the Subject Lands, in a large tree within a wooded area immediately adjacent to the Thames River.

At the federal level, the Bald Eagle is currently considered as being *Not At Risk* (COSEWIC, 2007). Provincially, the status of the Bald Eagle under the Endangered Species Act has recently been reviewed. Due to significant population recovery in the northern half of the province, the Bald Eagle has been elevated from *Endangered* (i.e., facing imminent extinction or extirpation from Ontario) to *Special Concern* (i.e., has characteristics that make it sensitive to human activities or natural events). In Southern Ontario, the number of successful bald eagle nests on record increased from fewer than five in the early 1980’s to more than 25 in 2005 (Laing, 2006). Concurrently, the mean number of number of chicks fledged per active nest increased in the order of 3-fold (i.e., from less than 0.5 to more than 1.5 chicks per nest). Although the southern population has exhibited these improvements in recent years, the Bald Eagle remains *Endangered* in this part of the Province, which includes the current Study Area.

In southern Ontario, the breeding season of the bald eagle begins in early to mid May. Most typically, two eggs are laid in a massive nest that is re-used from year to year by a given nesting pair. Following 5 to 7 weeks of incubation, young are tended by both parents for 10 to 11 weeks, at which point (i.e., in September) the young are typically ready to fledge. The fledged young may remain in the area of the nest for some time after fledging. Bald Eagles feed primarily on fish, and hunt along relatively large water bodies where fish are be present. Accordingly, the Bald Eagle usually nests by lakes or large rivers on conspicuous structures (cliffs, large trees) with wide views. Nest sites are re-used annually. The active nest currently established in the Study area, at the perimeter of one of the parcels of the Subject Lands, is likely to be revisited for at least one or two breeding seasons in the immediate future. If not, a new nest may be established somewhere else in or near to the Study Area, most likely along the Thames River.

Measures should to be taken to ensure the protection of the local Bald Eagles and their nest site(s). General measures to reduce the likelihood of disturbance or collision could include:

- Placement of turbines at maximum practical distance from the noted nest locations, and the Thames River in general.
- Restriction of construction activities so that they do not occur near the nest site between the time of initial return of parents to the nest to 3 or 4 weeks after fledging.
- Restrictions on operation of those turbines closest to the nest site during the same period noted above for restrictions on construction activity.

5.3 Follow-up Recommendations

The current study has provided a reasonably reliable understanding of the species of birds that are present in the Study Area throughout the year. The site-specific monitoring has provided a baseline indication of their local abundance and distribution. It is typically required that comparable monitoring is conducted following the completion of construction and the onset of wind turbine operation. Such monitoring serves to verify the findings of the baseline efforts, and also to detect any evidence of change in the local bird community that might be suggestive of an adverse effect of the wind power facility. To this end, the field monitoring efforts conducted for this study could simply be replicated in the first year or two of operations.

The presence of breeding Bald Eagles is the sole significant finding of this study. Additional studies to confirm the local status of this species and to characterize the behaviour when present in the Study Area are advisable.

Any follow-up monitoring efforts should be designed in consultation with the regional representatives of concerned authorities (e.g. EC-CWS, MNR).

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TABLES

Table 1: NHIC Natural Areas in Proximity to Study Area

Name	Type	Centroid UTM		Size (ha)
		Easting	Northing	
Thamesville Oxbow Wetland	Non-signifcant (provincial) Wetland	419500	4710100	5.0
Thamesville Sandhills	Life Science Site	418000	4708300	26.0
Thamesville Sandhills	International Biological Program Site	418200	4708500	13.4
Selton Rolling Sandland	International Biological Program Site	418100	4707300	20.2
Kentbridge Oxbow Wetland	Non-signifcant (provincial) Wetland	413200	4706800	3.0
Thamesville Moor	Life Science ANSI	417300	4714000	80.0
Wabash Woods	Life Science Site	415200	4710800	50.0

See Appendix A1 for detailed profiles of NHIC Natural Areas
See Figure 3 for graphic illustration of NHIC Natural Areas

Table 2: Important Bird Areas within 30 km of the Study Area

IBA Name (number)	Description	Distance and Direction from Study Area
Greater Rondeau Area (ON007)	Low-lying sand spit with variety of habitats. Supports significant populations of migrating waterfowl and shorebirds, along with populations of several threatened species that nest in the area	~30 km SSE
Skunk's Misery Complex (ON010)	A relatively large deciduous forests on the Bothwell sand plain. A veriety of habitat support several national VTE species (e.g.Hooded Warbler, Cerulean Warbler, Red-headed Woodpecker), and regionally rare species.	~20 km N
Eastern Lake St. Clair (ON012)	Extensive marshland and grassland on the shoreline, islands and delta lands of Lake St. Clair. These areas serve as one of the most significant staging areas for waterfowl in southern Ontario	~25 km W
Clear Creek forest (ON033)	Closed-canopy deciduous forest on the Lake Erie shoreline. Serves as one of the most significant sites in Canada for the nationally endangered Acadian Flycatcher	~25 km E
Southwest Elgin Forest Complex (ON048)	Carolinian forest on Lake Erie shoreline. Important habitat to Hooded Warbler and Acadian Flycatcher	~30 km ENE

See Appendix A3 for more detailed descriptions of IBAs
See Figure 4 for graphic illustration of IBA location

Table 3: Kent Breeze Avian Monitoring Stations

Station ID	Habitat/Cover Type	UTM Coordinates (Centroid)[1]	
		Easting	Northing
Point Count 1	Cultivated Field, Riparian Edge	417750	4709700
Point Count 2	Cultivated Field, Woodlot Edge	414250	4710350
Point Count 3	Cultivated Field, Woodlot Edge	415600	4712550
Point Count 4	Cultivated Field, Built-up, Riparian Edge	417200	4710550
Point Count 5	Cultivated Field	412800	4710000
Point Count 6	Cultivated Field	416200	4711150
Transect 1	Wooded Riparian	417500	4709700
Transect 2	Wooded Riparian	416800	4708750
Transect 3	Wooded Riparian, pasture, cultivated field	415250	4708750
Transect 4	Wooded Riparian, cultivated field	417500	4710800
Transect 5	Deciduous woodlot, interior and edge	414950	4710250
Transect 6	Deciduous woodlot, interior and edge	413950	4709500
Transect 7	Deciduous woodlot, interior and edge	415150	4711100
Transect 8	Deciduous woodlot, interior and edge	415650	4711400
Transect 9	Deciduous woodlot, interior and edge	412900	4711250
Transect 10	Deciduous woodlot, interior and edge	415750	4712900

See Figure 2 for graphic illustration of monitoring station location
1 - UTMs provided to the nearest 50 m

Table 4: Summary of Spring Monitoring Results - by Species

Species		Individuals Observed				Monitoring Periods	
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m	Total	Observed	Notes
American Crow	*Corvus brachyrhynchos*	11	3		14	5	overflights and local flights
American Goldfinch	*Carduelis tristis*	13			13	7	mix of overflights and local flights
American Robin	*Turdus migratorius*	43			43	7	low local flights, incl. chase flights
Bank Swallow	*Riparia riparia*	5			5	1	foraging along river
Barn Swallow	*Hirundo rustica*	14			14	5	forgaing flights and overflights
Black-capped Chickadee	*Parus atricapillus*	5			5	2	short flights to/from trees
Black-throated Green Warbler	*Dendroica virens*	1			1	1	foraging in riparian woods
Blue Jay	*Cyanocitta cristata*	3	14		17	3	overflights (various directions)
Bobolink	*Dolichonyx oryzivorus*	2			2	2	overflights N and E
Brown Thrasher	*Toxostoma rufum*	5			5	2	low local flights
Brown-headed Cowbird	*Molothrus ater*	32			32	9	local flights
Canada Goose	*Branta canadensis*	3			3	2	overflights W and N
Chipping Sparrow	*Spizzela passerina*	13			13	4	short local flights
Common Grackle	*Quiscalus quiscula*	273			273	10	mostly short local flights
Downy Woodpecker	*Picoides pubescens*	2			2	2	oveflight and local flight
Eastern Meadowlark	*Sturnella magna*	2			2	1	singing at ground level in field
European Starling	*Sturnus vulgaris*	150			150	11	mostly short local flights
Field Sparrow	*Spizzela pusilla*	2			2	2	short local flights
Gray Catbird	*Dumetella carolinensis*	3			3	3	perched, short local flights
Greater Yellowlegs	*Tringa melanoleuca*	1			1	1	low flight following river
Hairy Woodpecker	*Picoides villosus*	1			1	1	calling from treeline
Horned Lark	*Eremophila alpestris*	25			25	6	ground-level activity, overflights S and SE
House Finch	*Carpodacus mexicanus*	1			1	1	perched, singing
House Sparrow	*Passer domesticus*	1			1	1	short flight into tree
House Wren	*Troglodytes aedon*	2			2	2	singing from trees
Indigo Bunting	*Passerina cyanea*	2			2	2	local flights
Killdeer	*Charadrius vociferus*	23			23	8	low local flights and overflights
Mallard	*Anas platyrhynchos*	1			1	1	overflight NW
Mourning Dove	*Zenaida macroura*	27	2		29	8	local flights and overflights
Northern Cardinal	*Cardinalis cardinalis*	11			11	6	perched, very low local flights
Northern Flicker	*Colaptes auratus*	4			4	4	calling from trees
Northern Oriole	*Icterus galbula*	13			13	6	short local flights into trees
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	21			21	5	over-flights westward, foraging over river
Red-bellied Woodpecker	*Melanerpes carolinus*	3			3	2	short local flight
Red-eyed Vireo	*Vireo olivaceus*	4			4	3	calling from treeline
Red-tailed Hawk	*Buteo jamaicensis*			1	1	2	circling and drifting ~W
Red-winged Blackbird	*Agelaius phoeniceus*	87			87	11	mostly local flights
Rock Dove	*Columba livia*	22			22	2	short local flights near buildiings
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	3			3	1	foraging in riparian woods
Ruby-crowned Kinglet	*Regulus calendula*	4			4	1	foraging in riparian woods
Savannah Sparrow	*Paserculus sandwichensis*	1			1	1	very short, low flight in field
Sharp-shinned Hawk	*Accipiter striatus*			1	1	1	circling and drifting SW
Solitary sandpiper	*Tringa solitaria*	3			3	2	foraging and overflight along river valley
Song Sparrow	*Melospiza melodia*	27			27	9	short local flights
Spotted sandpiper	*Actitis macularia*	1			1	1	foraging at river's edge
Tree Swallow	*Tachycineta bicolor*	52			52	6	forage flights, mostly along river edge
Turkey Vulture	*Cathartes aura*	9	30	16	55	8	circling and soaring, various directions
Yellow-rumped Warbler	*Dendroica coronata*	3			3	1	foraging in riparian woods
Yellow Warbler	*Dendroica petechia*	2			2	2	singing in shrub
Unidentified shorebird	F. Scolopacidae	9			9	1	small flock, overflight along river valley
	Totals	945	49	18	1012		
	percent of total	93.4%	4.8%	1.8%			

Detailed spring monitoring results are provided in Appendix B2

Table 5: Summary of Spring Monitoring Results - by Station

Station ID	Habitat/Cover Type	Total Obseration Time (min)	Number of Species Observed	Total Individual Bird Observations	Individual Birds Observed per 10 min. period
Transect 1	Wooded Riparian	60	21	68	11.3
Point Count 1	Cultivated Field, Riparian Edge	120	30	221	18.4
Point Count 2	Cultivated Field, Woodlot Edge	120	18	119	9.9
Point Count 3	Cultivated Field, Woodlot Edge	120	22	140	11.7
Point Count 4	Cultivated Field, Built-up, Riparian Edge	120	22	228	19.0
Point Count 5	Cultivated Field	120	19	111	9.3
Point Count 6	Cultivated Field	60	12	125	20.8
	Totals:	720	50	1012	

Detailed spring monitoring results are provided in Appendix B2

Table 6: Summary of Fall Monitoring Results - by Species

Species		Individuals Observed			Total	Monitoring Periods Observed	Notes
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m			
Accipiter hawk	*Accipiter sp.*	1	1	2	4	3	drifting W and S
American Crow	*Corvus brachyrhynchos*	29	13		42	6	perched
American Goldfinch	*Carduelis tristis*	30	1		31	6	short local flights
American Robin	*Turdus migratorius*	48	12		60	6	individuals and sm. flocks, local flights
Blue Jay	*Cyanocitta cristata*	40			40	6	overflights ~westward, along river
Brown-headed Cowbird	*Molothrus ater*	7			7	1	several perched on tranmission lines
Buteo Hawk	*Buteo sp.*			3	3	3	circling and drifting
Canada Goose	*Branta canadensis*		9	53	62	3	flock overflights N and W
European Starling	*Sturnus vulgaris*	889	317		1206	6	large flocks and individuals, local flights
Golden-crowned Kinglet	*Regulus satrapa*	1			1	1	in tree
Gull species	*Larus Sp.*			12	12	1	circling and slowly drifting N
Horned Lark	*Eremophila alpestris*	3			3	3	ground-level activity
House Sparrow	*Passer domesticus*	3			3	1	foraging along roadside
Killdeer	*Charadrius vociferus*	1			1	1	calling at ground level
Mallard	*Anas platyrhynchos*	7			7	1	flew up from field
Mixed blackbird flocks	*F. Icteridae*	386	91		477	5	moving N or NW
Mourning Dove	*Zenaida macroura*	16	1		17	4	local flights
Northern Cardinal	*Cardinalis cardinalis*	1			1	1	calling and singing from trees
Northern Harrier	*Circus cyaneus*	1			1	1	low hunting flight over field
Red-tailed Hawk	*Buteo jamaicensis*		1		1	1	continuous glide north
Red-winged Blackbird	*Agelaius phoeniceus*	31			31	4	short local flights
Ruby-crowned Kinglet	*Regulus calendula*	6			6	1	moving through treeline
Sharp-shinned Hawk	*Accipiter striatus*	1	2		3	1	circling and drifting westward
Song Sparrow	*Melospiza melodia*	21			21	3	short local flights
Tree Swallow	*Tachycineta bicolor*	127	24		151	5	foraging flights and overflights
Turkey Vulture	*Cathartes aura*	7	24	4	35	5	circling and drifting
Wild Turkey	*Meleagris gallopavo*	6			6	1	foraging in field
	Totals	1662	496	74	2232		
	percent of total	74.5%	22.2%	3.3%			

Detailed fall monitoring results are provided in Appendix B3

Table 7: Summary of Fall Monitoring Results - by Station

Station ID	Habitat/Cover Type	Total Obseration Time (min)	Number of Species Observed	Total Individual Bird Observations	Individual Birds Observed per 10 min. period
Transect 1	Wooded Riparian	60	6	13	2.2
Point Count 1	Cultivated Field, Riparian Edge	120	13	815	67.9
Point Count 2	Cultivated Field, Woodlot Edge	120	15	142	11.8
Point Count 3	Cultivated Field, Woodlot Edge	60	16	740	123.3
Point Count 4	Cultivated Field, Built-up, Riparian Edge	60	10	227	37.8
Point Count 5	Cultivated Field	60	8	270	45.0
Point Count 6	Cultivated Field	60	7	25	4.2
	Totals:	540	53	2232	

Detailed fall monitoring results are provided in Appendix B3

Table 8: Summary of Breeding Bird Survey Results - by Species

Species		Number	Transects	Breeding	OBBA
Common name	**Scientific name**	Observed	Observed (of 10)	Status[1]	Status[2]
American Crow	*Corvus brachyrhynchos*	8	2	probable	confirmed
American Goldfinch	*Carduelis tristis*	23	5	probable	confirmed
American Robin	*Turdus migratorius*	66	9	confirmed	confirmed
Bald Eagle	*Haliaeetus leucocephalus*	1	1	confirmed	confirmed
Barn Swallow	*Hirundo rustica*	11	3	probable	confirmed
Belted Kingfisher	*Ceryle alcyon*	4	1	probable	possible
Black-billed Cuckoo	*Coccyzus erythropthalamus*	1	1	possible	possible
Black-capped Chickadee	*Parus atricapillus*	16	3	probable	probable
Blue Jay	*Cyanocitta cristata*	28	5	probable	confirmed
Brown-headed Cowbird	*Molothrus ater*	11	3	probable	confirmed
Canada Goose	*Branta canadensis*	13	1	confirmed	confirmed
Cedar waxwing	*Bombycilla cedrorum*	9	2	possible	probable
Chipping Sparrow	*Spizzela passerina*	11	4	probable	confirmed
Common Grackle	*Quiscalus quiscula*	48	5	probable	confirmed
Downy Woodpecker	*Picoides pubescens*	9	3	probable	confirmed
Eastern Kingbird	*Tyrannus tyrannus*	7	2	probable	confirmed
Eastern Phoebe	*Sayornis phoebe*	1	1	possible	confirmed
Eastern Wood-Peewee	*Contopus virens*	3	2	possible	possible
European Starling	*Sturnus vulgaris*	9	1	confirmed	confirmed
Field Sparrow	*Spizzela pusilla*	3	1	possible	probable
Gray Catbird	*Dumetella carolinensis*	26	8	probable	confirmed
Great Blue Herron	*Ardea herodias*	5	3	observed	possible
Great Horned Owl	*Bubo virginianus*	1	1	observed	confirmed
Horned Lark	*Eremophila alpestris*	9	1	possible	confirmed
House Sparrow	*Passer domesticus*	2	1	probable	confirmed
House Wren	*Troglodytes aedon*	14	5	probable	confirmed
Indigo Bunting	*Passerina cyanea*	9	7	possible	confirmed
Killdeer	*Charadrius vociferus*	9	3	probable	confirmed
Mourning Dove	*Zenaida macroura*	26	6	probable	confirmed
Northern Cardinal	*Cardinalis cardinalis*	32	9	probable	confirmed
Northern Flicker	*Colaptes auratus*	16	7	probable	confirmed
Northern Oriole	*Icterus galbula*	18	3	probable	confirmed
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	4	1	possible	confirmed
Ovenbird	*Seiurus aurocapillus*	1	1	possible	possible
Pileated Woodpecker	*Dryocopus pileatus*	1	1	possible	possible
Red-eyed Vireo	*Vireo olivaceus*	7	3	possible	confirmed
Red-tailed Hawk	*Buteo jamaicensis*	4	2	possible	probable
Red-winged Blackbird	*Agelaius phoeniceus*	64	6	confirmed	confirmed
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	9	4	probable	confirmed
Savannah Sparrow	*Paserculus sandwichensis*	4	1	possible	probable
Scarlet Tanager	*Piranga olivacea*	1	1	possible	probable
Song Sparrow	*Melospiza melodia*	30	6	probable	confirmed
Spotted Sandpiper	*Actitis macularia*	1	1	observed	probable
Tree Swallow	*Tachycineta bicolor*	40	3	probable	confirmed
Turkey Vulture	*Cathartes aura*	10	5	possible	probable
Veery	*Catharus fuscescens*	1	1	possible	possible
Warbling Vireo	*Vireo gilvus*	1	1	possible	confirmed
White-breasted Nuthatch	*Sitta carolinensis*	1	1	possible	possible
Wood Duck	*Aix sponsa*	1	1	observed	confirmed
Wood Thrush	*Hylocichla mustelina*	3	3	possible	confirmed
Yellow Warbler	*Dendroica petechia*	3	1	possible	confirmed
Yellow-bellied Sapsucker	*Sphyrapicus varius*	1	1	observed	-
Yellow-billed Cuckoo	*Coccyzus americanus*	3	1	possible	confirmed

Detailed BBS results are rpovided in Appendix B4

1 - breeding status based on maximum breeding evidence recorded during Site Survey

2 - Ontario Breeding Bird Atlas highest categorization in square MH1710 or MH1711. See Appendix A4.

Table 9: Summary of Breeding Bird Survey Results - by Station

Station ID	Habitat/Cover Type	Total Obseration Time (min)	Number of Species Observed	Total Individual Bird Observations	Individual Birds Observed per 10 min. period
Transect 1	Wooded riparian, cultivated field	120	18	108	9.0
Transect 2	Wooded riparian	90	22	112	12.4
Transect 3	Wooded riparian, pasture, cultivated field	90	19	96	10.7
Transect 4	Wooded riparian, cultivated field	60	19	82	13.7
Transect 5	Deciduous woodlot, interior and edge	60	9	25	4.2
Transect 6	Deciduous woodlot, interior and edge	60	14	43	7.2
Transect 7	Deciduous woodlot, interior and edge	60	17	47	7.8
Transect 8	Deciduous woodlot, interior and edge	90	16	49	5.4
Transect 9	Deciduous woodlot, interior and edge	60	12	39	6.5
Transect 10	Deciduous woodlot, interior and edge	90	10	38	4.2
	Totals:	780	53	639	

Detailed BBS results are provided in Appendix B4

Table 10: Summary of Species Observed in the Study Area (page 1 of 2)

Species		Spring	Fall	Breeding Season		Status				Conservation
Common name	Scientific name	Total	Total	Total	Status	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	Priority Level[5]
American Crow	*Corvus brachyrhynchos*	14	42	8	probable	G5	S5B	-	-	-
American Goldfinch	*Carduelis tristis*	13	31	23	probable	G5	S5B	-	-	3
American Robin	*Turdus migratorius*	43	60	66	confirmed	G5	S5B	-	-	-
Bald Eagle	*Haliaeetus leucocephalus*	-	-	1	confirmed	G4	S4B	NAR	END-R	1
Bank Swallow	*Riparia riparia*	5	-	-	-	G5	S5B	-	-	1
Barn Swallow	*Hirundo rustica*	14	-	11	probable	G5	S5B	-	-	3
Belted Kingfisher	*Ceryle alcyon*	-	-	4	probable	G5	S5B	-	-	-
Black-billed Cuckoo	*Coccyzus erythropthalamus*	-	-	1	possible	G5	S4B	-	-	2
Black-capped Chickadee	*Parus atricapillus*	5	-	16	probable	G5	S5	-	-	-
Black-throated Green Warbler	*Dendroica virens*	1	-	-	-	G5	S5B	-	-	2
Blue Jay	*Cyanocitta cristata*	17	40	28	probable	G5	S5	-	-	-
Bobolink	*Dolichonyx oryzivorus*	2	-	-	-	G5	S4B	-	-	2
Brown Thrasher	*Toxostoma rufum*	5	-	incidental	observed	G5	S5B	-	-	1
Brown-headed Cowbird	*Molothrus ater*	32	7	11	probable	G5	S5B	-	-	-
Canada Goose	*Branta canadensis*	3	62	13	confirmed	G5	S5B	-	-	-
Cedar waxwing	*Bombycilla cedrorum*	-	-	9	possible	G5	S5B	-	-	-
Chimney Swift	*Chaetura pelagica*	-	-	incidental	observed	G5	S5B	-	-	-
Chipping Sparrow	*Spizzela passerina*	13	-	11	probable	G5	S5B	-	-	-
Cliff Swallow	*Petrochelidon pyrrhonota*	-	-	incidental	confirmed	G5	S5B	-	-	4
Common Grackle	*Quiscalus quiscula*	269	-	48	probable	G5	S5B	-	-	-
Downy Woodpecker	*Picoides pubescens*	2	-	9	probable	G5	S5	-	-	-
Eastern Kingbird	*Tyrannus tyrannus*	-	-	7	probable	G5	S5B	-	-	-
Eastern Meadowlark	*Sturnella magna*	2	-	-	-	G5	S5B	-	-	3
Eastern Phoebe	*Sayornis phoebe*	-	-	1	possible	G5	S5B	-	-	4
Eastern Wood-Peewee	*Contopus virens*	-	-	3	possible	G5	S5B	-	-	-
European Starling	*Sturnus vulgaris*	150	1189	9	confirmed	G5	SE	-	-	-
Field Sparrow	*Spizzela pusilla*	2	-	3	possible	G5	S5B	-	-	3
Golden-crowned Kinglet	*Regulus satrapa*	-	1	-	-	G5	S5B	-	-	3
Gray Catbird	*Dumetella carolinensis*	3	-	26	probable	G5	S5B	-	-	4
Great Blue Herron	*Ardea herodias*	-	-	5	observed	G5	S5B	-	-	-
Great Horned Owl	*Bubo virginianus*	-	-	1	observed	G5	S5	-	-	-
Greater Yellowlegs	*Tringa melanoleuca*	1	-	-	-	G5	S4B	-	-	-
Green Heron	*Butorides virescens*	-	-	incidental	observed	G5	S4B	-	-	-
Hairy Woodpecker	*Picoides villosus*	1	-	-	-	G5	S5	-	-	-
Horned Lark	*Eremophila alpestris*	25	3	9	possible	G5	S5B	-	-	3
House Finch	*Carpodacus mexicanus*	1	-	-	-	G5	SE	-	-	-
House Sparrow	*Passer domesticus*	1	3	2	probable	G5	SE	-	-	-
House Wren	*Troglodytes aedon*	2	-	14	probable	G5	S5B	-	-	-
Indigo Bunting	*Passerina cyanea*	2	-	9	possible	G5	S5B	-	-	-
Killdeer	*Charadrius vociferus*	23	1	9	probable	G5	S5B	-	-	-

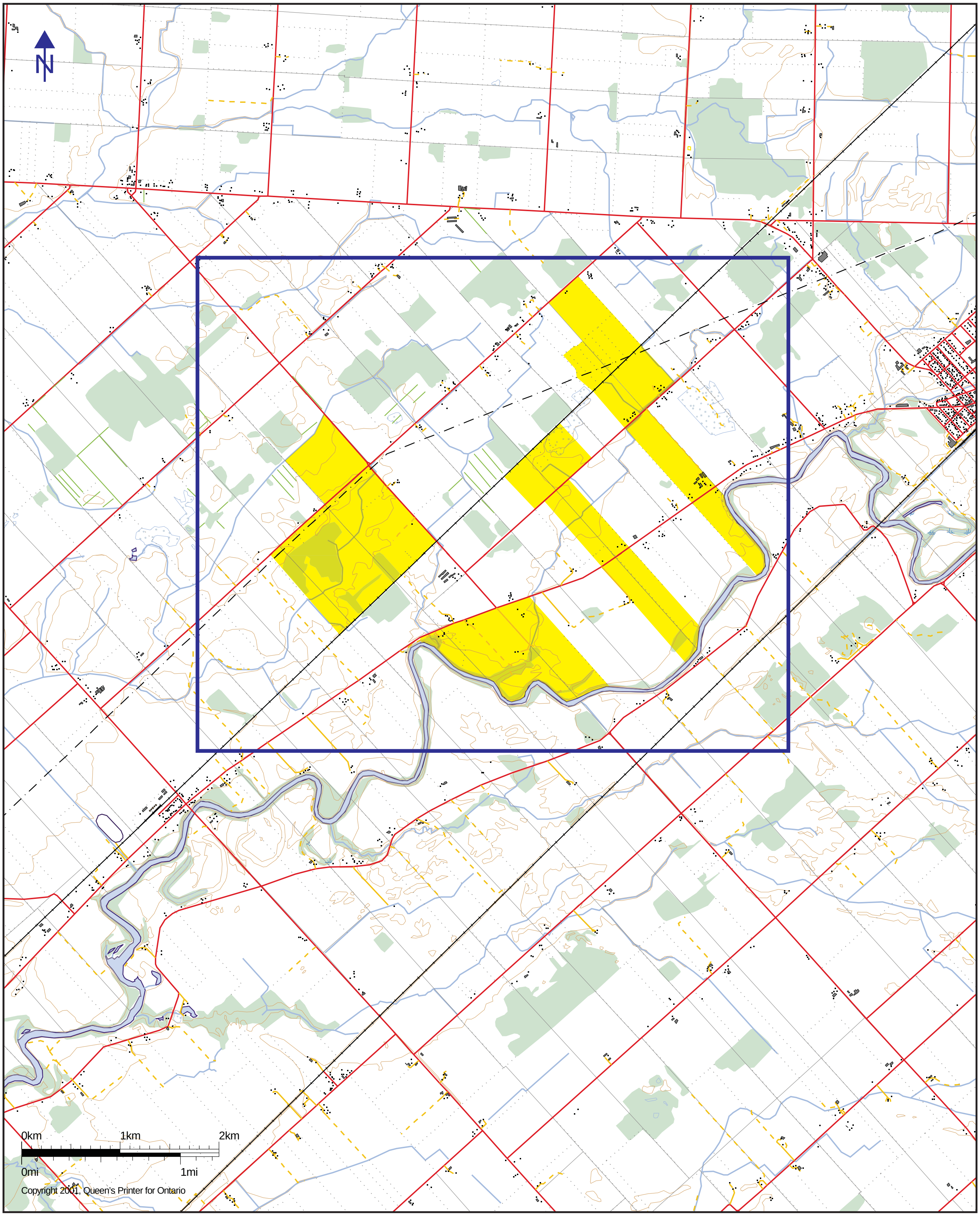
1. Global Rank: G4 - common (not susceptible to immediate threat), G5 - very common (secure under current conditions)
2. Provincial Rank: 4 - apparently secure, S5 - secure, SE - exotic
3. Federal Status: NAR - not at risk.
4. Provincial Status: END-R, endangered and regulated (ESA), NAR - not at risk.
5. Priority Level as per Couturier (1999) - level one (highest) through level four (lowest). See priority species list for Kent County in Appendix A5.

Table 10: Summary of Species Observed in the Study Area (page 2 of 2)

Species		Spring	Fall	Breeding Season		Status				Conservation
Common name	Scientific name	Total	Total	Total	Status	GRANK[1]	SRANK[2]	COSEWIC[3]	MNR[4]	Priority Level[5]
Mallard	*Anas platyrhynchos*	1	7	incidental	observed	G5	S5B	-	-	-
Mourning Dove	*Zenaida macroura*	27	17	26	probable	G5	S5B	-	-	-
Northern Cardinal	*Cardinalis cardinalis*	11	1	32	probable	G5	S5	-	-	-
Northern Flicker	*Colaptes auratus*	4	-	16	probable	G5	S5B	-	-	-
Northern Harrier	*Circus cyaneus*	-	1	-	-	G5	S4B	NAR	NAR	-
Northern Oriole	*Icterus galbula*	13	-	18	probable	G5	S5B	-	-	-
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	21	-	4	possible	G5	S5B	-	-	2
Ovenbird	*Seiurus aurocapillus*	-	-	1	possible	G5	S5B	-	-	4
Pileated Woodpecker	*Dryocopus pileatus*	-	-	1	possible	G5	S4S5	-	-	3
Purple Martin	*Progen subis*	-	-	incidental	confirmed	G5	S4B	-	-	2
Red-bellied Woodpecker	*Melanerpes carolinus*	3	-	-	-	G5	S4	-	-	1
Red-eyed Vireo	*Vireo olivaceus*	4	-	7	possible	G5	S5B	-	-	-
Red-tailed Hawk	*Buteo jamaicensis*	1	1	4	possible	G5	S5B	NAR	NAR	-
Red-winged Blackbird	*Agelaius phoeniceus*	87	31	64	confirmed	G5	S5B	-	-	-
Rock Dove	*Columba livia*	22	-	-	observed	G5	SE	-	-	-
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	3	6	9	probable	G5	S5B	-	-	-
Ruby-crowned Kinglet	*Regulus calendula*	4	-	-	-	G5	S5B	-	-	-
Savannah Sparrow	*Paserculus sandwichensis*	1	-	4	possible	G5	S5B	-	-	1
Scarlet Tanager	*Piranga olivacea*	-	-	1	possible	G5	S5B	-	-	2
Sharp-shinned Hawk	*Accipiter striatus*	1	3	-	-	G5	S5B	NAR	NAR	3
Solitary sandpiper	*Tringa solitaria*	3	-	incidental	observed	G5	S4B	-	-	-
Song Sparrow	*Melospiza melodia*	27	21	30	probable	G5	S5B	-	-	-
Spotted sandpiper	*Actitis macularia*	1	-	1	observed	G5	S5B	-	-	3
Tree Swallow	*Tachycineta bicolor*	52	151	40	probable	G5	S5B	-	-	-
Turkey Vulture	*Cathartes aura*	55	35	10	possible	G5	S4B	-	-	3
Veery	*Catharus fuscescens*	-	-	1	possible	G5	S4B	-	-	3
Warbling Vireo	*Vireo gilvus*	-	-	1	possible	G5	S5B	-	-	-
White-breasted Nuthatch	*Sitta carolinensis*	-	-	1	possible	G5	S5	-	-	-
Wild Turkey	*Meleagris gallopavo*	-	6	-	-	G5	S4	-	-	-
Wood Duck	*Aix sponsa*	-	-	1	observed	G5	S5B	-	-	4
Wood Thrush	*Hylocichla mustelina*	-	-	3	possible	G5	S5B	-	-	4
Yellow Warbler	*Dendroica petechia*	2	-	3	possible	G5	S5B	-	-	-
Yellow-bellied Sapsucker	*Sphyrapicus varius*	-	-	1	observed	G5	S5B	-	-	2
Yellow-billed Cuckoo	*Coccyzus americanus*	-	-	3	possible	G5	S4B	-	-	3
Yellow-rumped Warbler	*Dendroica coronata*	3	-	-	-	G5	S5B	-	-	-
Accipiter hawk species	*Accipiter* sp.	-	4	-	-	-	-	-	-	-
Blackbird species (mixed flocks)	F. Icteridae	-	3	-	-	-	-	-	-	-
Buteo hawk species	*Buteo* sp.	-	3	-	-	-	-	-	-	-
Gull species	*Larus* sp.	-	12	-	-	-	-	-	-	-
Shorebird species	F. Scolopacidae	9	-	-	-	-	-	-	-	-

1. Global Rank: G4 - common (not susceptible to immediate threat), G5 - very common (secure under current conditions)
2. Provincial Rank: 4 - apparently secure, S5 - secure, SE - exotic
3. Federal Status: NAR - not at risk.
4. Provincial Status: END-R, endangered and regulated (ESA), NAR - not at risk.
5. Priority Level as per Couturier (1999) - level one (highest) through level four (lowest). See priority species list for Kent County in Appendix A5.

FIGURES



KENT BREEZE AVIAN STUDY

FIGURE 1: STUDY AREA

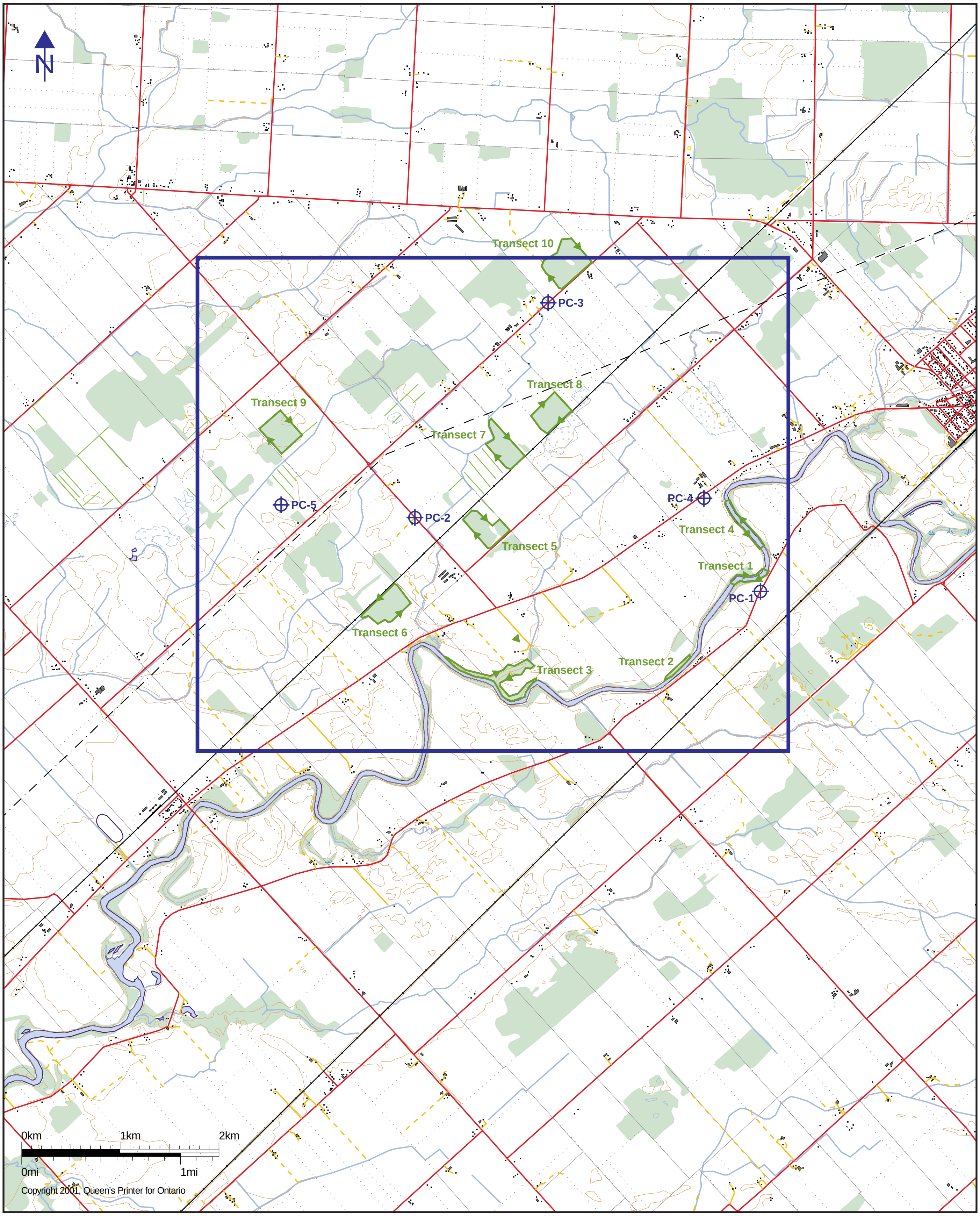
LEGEND

Study Area

Subject Lands

Date Initiated: 17 October 2007

Neil Morris ENVIRONMENTAL



KENT BREEZE AVIAN STUDY

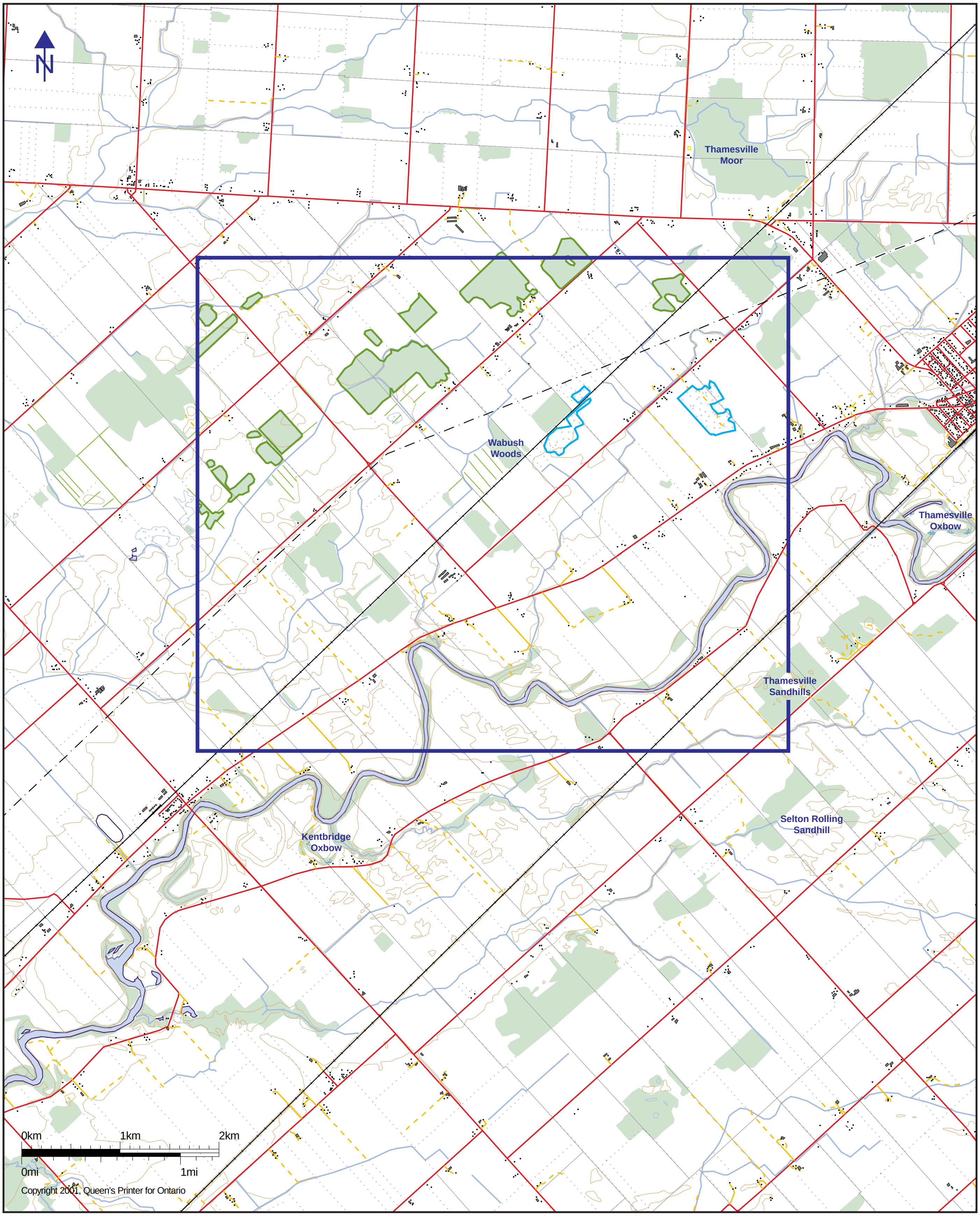
FIGURE 2: MONITORING LOCATIONS

LEGEND

Study Area

Date Initiated: 17 October 2007

Neil Morris ENVIRONMENTAL



LEGEND

Study Area

Wetlands

Woodlots

KENT BREEZE AVIAN STUDY

FIGURE 3: NATURAL FEATURES

Date Initiated: 17 October 2007

Neil Morris ENVIRONMENTAL

KENT BREEZE AVIAN STUDY

FIGURE 4: IMPORTANT BIRD AREAS

Date Initiated: 17 October 2007

Neil Morris ENVIRONMENTAL

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Map Courtesy of Birdnature.com

LEGEND

- Major Flyway
- Principal Routes
- Merging Routes (with other routes)

KENT BREEZE AVIAN STUDY

FIGURE 5: ATLANTIC MIGRATORY FLYWAY

Date Initiated: 17 October 2007

Neil Morris ENVIRONMENTAL

APPENDICES

Appendix A – Summaries of Existing Information

A1- NHIC NATURAL AREA PROFILES

The MNR's Natural heritage Information Centre (NHIC) maintains natural heritage information on a variety of natural areas in Ontario, including regulated national and provincial parks, Areas of Natural and Scientific Interest (ANSIs), MNR-evaluated wetlands, and non-government organization properties. Information that is stored in the NHIC database includes location information, vegetation and landform information, ecological values, biodiversity significance and information on significant species and vegetation communities occurring within the natural areas boundaries. The following area profiles from the NHIC database describe the Natural Areas on record within 10 km of the Kent Breeze Study Area.

THAMESVILLE MOOR AREA_ID: 120

Description:

This site is a Life Science ANSI. In the northwest portion of this ca 80 ha site, two stream channels enclose about 20 ha of wet grassland and forb meadow with scattered dogwood thickets. A number of rare prairie grasses are reported - Andropogon virginicus, Aristida longespica, Aristida necopina and Panicum sphaerocarpon - along with rare and uncommon orchids. A swamp woods (swamp white oak/red maple) occupies the southern and eastern extent of the site. [Lindsay 1984]

References:

Lindsay, K.M. 1984. Life Science Areas of Natural and Scientific Interest in Site District 7-2 West of the Haldimand Clay Plain: A Review and Assessment of Significant Natural Areas in Site District 7-2 West of the Haldimand Clay Plain. Ontario Ministry of Natural Resources, Central Region, Richmond Hill, and Southwestern Region, London. SR OFER 8403. viii + 131 pp. + map.

SELTON ROLLING SANDLAND AREA_ID: 1595

Description:

This Life Science ANSI is a 50 ha site on gently rolling sand land supporting second growth lowland woods mixed with upland (sugar maple-basswood) forest. Disturbances include past grazing, logging, exotic species, dump site and some clearing. Special features include Carolinian species and rare species (largest known stand of pawpaw in southern Ontario). [Klinkenberg 1984]

References:

Klinkenberg, R. 1984. Life Science Areas of Natural and Scientific Interest in Site District 7-1: A Review and Assessment of Significant Natural Areas in Site District 7-1. Ontario Ministry of Natural Resources, Parks and Recreational Areas, Southwestern Region, London. OFER 8403. vii + 22 pp. + appendices.

SELTON ROLLING SANDLAND AREA_ID: 5257

Description:

This is a 20.2 ha International Biological Program site; flat to gently rolling poorly drained sandplain; with extensive swamp depression; small representative deciduous swamp and upland forests (2 communities); diverse southerly and Carolinian biota, with provincially significant flora; threatened from clearance, with agriculture and drainage disturbances; OMNR-SW, KENAS. [Falls et al. 1990]

Vegetation:

1A22: Silver Maple (Acer saccharinum) - Red Maple (Acer rubrum) - Red Ash (Fraxinus pensylvanica); P2; wet sand with some muck accumulation; 14.2 ha.
1A21: Sugar Maple (Acer saccharum) - Basswood (Tilia americana) - Tulip Tree (Liriodendron tulipifera) - Sassafras (Sassafras albidum) - Pawpaw (Asimina triloba); F5; moist sand; 6.3 ha. [Walshe 1970]

Most of this area is flat wet sandland with muck accumulation occurring in some places. The south-west part rises gently to a sand ridge. In the low areas silver maple and red maple form 80% of the canopy, swamp white oak 10%, and red ash 10%. Clearings are frequent here.

Small saplings of silver and red maple are dominant in the shrub layer or co-dominant with spice bush (Lindera benzoin). Blue beech (Carpinus caroliniana), witch hazel (Hamamelis virginiana), and buttonbush (Cephalanthus occidentalis) are common. Red mulberry (Morus rubra) and saplings of sycamore (Platanus occidentalis) are occasional. Fragile fern (Cystopteris fragilis) is common in the herb layer. Dodder (Cuscuta gronovii) is extremely dense in the more open areas literally covering shrubs such as buttonbush and spice bush.

The most interesting community occurs on the sand ridges in the south-west part of the area. Here sugar maple is usually dominant and basswood is abundant, but small, almost pure, stands of tulip, sassafras, and pawpaw are present. In one place thirty tulip trees averaging 4 inches in DBH are almost the sole species. On the south border of the woods immediately south of the tulip trees is an almost pure community of large sassafras reaching 20 inches in DBH.

Also on the south border about 200 yards east of the sassafras is a very excellent stand of pawpaw about 100 yards long by 60 feet wide. About 200 trees averaging 6 inches in DBH occur here. Some specimens have a DBH of 10 inches or more. Fruit was observed on the trees. This is by far the best natural stand of pawpaw seen by the surveyor in southwestern Ontario. An extensive area of white poplar (Populus alba) is found just east of the pawpaw trees. Summer grape (Vitis aestivalis var. argentifolia) is common throughout the sugar maple community. [Walshe 1970]

Representation:

The most extensive stand and the largest trees of pawpaw seen by the surveyor in southwestern Ontario occur here.

Judging from the abundance of tulip tree saplings, an excellent stand of this species should develop in the future.

Very large sassafras trees, some over 20 inches in DBH, and abundant regeneration are present.

Though the woods is severely disturbed, remnants of most species of native flora still survive and, given protection, would spread throughout the area. [Walshe 1970]

Landform:

Landscape description: Flat, wet sandland gently rising to a sand ridge. Peat accumulations occur in undrained depressions.

Major soils: Gleysols, Organic Soils, Podzols.

Aquatic habitats: Permanent and intermittent swamps. [Walshe 1970]

References:

Falls, J.B., I.D. Macdonald and T.J. Beechey. 1990. Catalogue of IBP/CT Areas in Ontario with an Assessment of their Current Conservation Status. Unpublished report. 94 pp.

Walshe, S. 1970. International Biogical Programme, Checksheet for Region 5, Area 149: Selton Rolling Sandland. [16 pp.].

THAMESVILLE SAND HILLS AREA_ID: 5276

Description:

This is a 13.4 ha International Biological Program site; gently rolling sandplain with wet depressions; small isolated woodlot, with subintermediate aged, species rich deciduous forest (2 communities); southern and Carolinian biota, with provincially significant flora; general cutting disturbances; OMNR-SW, KENAS. [Falls et al. 1990]

Vegetation:

1A21: Black Oak (Quercus velutina) - Trembling Aspen (Populus tremuloides) - Red Maple (Acer rubrum) - Sassafras (Sassafras albidum) - Sweet Pignut Hickory (Carya ovalis) - Shagbark Hickory (Carya ovata) - Bitternut Hickory (Carya cordiformis) - White Oak (Quercus alba) - Red Cedar (Juniperus virginiana) - Largetooth Aspen (Populus grandidentata) - Bur Oak (Quercus macrocarpa) - Flowering Dogwood (Cornus florida); F5; dry sand; 9.3 ha.

1A22: Red Maple (Acer rubrum) - Black Gum (Nyssa sylvatica) - Green Ash (Fraxinus pennsylvanica) - Basswood (Tilia americana) - Blue Beech (Carpinus caroliniana) - Silver Maple (Acer saccharinum); P2; wet sand; 4.0 ha. [Walshe 1970]

In the northern part of this area, 10 foot-high dry sand ridges alternate with shallow depressions. Farther south the terrain becomes flat, wet, sandland. On the dry sand ridges black oak 6 to 8 inches in DBH forms 50% of the canopy, trembling aspen 20%, red maple 10%, and sassafras (often 20 inches in DBH) 10%. Sweet pignut hickory, shagbark hickory, bitternut hickory, white oak, red cedar, largetooth aspen, bur oak, and flowering dogwood are occasional. Sweet chestnut was formerly abundant here.

One variation of the former community is on some severely-disturbed, formerly clear-cut ridges in the extreme northern section where trembling aspen, largetooth aspen, hawthorne, staghorn sumach, and apple form dense stands. Black oak, and sassafras are minor components now, but, judging from the success of their regeneration, will eventually gain the upper hand. Herbs here include butterfly weed (Asclepias tuberosa) and bush clover (Lespedeza capitata).

In the shrub layer on the undisturbed ridges occurs abundant regeneration of sassafras and flowering dogwood. Maple-leaf viburnum (Viburnum acerifolium) and American hazel (Corylus americana) are occasional. Common herbs here include running strawberry bush (Euonymus obovatus), enchanter's nightshade (Circaea lutetiana), and large-flowered trillium (Trillium grandiflorum). In the shrub layer Virginia creeper (Parthenocissus quinquefolia) and prickly ash (Zanthoxylum americanum) are abundant. Greenbrier (Smilax hispida), frost grape (Vitis aestivalis var. argentifolia), moonseed (Menispermum canadense), winterberry (Ilex verticillata), wild yam (Dioscorea villosa), and nannyberry (Viburnum lentago) are occasional.

In the low depressions between the ridges and on the wet sand flats red maple is dominant or co-dominant with black gum or green ash. Basswood, blue beech, black walnut, swamp white oak, silver maple, and hackberry are occasional. Many large black gum over 25 inches in DBH and giant silver maple (sometimes reaching 40 inches in DBH) are present. Regeneration of black gum is more abundant than that of any other tree species. Herbs in the wet areas include cinnamon fern (Osmunda cinnamomea), marsh fern (Dryopteris thelypteris), ciliated loosestrife (Lysimachia ciliata), royal fern (Osmunda regalis) and rattlesnake fern (Botrychium simplex) has been reported from this woods. [Walshe 1970]

Representation:

This area contains possibly the best stand of black gum seen by the surveyor in southwestern Ontario. Between fifty and sixty large trees are present of which several are over 25 inches in

DBH. In addition, black gum saplings are more abundant than those of any other tree. This provides good assurance that the species will perpetuate itself.

Excellent stands of sassafras (some specimens are over 20 inches in DBH) and black oak are also present. [Walshe 1970]

Landform:

Landscape description: Alternating 3 m high sand ridges grading into flat, wet sandland.

Major soils: Podzols, Gleysols.

Aquatic habitats: Permanent and intermittent swamps. [Walshe 1970]

References:

Falls, J.B., I.D. Macdonald and T.J. Beechey. 1990. Catalogue of IBP/CT Areas in Ontario with an Assessment of their Current Conservation Status. Unpublished report. 94 pp.

Walshe, S. 1970. International Biological Programme, Checksheet for Region 5, Area 148: Thamesville Sand Hills.

KENTBRIDGE OXBOW - WETLAND AREA_ID: 5694

Description:

A Non-Provincially significant wetland, composed of one wetland type (100% swamp) (Fraser and Wormington, 1985). Total area of 3.0 ha.

Vegetation:

Vegetation Communities (Fraser and Wormington, 1985):

One form:
S1: robust emergents- wide-leaved sedge;

Two forms:
S2: deciduous trees; grasses/ weeds;
S3: narrow-leaved emergents- grasses/ sedges; duckweed;

Three forms:
S4: tall shrubs- willow; grasses; duckweed;

Landform:

Soils (Fraser and Wormington, 1985): 100% clays, loams or silts;
Site Type (Fraser and Wormington, 1985): 100% riverine;

References:

Fraser, D. and A. Wormington. 1985. Wetland Data Record and Evaluation- Kentbridge Oxbow. Second Edition. August, 1985. Ontario Ministry of Natural Resources. Manuscript. 22 pp + 1 map + 2 pp supplement.

THAMESVILLE OXBOW - WETLAND AREA_ID: 5696

Description:

This is a 5.0 ha Non-Provincially significant wetland, composed of one wetland type (100% swamp) (Wormington and Fraser, 1985).

Vegetation:

Vegetation Communities (Wormington and Fraser, 1985):
One form
S1: dead stumps;
S2: deciduous trees- willow, Black Ash;
S5: broad-leaved emergents- arrowhead;

Two forms
S3: deciduous trees; grasses;
S4: dead stumps; duckweed;

Landform:

Soils (Wormington and Fraser, 1985): 100% clays, loams or silts;
Site Type (Wormington and Fraser, 1985): 100% riverine;

References:

Wormington, A. and D. Fraser. 1985. Wetland Data Record and Evaluation- Thamesville Oxbow. Second Edition. August 19, 1985. Ontario Ministry of Natural Resources. Manuscript. 24 pp + 2 maps + 9 pp supplement.

THAMESVILLE SANDHILLS   AREA_ID: 7005

Description:

The 26 ha Life Science Site consists of rolling woodland and a small area of prairie-like field and provides a diversity of habitat in a range of successional stages. [Bowles et al. 1994]

Vegetation:

Dry-mesic sand plain vegetation is well represented at this site as well as wooded swamps and prairie-like meadows. Communities within the site as described below.

1. DRY-MESIC SUCCESSIONAL OLD FIELD
Dominant and Other Trees: No large trees.
Understorey: Open, large shrubs include Rhus typhina, Crataegus crus-galli, Quercus velutina. Smaller shrubs are Rubus allegheniensis, Rubus occidentalis, Rhus radicans.
Ground Layer: Anemone virginiana, Geum canadensis, Erigeron annuus, Poa compressa, Danthonia spicata.
Notes: This habitat supports successional growth on a sandy ridge. There are also a few scattered Juglans nigra < 20 cm dbh.

2. DRY-MESIC TO MESIC STAGHORN SUMAC SCRUB
Dominant and Other Trees: Very open. Crataegus pruinosa, Quercus rubra, and some Juglans nigra.
Understorey: Rhus typhina, Cornus foemina, Spirea alba.
Ground Layer: Erigeron spp. Rubus idaeus, Rumex acetosella, Rudbeckia hirta, Daucus carota.

3. WET-MESIC RED MAPLE - RED OAK WOODLAND
Dominant Trees: Acer rubrum, Quercus rubra.
Other Trees: A few stands of Populus tremuloides.
Understoret: Closed and shrubby. Lindera benzoin, Cornus foemina ssp. racemosa under Acer rubrum saplings, Zanthoxylum americanum.
Ground Layer: Maianthemum canadense, Parthenocissus inserta, Maianthemum racemosum, Gallium aparine, Ribes cynosbati.

4. MESIC RED OAK - BLACK OAK WOODLAND RIDGE
Dominant Trees: Quercus rubra, Quercus velutina.
Other Trees: A few large Tilia americana.
Understorey: Sassafras albidum, Prunus virginiana.
Ground Layer: Parthenocissus inserta, Ribes cynosbati, Rubus occidentalis.
Notes: The ground slopes up to this community from the moist mesic red maple red oak woodland. The slope is a semi-closed transitional area where Sassafras albidum and Juglans nigra are found with Ulmus rubra and Cornus foemina and an understorey similar to the ridge community. On ridges are several good stands of Sassafras albidum, >35 cm dbh.
Significant species: Agrimonia parviflora.

5. WET RED MAPLE - SILVER MAPLE SWAMP
Dominant Trees: Acer rubrum, Acer saccharinum.
Other Trees: Ulmus americana.
Understorey: Prunus pensylvanica, Lindera benzoin, Hamamelis virginiana.
Ground Layer: Iris virginica, Osmunda regalis, Dryopteris carthusiana, Thalictrum dioicum, Ranunculus recurvatus.
Notes: This community has pools of standing water.

6. WET-MESIC SECOND GROWTH BLUE-BEECH VERNAL SWAMP
Dominant Trees: Carpinus caroliniana 15 - 20 cm dbh.

Understorey: Semi-closed. Lindera benzoin, Thalictrum dioicum.
Ground Layer: Parthenocissus inserta, Onoclea sensibilis, Maianthemum stellatum, Dryopteris spinulosa, Sanicula sp., Galium triflorum, Osmunda regalis.
Notes: Some standing water occurs in the community.

7. WET-MESIC TO WET YELLOW BIRCH WOODLAND
Dominant Trees: Betula alleghaniensis, Acer saccharum.
Other Trees: Prunus pensylvanica, Quercus rubra, Sassafras albidum.

8. FORB MEADOW
Dominant Trees: None
Other Trees: Some scattered Prunus pensylvanica and Crataegus spp. with Acer saccharum on edge.
Understorey: Cornus stolonifera, Cornus obliqua.
Ground Layer: Plantago lanceolata, Fragaria virginiana, Rumex acetosella, Asclepias syriaca, Asclepias tuberosa. [Bowles et al. 1994]

<u>Landforms</u>:

This site is situated on the Bothwell Sand Plain (Chapman and Putnam, 1984). Finer, recent eolian material in the west is represented by poorly developed sand ridges (about 3 metres high) with alternating shallow depressions. Continuing east, the ridges taper to smaller upland hummocks which trend southwest to northeast (Cooper and Baker, 1978).

<u>Hydrology</u>:

Standing water and swampy conditions occur in depressed areas where drainage is impeded by the underlying clay parent material and where the water table is close to the surface. Moist to swampy conditions occur close to the southern road cut, making these areas wet on a year round basis. The Julian Drain lies just south of the site flowing southwest to join the Thames River, but it is doubtful that the drain plays a role in site drainage of the site itself.

<u>Soils</u>:

Well drained acidic fine soils are found northwest of the road cut. Here the soils are generally free of carbonates, even in depressed areas where a finer silty clay predominates.

Southeast of the road cut, drainage becomes poor to imperfect as the fine sand becomes a finer sandy clay in depressions. The soil reaction is neutral to alkaline and no carbonates are present (Soil Survey Report No. 3, 1930).

The southeastern tip again reveals sandy hummocks with finer loamy sand and sandy clay loam in moist depressions. Moist, depressed pockets in the east contain about 16 cm of muck-like organic matter overlying a moist, sandy clay. [Bowles et al. 1994]

<u>References</u>:

Bowles, J.M., R. Klinkenberg, M. Kanter and A. Woodliffe (eds.) 1994. Significant Natural Areas of Kent County, Ontario, 1985-1986. Part I: Introduction. Part II: Natural Areas Evaluation. Part III: Natural History & Annotated Checklists. Draft. A Carolinian Canada Project. Parts I and II, 111 pp.; Part III, 106 pp.

WABASH WOODS   AREA_ID: 7021

Description:

A Life Science Site, totaling 50 ha in area. This site consists of two small woodlots abutting a Canadian Pacific Railway track. The woodlot has been subjected to recent cutting, but contains some mature stands with a number of Carolinian elements. Between the railway and woodlot a wet ditch provides variety of habitat. [Bowles et al. 1994]

Vegetation:

Four community types have been recognised in this site. These include an American Beech - Sugar Maple upland, a small Black Cherry stand, a Silver Maple swamp with some Swamp White Oak, and a wet shrubby ditch between the railway and the woodlot. Description of these communities follows.

1. MESIC UPLAND AMERICAN BEECH FOREST

Dominant Trees: Closed. Fagus grandifolia.
Other Trees: Acer saccharum, some large Liriodendron tulipifera and Sassafras albidum, Prunus serotina.
Understorey: Saplings of Fagus grandifolia and Acer saccharum, Cornus florida, Vitis aestivalis, Viburnum lentago, Ribes cynosbati.
Ground Layer: Tiarella cordifolia, Mitella diphylla, Aralia nudicaulis, Epifagus virginiana, Osmorhiza claytonii, Dryopteris carthusiana, Adiantum pedatum, Botrychium virginianum.
Notes: Very mature trees with no recent evidence of cutting, good Carolinian type.

2. MESIC RIDGE BLACK CHERRY FOREST
Dominant Trees: Closed. Prunus serotina.
Other Trees: Fagus grandifolia, Acer saccharum.
Understorey: Saplings of Prunus serotina, Hamamelis virginiana, Aralia nudicaulis, Viburnum lentago.
Ground Layer: Agrimonia gryposepala.
Notes: This community covers a very small area of the site.

3. WET-MESIC SILVER MAPLE SWAMP
Dominant Trees: Closed. Acer saccharinum.
Other Trees: Quercus bicolor, Acer rubrum.
Shrubs: Some Cephalanthus occidentalis in more open areas, Ribes americanum.
Ground Layer: Lysimachia thyrsiflora, Boehmeria cylindrica, Onoclea sensibilis, Cicuta maculata, Lycopus americanus, Rubus pubescens, Siurn suave.

4. OPEN RAILWAY EMBANKMENT AND D1TCH
Dominant and Other Trees: A few small Quercus macrocarpa.
Understorey: Cornus foemina ssp. racemosa, Rhus typhina, Celastrus scandens, Corylus americana, Prunus virginiana.
Ground Layer: Solidago canadensis, Monarda fistula, Phytolacca americana, Aster umbellatus, Pteridium aquilinum, Helianthus giganteus. In wet ditch Sagittaria latifolia, Mimulus ringens, Alisma subcordatum, Thelypteris palustris, Penthorum sedoides, Erechtites hieracifolia. [Bowles et al. 1994]

Landforms:

The Wabash Woods is located on the Bothwell Sand Plain physiographic region (Chapman and Putnam, 1984). The site has been covered with fine to medium grained eolian sand deposits. The source of this eolian sand in this area is usually from old deltaic deposits. The sand has been worked into poorly developed sand dunes (Fitzgerald and Hradsky, 1980). The site is therefore gently rolling but has only approximately 2 meters of relief.

Hydrology:

There is a drainage ditch along the northern boundary of the western half of the site. The drainage ditch flows south and is not very active.

Soils:

The site is covered with sandy soil which has been blown into ridges and poorly shape dunes. The site is imperfectly to poorly drained because it is underlain by impermeable till which slows infiltration. This creates a locally seasonally high water table as water collects in the sand above the impermeable material. The sand on top of the dune ridge is imperfectly drained. The lower slopes and low areas between the dunes are poorly drained. [Bowles et al. 1994]

References:

Bowles, J.M., R. Klinkenberg, M. Kanter and A. Woodliffe (eds.) 1994. Significant Natural Areas of Kent County, Ontario, 1985-1986. Part I: Introduction. Part II: Natural Areas Evaluation. Part III: Natural History & Annotated Checklists. Draft. A Carolinian Canada Project. Parts I and II, 111 pp.; Part III, 106 pp.

A2 – NHIC Element Occurrence Data

NHIC Element Occurrences from Map Square 17MH10

Species		Status			
Common Name	Scientific Name	COSEWIC	MNR	Srank	Grank
Eastern Hog-nosed Snake	*Heterodon platirhinos*	THR	THR	S3	G5
Rayed Bean	*Villosa fabalis*	END	END	S1	G1G2
Long-stlyed Canadian Snakeroot	*Sanicula canadensis* var. *grandis*			S2	G5T3T5
Sweet Joe-pye-weed	*Eupatorium purpureum*			S3	G5
Gray-headed Coneflower	*Ratibida pinnata*			S2S3	G5
Cup-plant	*Silphium perfoliatum*			S2	G5
Wingstem	*Verbesina alternifolia*			S2S3	G5
Flowering Dogwood	*Cornus florida*			S2	G5
Wild Senna	*Cassia hebecarpa*			S1	G5
American Chestnut	*Castanea dentata*	END	END	S2	G4
Virginia Yellow Flax	*Linum virginianum*			S2	G4G5
Black Gum	*Nyssa sylvatica*			S3	G5
Tall Dock	*Rumex altissimus*			S2?	G5
Hairy Bedstraw	*Galium pilosum*			S3	G5
Palmate-leaved Violet	*Viola palmata*			S2	G5
Violet	*Viola palmata* var. *palmata*			S2	G5T?
Green Dragon	*Arisaema dracontium*	SC	SC	S3	G5
Emory's Sedge	*Carex emoryi*			S3	G5
Hairy-fruited Sedge	*Carex trichocarpa*			S3	G4
Purple Love Grass	*Eragrostis spectabilis*			S2	G5

NHIC Element Occurrences from Map Square 17MH11

Species		Status			
Common Name	**Scientific Name**	**COSEWIC**	**MNR**	**Srank**	**Grank**
Louisiana Waterthrush	*Seiurus motacilla*	SC	SC	S3B,SZN	G5
Spotted Gar	*Lepisosteus oculatus*	THR	THR	S2	G5
Brindled Madtom	*Noturus miurus*	NAR	NAR	S2	G5
American Badger	*Taxidea taxus*	END	END	S2	G5
Spiny Softshell	*Apalone spinifera*	THR	THR	S3	G5
Blue-tipped Dancer	*Argia tibialis*			S3	G5
Azure Bluet	*Enallagma aspersum*			S3	G5
Northern Riffleshell	*Epioblasma torulosa rangiana*	END	END	S1	G2T2
Snuffbox	*Epioblasma triquetra*	END	END	S1	G3
Mudpuppy Mussel	*Simpsonaias ambigua*	END	END	S1	G3
Rayed Bean	*Villosa fabalis*	END	END	S1	G1G2
Wingstem	*Verbesina alternifolia*			S2S3	G5
Missouri Ironweed	*Vernonia missurica*			S3?	G4G5
Yellow Wild-indigo	*Baptisia tinctoria*			S2	G5
Tick-trefoil	*Desmodium canescens*			S2	G5
Kentucky Coffee-tree	*Gymnocladus dioicus*	THR	THR	S2	G5
Butternut	*Juglans cinerea*	END	END	S3?	G3G4
Small-flower Groovebur	*Agrimonia parviflora*			S3	G5
Culver's-root	*Veronicastrum virginicum*			S2	G4
Emory's Sedge	*Carex emoryi*			S3	G5
Yellow Ladies'-tresses	*Spiranthes ochroleuca*			S2	G4
Three-awn	*Aristida longespica* var. *longespica*			S2	G5T5?
Panic Grass	*Panicum sphaerocarpon* var. *sphaerocarpon*			S3	G5T5
Purple Love Grass	*Eragrostis spectabilis*			S2	G5
Slender Paspalum	*Paspalum setaceum*			S2	G5
Longleaf Dropseed	*Sporobolus asper*			S1S2	G5
Broad Beech Fern	*Phegopteris hexagonoptera*	SC	SC	S3	G5

NHIC Element Occurrences (EO) within 10 km of Kent Breeze Study Area

NHIC Reference			Species		Status		
EO_ID	Date of Record	UTM Centroid (rounded)	Common Name	Scientific Name	Srank	MNR	COSEWIC
32671	1979-11	17 411000 4715000	American Badger	Taxidea taxus	S2	END	END
21146	10/8/1986	17 421000 4715000	American Chestnut	Castanea dentata	S2	END	END
21324	1987	17 414000 4709000	American Chestnut	Castanea dentata	S2	END	END
32488	2000	17 419000 4709000	American Chestnut	Castanea dentata	S2	END	END
41728	6/30/1999	17 414000 4713000	Azure Bluet	Enallagma aspersum	S3		
32493	2001	17 419000 4709000	Black Gum	Nyssa sylvatica	S3		
60036	6/8/1982	17 423000 4711000	Black Gum	Nyssa sylvatica	S3		
60233		17 420000 4710000	Bluebells	Mertensia virginica	S3		
41689	7/30/1999	17 407000 4716000	Blue-ringed Dancer	Argia sedula	S2		
41628	7/9/2000	17 414000 4718000	Blue-tipped Dancer	Argia tibialis	S3		
41628	7/9/2000	17 414000 4718000	Blue-tipped Dancer	Argia tibialis	S3		
41629	7/9/2000	17 407000 4716000	Blue-tipped Dancer	Argia tibialis	S3		
41629	7/9/2000	17 407000 4716000	Blue-tipped Dancer	Argia tibialis	S3		
32559	10/2/1997	17 407000 4716000	Brindled Madtom	Noturus miurus	S2	NAR	NAR
32560	10/4/1997	17 414000 4718000	Brindled Madtom	Noturus miurus	S2	NAR	NAR
17247	10/8/1986	17 415000 4711000	Broad Beech Fern	Phegopteris hexagonoptera	S3	SC	SC
17248	6/17/1986	17 425000 4710000	Broad Beech Fern	Phegopteris hexagonoptera	S3	SC	SC
17248	6/17/1986	17 428000 4713000	Broad Beech Fern	Phegopteris hexagonoptera	S3	SC	SC
32613		17 415000 4718000	Butternut	Juglans cinerea	S3?	END	END
32616		17 422000 4708000	Butternut	Juglans cinerea	S3?	END	END
5621	10/15/1982	17 423000 4711000	Common Hoptree	Ptelea trifoliata	S3	THR	THR
33772	7/25/1999	17 422000 4713000	Culver's-root	Veronicastrum virginicum	S2		
60310	1892-08-15	17 420000 4712000	Culver's-root	Veronicastrum virginicum	S2		
5185	5/29/1987	17 411000 4705000	Cup-plant	Silphium perfoliatum	S2		
34333	6/8/1989	17 413000 4707000	Cup-plant	Silphium perfoliatum	S2		
34334	7/25/1999	17 424000 4713000	Cup-plant	Silphium perfoliatum	S2		
41737	7/25/1999	17 422000 4713000	Double-striped Bluet	Enallagma basidens	S3		
41737	7/25/1999	17 422000 4713000	Double-striped Bluet	Enallagma basidens	S3		
2858	5/21/1987	17 411000 4717000	Emory's Sedge	Carex emoryi	S3		
2859	5/29/1987	17 411000 4705000	Emory's Sedge	Carex emoryi	S3		
2862	7/25/1987	17 409000 4704000	Emory's Sedge	Carex emoryi	S3		
2863	7/25/1987	17 407000 4716000	Emory's Sedge	Carex emoryi	S3		
63935	6/8/1989	17 413000 4707000	Emory's Sedge	Carex emoryi	S3		
64776	7/25/1999	17 424000 4713000	Emory's Sedge	Carex emoryi	S3		
7837	9/19/1982	17 421000 4716000	Fall Witchgrass	Digitaria cognata	S1		
67839	7/1/1987	17 407000 4716000	Flag-tailed Spinyleg	Dromogomphus spoliatus	S1		
66665	6/8/1989	17 419000 4709000	Flowering Dogwood	Cornus florida	S2		
64438	8/14/1997	17 419000 4710000	Gray-headed Coneflower	Ratibida pinnata	S2S3		

NHIC Element Occurrences (EO) within 10 km of Kent Breeze Study Area

NHIC Reference			Species		Status		
EO_ID	Date of Record	UTM Centroid (rounded)	Common Name	Scientific Name	Srank	MNR	COSEWIC
64783	7/25/1999	17 422000 4713000	Gray-headed Coneflower	Ratibida pinnata	S2S3		
17384	5/29/1987	17 411000 4705000	Green Dragon	Arisaema dracontium	S3	SC	SC
5595	6/8/1989	17 419000 4709000	Hairy Bedstraw	Galium pilosum	S3		
63803	6/18/1986	17 424000 4712000	Hairy-fruited Sedge	Carex trichocarpa	S3		
63805	6/18/1986	17 415000 4708000	Hairy-fruited Sedge	Carex trichocarpa	S3		
91678	7/1/1998	17 422000 4713000	Halloween Pennant	Celithemis eponina	S3		
11223	6/25/1950	17 414000 4719000	Kentucky Coffee-tree	Gymnocladus dioicus	S2	THR	THR
67953	1995-08	17 421000 4711000	Kidneyshell	Ptychobranchus fasciolaris	S1	END	END
67970	7/27/1999	17 408000 4716000	Kidneyshell	Ptychobranchus fasciolaris	S1	END	END
67971	8/21/1997	17 412000 4717000	Kidneyshell	Ptychobranchus fasciolaris	S1	END	END
67973	8/14/1997	17 417000 4709000	Kidneyshell	Ptychobranchus fasciolaris	S1	END	END
67974	8/25/1973	17 414000 4718000	Kidneyshell	Ptychobranchus fasciolaris	S1	END	END
64539	8/3/1992	17 420000 4715000	Longleaf Dropseed	Sporobolus asper	S1S2		
64540	8/3/1992	17 422000 4713000	Longleaf Dropseed	Sporobolus asper	S1S2		
60104	6/24/1950	17 418000 4707000	Long-stlyed Canadian Snakeroot	Sanicula canadensis var. grandis	S2		
13416	7/6/1952	17 420000 4711000	Louisiana Waterthrush	Seiurus motacilla	S3B,SZN	SC	SC
64562	8/3/1992	17 418000 4713000	Missouri Ironweed	Vernonia missurica	S3?		
32715	5/10/1999	17 412000 4717000	Mudpuppy Mussel	Simpsonaias ambigua	S1	END	END
32718	7/29/1999	17 407000 4716000	Mudpuppy Mussel	Simpsonaias ambigua	S1	END	END
19568	1954	17 421000 4718000	Northern Bobwhite	Colinus virginianus	S1S2	END	END
22610	8/26/1973	17 407000 4716000	Northern Riffleshell	Epioblasma torulosa rangiana	S1	END	END
22611	8/21/1997	17 412000 4717000	Northern Riffleshell	Epioblasma torulosa rangiana	S1	END	END
2734	5/29/1987	17 411000 4705000	Palmate-leaved Violet	Viola palmata	S2		
33742	6/18/1986	17 413000 4707000	Palmate-leaved Violet	Viola palmata	S2		
59130	9/18/1976	17 417000 4714000	Panic Grass	Panicum sphaerocarpon var. sphaerocarpon	S3		
2242	1892-08-15	17 420000 4713000	Purple Giant Hyssop	Agastache scrophulariifolia	SX		
3441	9/19/1982	17 420000 4716000	Purple Love Grass	Eragrostis spectabilis	S2		
3450	9/16/1982	17 419000 4709000	Purple Love Grass	Eragrostis spectabilis	S2		
64563	8/3/1992	17 418000 4713000	Purple Love Grass	Eragrostis spectabilis	S2		
22601	8/26/1973	17 407000 4716000	Rayed Bean	Villosa fabalis	S1	END	END
22602	8/21/1997	17 412000 4717000	Rayed Bean	Villosa fabalis	S1	END	END
22606	8/14/1997	17 417000 4708000	Rayed Bean	Villosa fabalis	S1	END	END
64782	7/25/1999	17 422000 4713000	Rough Bugleweed	Lycopus asper	S2		
67932	7/18/2001	17 408000 4716000	Round Hickorynut	Obovaria subrotunda	S1	END	END
67934	1991-08	17 414000 4718000	Round Hickorynut	Obovaria subrotunda	S1	END	END
67459	8/30/2002	17 416000 4720000	Round Pigtoe	Pleurobema sintoxia	S1		END

NHIC Element Occurrences (EO) within 10 km of Kent Breeze Study Area

NHIC Reference			Species		Status		
EO_ID	Date of Record	UTM Centroid (rounded)	Common Name	Scientific Name	Srank	MNR	COSEWIC
67459	8/28/1998	17 417000 4726000	Round Pigtoe	Pleurobema sintoxia	S1		END
67459	8/15/1965	17 417000 4722000	Round Pigtoe	Pleurobema sintoxia	S1		END
67459	8/7/2002	17 417000 4723000	Round Pigtoe	Pleurobema sintoxia	S1		END
67460	7/30/2002	17 408000 4716000	Round Pigtoe	Pleurobema sintoxia	S1		END
67460	7/22/2002	17 412000 4718000	Round Pigtoe	Pleurobema sintoxia	S1		END
67472	1995-08	17 421000 4711000	Round Pigtoe	Pleurobema sintoxia	S1		END
1189	7/13/1994	17 418000 4711000	Sensitive species	Sensitive species	S3	THR	THR
1189	7/13/1994	17 418000 4711000	Sensitive species	Sensitive species	S3	THR	THR
1189	6/29/1997	17 418000 4711000	Sensitive species	Sensitive species	S3	THR	THR
3329	9/1/1978	17 424000 4715000	Sensitive species	Sensitive species	S2		
3330	9/18/1976	17 417000 4714000	Sensitive species	Sensitive species	S2		
4954	7/11/1981	17 419000 4709000	Sensitive species	Sensitive species	S3	THR	THR
91380	6/28/1964	17 420000 4712000	Sensitive species	Sensitive species	S3	SC	SC
91380	6/28/1964	17 420000 4712000	Sensitive species	Sensitive species	S3	SC	SC
91660	7/25/1987	17 407000 4716000	Sensitive species	Sensitive species	S3	SC	SC
91660	7/25/1987	17 407000 4716000	Sensitive species	Sensitive species	S3	SC	SC
59185	9/18/1977	17 421000 4715000	Slender Paspalum	Paspalum setaceum	S2		
64564	8/3/1992	17 420000 4716000	Slender Paspalum	Paspalum setaceum	S2		
59736	5/26/1977	17 417000 4714000	Small-flower Groovebur	Agrimonia parviflora	S3		
59737	5/26/1977	17 420000 4711000	Small-flower Groovebur	Agrimonia parviflora	S3		
63857	6/25/1987	17 419000 4713000	Small-flower Groovebur	Agrimonia parviflora	S3		
41591	8/10/1999	17 421000 4711000	Smoky Rubyspot	Hetaerina titia	S2		
32790	7/29/1999	17 408000 4716000	Snuffbox	Epioblasma triquetra	S1	END	END
32796	5/10/1999	17 412000 4717000	Snuffbox	Epioblasma triquetra	S1	END	END
832	6/18/1975	17 415000 4718000	Spotted Gar	Lepisosteus oculatus	S2	THR	THR
1821	5/29/1987	17 411000 4705000	Sweet Joe-pye-weed	Eupatorium purpureum	S3		
63936	6/8/1989	17 413000 4707000	Tall Dock	Rumex altissimus	S2?		
3354	9/19/1982	17 421000 4716000	Three-awn	Aristida longespica var. geniculata	S2		
6002	9/18/1976	17 417000 4714000	Three-awn	Aristida longespica var. longespica	S2		
6003	9/11/1977	17 424000 4715000	Three-awn	Aristida longespica var. longespica	S2		
6005	9/18/1977	17 421000 4716000	Three-awn	Aristida longespica var. longespica	S2		
59110	9/18/1977	17 422000 4716000	Three-awn	Aristida longespica var. longespica	S2		
2098	1892-08-15	17 419000 4711000	Tick-trefoil	Desmodium canescens	S2		
63802	6/18/1986	17 413000 4707000	Violet	Viola palmata var. palmata	S2		
63853	5/29/1987	17 411000 4705000	Violet	Viola palmata var. palmata	S2		
59941	9/16/1982	17 419000 4709000	Virginia Yellow Flax	Linum virginianum	S2		
23120	8/13/1934	17 420000 4711000	Wild Senna	Cassia hebecarpa	S1		
23124	8/13/1966	17 410000 4709000	Wild Senna	Cassia hebecarpa	S1		

NHIC Element Occurrences (EO) within 10 km of Kent Breeze Study Area

NHIC Reference			Species		Status		
EO_ID	Date of Record	UTM Centroid (rounded)	Common Name	Scientific Name	Srank	MNR	COSEWIC
60445		17 420000 4712000	Wingstem	Verbesina alternifolia	S2S3		
60448	8/10/1957	17 421000 4711000	Wingstem	Verbesina alternifolia	S2S3		
63833	9/6/1986	17 415000 4708000	Wingstem	Verbesina alternifolia	S2S3		
63872	7/25/1987	17 407000 4716000	Wingstem	Verbesina alternifolia	S2S3		
63996	8/14/1997	17 420000 4710000	Wingstem	Verbesina alternifolia	S2S3		
63997	5/21/1987	17 411000 4717000	Wingstem	Verbesina alternifolia	S2S3		
63998	5/21/1987	17 415000 4718000	Wingstem	Verbesina alternifolia	S2S3		
63999	5/29/1987	17 411000 4705000	Wingstem	Verbesina alternifolia	S2S3		
64001	7/25/1987	17 409000 4704000	Wingstem	Verbesina alternifolia	S2S3		
64002	8/3/1992	17 422000 4712000	Wingstem	Verbesina alternifolia	S2S3		
64595	6/8/1989	17 413000 4707000	Wingstem	Verbesina alternifolia	S2S3		
64775	7/25/1999	17 424000 4713000	Wingstem	Verbesina alternifolia	S2S3		
2084	7/26/1944	17 420000 4711000	Yellow Wild-indigo	Baptisia tinctoria	S2		
59818	7/26/1944	17 420000 4712000	Yellow Wild-indigo	Baptisia tinctoria	S2		

A3 – Important Bird Area Descriptions

IBA	Long Point Peninsula and Marshes Port Rowan, Ontario			
Site Summary				
ON001	Latitude Longitude	42.58° N 80.33° W	Elevation Size	173 - 181 m 241.0 km²

Habitats:	Land Use:	Potential or ongoing Threats:
coniferous forest (temperate), deciduous woods (temperate), mixed woods (temperate), savanna, sedge/grass meadows, freshwater marsh, coastal sand dunes & beaches, unknown	Agriculture, Hunting, Not Utilized (Natural Area), Tourism/recreation, Urban/industrial/transport	Disturbance, Recreation/tourism, Urban/industrial development

IBA Criteria: **Globally Significant:** Congregatory Species, Waterfowl Concentrations, Migratory Landbird Concentrations, **Nationally Significant:** Threatened Species, Congregatory Species

Conservation status: International Monarch Butterfly Reserve, National Wildlife Area (federal), Ramsar Site (Wetland of International Significance), World Biosphere Reserve

Site Description

The Long Point site includes the Long Point Peninsula, Long Point Inner Bay and the Turkey Point and Big Creek marshes. Extending 32 km into Lake Erie, the Long Point Peninsula is the longest freshwater sandspit in the world. With an area of approximately 105,000 ha, it is constantly changing due to the continuous deposition and erosion of sediments through wind and wave erosion. The peninsula itself is a series of alternating ridges that are separated by ponds and swales. These wetlands and associated sand dunes are the best remaining example of this type of ecosystem in the Great Lakes basin.

Protected from the prevailing south-westerly winds by the sandspit, extensive marshes have formed in its lee or northern side. The Inner Bay (approximately 28,000 ha) encompasses the open water from the Big Creek marshes in the west to an imaginary line drawn from Turkey Point to Pottahawk Point in the east. The northern and western shores are fringed by shallow marshes, with the extensive marshes of Turkey Point in the northeast corner and those of Long Point to the south and west. The moderating effect of Lake Erie, combined with the southern geographic location of Long Point, allows a number of plants and animals to survive here at the northern fringe of their North American range.

Birds

The Long Point area is most renowned for the concentrations of waterfowl that make use of the area during spring and fall migration. Single day counts of 70,000 to over 100,000 waterfowl are made regularly. Over the last five years (1992 to 1996) nationally and/or globally significant numbers (i.e., greater than 1% of the biogeographic population) of eight waterfowl species have been recorded (Tundra Swan - eastern population, American Black Duck, Canvasback, Common Merganser, American Wigeon, Ring-necked Duck, Redhead, and scaup (Greater and Lesser Scaup combined). Of these eight species, Tundra Swan, American Black Duck and Canvasback consistently occur in globally significant numbers (6.0% to 13%; 2.1% to 3.6%; and 2.1% to 6.8% of their populations respectively). It should be recognized that these data are based on single-day-counts; over the course of the migration season it is likely that the number of individuals and associated percentages for each of these species would be even higher. Over the last 20 years there have been occasions when even higher numbers of waterfowl have been recorded: 10 to 15% of the Canvasback population; up to 10% of the Redhead population; and up to 35% to 45% of the Tundra Swan (eastern) population. Other waterbirds that occur in large numbers include Whimbrel (often in the hundreds), Bonaparte’s Gull (regular one-day counts in excess of 5,000), and Common Terns (regular one-day counts in excess of 1,000)

In addition to waterfowl, the Long Point area also supports an exceptional number and diversity of resident and migrant landbirds. A total of 367 bird species have been recorded at Long Point to date. This represents approximately 85% of the species that have been recorded thus far in Ontario. About 120 species have nested in the area and on average, about 260 species of birds are recorded each year.

The Long Point Bird Observatory operates three migration monitoring stations on the spit. As of the end of 1995, they had banded 522,244 birds of 265 different species. Using the estimated daily totals of migrant birds in each of the three census areas it has been estimated that the average number of migrants using the area is 2.4 million individuals in the spring and 7 million in the fall.

Several nationally threatened bird species nest in the Long Point area including nationally significant numbers of King Rail (endangered), Least Bittern (vulnerable), and Prothonotary Warbler (endangered). Red-headed Woodpecker (nationally vulnerable) are also present, but not in nationally significant numbers. Local populations of all of these species appear to have declined in recent years and some may be extirpated or only occasional breeders. Long Point formerly supported a significant breeding population of Piping Plovers (globally vulnerable; nationally endangered) but the last recorded evidence of attempted breeding was in 1981. This species is now very rarely seen during migration. However, suitable breeding habitat still remains.

Summary of bird records available for Long Point Peninsula and Marshes

Click here to view all records

Species	Season	Number	Unit	Date
American Black Duck	FM	7,650 - 12,771 G	I	1995 - 1998
American Goldfinch	SM	900	I	1994
American Green-winged Teal	FM	5,409	I	1998
American Pipit	FM	1,100	I	1994
American Redstart	SM	450	I	1993
American Wigeon	FM	14,655 - 21,000 G	I	1991 - 1993
Baltimore Oriole	SM	350	I	1993
Bank Swallow	FM	25,000	I	1996
Barn Swallow	FM	25,000	I	1996
Black-crowned Night-Heron	BR	426 N	N	1991
Bonaparte's Gull	FM	15,000 G	I	1994
Bonaparte's Gull	SM	20,000 G	I	1995
Bufflehead	SM	1,108	I	1995
Canada Goose	WI	1,389	I	1997
Canvasback	FM	41,865 G	I	1993
Canvasback	SM	51,766 G	I	1998
Cedar Waxwing	FM	2,000	I	1995
Chestnut-sided Warbler	SM	300	I	1993
Chipping Sparrow	SM	270	I	1996
Colonial Waterbirds/Seabirds	BR	154	N	1981
Common Grackle	FM	220,000	I	1995
Common Merganser	SM	4,950 N	I	1995
Common Tern	FM	2,000 G	I	1994
Common Tern	SM	1,000 G	I	1997
Eastern White-crowned Sparrow	SM	600	I	1995
Forster's Tern	BR	154 N	N	1981
Golden-crowned Kinglet	FM	900	I	1992
Great Black-backed Gull	SM	160	I	1994
King Rail	BR	2 N	P	1995
Landbird Concentrations	FM	7,000,000	I	1995
Landbird Concentrations	SM	2,400,000	I	1995
Least Bittern	BR	11 N	P	1995

Least Flycatcher	SM	550	I	1993
Little Gull	FM	120	I	1996
Magnolia Warbler	SM	850	I	1993
Mallard	FM	14,901 - 25,200 G	I	1995 - 1998
Marbled Godwit	FM	9	I	1995
Myrtle Warbler	FM	2,000	I	1993
Peregrine Falcon	FM	9	I	1995
Piping Plover (Great Lakes)	SU	1 C	I	2000
Prothonotary Warbler	BR			
Red-breasted Merganser	SM	2,970 G	I	1998
Red-eyed Vireo	SM	450	I	1993
Red-headed Woodpecker	SM	20	I	1995
Redhead	FM	10,089 N	I	1992
Ring-necked Duck	SM	8,270 G	I	1994
Rose-breasted Grosbeak	SM	350	I	1995
Ruddy Duck	FM	3,970	I	1997
Scaup species	FM	31,600 - 122,820 G	I	1993 - 1998
Swainson's Thrush	SM	600	I	1993
Tree Swallow	FM	25,000	I	1996
Tundra Swan (Eastern)	FM	9,544 - 11,260 G	I	1993 - 1998
Tundra Swan (Eastern)	SM	8,000 G	I	1992
Waterfowl	FM	2,240,000 - 9,624,545 G	D	1992 - 1998
Waterfowl	FM	191,002 G	I	1998
Waterfowl	SM	766,000 - 3,322,951 G	D	1992 - 1998
Waterfowl	SM	97,346 G	I	1998
Whimbrel	SM	600 G	I	1995
White-throated Sparrow	SM	800	I	1996
Yellow Warbler	SM	400	I	1993

Note: species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurence.

Conservation Issues

In August 1996, the Long Point area was announced as the first globally significant Important Bird Area in Canada. This international recognition is one of many: in 1982 it was designated as a Ramsar site following the convention on Wetlands of International Importance; in 1986 it was recognized as a World Biosphere site by UNESCO within the Man and Biosphere Program; and in 1995 it was recognized as an International Monarch Butterfly Reserve.

The presence of the significant natural features at Long Point is largely due to the stewardship of the Long Point Company. They have owned and managed a large portion of the Point for duck hunting since 1866. More recently, the Canadian Wildlife Service has become active in the conservation of the area through the establishment of National Wildlife Areas in 1973 and 1979. Other major tenants who manage their land for conservation include the Ontario Ministry of Natural Resources, Long Point Region Conservation Authority, Ducks Unlimited, and at least five different private waterfowl clubs.

Although much of the area is protected through ownership by conservation interests, there are direct threats to non-protected wetlands due to proposals to convert the marsh for agricultural or recreational purposes. In addition to direct loss of habitat through development, disturbance to resting flocks of waterfowl by motor boats is also a serious concern. To counter this threat public awareness programs have been undertaken. Other threats include the potential for off-site developments that may interfere with the shoreline transport of sand that forms Long Point or the artificial manipulation of Great Lakes water levels.

IBA Site Summary	Greater Rondeau Area Blenheim, Ontario			
ON007	Latitude Longitude	42.25° N 81.88° W	Elevation Size	174 - 178 m 87.0 km²

Habitats:	Land Use:	Potential or ongoing Threats:
mixed woods (temperate), freshwater lake, arable & cultivated lands	Agriculture, Nature conservation and research, Hunting, Tourism/recreation, Urban/industrial/transport	Disturbance, Introduced species, Other environmental events, Urban/industrial development

IBA Criteria: **Globally Significant:** Congregatory Species, Waterfowl Concentrations, Migratory Landbird Concentrations

Conservation status: IBA Conservation Plan written/being written, Provincial Park (including Marine)

Site Description

The Greater Rondeau Area is situated on the shoreline of Lake Erie, southeast of the town of Chatham. In addition to Rondeau Provincial Park, this site encompasses adjacent areas including Rondeau Bay and associated marshes and adjacent fields, Bates marsh, Erieau pier, harbour and beach, McGeachy's Pond, and the Morpeth Cliffs. Rondeau is the largest provincial park in southwestern Ontario. It is a low-lying sand spit that consists of a series of ridges and sloughs. A variety of habitats are present which contribute to the bird diversity. These habitats include productive southern hardwood forests, sandy beaches and wetlands ranging from woodland sloughs, to a large marsh and productive inland bay. The unique habitats of the park and surrounding area support many nationally vulnerable, threatened, and endangered species of flora and fauna.

Birds

The Greater Rondeau Area supports significant populations of migrating waterfowl and shorebirds, along with populations of several threatened species that nest in the area.

The wetlands of Rondeau are recognized as a major waterfowl staging area. In addition, shorebirds are also found in large numbers. Species that are present in significant numbers (greater than 1% of their estimated North American or world population) include: Greater Scaup (1.6%); Tundra Swan (4% of their North American population); Common Goldeneye (about 1%); Ruddy Turnstone (1.2%); and Forsters Tern (about 1%). In spring and fall, thousands of Black-bellied Plovers and American Golden-Plovers can be seen feeding in open fields; the exact composition of these flocks, and therefore their significance, is not known, however. Up to 250 Whimbrel have also been recorded in spring migration.

Numerous nationally endangered species nest at Rondeau Provincial Park. The park has traditionally supported the largest breeding population of Prothonotary Warblers in Canada. This species has since declined in numbers, with only 13 pairs being recorded in Canada during 1997, six of which nested at Rondeau. Acadian Flycatchers and King Rails also breed at Rondeau: in 1997, four territorial Acadian Flycatchers were recorded in the mature deciduous forest habitats, and in the adjacent marsh, two King Rails were recorded. For both of these species, the estimated Canadian population is well below 100 pairs. In addition, at least nine pairs of Least Bitterns (nationally vulnerable) were recorded in 1997.

During the 1981 to 1985 surveys for the Atlas of the Breeding Birds of Ontario, the Rondeau area had the highest diversity of breeding birds in the province. Out of the more than 330 species recorded as breeding in Ontario, 134 were recorded in the Greater Rondeau Area.

Summary of bird records available for Greater Rondeau Area

Click here to view all records

Species	Season	Number	Unit	Date
Acadian Flycatcher	BR	4 N	P	1997
American Coot	FM	1,900	I	1994
American Golden-Plover	FM	1,000	I	1995
American Golden-Plover	SM	1,000	I	1995
Bald Eagle	BR	1	N	1995
Black Tern	BR	37	I	1997
Black Tern	BR	11	N	1992
Black-bellied Plover	FM	1,000	I	1995
Black-bellied Plover	SM	1,000	I	1995
Canvasback	SM	3,400	I	1995
Cattle Egret	SM	4	I	1996
Common Goldeneye	SM	7,000	I	1995
Common Loon	SM	437	I	1997
Double-crested Cormorant (Interior)	SM	2,500	I	1994
Forster's Tern	BR	3 - 200 G	N	1990 - 1992
Great Egret	FM	27 N	I	1995
Greater Scaup	SM	12,500 G	I	1995
Hooded Warbler	BR		I	1997
Hooded Warbler	SM	40 N	I	1996
Horned Grebe	SM	120	I	1996
King Rail	BR	2 N	I	1997
Least Bittern	BR	9	I	1997
Louisiana Waterthrush	BR	2 N	P	1996
Prothonotary Warbler	BR	15 N	I	1997
Prothonotary Warbler	BR	40 - 100 N	P	1935 - 1985
Prothonotary Warbler	SM	10 N	I	1994
Ring-necked Duck	SM	1,025	I	1995
Ruddy Turnstone	SM	350	I	1996
Sora	FM	100	I	1995
Tundra Swan (Eastern)	SM	8,500 G	I	1996
Virginia Rail	BR	16	I	1997
Waterfowl	SM	24,000 G	I	1995
Whimbrel	SM	253	I	1995
Yellow-breasted Chat (Eastern)	OT	15 N	I	1995

Note: species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurence.

Conservation Issues

Rondeau was designated as a provincial park in 1894. Despite this legislated level of protection, there are still threats to the habitats and wildlife of this area. Natural processes of habitat succession in the forested area, and soil erosion from the adjacent agricultural areas are altering the structure of the ecosystem. Introduced invasive plants such as Phragmites are increasing in numbers and out-competing the native plants. The excessive use of herbicides and pesticides on nearby agricultural fields could also impact wildlife.

IBA	Skunk's Misery Complex Bothwell, Ontario			
Site Summary				
ON010	Latitude Longitude	42.65° N 81.8° W	Elevation Size	210 - 213 m 10.0 km²

Habitats: coniferous forest (temperate), deciduous woods (temperate), arable & cultivated lands	**Land Use:** Agriculture, Nature conservation and research, Tourism/recreation	**Potential or ongoing Threats:** Arable farming, Dykes/dam/barrages, Deforestation, Recreation/tourism

IBA Criteria: **Nationally Significant:** Threatened Species

Conservation status: None

Site Description

The Skunk's Misery Complex is located in southern Ontario about 40 km northeast of Chatham. It is comprised of a group of relatively large deciduous forests located on the Bothwell sand plain to the west of Bothwell and to the north and south of Newbury. The topography is flat to gently rolling with the surficial deposits being comprised of sands overlying clay. The result is a mixed sandy area with water-soaked soils that are unsuitable for agriculture unless extensive drainage occurs. This is likely the reason why these large forests have not been cleared.

A variety of forest habitats are present in this complex, ranging from pine plantations, to closed canopy swamp forest (Silver Maple / Black Ash / Swamp White Oak) with standing water into July, to recently logged and regenerating upland forest. In addition to supporting significant concentrations of birds, these forests also support many other species of provincial and national significance, including Butlers Garter Snake, and Large Whorled Pogonia.

Birds

The Skunk's Misery Complex supports a significant population of Hooded Warblers (nationally threatened). Within the entire complex, detailed surveys have been completed at only two sites, with a total of 12 15 Hooded Warbler territories being recorded in 1998 (as much as 10% of the estimated Canadian population). Acadian Flycatchers (nationally endangered) are also present with three and four pairs in 1999 and 2000, respectively; at least one pair occurs annually on a long-term basis. Cerulean Warblers (nationally vulnerable) appear to be scattered throughout the complex, especially on the slightly higher sites where White Oak is more noticeable (as many as eight contiguous territories were recorded at one site in 1998). A Red-headed Woodpecker (nationally vulnerable) was also recorded.

In addition to nationally threatened species, the site also supports a rich assemblage of species that are largely restricted to eastern temperate forests (19 of 28 species) or are regionally uncommon. These species include: Broad-winged Hawk (2 pairs), Yellow-throated Vireo (5 + pairs), Black-and-White Warbler (3 + pairs), Mourning Warbler (3 + pairs), Chestnut-sided Warbler (5 + pairs), and Northern Waterthrush (6 + pairs). A cumulative total of 13 species of breeding wood warblers was encountered at this site on 4 visits in 1997 and 4 visits in 1998.

Summary of bird records available for Skunk's Misery Complex

Click here to view all records

Species	Season	Number	Unit	Date
Acadian Flycatcher	BR	3 - 4 N	N	1999 - 2000
Acadian Flycatcher	BR	1 - 2 N	P	1997 - 1998
Cerulean Warbler	BR	10 N	T	1995
Hooded Warbler	BR	11 - 12 N	P	1997 - 1998
Prairie Warbler	BR	1	T	1983
Red-shouldered Hawk	BR	1	I	1984

Note: species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurence.

Conservation Issues

The large amounts of regional forest cover in the Skunk's Misery Complex are critical to the long-term presence of the significant bird populations that occur at this site. Although this aspect is recognized, conservation efforts are complicated by multiple ownership (both public and private). The Middlesex Stewardship Council and Stewardship Kent have worked on a community-based Conservation Strategy and a Community Stewardship Program. In addition, the County of Middlesex and the Lower Thames Valley Conservation Authority have worked on a forest management plan.

IBA	Eastern Lake St. Clair Southwestern Ontario, Ontario			
Site Summary				
ON012	Latitude Longitude	42.5° N 82.5° W	Elevation Size	174 - 176 m 924.0 km²

Habitats: deciduous woods (temperate), native grassland, freshwater lake, arable & cultivated lands	**Land Use:** Agriculture, Nature conservation and research, Fisheries/aquaculture, Hunting, Other, Tourism/recreation	**Potential or ongoing Threats:** Agricultural pollution/pesticides, Arable farming, Disturbance, Dykes/dam/barrages, Introduced species, Other environmental events, Recreation/tourism

IBA Criteria: **Globally Significant:** Congregatory Species, Waterfowl Concentrations, **Nationally Significant:** Congregatory Species

Conservation status: IBA Conservation Plan written/being written, National Wildlife Area (federal), Ramsar Site (Wetland of International Significance)

Site Description

Lake St.Clair, which forms part of the Great Lake system, is located in extreme southwestern Ontario to the north of the cities of Windsor and Detroit. The St. Clair River provides an inflow from Lake Huron to the north, and the Detroit River provides an outflow to Lake Erie to the south. The Eastern Lake St. Clair IBA encompasses the eastern shore, marshlands and agricultural fields from the Sydenham river at Wallaceburg to the mouth of the Thames River and the open waters of Lake St. Clair, south of the St.Clair River delta under Canadian jurisdiction. The large delta and the shallow nature of the lake result in extensive areas of marshland that is characterized by both submerged and emergent vegetation. Walpole Island, which is located within the St. Clair delta, contains some of the most significant tall grass prairie /oak savannah communities remaining in Canada.

Birds

Lake St. Clair is recognized as being one of the most significant staging areas for waterfowl in southern Ontario. During studies completed in the 1970s and early 1980s, it was estimated that peak totals of waterfowl were over 60,000 during spring migration, and over 150,000 during fall migration. The site was estimated to support 1,137,000 Canvasback and Redhead waterfowl-days, and as many as 5,123,000 dabbling duck waterfowl-days. (A waterfowl-day equals the number of ducks multiplied by the number of days present). The agricultural fields along the east shoreline also support large numbers of Black-bellied Plovers and American Golden Plovers during spring migration. As many as 5,000 Black-bellied Plovers have been reported, which could represent as much as 3.5% of the estimated North American population.

In addition to being significant as a staging area, the Lake St. Clair marshes also support significant populations of breeding birds. One of the largest breeding concentrations of Black Terns in Ontario is present, along with over 3.5 % of the estimated North American Forsters Tern population. The largest known Canadian population of King Rails (nationally endangered) has been recorded, along with significant numbers of Least Bitterns (nationally vulnerable).

The prairie and oak savannah communities of Walpole Island also support threatened bird species, with the largest self-sustaining concentration of Northern Bobwhite (nationally endangered) being present. There are also historic nesting records of Henslows Sparrows (nationally endangered), along with numerous other potential breeding records for nationally threatened species such as Acadian Flycatcher, Cerulean Warbler, Prothonotary Warbler, and Yellow-breasted Chat.

Summary of bird records available for Eastern Lake St. Clair

Click here to view all records

Species	Season	Number	Unit	Date

Acadian Flycatcher	BR	1	N	T	1986
American Coot	BR	29 - 200		I	1997 - 1998
Bald Eagle	BR	1		P	1995
Black Tern	BR	153	N	N	1991 - 1992
Black Tern	BR	75	N	P	1997 - 1998
Black-bellied Plover	SM	1,500 - 5,000	G	I	1993 - 1995
Black-crowned Night-Heron	BR	24		I	1997
Canada Goose	FM	672,000	G	D	1980
Canada Goose	SM	378,000	G	D	1980
Cerulean Warbler	BR	6		I	1995
Common Moorhen	BR	55		I	1997
Cooper's Hawk	BR	4		I	1995
Eastern Tufted Titmouse	BR	8		I	1995
Forster's Tern	BR	555	G	P	1991
Great Egret	FM	150	N	I	1997
Henslow's Sparrow	BR	1	N	P	1986
King Rail	BR	32	N	I	1997
Least Bittern	BR	13 - 75	N	I	1997 - 1998
Northern Bobwhite	RE	34	N	I	1995
Prothonotary Warbler	BR	2	N	I	1986
Redhead/Canvasback	FM	1,137,000		D	1980
Redhead/Canvasback	SM	227,000		D	1980
Sora	BR	17		I	1997
Tundra Swan (Eastern)	FM	11,500	G	D	1980
Tundra Swan (Eastern)	SM	135,000	G	D	1980
Virginia Rail	BR	26 - 100		I	1997 - 1998
Waterfowl	FM	7,050,500	G	D	1980
Waterfowl	SM	1,580,000	G	D	1980
Yellow-breasted Chat (Eastern)	BR	2	N	I	1986
Yellow-headed Blackbird	BR	15		P	1995

Note: species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurence.

Conservation Issues

Although portions of this site are managed as protected areas (e.g., St. Clair and Bear Creek National Wildlife Areas, Tremblay Beach; Ruscom Shores Conservation Areas), there is still on-going loss and degradation of marsh habitat as a result of incremental land use change. A large proportion of the site is located within the Walpole Island First Nation Lands. Conservation of this site will require a lake-wide management system that is equitable for all users.

IBA

Site Summary

Clear Creek
Ridgetown, Ontario

ON033	Latitude Longitude	42.45° N 81.71° W	Elevation Size	174 - 205 m 4.0 km²

Habitats: deciduous woods (temperate), rivers/streams, forestry plantations, urban parks/gardens	**Land Use:** Nature conservation and research, Forestry	**Potential or ongoing Threats:** Recreation/tourism, Selective logging/cutting

IBA Criteria: **Nationally Significant:** Threatened Species

Conservation status: None

Site Description

The Clear Creek forest is located along the north shore of Lake Erie, part way between the towns of Ridgetown and Rodney, Ontario. The site, which is also referred to as Clearville Creek, includes the Clear Creek Area of Natural and Scientific Interest (ANSI) and a portion of the Kent-Elgin ANSI. It is mainly a closed-canopy deciduous forest with typical species being Red Oak, Sugar Maple, American Beech, Black Walnut, and Black Cherry. In most areas, there is almost no subcanopy and no shrub layer. The creek has formed a steep-sided ravine (over 30 m in depth) for the last 200 m before it enters Lake Erie. There are flat tableland benches along the sides of the creek for most of this length. A Boy Scout Camp is located on the east side of the creek, and a campground is located at the creek mouth. As many as 24 nationally, provincially, or regionally rare vascular plant species have been recorded at this site.

Birds

Until recently, the Clear Creek site was not visited regularly by birders, or even local field naturalists, because few birds of interest had been identified in the area. However, over the last few years, it has been determined that this is one of the most significant sites in Canada for the nationally endangered Acadian Flycatcher. As many as four territories were recorded in both 1997 and 1998, with the 1998 surveys yielding five active nests (one was thought to be a second attempt). There were three territories in 1999, and three successful nests in 2000. Since the Canadian Acadian Flycatcher population is estimated to number less than 50 pairs, this is a significant concentration. In 1985, a single pair of Acadian Flycatchers with fledged young was found at this site. This suggests a long history of usage by this species, although no surveys were completed during the intervening years to document their presence. Within the Clear Creek ANSI further suitable habitat for one or more pairs was observed in 1997. No other threatened species were observed on either visit. Other deciduous forest species that are present at this site include Yellow-billed Cuckoo, Red-eyed Vireo, Ovenbird, Scarlet Tanager, and Rose-breasted Grosbeak.

Summary of bird records available for Clear Creek

Click here to view all records

Species	Season	Number	Unit	Date
Acadian Flycatcher	BR	3 - 4 N	N	1998 - 2000
Acadian Flycatcher	BR	1 N	P	1985
Acadian Flycatcher	BR	3 - 5 N	T	1997 - 1999

Note: species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurence.

Conservation Issues

Acadian Flycatchers have very specific habitat requirements and are generally recorded only in extensive, closed canopy forests. Selective logging would likely reduce the suitability of this habitat. Over the last 70 years, logging has occurred in all of the forests within the Clear Creek and Kent Elgin Shoreline ANSI, and in most areas, selective cutting has occurred within the last 30 years. In 1997 and 1998 no recent evidence of logging was observed. The area frequented by the Acadian Flycatchers is reasonably well protected, as the majority is contained within the steep ravine on Boy Scout camp property. It is unlikely that logging or development will occur in the near future.

IBA Site Summary	Southwest Elgin Forest Complex Rodney, Ontario			
ON048	Latitude Longitude	42.33° N 81.55° W	Elevation Size	180 - 215 m 25.0 km²

Habitats:	Land Use:	Potential or ongoing Threats:
deciduous woods (temperate), mixed woods (temperate), rivers/streams, arable & cultivated lands, perennial crops/orchards, urban parks/gardens	Agriculture, Forestry, Rangeland/pastureland, Tourism/recreation	Deforestation

IBA Criteria: Nationally Significant: Threatened Species, Congregatory Species

Conservation status: Conservation Area (provincial), Provincial Park (including Marine)

Site Description

The Southwest Elgin Count Forest Complex refers to a 20 kilometre stretch of discontinuous woodlots that are within 5 kilometres of the Lake Erie shoreline in southwest Elgin County. The site includes John E. Pearce Provincial Park at the eastern end, with the Elgin-Kent border on the west. This site has fairly good forest cover in privately owned woodlots, and has several very deeply incised, treed ravines. This part of Elgin County has relatively large amounts of forest cover, and has larger unfragmented woodlots than in many counties in southwestern Ontario. The woodlots are deciduous in character (often Sugar Maple and American Beech), and have a strong element of less common species such as Sassafras and Tulip Tree. Most of southwest Elgin County lies on an eastern extension of the Bothwell Sand Plain.

Birds

Hooded Warblers have been reported at woodlots in the Southwest Elgin Forest Complex for many years. The warblers are sometimes found in the same woodlots and at other times in new locations, primarily because there is still good forest cover and a fairly frequent logging cycle. Together these factors provides continuous Hooded Warbler habitat. There are usually 1 to 2 pairs per woodlot. However, there are also many logged woodlots in the site which are never visited, thus the Hooded Warbler population is probably in the range of 10 to 20 pairs. In 1997, Hooded Warblers were confirmed as present at three sites. Thus, between about 5 and 10% of the national population of this nationally threatened species is found here.

There are also three to five steep-sided closed-canopy ravines entering Lake Erie, with similar habitat to that of known Acadian Flycatcher sites. This species is nationally endangered. These ravines were surveyed in 1998 and two sites had at least one Acadian Flycatcher present (at one, a female incubating three eggs, and at the other, a single territorial male). Acadian Flycatchers were found at another location in 1985, 1986 and 1990, but not in 1987 or 1997. The area where this pair was found was heavily logged in 1996 explaining their absence in 1997; a pair of Hooded Warblers, however, were found there in 1997.

Summary of bird records available for Southwest Elgin Forest Complex

Click here to view all records

Species	Season	Number	Unit	Date
Acadian Flycatcher	BR	2 N	I	1998
Acadian Flycatcher	BR	1 N	P	1990
Hooded Warbler	BR	3 - 10 N	P	1995 - 1997

Note: species shown in bold indicate that their population level (as estimated by the maximum number) exceeds at least one of the IBA thresholds (national, continental or global). The site may still not qualify for that level of IBA if the maximum number reflects an exceptional or historical occurrence.

Conservation Issues

Logging affects bird habitats, like the woods of Southwest Elgin, both positively and negatively in that it improves the habitat for Hooded Warblers, but degrades it for Acadian Flycatchers. The woodlots in Southwest Elgin County have been shown to provide suitable habitat for Acadian Flycatchers but since logging is ongoing it is unlikely that larger numbers will be present in the foreseeable future. At present, these woodlots have no protection or conservation measures planned. All the land is privately held, with the exception of John E. Pearce Provincial Park (100 hectares) and the Ernie M. Warwick Conservation Area (~ 100 hectares).

A4 – Ontario Breeding Bird Atlas Data

Summary of Ontario Breeding Bird Atlas Data - Square 17MH10

	Breeding Evidence		Point Counts			
Species	Max BE	Categ	#PC[1]	%PC	Abun	#Sq
American Crow	FY	CONF	12	48	0.96	1
American Goldfinch	P	PROB	4	16	0.2	1
American Kestrel	P	PROB				
American Redstart	A	PROB				
American Robin	CF	CONF	16	64	1.44	1
American Woodcock	S	POSS				
Bald Eagle	NB	CONF				
Baltimore Oriole	FY	CONF	4	16	0.24	1
Bank Swallow	AE	CONF				
Barn Swallow	FY	CONF	8	32	0.64	1
Belted Kingfisher	H	POSS				
Black/Yellow-billed Cuckoo	S	POSS				
Black-capped Chickadee	S	POSS				
Blue Jay	FY	CONF	4	16	0.24	1
Blue-gray Gnatcatcher	H	POSS				
Blue-winged Warbler	P	PROB				
Bobolink	P	PROB	5	20	0.36	1
Broad-winged Hawk	H	POSS				
Brown Thrasher	CF	CONF				
Brown-headed Cowbird	FY	CONF	6	24	0.48	1
Canada Goose	FY	CONF				
Cedar Waxwing	P	PROB				
Chestnut-sided Warbler	S	POSS				
Chimney Swift	P	PROB				
Chipping Sparrow	FY	CONF				
Cliff Swallow	AE	CONF				
Common Grackle	CF	CONF	20	80	3.64	1
Common Yellowthroat	CF	CONF				
Cooper's Hawk	NY	CONF				
Downy Woodpecker	CF	CONF				
Eastern Kingbird	CF	CONF	3	12	0.2	1
Eastern Meadowlark	S	POSS				
Eastern Phoebe	CF	CONF				
Eastern Screech-Owl	T	PROB				
Eastern Towhee	A	PROB				
Eastern Wood-Pewee	S	POSS	1	4	0.04	1
European Starling	FY	CONF	17	68	3.68	1
Field Sparrow	S	POSS				
Gray Catbird	CF	CONF	3	12	0.12	1
Great Blue Heron	H	POSS	1	4	0.04	1
Great Crested Flycatcher	P	PROB				
Great Horned Owl	P	PROB				
Green Heron	A	PROB				
Hairy Woodpecker	FY	CONF				
Horned Lark	CF	CONF	5	20	0.48	1
House Finch	P	PROB	1	4	0.12	1
House Sparrow	AE	CONF	5	20	0.48	1
House Wren	FY	CONF	2	8	0.08	1

Indigo Bunting	A	PROB				
Killdeer	FY	CONF	6	24	0.28	1
Mallard	P	PROB	1	4	0.04	1
Mourning Dove	FY	CONF	13	52	1	1
Mourning Warbler	S	POSS				
Northern Cardinal	CF	CONF	8	32	0.4	1
Northern Flicker	CF	CONF	2	8	0.08	1
Northern Harrier	H	POSS				
Northern Mockingbird	P	PROB				
Northern Rough-winged	AE	CONF	1	4	0.04	1
Ovenbird	S	POSS				
Pine Warbler	T	PROB				
Purple Martin	AE	CONF	1	4	0.08	1
Red-bellied Woodpecker	P	PROB				
Red-eyed Vireo	FY	CONF	2	8	0.08	1
Red-headed Woodpecker	S	POSS				
Red-tailed Hawk	P	PROB				
Red-winged Blackbird	FY	CONF	18	72	2.52	1
Rock Dove	AE	CONF	4	16	0.32	1
Rose-breasted Grosbeak	CF	CONF	2	8	0.08	1
Ruby-throated Hummingbird	D	PROB				
Savannah Sparrow	P	PROB	6	24	0.28	1
Sharp-shinned Hawk	H	POSS				
Song Sparrow	CF	CONF	17	68	0.72	1
Spotted Sandpiper	P	PROB				
Tree Swallow	AE	CONF	1	4	0.04	1
Turkey Vulture	P	PROB	1	4	0.08	1
Veery	S	POSS				
Vesper Sparrow	FY	CONF	1	4	0.04	1
Warbling Vireo	CF	CONF				
White-breasted Nuthatch	S	POSS	1	4	0.04	1
Wild Turkey	P	PROB				
Willow Flycatcher	S	POSS	1	4	0.08	1
Wood Duck	FY	CONF				
Wood Thrush	NE	CONF	2	8	0.08	1
Yellow Warbler	CF	CONF	2	8	0.12	1
Yellow-billed Cuckoo	CF	CONF				
Yellow-throated Vireo	S	POSS				

Data current as of September, 2007

1 - a total of 25 point count stations have been established in square 17MH10

Summary of Ontario Breeding Bird Atlas Data - Square 17MH11

Species	Breeding Evidence		Point Counts			
	Max BE	Categ	#PC[1]	%PC	Abun	#Sq
American Crow	P	PROB	16	64	1.08	1
American Goldfinch	AE	CONF	9	36	0.56	1
American Kestrel	P	PROB	1	4	0.08	1
American Redstart	S	POSS				
American Robin	CF	CONF	20	80	1.48	1
American Woodcock	S	POSS				
Baltimore Oriole	NY	CONF	3	12	0.12	1
Bank Swallow	H	POSS				
Barn Swallow	FY	CONF	8	32	0.92	1
Black/Yellow-billed Cuckoo	S	POSS				
Black-billed Cuckoo	H	POSS				
Black-capped Chickadee	A	PROB	1	4	0.04	1
Blue Jay	CF	CONF	2	8	0.08	1
Blue-winged Teal	FY	CONF				
Bobolink	P	PROB				
Brown Thrasher	AE	CONF				
Brown-headed Cowbird	FY	CONF	8	32	0.8	1
Canada Goose	P	PROB				
Cedar Waxwing	P	PROB	5	20	0.36	1
Chimney Swift	P	PROB				
Chipping Sparrow	CF	CONF	1	4	0.08	1
Cliff Swallow	AE	CONF				
Common Grackle	NY	CONF	16	64	2	1
Common Yellowthroat	A	PROB	1	4	0.04	1
Cooper's Hawk	H	POSS				
Downy Woodpecker	CF	CONF	1	4	0.04	1
Eastern Kingbird	AE	CONF	1	4	0.08	1
Eastern Meadowlark	H	POSS				
Eastern Phoebe	AE	CONF				
Eastern Screech-Owl	T	PROB				
Eastern Towhee	A	PROB				
Eastern Wood-Pewee	S	POSS				
European Starling	CF	CONF	17	68	4.36	1
Field Sparrow	P	PROB				
Gray Catbird	CF	CONF	5	20	0.2	1
Great Blue Heron	H	POSS	2	8	0.12	1
Great Crested Flycatcher	CF	CONF	1	4	0.04	1
Great Horned Owl	NE	CONF				
Green Heron	H	POSS				
Hairy Woodpecker	P	PROB				
Horned Lark	CF	CONF	10	40	1.12	1
House Finch	P	PROB	1	4	0.04	1
House Sparrow	AE	CONF	7	28	1.44	1
House Wren	CF	CONF	2	8	0.08	1
Indigo Bunting	CF	CONF	3	12	0.12	1
Killdeer	FY	CONF	6	24	0.32	1
Mallard	P	PROB				
Mourning Dove	FY	CONF	20	80	1.72	1

Northern Cardinal	FY	CONF	7	28	0.36	1
Northern Flicker	P	PROB				
Northern Harrier	H	POSS				
Northern Mockingbird	H	POSS				
Northern Rough-winged	H	POSS				
Orchard Oriole	H	POSS				
Pileated Woodpecker	H	POSS				
Purple Martin	AE	CONF	1	4	0.04	1
Red-bellied Woodpecker	A	PROB	1	4	0.04	1
Red-eyed Vireo	FY	CONF				
Red-tailed Hawk	P	PROB	2	8	0.08	1
Red-winged Blackbird	CF	CONF	16	64	2.04	1
Rock Dove	AE	CONF	6	24	2.24	1
Rose-breasted Grosbeak	A	PROB	1	4	0.04	1
Ruby-throated Hummingbird	D	PROB				
Savannah Sparrow	S	POSS	1	4	0.04	1
Scarlet Tanager	A	PROB				
Sharp-shinned Hawk	H	POSS				
Song Sparrow	CF	CONF	16	64	0.72	1
Spotted Sandpiper	P	PROB				
Tree Swallow	P	PROB				
Turkey Vulture	P	PROB	3	12	0.12	1
Vesper Sparrow	CF	CONF	2	8	0.08	1
Warbling Vireo	NY	CONF	3	12	0.12	1
White-breasted Nuthatch	S	POSS				
Wild Turkey	P	PROB				
Willow Flycatcher	S	POSS	1	4	0.04	1
Wood Duck	FY	CONF	1	4	0.04	1
Wood Thrush	NE	CONF	2	8	0.08	1
Yellow Warbler	CF	CONF	3	12	0.12	1
Yellow-billed Cuckoo	S	POSS	1	4	0.04	1
Yellow-throated Vireo	A	PROB				

Data current as of September, 2007

1 - a total of 25 point count stations have been established in square 17MH11

A5 – Conservation Priority List – Kent County

MUNICIPAL LIST OF PRIORITY SPECIES

Table 3. Municipal list of priority species for Kent County. Please note that forest birds, marsh birds and open country birds are listed separately and that the list is sorted alphabetically within each priority category (level one to four): thus, there is no difference in importance among species within a given category. It should be noted that all species on the list are deemed priority species and that the designation of level one, level two, level three, and level four is a relative ranking within the overall group. Non-VTE species that rely on human structures such as buildings, bridges, etc., should be deemed a priority only when found nesting in natural habitats. These species include: Barn Swallow, Chimney Swift, Cliff Swallow, Common Nighthawk, Eastern Bluebird, Eastern Phoebe and Purple Martin. Symbols: (++) denotes "endangered" or "threatened" status at the provincial or federal level; (*) denotes "vulnerable" status at the provincial or federal level. Please refer to Table 2 to determine precise designations. At a minimum, **municipalities must protect the habitat of endangered and threatened species.** Contact OMNR staff for additional advice. Nesting habitat information for all species breeding within southern Ontario is provided in Appendix F. Appendix G provides the rationale for the inclusion of each species on the list.

FOREST	MARSH	OPEN COUNTRY
LEVEL ONE	**LEVEL ONE**	**LEVEL ONE**
Species Name	**Species Name**	**Species Name**
Acadian Flycatcher++	American Bittern	Bank Swallow
Bald Eagle++	American Coot	Brown Thrasher
Blue-winged Warbler	Black Tern*	Clay-colored Sparrow
Cerulean Warbler*	Black-crowned Night-Heron	Common Nighthawk
Chuck-will's-widow	Horned Grebe	Northern Bobwhite++
Golden-winged Warbler	King Rail++	Northern Mockingbird
Hooded Warbler++	Least Bittern*	Savannah Sparrow
Long-eared Owl	Pied-billed Grebe	
Louisiana Waterthrush*	Sedge Wren	
Northern Saw-whet Owl	Sora	
Prothonotary Warbler++	Virginia Rail	
Red-bellied Woodpecker		
Red-headed Woodpecker*		
Red-shouldered Hawk*		
Yellow-breasted Chat*		
LEVEL TWO	**LEVEL TWO**	**LEVEL TWO**
Species Name	**Species Name**	**Species Name**
American Redstart	American Black Duck	American Kestrel
Black-billed Cuckoo	Blue-winged Teal	Bobolink
Black-throated Green Warbler	Gadwall	Eastern Bluebird
Broad-winged Hawk	Purple Martin	Northern Rough-winged Swallow
Brown Creeper	Swamp Sparrow	Upland Sandpiper
Canada Warbler		Vesper Sparrow
Chestnut-sided Warbler		Western Meadowlark
Eastern Towhee		
Mourning Warbler		
Prairie Warbler		
Scarlet Tanager		
Whip-poor-will		
White-eyed Vireo		
Yellow-bellied Sapsucker		

LEVEL THREE	LEVEL THREE	LEVEL THREE
Species Name	**Species Name**	**Species Name**
Alder Flycatcher	American Wigeon	American Goldfinch
Black-and-white Warbler	Canvasback	Barn Swallow
Blackburnian Warbler	Common Snipe	Eastern Kingbird
Carolina Wren	Lesser Scaup	Eastern Meadowlark
Cooper's Hawk	Marsh Wren	Field Sparrow
Golden-crowned Kinglet		Grasshopper Sparrow
Northern Waterthrush		Horned Lark
Orchard Oriole		Spotted Sandpiper
Pileated Woodpecker		
Pine Warbler		
Purple Finch		
Red-breasted Nuthatch		
Ruby-throated Hummingbird		
Sharp-shinned Hawk		
Tufted Titmouse		
Turkey Vulture		
Veery		
Yellow-billed Cuckoo		
LEVEL FOUR	**LEVEL FOUR**	**LEVEL FOUR**
Species Name	**Species Name**	**Species Name**
American Woodcock	Common Moorhen	Cliff Swallow
Blue-gray Gnatcatcher	Common Tern	
Eastern Phoebe	Northern Pintail	
Gray Catbird	Sandhill Crane	
Hooded Merganser	Wilson's Phalarope	
Ovenbird		
Ruffed Grouse		
Winter Wren		
Wood Duck		
Wood Thrush		
Yellow-throated Vireo		

A6 – Christmas Bird Count Data

Summary of Christmas Bird Counts - Blenheim, 1997 to 2006

Common Name	Number of years in which observed	Total number observed number
American Avocet	1	1
American Bittern	1	1
American Black Duck	9	3706
American Coot	10	15565
American Crow	10	20868
American Goldfinch	10	2578
American Green-winged Teal	3	32
American Kestrel	10	289
American Pipit	8	198
American Robin	10	133
American Tree Sparrow	10	7597
American Wigeon	10	1138
American Woodcock	3	3
Bald Eagle	10	57
Belted Kingfisher	4	4
Black Scoter	8	56
Black-bellied Plover	1	1
Black-capped chickadee	10	2385
Black-crowned Night-Heron	3	9
Black-legged Kittiwake	1	1
Blue Jay	10	2016
Bonaparte's Gull	10	7932
Brewer's Blackbird	2	4
Brown Creeper	10	76
Brown Thrasher	5	7
Brown-headed Cowbird	10	10743
Bufflehead	10	2300
Cackling Goose	2	10
Canada Goose	10	25395
Canada Goose (small races)	3	11
Canvasback	10	2328
Carolina Wren	10	235
Cedar Waxwing	10	425
Chipping Sparrow	6	22
Common Goldeneye	10	2782
Common Grackle	10	254
Common Loon	6	27
Common Merganser	10	5427
Common Redpoll	5	872
Common Snipe	5	37
Common Yellowthroat	7	18
Cooper's Hawk	10	77
Dark-eyed Junco	10	8324
Double-crested Cormorant	8	25
Downy Woodpecker	10	1262
Dunlin	2	18

Summary of Christmas Bird Counts - Blenheim, 1997 to 2006

Common Name	Number of years in which observed	Total number observed number
Eastern Bluebird	10	92
Eastern Meadowlark	2	4
Eastern Phoebe	4	7
Eastern Rufous-sided Towhee	1	1
Eastern Screech-Owl	10	196
Eastern Towhee	6	23
Eurasian Wigeon	1	1
European Starling	10	39598
Field Sparrow	10	45
Forster's Tern	1	2
Fox Sparrow	10	41
Gadwall	10	6748
Glaucous Gull	1	2
Golden-crowned Kinglet	10	536
Gray Catbird	3	7
Great Black-backed Gull	10	858
Great Blue Heron	9	92
Great Horned Owl	10	141
Greater Scaup	10	94222
Green-winged Teal	3	5
Hairy Woodpecker	10	204
Harlequin Duck	1	1
Harris's Sparrow	1	1
Hermit Thrush	10	30
Herring Gull	10	6306
Hoary Redpoll	1	1
Hooded Merganser	10	453
Horned Grebe	7	48
Horned Lark	10	5874
House Finch	10	4375
House Sparrow	10	17435
House Wren	1	2
Killdeer	7	108
King Eider	1	2
Lapland Longspur	1	207
Lesser Black-backed Gull	1	7
Lesser Scaup	10	24909
Long-eared Owl	9	53
Long-tailed Duck	5	22
Mallard	10	20542
Marsh Wren	5	19
merganser sp.	2	195
Merlin	1	1
Mourning Dove	10	8360
Mute Swan	6	22
Northern Flicker	10	110

Summary of Christmas Bird Counts - Blenheim, 1997 to 2006

Common Name	Number of years in which observed	Total number observed number
Northern Cardinal	10	3192
Northern Goshawk	1	2
Northern Harrier	10	192
Northern Mockingbird	10	39
Northern Pintail	8	132
Northern Saw-whet Owl	2	2
Northern Shoveler	5	186
Northern Shrike	10	22
Oldsquaw	3	23
Orange-crowned Warbler	2	2
Peregrine Falcon	1	1
Pied-billed Grebe	8	70
Pileated Woodpecker	7	12
Pine Siskin	8	94
Pine Warbler	1	1
Purple Finch	9	95
Purple Sandpiper	3	8
Red Phalarope	1	1
Red-bellied Woodpecker	10	273
Red-breasted Merganser	10	3019
Red-breasted Nuthatch	9	152
Redhead	10	13448
Red-headed Woodpecker	5	11
Red-necked Grebe	1	1
Red-shouldered Hawk	3	10
Red-tailed Hawk	10	421
Red-winged Blackbird	10	2654
Ring-billed Gull	10	50235
Ring-necked Duck	10	540
Ring-necked Pheasant	6	12
Rock Dove	10	1808
Ross's Goose	2	3
Rough-legged Hawk	10	101
Ruby-crowned Kinglet	8	28
Ruddy Duck	10	609
Ruffed Grouse	1	1
Rusty Blackbird	10	413
Sanderling	1	1
Sandhill Crane	1	18
Savannah Sparrow	6	53
scaup sp.	10	30012
Sharp-shinned Hawk	10	77
Short-eared Owl	9	45
Snow Bunting	10	22599
Snow Goose	10	80
Snowy Owl	7	20

Summary of Christmas Bird Counts - Blenheim, 1997 to 2006

Common Name	Number of years in which observed	Total number observed number
Song Sparrow	10	1268
Sora	1	1
Surf Scoter	10	478
Swamp Sparrow	10	950
Tufted Titmouse	8	27
Tundra Swan	10	22401
Turkey Vulture	2	3
Vesper Sparrow	1	1
Virginia Rail	1	1
Western Sandpiper	1	2
White-breasted Nuthatch	10	628
White-crowned Sparrow	10	458
White-throated Sparrow	10	530
White-winged Crossbill	1	2
White-winged Scoter	8	161
Wild Turkey	3	160
Wilson's Snipe	2	3
Winter Wren	10	84
Wood Duck	7	17
Yellow-bellied Sapsucker	3	4
Yellow-rumped (Myrtle) Warbler	8	45

Appendix B – Detailed Results of Site-Specific Monitoring

B1 – Monitoring Transect Descriptions

Transect 1:

General Description: Riparian - Steep wooded banks of Thames River, leading to a narrow herbaceous zone at waters edge. Wooded area with scattered deciduous trees in spots, discontinuous canopy overall. Uneven aged, with some trees very large, potentially suited to nest sites for birds of prey.

Common Tree Species: Eastern cottonwood (*Populus deltoides*), Balsam poplar (*Populus balsamifera*), Black willow (*Salix nigra*), Manitoba maple (*Acer negundo*)

Common Understory Plants: Staghorn sumac (*Rhus typhina*), Choke cherry saplings (*Prunus virginiana*), wild grape (*Vitis sp*.), Nannyberry (*Viburnum lentago*), Wild raspberry (*Rubus* sp.). Reeds (*Phragmites* sp.) at waters edge.

Transect 2:

General Description: Riparian - Wooded banks of Thames River, not as steep as Transect 1. Fairly solid upper canopy composed primarily of mature deciduous trees.

Common Tree Species: Basswood (*Tilia Americana*), Black walnut (*Juglans nigra*), numerous dead elms (*Ulmus* sp.) a few Manitoba maple (*Acer negundo*), and large Sycamores (*Platanus occidentalis*)

Common Understory Plants: Virginia creeper, Wild grape (*Vitis sp*.), Wild raspberry (*Rubus* sp.), a few Hawthorns (*Crataegus* sp.), Poison ivy (*Rhus radicans*), Jewelweed (*Impatiens capensis*), Hemlock-parsley (*Conioselinium chinense*), Wood nettle (*Laportea cabadensis*), Goldenrod (*Solidago* sp.)

Transect 3:

General Description: Variable width (~25 – 50 m) wooded riparian zone, and adjacent pasture and field crops. Steep sloped banks. Inconsistent canopy, shrub-dominated stretches.

Common Tree Species: Eastern cottonwood (*Populus deltoides*), Black walnut (*Juglans nigra*), Ashes (*Fraxinus* sp.), Elms (*Ulmus* sp.), a few sugar maple (*Acer saccharum*).

Common Understory Plants: Wild grape (*Vitis sp*.), Wild raspberry (*Rubus* sp.), Hawthorns (*Crataegus* sp.), Wood nettle (*Laportea cabadensis*), stinging nettle (Urtica dioica), goldenrod (*Solidago* sp.), False Solomon's seal (*Smilacima racemosa*).

Transect 4:

General Description: Wooded riparian zone on west side of River, and adjacent cultivated lands. Cultivated to top of bank on west. Steep sloped banks. Inconsistent canopy on west bank, completely open in spots. Opposite bank is fairly evenly wooded with a closed canopy.

Common Tree Species: Eastern cottonwood (*Populus deltoides*), Black walnut (*Juglans nigra*), Black willow (*Salix nigra*), Rock Elm (*Ulmus thomasii*), Manitoba maple (*Acer negundo*), Basswood (*Tilia Americana*), and very large Sycamores (*Platanus occidentalis*).

Common Understory Plants: Wild grape (*Vitis sp*.), Wild raspberry (*Rubus* sp.), Staghorn sumac (*Rhus typhina*), Goldenrod (*Solidago* sp.), various asters.

Transect 5:

General Description: Deciduous woodlot (interior an exterior) and adjacent field crops. Mature hardwoods dominate a closed canopy.

Common Tree Species: Sugar maple (*Acer saccharum*), Silver maple (*Acer saccharinum),* Eastern cottonwood (*Populus deltoides*), Black walnut (*Juglans nigra*), Elms (*Ulmus spp.*), Basswood (*Tilia Americana*), Ashes (*Fraxinus* sp.), Black cherry (*Prunus serotina*), Shagbark hickory (*Carya ovata*), a few Mulberry (*Morus* sp.)

Common Understory Plants: Sassafras saplings (*Sassafras albidum*), Virginia creeper, Wild raspberry (*Rubus* sp.), Poison ivy (*Rhus radicans*), Canada lily (*Lilium canadense*), Trilliums (*Trillium grandiflorum*), various wood ferns.

Transect 6:

General Description: Deciduous woodlot (interior an exterior) and adjacent field crops. Mature hardwoods dominate a closed canopy.

Common Tree Species: Sugar maple (*Acer saccharum*), Silver maple (*Acer saccharinum),* Elms (*Ulmus spp.*), Basswood (*Tilia Americana*), Ashes (*Fraxinus* sp.),

Common Understory Plants: Sassafras saplings (*Sassafras albidum*), Wild raspberry (*Rubus* sp.), Wild grape (*Vitis sp*.), Goldenrod (*Solidago* sp.), Wood nettle (*Laportea cabadensis*).

Transect 7:

General Description: Deciduous woodlot (interior an exterior) and adjacent field crops. Mature hardwoods dominate a dense, even canopy.

Common Tree Species: Sugar maple (*Acer saccharum*), Rock Elm (*Ulmus thomasii*), Ashes (*Fraxinus* sp.), Black cherry (*Prunus serotina*), Ironwood (*Ostrya virginiana*), a few Red Oak (*Quercus Rubra*).

Common Understory Plants: Wild raspberry (*Rubus* sp.), Wild grape (*Vitis sp*.), Goldenrod (*Solidago* sp.), Trilliums (*Trillium grandiflorum)*, a few spots of wet soil occupied by various reeds and sedges.

Transect 8:

General Description: Deciduous woodlot (interior an exterior) and adjacent field crops. A very dense stand of mature hardwoods with a closed canopy. Many Carolinian species.

Common Tree Species: Dominated by Ashes (*Fraxinus* sp.), also Sugar maple (*Acer saccharum*), Silver maple (*Acer saccharinum),* Elms (*Ulmus spp.*), Red Oak (*Quercus Rubra*), large (~70-80 cm DBH) White Oak (*Quercus alba*), Blue beech (*Carpinus caroliniana*), Beech (*Fagus grandifolia*). Several very large (60-80 cm DBH) Tulip trees (Liriodendron tulipifera). Eastern cottonwood (*Populus deltoides*) found mostly along perimeter.

Common Understory Plants: Mostly shade-tolerant species. Sassafras saplings (*Sassafras albidum*), Witch-hazel (*Hamamelis virginiana*), May apple (*Podophyllum peltatum*), Jack-in-the-pulpit (*Arisaema tryphyllum*), gooseberries (*Ribes* sp.), False Solomon's seal (*Smilacima racemosa*), Trilliums (*Trillium grandiflorum).*

Transect 9:

General Description: Deciduous woodlot (interior an exterior) and adjacent field crops. Mid-aged and hardwoods dominate an uneven and patchy canopy. Patches of mature hardwoods with closed canopy.

Common Tree Species: Rock Elm (*Ulmus thomasii*), Ashes (*Fraxinus* sp.), Sugar maple (*Acer saccharum*), Red Oak (*Quercus Rubra*), Eastern cottonwood (*Populus deltoides*), Balsam poplar (*Populus balsamifera*). Isolated patches of Tulip tree (*Liriodendron tulipifera*), Sassafras saplings (*Sassafras albidum*) and Basswood (*Tilia Americana*).

Common Understory Plants: Staghorn sumac (*Rhus typhina*) common along edge. Alternate-leaved dogwood (*Cornus alternifolia*), Wild grape (*Vitis sp*.), Goldenrod

(*Solidago* sp.), Jewelweed (*Impatiens capensis*), several spots of wet soil occupied by various reeds, sedges and cattails (*Typha* sp.).

Transect 10:

General Description: Mixed woodlot (interior an exterior) and adjacent field crops. Mixed-aged, uneven and patchy canopy. Primarily deciduous interior, with Carolinian species scattered. Also patches of conifers, esp. along eastern perimeter. Evidence of logging.

Common Tree Species: Elms (*Ulmus sp.*), Ashes (*Fraxinus* sp.), Sugar maple (*Acer saccharum*), Red Oak (*Quercus Rubra*), Eastern cottonwood (*Populus deltoides*), Balsam poplar (*Populus balsamifera*). Patches of White spruce (*Picea glauca*), White pine (Pinus strobus), Eastern white cedar (*Thuja occidentalis*). Scattered White Oak (*Quercus alba*), Blue beech (*Carpinus caroliniana*), Beech (*Fagus grandifolia*), and Ironwood (*Ostrya virginiana*)

Common Understory Plants: Staghorn sumac (*Rhus typhina*) common along edge. Wild raspberry (*Rubus* sp.), Witch-hazel (*Hamamelis virginiana*), scattered Sassafras saplings (*Sassafras albidum*), Poison ivy (*Rhus radicans*), wood ferns, Trilliums (*Trillium grandiflorum).*

B2 – Spring Monitoring Data

Project:	Kent Breeze and MacLeod Project - Spring Migration Survey
Station:	PC-1
Date:	11-May-07
Start Time:	7:20
Wind (Beaufort):	1
Sky:	light fog (lifting)
Observer:	Neil Morris

Species		Individuals Observed				
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	Turdus migratorius	8			8	low local flights, incl. chase flights
American Goldfinch	Carduelis tristis	3			3	short local flights
Blue Jay	Cyanocitta cristata	2	11		13	over-flights eastward, following river
Black-capped Chickadee	Parus atricapillus	3			3	calling from tree-line
Bobolink	Dolichonyx oryzivorus	1			1	over-flight eastward
Brown-headed Cowbird	Molothrus ater	9			9	
Canada Goose	Branta canadensis	1			1	over-flight westward along river
Common Grackle	Quiscalus quiscula	30			30	mostly short local flights
Downy Woodpecker	Picoides pubescens	1			1	low over-flight to NE
European Starling	Sturnus vulgaris	4			4	
Horned Lark	Eremophila alpestris	2			2	calling at ground level in field
Killdeer	Charadrius vociferus	5			5	low local flights and over-flights
Northern Cardinal	Cardinalis cardinalis	4			4	calling from tree-line
Northern Oriole	Icterus galbula	4			4	short local flights into trees
Northern Rough-winged Swallow	Stelgidopteryx serripennis	1			1	over-flight westward at 10 to 30 m
Red-bellied Woodpecker	Melanerpes carolinus	1			1	calling from tree-line
Red-winged Blackbird	Agelaius phoeniceus	27			27	low local flights, incl. chase flights
Solitary sandpiper	Tringa solitaria	1			1	over-flight to ENE
Tree Swallow	Tachycineta bicolor	12			12	forage flights along river edge
Totals:		119	11	0	130	

Total species observed: **19**

Project:	Kent Breeze and MacLeod Project - Spring Migration Survey
Station:	PC-2
Date:	11-May-07
Start Time:	12:30
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Robin	Turdus migratorius	3			3	low local flights
American Goldfinch	Carduelis tristis	1			1	flight from tree to tree
Brown Thrasher	Toxostoma rufum	4			4	low local flights, often very vocal
Brown-headed Cowbird	Molothrus ater	5			5	short local flights
Eastern Meadowlark	Sturnella magna	2			2	calling at ground level in field
European Starling	Sturnus vulgaris	48			48	short local flights, carrying food to nest
House Wren	Troglodytes aedon	1			1	calling from trees
Killdeer	Charadrius vociferus	2			2	short flight to NW
Northern Cardinal	Cardinalis cardinalis	1			1	very low (<5 m) and short flight
Red-tailed Hawk	Buteo jamaicensis			1	1	circling and drifting SW
Red-winged Blackbird	Agelaius phoeniceus	5			5	short local flights
Song Sparrow	Melospiza melodia	5			5	short local flights
Turkey Vulture	Cathartes aura		1		1	soaring SW
Totals:		77	1	1	79	

Total species observed: 13

Project:	Kent Breeze and MacLeod Project - Spring Migration Survey
Station:	PC-3
Date:	11-May-07
Start Time:	10:20
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Crow	Corvus brachyrhynchos	4			4	short local flight
American Goldfinch	Carduelis tristis	1			1	over-flight to the SE
Barn Swallow	Hirundo rustica	1			1	over-flight to the north
Canada Goose	Branta canadensis	2			2	over-flight to the north
Chipping Sparrow	Spizzela passerina	2			2	singing from trees
Common Grackle	Quiscalus quiscula	23			23	mostly short local flights
European Starling	Sturnus vulgaris	11			11	mostly short local flights
Gray Catbird	Dumetella carolinensis	1			1	singing from trees
Killdeer	Charadrisu vociferus	2			2	calling at ground level in field
Northern Cardinal	Cardinalis cardinalis	1			1	very low (<5m) and short flight westward
Northern Flicker	Colaptes auratus	1			1	calling from trees
Northern Oriole	Icterus galbula	2			2	singing from trees
Northern Rough-winged Swallow	Stelgidopteryx serripennis	2			2	overflight to the SW
Red-winged Blackbird	Agelaius phoeniceus	11			11	short local flights, various directions
Song Sparrow	Melospiza melodia	2			2	ground-level movement
Turkey Vulture	Cathartes aura	3	5	5	13	soaring and drifting, mainly northward
Yellow Warbler	Dendroica petechia	1			1	singing from shrubs
Totals:		70	5	5	80	

Total species observed: **17**

Project:	Kent Breeze and MacLeod Project - Spring Migration Survey
Station:	PC-4
Date:	11-May-07
Start Time:	13:42
Wind (Beaufort):	3
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	Turdus migratorius	2			2	short, low local flights
American Goldfinch	Carduelis tristis	1			1	very low (<5m) local flight
Brown-headed Cowbird	Molothrus ater	1			1	low local flight
Chipping Sparrow	Spizzela passerina	8			8	short local flights to/rom trees
Common Grackle	Quiscalus quiscula	37			37	short local flights - various directions
European Starling	Sturnus vulgaris	21			21	short local flights - various directions
Field Sparrow	Spizzela pusilla	1			1	short local flight eastward
House Finch	Carpodacus mexicanus	1			1	singing from tree
Killdeer	Charadrius vociferus	3			3	short local flight
Mourning Dove	Zenaida macroura	3			3	short local flight
Northern Cardinal	Cardinalis cardinalis	1			1	singing from tree
Northern Rough-winged Swallow	Stelgidopteryx serripennis	5			5	low foraging flights
Red-tailed Hawk	Buteo jamaicensis			1	1	circling and drifting to the west
Red-winged Blackbird	Agelaius phoeniceus	3			3	short local flight
Rock Dove	Columba livia	6			6	short local flights near buildiings
Song Sparrow	Melospiza melodia	4			4	short local flight
Tree Swallow	Tachycineta bicolor	17			17	foraging flights near farm buildings
Turkey Vulture	Cathartes aura		1	1	2	circling and soaring ~westward
Totals:		114	1	2	117	

Total species observed: **18**

Project:	Kent Breeze and MacLeod Project - Spring Migration Survey
Station:	PC-5
Date:	11-May-07
Start Time:	9:05
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m		
American Crow	Corvus brachyrhynchos	2	2		4	short local flights and an overflight
American Goldfinch	Carduelis tristis	1			1	overflight to the east
Barn Swallow	Hirundo rustica	1			1	overflight to the NW
Blue Jay	Cyanocitta cristata		3		3	overflight to the east
Brown-headed Cowbird	Molothrus ater	4			4	short local flights
Common Grackle	Quiscalus quiscula	9			9	short local flights and a few overflights
European Starling	Sturnus vulgaris	2			2	short local flights
Hairy Woodpecker	Picoides villosus	1			1	calling from treeline
Horned Lark	Eremophila alpestris	4			4	overflights S and SE
Indigo Bunting	Passerina cyanea	1			1	local flight from transmission lines
Killdeer	Charadrius vociferus	1			1	short local flight
Mallard	Anas platyrhynchos	1			1	overflight NW
Mourning Dove	Zenaida macroura	3			3	local flight from transmission lines
Northern Flicker	Colaptes auratus	1			1	calling from treeline
Red-eyed Vireo	Vireo olivaceus	2			2	calling from treeline
Red-winged Blackbird	Agelaius phoeniceus	3			3	short local flights
Song Sparrow	Melospiza melodia	5			5	calling from treeline
Turkey Vulture	Cathartes aura		15	6	21	kettling and moving slowly northward
Totals:		41	20	6	67	

Total species observed: 18

Project: Kent Breeze and MacLeod Project - Spring Migration Survey
Station: PC-6
Date: 11-May-07
Start Time: 11:25
Wind (Beaufort): 2
Sky: clear
Observer: Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	Turdus migratorius	2			2	calling from trees
Bobolink	Dolichonyx oryzivorus	1			1	overflight to the north
Brown-headed Cowbird	Molothrus ater	3			3	short local flights
Common Grackle	Quiscalus quiscula	85			85	flock of ~50 and individuals, foraging
European Starling	Sturnus vulgaris	5			5	short local flights
Horned Lark	Eremophila alpestris	4			4	short local flights
Killdeer	Charadrius vociferus	6			6	short local flights
Mourning Dove	Zenaida macroura	4			4	short local flights and an overflight N
Red-winged Blackbird	Agelaius phoeniceus	3			3	short local flight and overflights N
Sharp-shinned Hawk	Accipiter striatus			1	1	circling and drifting SW
Tree Swallow	Tachycineta bicolor	3			3	overflight to the north
Turkey Vulture	Cathartes aura	2	4	4	10	circling and soaring NW and S
Totals:		116	4	5	125	

Total species observed: 12

Project: Kent Breeze and MacLeod Projects - Spring Migration Survey
Station: PC-1
Date: 19-May-07
Start Time: 6:20
Wind (Beaufort): 2
Sky: partly cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	8			8	
American Crow	*Corvus brachyrhynchos*	1			1	short local flight, ~5m height
American Goldfinch	*Carduelis tristis*	1			1	
Barn Swallow	*Hirundo rustica*	5			5	low (<5m) foraging flights
Brown-headed Cowbird	*Molothrus ater*	4			4	short local flights, <10m height
Chipping Sparrow	*Spizzela passerina*	2			2	singing in tree-line
Common Grackle	*Quiscalus quiscula*	23			23	local flights, foraging
European Starling	*Sturnus vulgaris*	3			3	low over-flights
Gray Catbird	*Dumetella carolinensis*	1			1	calling from tree-line
Horned Lark	*Eremophila alpestris*	3			3	calling at ground level
Killdeer	*Charadrius vociferus*	3			3	short local flights, <10m height
Northern Cardinal	*Cardindalis cardinalis*	2			2	singing in tree-line
Northern Flicker	*Colaptes auratus*	1			1	singing in tree-line
Northern Oriole	*Icterus galbula*	1			1	local flight to tree
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	6			6	low foraging flights near river edge
Red-bellied Woodpecker	*Melanerpes carolinus*	2			2	calling and foraging
Red-eyed Vireo	*Vireo olivaceus*	1			1	singing in tree-line
Red-winged Blackbird	*Agelaius phoeniceus*	6			6	short local flights, 5 - 20m height
Savannah Sparrow	*Paserculus sandwichensis*	1			1	very short, low flight in field
Song Sparrow	*Melospiza melodia*	1			1	short local flight, <5m height
Tree Swallow	*Tachycineta bicolor*	3			3	low foraging flights near river edge
Turkey Vulture	*Cathartes aura*	2	1		3	circling
Yellow Warbler	*Dendroica petechia*	1			1	singing in tree-line
Unidentified shorebird	F. Scolopacidae	9			9	small flock, overflight along river
Totals:		90	1	0	91	

Total species observed: 24

Project:	Kent Breeze and MacLeod Projects - Spring Migration Survey
Station:	PC-2
Date:	19-May-07
Start Time:	11:15
Wind (Beaufort):	3
Sky:	mainly cloudy
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
Brown-headed Cowbird	*Molothrus ater*	1			1	short local flight into tree canopy
Common Grackle	*Quiscalus quiscula*	4			4	short local flight into tree canopy
European Starling	*Sturnus vulgaris*	15			15	frequent local movement of small local flock
Horned Lark	*Eremophila alpestris*	5			5	count is approx. - calling at ground level
Mourning Dove	*Zenaida macroura*	1			1	low overflight southward
Northern Oriole	*Icterus galbula*	1			1	short local flight into trees
Red-winged Blackbird	*Agelaius phoeniceus*	9			9	short and low local flights, incl. chase flights
Song Sparrow	*Melospiza melodia*	2			2	very low (<5m) intraspecific chase flight
Turkey Vulture	*Cathartes aura*		2		2	circling and drifting south to north
Totals:		38	2	0	40	

Total species observed: **9**

Project: Kent Breeze and MacLeod Projects - Spring Migration Survey
Station: PC-3
Date: 19-May-07
Start Time: 8:45
Wind (Beaufort): 3
Sky: cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Crow	*Corvus brachyrhynchos*	3	1		4	1 overflight N at ~100 m
American Goldfinch	*Carduelis tristis*	5			5	overflights SE and N
Barn Swallow	*Hirundo rustica*	5			5	low foraging flights
Black-capped Chickadee	*Parus atricapillus*	2			2	short flights to/from trees
Blue Jay	*Cyanocitta cristata*	1			1	overflight W
Common Grackle	*Quiscalus quiscula*	14			14	short local flights
Downy Woodpecker	*Picoides pubescens*	1			1	flight to tree
European Starling	*Sturnus vulgaris*	11			11	short local flights
Mourning Dove	*Zenaida macroura*	3	2		5	oveflights W
Red-winged Blackbird	*Agelaius phoeniceus*	7			7	overflights northward
Tree Swallow	*Tachycineta bicolor*	2			2	low foraging flights
Turkey Vulture	*Cathartes aura*	2	1		3	circling and drifting N and W
Totals:		56	4	0	60	

Total species observed: **12**

Project: Kent Breeze and MacLeod Projects - Spring Migration Survey
Station: PC-4
Date: 19-May-07
Start Time: 12:35
Wind (Beaufort): 3
Sky: cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	15			15	short, low local flights, incl. chase flights
Barn Swallow	*Hirundo rustica*	2			2	foraging flights in proximity to farm buildings
Brown-headed Cowbird	*Molothrus ater*	1			1	short flight from field to river ede
Chipping Sparrow	*Spizzela passerina*	1			1	short flight into tree
Common Grackle	*Quiscalus quiscula*	33			33	short local flights in various directions
European Starling	*Sturnus vulgaris*	26			26	short local flights in various directions
House Sparrow	*Passer domesticus*	1			1	short flight into tree
Indigo Bunting	*Passerina cyanea*	1			1	short flight into tree
Killdeer	*Charadrius vociferus*	1			1	short flight into field
Mourning Dove	*Zenaida macroura*	6			6	short local flights to and from various features
Northern Oriole	*Icterus galbula*	2			2	short flight into tree
Red-winged Blackbird	*Agelaius phoeniceus*	5			5	short local flights to and from various features
Rock Dove	*Columba livia*	16			16	short flights in proximity to farm buildings
Song Sparrow	*Melospiza melodia*	1			1	short local flight
Totals:		111	0	0	111	

Total species observed: 14

Project: Kent Breeze and MacLeod Projects - Spring Migration Survey
Station: PC-5
Date: 19-May-07
Start Time: 10:00
Wind (Beaufort): 4
Sky: cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Crow	*Corvus brachyrhynchos*	1			1	low over-flight to the south
Brown-headed Cowbird	*Molothrus ater*	4			4	short, low local flights
Common Grackle	*Quiscalus quiscula*	11			11	low over-flights and local flights
European Starling	*Sturnus vulgaris*	4			4	short, low local flights
Field Sparrow	*Spizzela pusilla*	1			1	flight between adjacent fields
Horned Lark	*Eremophila alpestris*	9			9	very short, low flights in field
Mourning Dove	*Zenaida macroura*	3			3	low over-flights and local flights
Red-winged Blackbird	*Agelaius phoeniceus*	8			8	short, low local flights
Song Sparrow	*Melospiza melodia*	3			3	short, low local flights
Totals:		44	0	0	44	

Total species observed: 9

Project: Kent Breeze and MacLeod Projects - Spring Migration Survey
Station: Transect 1
Date: 19-May-07
Start Time: 7:30
Wind (Beaufort): 2
Sky: partly cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	5			5	foraging in riparian woods
Bank Swallow	*Riparia riparia*	5			5	foraging along river
Black-throated Green Warbler	*Dendroica virens*	1			1	foraging in riparian woods
Brown Thrasher	*Toxostoma rufum*	1			1	foraging in riparian woods
Gray Catbird	*Dumetella carolinensis*	2			2	calling in riparian woods
Greater Yellowlegs	*Tringa melanoleuca*	1			1	flying NW, low along river
House wren	*Troglodytes aedon*	1			1	singing in riparian woods
Mourning Dove	*Zenaida macroura*	4			4	perched, calling
Northern Cardinal	*Cardindalis cardinalis*	2			2	calling and foraging in riparian woods
Northern Flicker	*Colaptes auratus*	1			1	calling in riparian woods
Northern Oriole	*Icterus galbula*	3			3	foraging in riparian woods
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	7			7	foraging along river
Red-eyed Vireo	*Vireo olivaceus*	1			1	singing in riparian woods
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	3			3	foraging in riparian woods
Ruby-crowned Kinglet	*Regulus calendula*	4			4	foraging in riparian woods
Song Sparrow	*Melospiza melodia*	4			4	calling and foraging in riparian zone
Solitary Sandpiper	*Tringa solitaria*	2			2	foraging at river's edge
Spotted sandpiper	*Actitis macularia*	1			1	foraging at river's edge
Tree Swallow	*Tachycineta bicolor*	15			15	foraging along river
Yellow-rumped warbler	*Dendroica coronata*	3			3	foraging in riparian woods
Yellow Warbler	*Dendroica petechia*	2			2	singing and foraging in riparian shrubs
Totals:		68	0	0	68	

Total species observed: 21

B3 – Fall Monitoring Data

Project: Kent Breeze and MacLeod Projects - Fall Migration Survey
Station: PC-1
Date: 4-Oct-06
Start Time: 17:00
Wind (Beaufort): 3
Sky: cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	15			15	mixed flock with blackbirds, following river
American Crow	*Corvus brachyrhynchos*	15			15	perched
American Goldfinch	*Carduelis tristis*	12			12	short local flights
Canada Goose	*Branta canadensis*			47	47	4 separate flocks in V-formation, moving ~ westward
European Starling	*Sturnus vulgaris*	250			250	large flock perched on transmission lines
Mourning Dove	*Zenaida macroura*	2			2	local flight
Red-winged Blackbird	*Agelaius phoeniceus*	15			15	mixed flock with robins following river
Tree Swallow	*Tachycineta bicolor*	87			87	individual and clustered overflights at 20 - 40 m
Wild Turkey	*Meleagris gallopavo*	6			6	foraging in field
Mixed blackbird flocks	F. Icteridae	175			175	a few lare flocks, moving generally eastward
Totals:		577	0	47	624	

Total species observed: 10

Project: Kent Breeze and MacLeod Projects - Fall Migration Survey
Station: PC-2
Date: 4-Oct-06
Start Time: 18:15
Wind (Beaufort): 3
Sky: partly cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	19	1		20	individuals and sm. flocks, various directions
Horned Lark	*Eremophila alpestris*	1			1	low flight along roadside
Mallard	*Anas platyrhynchos*	7			7	flew up from field
Mourning Dove	*Zenaida macroura*	3			3	individual flights ~northward
Northern Cardinal	*Cardinalis cardinalis*	1			1	Auditory only
Ruby-crowned Kinglet	*Regulus calendula*	6			6	moving through treeline
Song Sparrow	*Melospiza melodia*	6			6	landed in field
Tree Swallow	*Tachycineta bicolor*	35			35	individuals and small flocks
Accipiter hawk	*Accipiter* sp.	1			1	along top of treeline
Mixed blackbird flocks	F. Icteridae	14	23		37	various directions
Totals:		93	24	0	117	

Total species observed: 10

Project: Kent Breeze and MacLeod Projects - Fall Migration Survey
Station: Transect 1
Date: 4-Oct-06
Start Time: 15:25 PM
Wind (Beaufort): 2
Sky: partly cloudy
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
Northern Cardinal	*Cardinalis cardinalis*	5			5	foraging
Golden-crowned Kinglet	*Regulus satrapa*	2			2	foraging
Song Sparrow	*Melospiza melodia*	3			3	understory
Northern Flicker	*Colaptes auratus*	1			1	foraging
Blue Jay	*Cyanocitta cristata*	1			1	through flight
Yellow-bellied Sapsucker	*Sphyrapicus varius*	1			1	foraging
Totals:		13	0	0	13	

Total species observed: 6

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-1
Date:	5-Oct-06
Start Time:	14:30
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	Scientific name	0 - 40 m	40 - 120 m	>120 m		
American Robin	*Turdus migratorius*	3	1		4	1 overflight W @~40m, along river
American Crow	*Corvus brachyrhynchos*	6	2		8	associated with river
Blue Jay	*Cyanocitta cristata*	21			21	overflights ~westward, along river
European Starling	*Sturnus vulgaris*	5			5	landed along river
Mourning Dove	*Zenaida macroura*	6			6	most perched on utility lines
Red-winged Blackbird	*Agelaius phoeniceus*	4			4	short local flights
Tree Swallow	*Tachycineta bicolor*		20		20	facing into east wind, drifting west
Accipiter Hawk	*Accipiter* sp.			1	1	steady glide to the WNW
Buteo Hawk	*Buteo* sp.			1	1	weastward
Mixed blackbird flocks	F. Icteridae	61	60		121	higher flights generally the west, lower flights to the east
	Totals:	106	83	2	191	

Total species observed: 10

Project: Kent Breeze and MacLeod Projects - Fall Migration Survey
Station: PC-2
Date: 5-Oct-06
Start Time: 13:10
Wind (Beaufort): 2
Sky: clear
Observer: Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Crow	*Corvus brachyrhynchos*	2	8		10	circling above woodlot @ ~40-50 m
American Goldfinch	*Carduelis tristis*	1			1	short local flight
Blue Jay	*Cyanocitta cristata*	3			3	short local flights
Horned Lark	*Eremophila alpestris*	1			1	short ground-level flight
Northern Harrier	*Circus cyaneus*	1			1	low hunting flight over field
Turkey Vulture	*Cathartes aura*	1	6	2	9	most circling, 2 gliding ~S @ >120m
Totals:		9	14	2	25	

Total species observ 6

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-3
Date:	5-Oct-06
Start Time:	9:15
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	*Turdus migratorius*	7			7	overflights eastward
American Crow	*Corvus brachyrhynchos*	6			6	southward
American Goldfinch	*Carduelis tristis*	13			13	small flock mixed with starlings
Blue Jay	*Cyanocitta cristata*	9			9	local flights to/from woodlots
Canada Goose	*Branta canadensis*			2	2	overflight northward
European Starling	*Sturnus vulgaris*	320	300		620	some individual local flights, 2 separate lg. flocks of ~300
Golden-crowned Kinglet	*Regulus satrapa*	1			1	Auditory only
Horned Lark	*Eremophila alpestris*	1			1	Auditory only
Sharp-shinned Hawk	*Accipiter striatus*	1	2		3	circling and drifting westward
Song Sparrow	*Melospiza melodia*	4			4	short local flights
Tree Swallow	*Tachycineta bicolor*		3		3	overflight NW
Turkey Vulture	*Cathartes aura*	5	7		12	mostly circling over woodlots
Gull species	*Larus* sp.			12	12	circling and slowly drifting N
Buteo hawk	*Buteo* sp.			1	1	drifting with Accipiter at ~ 300 m
Accipiter hawk	*Accipiter* sp.	1	1	1	3	drifting W and S
Mixed blackbird flock	F. Icteridae	43			43	moving N or NW
Totals:		411	313	16	740	

Total species observed: 16

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-4
Date:	5-Oct-06
Start Time:	10:03
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	*Turdus migratorius*	1	10		11	flock of 10 overflight ~W along river
American Crow	*Corvus brachyrhynchos*		2		2	overflight eatsward along river
American Goldfinch	*Carduelis tristis*	3	1		4	
Blue Jay	*Cyanocitta cristata*	3			3	local flights from tree to tree
Brown-headed Cowbird	*Molothrus ater*	7			7	several perched on transmission lines
Canada Goose	*Branta canadensis*		9	4	13	overflight to the West
European Starling	*Sturnus vulgaris*	57			57	small flocks and individuals, local flights
Killdeer	*Charadrius vociferus*	1			1	calling at ground level
Mourning Dove	*Zenaida macroura*	5	1		6	local flights
Red-winged Blackbird	*Agelaius phoeniceus*	9			9	perched on transmission lines
Song Sparrow	*Melospiza melodia*	11			11	small flocks, local flights
Turkey Vulture	*Cathartes aura*		1	1	2	moving East
Mixed blackbird flocks	F. Icteridae	93	8		101	various directions
Totals:		190	32	5	227	

Total species observed: 10

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-5
Date:	5-Oct-06
Start Time:	11:50
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed				
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m	Total	Notes
American Robin	*Turdus migratorius*	3			3	overflight ENE
American Goldfinch	*Carduelis tristis*	1			1	calling from treeline
Blue Jay	*Cyanocitta cristata*	1			1	
European Starling	*Sturnus vulgaris*	250			250	large flock, continuous short movements
House Sparrow	*Passer domesticus*	3			3	foraging along roadside
Tree Swallow	*Tachycineta bicolor*	5	1		6	mostly foraging flights
Turkey Vulture	*Cathartes aura*		4	1	5	circling and drifting
Buteo hawk	*Buteo* sp.			1	1	circling and drifting
Totals:		263	5	2	270	

Total species observed: **8**

Project:	Kent Breeze and MacLeod Projects - Fall Migration Survey
Station:	PC-5
Date:	5-Oct-06
Start Time:	15:45
Wind (Beaufort):	3
Sky:	clear
Observer:	Neil Morris

Species		Individuals Observed			Total	Notes
Common name	**Scientific name**	0 - 40 m	40 - 120 m	>120 m		
American Crow	*Corvus brachyrhynchos*		1		1	overflight SE at ~ 40 m
American Goldfinch	*Carduelis tristis*	1			1	short local flight
Blue Jay	*Cyanocitta cristata*	3			3	short flights into trees
European Starling	*Sturnus vulgaris*	7			7	
Red-winged Blackbird	*Agelaius phoeniceus*	5			5	short local flight
Turkey Vulture	*Cathartes aura*	1	6		7	circling over woodlot
Red-tailed Hawk	*Buteo jamaicensis*		1		1	continuous glide north
Totals:		17	8	0	25	

Total species observed: **7**

B4 – Breeding Bird Survey Data

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 1
Date:	5-Jul-06
Start Time:	10:00
Finish Time:	12:00
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	6	singing, male chase flights
Belted Kingfisher	*Ceryle alcyon*	4	2 pairs
Brown-headed Cowbird	*Molothrus ater*	5	males and females
Common Grackle	*Quiscalus quiscula*	11	males and females, vocal and active
Eastern Phoebe	*Sayornis phoebe*	1	singing
Great Blue Herron	*Ardea herodias*	1	lone bird foraging along river
Horned Lark	*Eremophila alpestris*	9	calling, in field adjacent to river
House Wren	*Troglodytes aedon*	2	singing
Killdeer	*Charadrius vociferus*	3	adjacent field and river shore,calling
Northern Cardinal	*Cardinalis cardinalis*	5	males and females, singing
Northern Oriole	*Icterus galbula*	9	males and females, singing
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	4	foraging
Red-winged Blackbird	*Agelaius phoeniceus*	19	singing
Song Sparrow	*Melospiza melodia*	5	singing, perched
Spotted Sandpiper	*Actitis macularia*	1	lone bird, foraging
Tree Swallow	*Tachycineta bicolor*	21	males and females, foraging and perched
Turkey Vulture	*Cathartes aura*	1	overflight
Wood Duck	*Aix sponsa*	1	male, flew up from river

Total Birds Observed:	18
Species count:	108

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 2
Date:	5-Jul-06
Start Time:	12:10
Finish Time:	13:40
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	11	males and females, singing and chase flights
American Goldfinch	*Carduelis tristis*	3	males and females, males singing
Barn Swallow	*Hirundo rustica*	3	associated with nearby buildings
Black-capped Chickadee	*Parus atricapillus*	6	calling and singing
Blue Jay	*Cyanocitta cristata*	5	calling and foraging
Chipping Sparrow	*Spizzela passerina*	3	foraging and calling
Common Grackle	*Quiscalus quiscula*	13	calling and displaying
Downy Woodpecker	*Picoides pubescens*	4	males and females, calling
Eastern Kingbird	*Tyrannus tyrannus*	3	territorial displays
European Starling	*Sturnus vulgaris*	9	carrying nest material
Gray Catbird	*Dumetella carolinensis*	3	calling from understory
House Wren	*Troglodytes aedon*	5	male singing
Mourning Dove	*Zenaida macroura*	8	singing, pairing display
Northern Flicker	*Colaptes auratus*	2	male and female
Northern Cardinal	*Cardinalis cardinalis*	5	males and females, singing
Northern Oriole	*Icterus galbula*	7	males and females, singing
Pileated Woodpecker	*Dryocopus pileatus*	1	excavation in dead elm
Red-winged Blackbird	*Agelaius phoeniceus*	15	territorial displays
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	2	pair
Turkey Vulture	*Cathartes aura*	2	overflight
White-breasted Nuthatch	*Sitta carolinensis*	1	foraging and calling
Yellow-bellied Sapsucker	*Sphyrapicus varius*	1	holes observed in basswood tree

Total Birds Observed:	22
Species count:	112

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 3
Date:	5-Jul-06
Start Time:	14:30
Finish Time:	16:00
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	8	calling, singing, foraging, chasing
American Goldfinch	*Carduelis tristis*	3	in flight, calling
Barn Swallow	*Hirundo rustica*	3	foraging flights
Black-capped Chickadee	*Parus atricapillus*	4	calling, singing
Blue Jay	*Cyanocitta cristata*	6	calling and foraging
Canada Goose	*Branta canadensis*	13	2 pairs with 9 young in total
Common Grackle	*Quiscalus quiscula*	6	calling and foraging
Gray Catbird	*Dumetella carolinensis*	2	singing
Great Blue Herron	*Ardea herodias*	1	foraging
House Wren	*Troglodytes aedon*	3	singing
Indigo Bunting	*Passerina cyanea*	1	singing male
Killdeer	*Charadrius vociferus*	4	adjacent field, calling
Mourning Dove	*Zenaida macroura*	5	perched, calling
Northern Flicker	*Colaptes auratus*	2	pair
Red-winged Blackbird	*Agelaius phoeniceus*	7	territorial behaviour
Savannah Sparrow	*Paserculus sandwichensis*	4	associated with adjacent field
Song Sparrow	*Melospiza melodia*	5	singing and calling
Tree Swallow	*Tachycineta bicolor*	15	males and females, foraging and perched
Turkey Vulture	*Cathartes aura*	4	overflights

Total Birds Observed:	19
Species count:	96

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 4
Date:	5-Jul-06
Start Time:	17:30
Finish Time:	18:30
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	14	calling, singing, foraging - nest found
American Crow	*Corvus brachyrhynchos*	3	perched, calling
American Goldfinch	*Carduelis tristis*	6	males and females in flight, calling
Bald Eagle	*Haliaeetus leucocephalus*	1	circling at ~100 m, over river valley
Barn Swallow	*Hirundo rustica*	5	small flock, foraging flight
Cedar waxwing	*Bombycilla cedrorum*	5	calling and foraging
Chipping Sparrow	*Spizzela passerina*	4	male and female, foraging and calling
Common Grackle	*Quiscalus quiscula*	11	both sexes, males displaying
Gray Catbird	*Dumetella carolinensis*	2	calling
Great Blue Herron	*Ardea herodias*	2	overflight, foraging
House Sparrow	*Passer domesticus*	2	male and female foraging
Indigo Bunting	*Passerina cyanea*	2	singing males
Mourning Dove	*Zenaida macroura*	3	perched, calling
Northern Flicker	*Colaptes auratus*	2	pair
Northern Cardinal	*Cardinalis cardinalis*	1	male singing
Ovenbird	*Seiurus aurocapillus*	1	singing
Red-winged Blackbird	*Agelaius phoeniceus*	9	males and females, calling and displaying
Song Sparrow	*Melospiza melodia*	5	singing and calling
Tree Swallow	*Tachycineta bicolor*	4	males and females, foraging and perched

Total Birds Observed:	19
Species count:	82

Project: Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station: Transect 5
Date: 5-Jul-06
Start Time: 18:40
Finish Time: 19:40
Wind (Beaufort): 2
Sky: clear
Observer: Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	3	
Black-billed Cuckoo	*Coccyzus erythropthalamus*	1	calling
Field Sparrow	*Spizzela pusilla*	3	foraging in adjacent field
Gray Catbird	*Dumetella carolinensis*	6	singing from understory
House Wren	*Troglodytes aedon*	3	singing
Mourning Dove	*Zenaida macroura*	1	perched, calling
Northern Cardinal	*Cardinalis cardinalis*	2	males singing
Song Sparrow	*Melospiza melodia*	5	singing and calling
Veery	*Catharus fuscescens*	1	singing

Total Birds Observed: 9
Species count: 25

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 6
Date:	5-Jul-06
Start Time:	19:55
Finish Time:	20:55
Wind (Beaufort):	2
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	5	males and females, chase flights
Brown-headed Cowbird	*Molothrus ater*	4	males and females
Common Grackle	*Quiscalus quiscula*	7	males and females, calling and displaying
Gray Catbird	*Dumetella carolinensis*	2	calling
Great Horned Owl	*Bubo virginianus*	1	perched, calling
House Wren	*Troglodytes aedon*	1	singing
Indigo Bunting	*Passerina cyanea*	1	male singing
Killdeer	*Charadrius vociferus*	2	calling
Northern Flicker	*Colaptes auratus*	2	pair
Northern Cardinal	*Cardinalis cardinalis*	4	males and females, male singing
Northern Oriole	*Icterus galbula*	2	male singing
Red-winged Blackbird	*Agelaius phoeniceus*	9	carrying nest material
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	2	pair
Wood Thrush	*Hylocichla mustelina*	1	singing

Total Birds Observed:	14
Species count:	43

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 7
Date:	6-Jul-06
Start Time:	9:00
Finish Time:	10:00
Wind (Beaufort):	0
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	4	calling, territorial chase flights
Blue Jay	*Cyanocitta cristata*	8	perched and flying, calling
Brown-headed Cowbird	*Molothrus ater*	2	male and female
Downy Woodpecker	*Picoides pubescens*	2	male and female
Gray Catbird	*Dumetella carolinensis*	5	singing from understory
Indigo Bunting	*Passerina cyanea*	1	male singing
Northern Flicker	*Colaptes auratus*	2	males singing
Northern Cardinal	*Cardinalis cardinalis*	7	singing
Red-eyed Vireo	*Vireo olivaceus*	2	perched, calling
Red-tailed Hawk	*Buteo jamaicensis*	1	circling and calling
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	3	males and females
Song Sparrow	*Melospiza melodia*	3	
Turkey Vulture	*Cathartes aura*	1	overflight
Warbling Vireo	*Vireo gilvus*	1	singing
Wood Thrush	*Hylocichla mustelina*	1	singing
Yellow Warbler	*Dendroica petechia*	3	males, singing
Yellow-billed Cuckoo	*Coccyzus americanus*	1	calling

Total Birds Observed: 17
Species count: 47

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 8
Date:	6-Jul-06
Start Time:	10:10
Finish Time:	11:40
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Goldfinch	*Carduelis tristis*	4	males and females in flight, calling
Black-capped Chickadee	*Parus atricapillus*	6	calling, singing, foraging
Blue Jay	*Cyanocitta cristata*	7	perched and in flight, calling
Downy Woodpecker	*Picoides pubescens*	3	males calling
Eastern Wood-Peewee	*Contopus virens*	2	singing
Gray Catbird	*Dumetella carolinensis*	2	singing
Indigo Bunting	*Passerina cyanea*	1	male singing
Mourning Dove	*Zenaida macroura*	3	perched, calling
Northern Flicker	*Colaptes auratus*	4	males and females
Northern Cardinal	*Cardinalis cardinalis*	3	males singing
Red-eyed Vireo	*Vireo olivaceus*	2	singing
Red-tailed Hawk	*Buteo jamaicensis*	3	1 circling and calling over woodlot, 2 perched
Red-winged Blackbird	*Agelaius phoeniceus*	5	males (calling) and females
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	2	pair, foraging
Scarlet Tanager	*Piranga olivacea*	1	male
Yellow-billed Cuckoo	*Coccyzus americanus*	1	singing

Total Birds Observed: 16
Species count: 49

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	
Date:	6-Jul-06
Start Time:	12:35
Finish Time:	13:35
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	5	males and females, territorial behaviour
Blue Jay	*Cyanocitta cristata*	2	calling, foraging
Chipping Sparrow	*Spizzela passerina*	2	singing
Gray Catbird	*Dumetella carolinensis*	4	singing
Indigo Bunting	*Passerina cyanea*	1	male singing
Mourning Dove	*Zenaida macroura*	6	perched and flying, calling
Northern Flicker	*Colaptes auratus*	2	calling
Northern Cardinal	*Cardinalis cardinalis*	4	singing
Red-eyed Vireo	*Vireo olivaceus*	3	singing
Song Sparrow	*Melospiza melodia*	7	calling and singing
Turkey Vulture	*Cathartes aura*	2	circling over woodlot
Wood Thrush	*Hylocichla mustelina*	1	singing

Total Birds Observed:	12
Species count:	39

Project:	Kent Breeze and MacLeod Projects - Breeding Bird Survey
Station:	Transect 10
Date:	6-Jul-06
Start Time:	13:55
Finish Time:	15:25
Wind (Beaufort):	1
Sky:	clear
Observer:	Neil Morris

Species		Number	
Common name	**Scientific name**	Observed	Notes
American Robin	*Turdus migratorius*	11	both sexes, territorial behaviour by males
American Crow	*Corvus brachyrhynchos*	5	perched, calling
American Goldfinch	*Carduelis tristis*	7	males and females, males singing
Cedar waxwing	*Bombycilla cedrorum*	4	foraging and calling
Chipping Sparrow	*Spizzela passerina*	2	perched, singing
Eastern Kingbird	*Tyrannus tyrannus*	4	calling, chasing
Eastern Wood-Peewee	*Contopus virens*	1	singing
Indigo Bunting	*Passerina cyanea*	2	males singing
Northern Cardinal	*Cardinalis cardinalis*	1	male singing
Yellow-billed Cuckoo	*Coccyzus americanus*	1	perched, singing

Total Birds Observed:	10
Species count:	38

APPENDIX C

Noise Assessment Report

HATCH™

Kent Breeze Corporation

Noise Assessment Report

Kent Breeze Wind Farm and MacLeod Windmill Project

H335112-0000-00-124-0001
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May 14, 2010

Project Report

May 14, 2010

Kent Breeze Corporation

Kent Breeze Wind Farm and MacLeod Windmill Project

DISTRIBUTION

Teresa Newland – Kent Breeze Corporation

Noise Assessment Report

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Report Disclaimer

This report has been prepared by Hatch for the sole and exclusive use of Kent Breeze (the "Client") for the purpose of assisting the management of the Client in making decisions with respect to the potential development of the Kent Breeze Wind Farm and Macleod Windmill Project and for attachment to their application for a Renewable Energy Approval from the Ontario Ministry of the Environment (MOE) and may be used for this purpose; but shall not be (a) used for any other purpose, or (b) provided to, relied upon or used by any third party.

Executive Summary

A noise impact assessment on the Kent Breeze Wind Farm and the Macleod Wind Mill projects was carried out to determine compliance with Ontario Ministry of Environment "Noise Guidelines for Wind Farms" (MOE 2008).

These projects represent two planned wind farms adjacent to each other near the town of Thamesville, in the Regional Municipality of Chatham-Kent, Ontario. They are collectively called "Kent Breeze Wind Farms" There are no other planned or approved wind farms within a 5 km radius of the project site.

Information on real and potential receptors was gathered by the IBI Group and forwarded to Hatch along with UTM coordinates for each. Wind turbine locations were laid out for noise compliance and also compliance to the setbacks required by Ontario Regulation 359-09.

Wind turbine noise emissions were adjusted for the site's summer night-time wind shear which is higher than the manufacturers test site. The result of this adjustment meant that only a single sound power level was applicable for all wind speeds required to be examined by the MOE.

The noise study documented in this report concludes that all receptors are compliant with the Noise Guidelines (MOE 2008).

The maximum noise emission for a non-participating receptor at an existing dwelling is 40.0 dB. The maximum noise emission at a future dwelling placed on what is now a vacant lot is 40.0 dB.

1. Introduction

Kent Breeze Corporation has been awarded two Standard Offer contracts by the Ontario Power Authority for the supply of up to 10 MW of wind power each into the local distribution network (27.6 kV). The two projects are known as the Kent Breeze Wind Farm and Macleod Windmill Project and are located adjacent to each other in the Regional Municipality of Chatham-Kent, approximately 10 km from the town of Thamesville, Ontario.

Kent Breeze has filed a "notice of commencement" for the projects under the Environmental Assessment Act and has received a firm offer for wind turbines from General Electric (GE), their 2.5xl model at a hub height of 85-m. (2.5 MW each, 4 machines per project, 8 machines in total).

This Noise Impact Assessment is a study required by the Ontario Ministry of the Environment (MOE) as a prerequisite for the issuance of a Renewable Energy Approval.

2. Project Layout

The project layout presented in this report meets two primary criteria:

- Noise compliance in accordance with "Noise Guidelines for Wind Farms (MOE, October 2008)
- Setback compliance per Ontario Regulation 359-09.

Since the publication of "Noise Guidelines for Wind Farms", the Green Energy Act was implemented and required wind farms to meet certain setback rules. This project chose a minimum setback of 550 m from receptors as permitted by Ontario Regulation 359-09.

The layout also complies with the following:

- Setback from roads, railways – 60 m (blade length + 10 m, see Table 2.1, item i)
- Lot line setback – 85 m (hub height)
- Significant woodlot setback – 120 m.

Table 2.1 Project Layout Requirements Summary

Item	Description	Report Location
a)	Geographic Location of the Project Study Area	Map 1 in Appendix A
b)	Locations of Wind Turbines	Maps 1 to 4 in Appendix A
c)	Location of transformer substation or switching station	Switching station only – Map 5 in Appendix A
d)	Locations of all Receptors	Maps 3 and 4 in Appendix A, and Tables 4.1 and 4.2
e)	Property Boundaries	Maps 1, 3, 4 in Appendix A
f)	Municipal Zoning and Land-Use Plans	All properties on which wind turbines are located are zoned agricultural.
g)	Topographical Features	Maps 2 and 5 in Appendix A
h)	Other Wind Farms	Kent Breeze and Macleod Windmills represent two adjacent proposed wind farms. There are no other approved or planned wind farms within 5 km of the project area.
i)	Renewable Energy Setback Compliance	Compliance with Ontario Regulation 359-09 is shown on Map 4 in Appendix A. The GE2.5xl machines will have an 85-m hub height and 100-m rotor diameter. Blade length = rotor diameter divided by 2 (= 50 m).

3. Noise Sources

3.1 Wind Turbine Generators

3.1.1 Make, Model and Hub Height
GE 2.5xl, 85-m hub height.

3.1.2 Maximum Electrical Output Rating
2500 kW.

3.1.3 Range of Rotational Speeds
5-14 rpm

3.1.4 Mode of Operation
The noise information provided in this application (Appendix B) is for Normal Operating Mode (NO). The GE 2.5xl can operate in "noise reduced" modes. This application is not based on any noise reduced mode of operation.

3.1.5 Sound Power Levels
Refer to Product Acoustic Specifications in Appendix B.

3.1.6 Frequency Spectra in Octave Bands
Refer to Product Acoustic Specifications in Appendix B.

3.1.7 Tonality
Refer to Product Acoustic Specifications in Appendix B. There are no sound emissions defined as tonal by IEC standards.

3.2 Transformer Substation
The project does not have a step-up transformer required to convert power to grid voltage. The wind turbine generators produce power at local distribution system voltage and are connected to the grid at the two switching stations located on Map 5 in Appendix A.

3.3 Adjustment to Wind Turbine Generator Acoustic Emissions for Wind Speed Profile
GE Normal Operation noise emissions form the input data for the calculations of Adjusted Emissions Levels. The adjustment method is detailed in Appendix C.

Two adjustments were made to the manufacturer's noise emissions, one for wind shear (0.42, summer 11p.m. to 7 a.m.) and the other to increase each of the apparent sound power levels by octave band by 0.9 dB to account for the manufacturer's reported uncertainty. The A-weighted sound power level used in modeling is 105.1 dbA re 10^{-12}W for normalized wind speeds ranging from 6 to 10 m/s at 10-m height.

3.3.1 Wind Turbine Acoustic Emissions Summary

Table 3.1 Wind Turbine Acoustic Emissions Summary

Make and Model	GE 2.5 xl									
Electrical Rating (kW)	2500									
Hub Height (m)	85									
Wind Shear Coefficient	0.42									
Octave Band Apparent Sound Power Level LwA (dBA re 1E-12W)										
	Manufacturer's Emissions Levels					**Adjusted Sound Power Levels**				
Wind Speed (m/s)	6	7	8	9	10	6	7	8	9	10
Frequency (Hz)			[1]							
63	-	-	86.8	-	-	86.8	86.8	86.8	86.8	86.8
125	-	-	93.3	-	-	93.3	93.3	93.3	93.3	93.3
250	-	-	99.5	-	-	99.5	99.5	99.5	99.5	99.5
500	-	-	100.1	-	-	100.1	100.1	100.1	100.1	100.1
1000	-	-	98.4	-	-	98.4	98.4	98.4	98.4	98.4
2000	-	-	95.1	-	-	95.1	95.1	95.1	95.1	95.1
4000	-	-	87.3	-	-	87.3	87.3	87.3	87.3	87.3
8000	-	-	70.9	-	-	70.9	70.9	70.9	70.9	70.9
A-weighted	-	-	105.1	-	-	105.1	105.1	105.1	105.1	105.1
[1] The maximum noise emission										

3.4 Noise Sources and Locations

Wind turbine identification and their coordinates are given in Table 3.2. Coordinates are in Universal Transverse Mercator (UTM) NAD83, Zone 17. Refer also to the maps in Appendix A. During project development turbines Kent 2 and MacLeod 2 were deleted from the layout. This is the reason why turbines are not sequentially numbered.

Table 3.2 Noise Sources Identification and UTM Coordinates

Project Name: Kent Breeze Wind Farms and Macleod Windmill Project				
Identifier	**Equipment Make and Model**	**UTM Coordinates**		**Remarks**
		X (Easting)	**Y (Northing)**	
Kent-1	GE 2.5xl	413230	4711135	
Kent-2				Deleted
Kent-3	GE 2.5xl	412788	4709343	
Kent-4	GE 2.5xl	413679	4709641	
Kent-5	GE 2.5xl	414023	4710276	
Macleod-1	GE 2.5xl	414288	4710646	
Macleod-2				Deleted
Macleod-3	GE 2.5xl	415670	4710482	
Macleod-4	GE 2.5xl	415773	4711215	
Macleod-5	GE 2.5xl	415995	4712127	

4. Receptors

The project's receptor list is included in Tables 4.1 and 4.2. Receptor locations were provided by the IBI Group, London, Ontario.

"Potential" receptors refer to receptors on vacant lots. Location of the receptor on these lots was by IBI. All of the vacant lots are very large and there are multiple locations where a dwelling may reasonably be expected to be located. In all cases, the location provides the prospective dwelling builder at least a 100 m x 100 m building envelope on a portion of the vacant land that would reasonably be expected to contain a dwelling and conforms to the municipal zoning bylaws in effect.

There is one "Participating Receptor" (Number 19). It is a house on land controlled by the proponent (Kent Breeze Corporation).

Table 4.1 Point of Reception Locations

Point of Reception ID	Description	UTM Coordinates	
		X	Y
1	Dwelling	416364.46	4711359
2	Dwelling	416390.09	4711380
3	Dwelling	416410.09	4711398
4	Dwelling	416435.09	4711417
5	Dwelling	416726.09	4711689
6	Dwelling	416770.38	4711633
7	Dwelling	416784.09	4711646
8	Dwelling	416655.09	4711531
9	Dwelling	416697.54	4711663
10	Dwelling	415956.09	4712857
11	Dwelling	415744.09	4712662
12	Dwelling	415443.01	4712386
13	Dwelling	415269.09	4712225
14	Dwelling	415194.09	4712261
15	Dwelling	415304.09	4712358
16	Dwelling	415370.09	4712327
17	Dwelling	415310.09	4712525
18	Dwelling	415411.24	4712593
20	Dwelling	413022.09	4710315
21	Dwelling	412613.08	4709948
22	Dwelling	414506.11	4709204
23	Dwelling	414583.11	4709326
24	Dwelling	415162.1	4709529
25	Dwelling	415198.1	4709545
26	Dwelling	415764.08	4709276
27	Dwelling	416351.09	4709566
28	Dwelling	415787.08	4709822
29	Dwelling	416335.09	4710089
30	Dwelling	416718.1	4710349
31	Dwelling	416683.09	4710331
32	Dwelling	416548.09	4710115
33	Dwelling	416854.1	4710451
34	Dwelling	416823.09	4710344
35	Dwelling	416898.1	4710351
36	Dwelling	417001.09	4710581
37	Dwelling	417309.19	4710671
38	Dwelling	417254.09	4710631
39	Dwelling	417279.52	4710651
40	Dwelling	410953.7	4708570
41	Dwelling	410920.8	4708615
42	Dwelling	410902.51	4708653
43	Dwelling	410876.1	4708685
44	Dwelling	410818.01	4708739
45	Dwelling	410479.27	4709127
46	Dwelling	410109.23	4709499
47	Dwelling	409944.24	4711102
48	Dwelling	412031.57	4713014
49	Dwelling	412016.74	4712987
50	Dwelling	412324.8	4711405
51	Dwelling	412133.69	4711252
52	Dwelling	411831.43	4710967
53	Dwelling	411685.86	4710947
54	Dwelling	411567.66	4710710
55	Dwelling	411522.93	4710670
56	Dwelling	411207.93	4710391
57	Dwelling	410935.36	4710176
58	Dwelling	411425.38	4708942
59	Dwelling	411707.9	4709091
60	Dwelling	413270.24	4712257
61	Dwelling	413559.31	4712651
62	Dwelling	413619.98	4712747
63	Dwelling	413791.38	4712840
64	Dwelling	413877.95	4712936
65	Dwelling	413961.16	4712911
66	Dwelling	414070.33	4713084
67	Dwelling	414098.24	4713036
68	Dwelling	414497.63	4713489
69	Dwelling	414692.23	4713445
70	Dwelling	413427.31	4713559
71	Dwelling	413137.87	4713573
72	Dwelling	412814.59	4713568
73	Dwelling	412930.57	4713583
74	Dwelling	412533.61	4713448
75	Dwelling	412269.91	4713216
76	Dwelling	414217.6	4711293
77	Dwelling	414477.68	4711523
78	Dwelling	414521.29	4711663
79	Dwelling	414620.55	4711658
80	Dwelling	414613.56	4711731
81	Dwelling	414919.05	4711867
82	Dwelling	415013.53	4712084
83	Dwelling	415014.63	4712009
84	Dwelling	415220.86	4712128
85	Dwelling	415242.92	4712316
86	Dwelling	416236.21	4713105
87	Dwelling	416221.5	4713368
88	Dwelling	416501.99	4713352
89	Dwelling	416558.97	4713385
90	Dwelling	414854.35	4713457
91	Dwelling	417334.66	4713355
92	Dwelling	417827.06	4713271
93	Dwelling	418001.28	4713188
94	Dwelling	418281.62	4712891
95	Dwelling	418299.74	4712864
96	Dwelling	418319.94	4712840
97	Dwelling	418332.85	4712827
98	Dwelling	418345.21	4712817
99	Dwelling	418367.97	4712788
100	Dwelling	418383.92	4712777
101	Dwelling	418395.93	4712765
102	Dwelling	418421.92	4712733
103	Dwelling	418440.02	4712711
104	Dwelling	418493.6	4712655
105	Dwelling	418641.01	4712445
106	Dwelling	418972.92	4712104
107	Dwelling	419002.88	4712063
108	Dwelling	419186.06	4711913
109	Dwelling	418754.9	4711529
110	Dwelling	418650.4	4711460
111	Dwelling	418609.82	4711434
112	Dwelling	418594.15	4711419
113	Dwelling	418525.01	4711432
114	Dwelling	418503.59	4711311
115	Dwelling	418647.79	4711336
116	Dwelling	418448.45	4711278
117	Dwelling	418337.8	4711323
118	Dwelling	418275.27	4711412
119	Dwelling	418296.78	4711384
120	Dwelling	418306.75	4711374
121	Dwelling	418316.73	4711353
122	Dwelling	418309.42	4711302
123	Dwelling	418260.85	4711270
124	Dwelling	418198.1	4711269
125	Dwelling	418147.76	4711220
126	Dwelling	418236.68	4711157
127	Dwelling	418193.44	4711133
128	Dwelling	418112.5	4711186
129	Dwelling	418064.83	4711180
130	Dwelling	418017.6	4711158
131	Dwelling	417961.49	4711133
132	Dwelling	417933.33	4711117
133	Dwelling	417860.82	4711090
134	Dwelling	417761.26	4711028
135	Dwelling	417784.98	4711041
136	Dwelling	417720.23	4711011
137	Dwelling	417794.52	4710977
138	Dwelling	417656.08	4710994
139	Dwelling	417779.46	4710942
140	Dwelling	417707.4	4710907
141	Dwelling	417670.09	4710878
142	Dwelling	417605.74	4710865
143	Dwelling	417559.35	4710932
144	Dwelling	417534.08	4710923
145	Dwelling	417592.71	4710843
146	Dwelling	417540.59	4710837
147	Dwelling	417470.91	4710785
148	Dwelling	417522.23	4710817
149	Dwelling	417441.89	4710902
150	Dwelling	417127.44	4710646
151	Dwelling	417205.38	4710694
152	Dwelling	418521.68	4710541
153	Dwelling	418180.84	4710426
154	Dwelling	418133.58	4710378
155	Dwelling	418112.12	4710256
156	Dwelling	417966.41	4710149
157	Dwelling	417885.34	4710002
158	Dwelling	416486.76	4708488
159	Dwelling	415999.99	4708121
160	Dwelling	414460.56	4707649
161	Dwelling	412177.69	4707285
162	Dwelling	412180.41	4707229
163	Dwelling	412185.6	4707371
164	Dwelling	411919.87	4707478
165	Dwelling	411942.59	4707495
166	Dwelling	411952.65	4707507
167	Dwelling	411974.91	4707523
168	Dwelling	412045.81	4707557
169	Dwelling	412083.32	4707591
170	Dwelling	412277.72	4707736
171	Dwelling	412312.79	4707778
172	Dwelling	412393.15	4707810
173	Dwelling	412426.69	4707852
174	Dwelling	412578.98	4707957
175	Dwelling	412550.97	4707845
176	Dwelling	413443.47	4708541
177	Dwelling	413678.23	4708700

Point of Reception ID	Description	UTM Coordinates	
		X	Y
178	Dwelling	413747.67	4708750
179	Dwelling	414078.38	4708959
180	Dwelling	414725.19	4709325
181	Dwelling	415249.34	4709446
182	Dwelling	415251.66	4709018
183	Dwelling	413069.65	4708385
184	Dwelling	412390.45	4707922
185	Dwelling	412134.56	4707713
186	Dwelling	412013.79	4707627
187	Dwelling	411992.43	4707604
188	Dwelling	411951.02	4707570
189	Dwelling	411923.21	4707543
190	Dwelling	411850	4707568
191	Dwelling	411856.66	4707556
192	Dwelling	411854.56	4707603
193	Dwelling	411737.31	4707709
194	Dwelling	410677.58	4708893
195	Dwelling	415231.84	4713583
196	Dwelling	415469.47	4713517
197	Dwelling	416810.11	4713353
198	Dwelling	416607.14	4713353
199	Dwelling	417657.51	4712433
200	Dwelling	417580.77	4712353
201	Dwelling	417562.89	4712321
202	Dwelling	417517.97	4712295
203	Dwelling	417541.81	4712203
204	Dwelling	417300.86	4712182
205	Dwelling	417251.26	4712161
206	Dwelling	417211.45	4712152
207	Dwelling	417051.26	4711951
208	Dwelling	417096.39	4711904
209	Dwelling	417034.33	4711858
210	Dwelling	416923.67	4712735
211	Dwelling	414614.68	4709856
212	Dwelling	414642.37	4709804
213	Dwelling	414673.03	4709784

Point of Reception ID	Description	UTM Coordinates	
		X	Y
214	Potential Receptor (Vacant Lot)	411269.71	4710577
215	Potential Receptor (Vacant Lot)	412429.21	4712316
216	Potential Receptor (Vacant Lot)	412512.62	4712389
217	Potential Receptor (Vacant Lot)	413674.8	4712612
218	Potential Receptor (Vacant Lot)	413248.32	4712377
219	Potential Receptor (Vacant Lot)	413479.26	4712450
220	Potential Receptor (Vacant Lot)	414345.62	4713223
221	Potential Receptor (Vacant Lot)	415630.3	4713977
222	Potential Receptor (Vacant Lot)	416832.98	4713872
223	Potential Receptor (Vacant Lot)	417003.42	4713877
224	Potential Receptor (Vacant Lot)	417291.48	4713325
225	Potential Receptor (Vacant Lot)	418023.65	4712880
226	Potential Receptor (Vacant Lot)	418018.84	4712688
227	Potential Receptor (Vacant Lot)	417882.01	4711188
228	Potential Receptor (Vacant Lot)	418129.27	4711435
229	Potential Receptor (Vacant Lot)	418215.69	4711527
230	Potential Receptor (Vacant Lot)	415421.48	4707903
231	Potential Receptor (Vacant Lot)	415224.29	4707844
232	Potential Receptor (Vacant Lot)	415043.18	4707776
233	Potential Receptor (Vacant Lot)	414907.08	4707722
234	Potential Receptor (Vacant Lot)	414271.22	4707418
235	Potential Receptor (Vacant Lot)	412223.23	4707796
236	Potential Receptor (Vacant Lot)	411364.4	4708694
237	Potential Receptor (Vacant Lot)	411310.85	4708751
238	Potential Receptor (Vacant Lot)	410748.5	4708831
239	Potential Receptor (Vacant Lot)	410707.1	4709928
240	Potential Receptor (Vacant Lot)	410825.66	4710041
241	Potential Receptor (Vacant Lot)	411010.09	4710229
242	Potential Receptor (Vacant Lot)	411121.12	4710312
243	Potential Receptor (Vacant Lot)	411324.37	4710511
244	Potential Receptor (Vacant Lot)	411544.59	4710841
245	Potential Receptor (Vacant Lot)	411663.85	4710798
246	Potential Receptor (Vacant Lot)	411783.12	4710914
247	Potential Receptor (Vacant Lot)	412996.19	4711989
248	Potential Receptor (Vacant Lot)	412752.56	4711776
249	Potential Receptor (Vacant Lot)	412537.88	4711577

Point of Reception ID	Description	UTM Coordinates	
		X	Y
250	Potential Receptor (Vacant Lot)	411962.01	4711211
251	Potential Receptor (Vacant Lot)	411982.46	4711098
252	Potential Receptor (Vacant Lot)	411472.4	4708785
253	Potential Receptor (Vacant Lot)	411558.38	4708857
254	Potential Receptor (Vacant Lot)	411744	4709135
255	Potential Receptor (Vacant Lot)	411988.17	4709250
256	Potential Receptor (Vacant Lot)	412306.8	4707873
257	Potential Receptor (Vacant Lot)	412498.07	4709965
258	Potential Receptor (Vacant Lot)	412911.86	4710228
259	Potential Receptor (Vacant Lot)	414103.3	4711292
260	Potential Receptor (Vacant Lot)	414341.06	4711376
261	Potential Receptor (Vacant Lot)	414567.71	4711568
262	Potential Receptor (Vacant Lot)	415103.04	4712068
263	Potential Receptor (Vacant Lot)	415745.94	4713418
264	Potential Receptor (Vacant Lot)	416454.83	4713293
265	Potential Receptor (Vacant Lot)	417382.5	4712267
266	Potential Receptor (Vacant Lot)	417469.28	4712349
267	Potential Receptor (Vacant Lot)	417618.12	4712152
268	Potential Receptor (Vacant Lot)	416923.65	4711865
269	Potential Receptor (Vacant Lot)	417585.27	4710980
270	Potential Receptor (Vacant Lot)	416981.15	4711797
271	Potential Receptor (Vacant Lot)	416757.87	4711576
272	Potential Receptor (Vacant Lot)	416565.93	4710278
273	Potential Receptor (Vacant Lot)	416128.76	4709981
274	Potential Receptor (Vacant Lot)	416432.66	4710203
275	Potential Receptor (Vacant Lot)	416725.6	4710219
276	Potential Receptor (Vacant Lot)	416416.23	4710000
277	Potential Receptor (Vacant Lot)	417133.53	4710520
278	Potential Receptor (Vacant Lot)	414855.69	4709461
279	Potential Receptor (Vacant Lot)	414943.3	4709340
280	Potential Receptor (Vacant Lot)	414466.92	4709176
281	Potential Receptor (Vacant Lot)	413886.51	4708812
282	Potential Receptor (Vacant Lot)	413796.16	4708757
283	Potential Receptor (Vacant Lot)	414231.47	4709222
284	Potential Receptor (Vacant Lot)	413868.08	4708935
285	Potential Receptor (Vacant Lot)	413739.86	4708836

Point of Reception ID	Description	UTM Coordinates	
		X	Y
286	Potential Receptor (Vacant Lot)	413593.54	4708740
287	Potential Receptor (Vacant Lot)	413281.46	4708393
288	Potential Receptor (Vacant Lot)	413096.26	4708405
289	Potential Receptor (Vacant Lot)	412983.04	4708196
290	Potential Receptor (Vacant Lot)	412892.69	4708292
291	Potential Receptor (Vacant Lot)	414737.18	4709893
292	Potential Receptor (Vacant Lot)	415060.06	4710181

Table 4.2 Participating Receptor Locations

Point of Reception ID	Description	UTM Coordinates	
		X	Y
19	Dwelling (Participating)	413972.0	4710708

5. Noise Impact Assessment

5.1 Distance Requirement

Several receptors are within 1500 m of a wind turbine. In addition, noise from the wind turbine is in excess of 102 dBA. Per the requirements of MOE 2008 and Ontario Regulation 359-09, a "detailed noise impact assessment" was carried out for all receptors identified within the project area.

5.2 Impact of Adjacent Planned and Approved Wind Farms

The Kent Breeze Wind Farm and Macleod Windmill project represent two adjacent "planned" wind farms. They are assessed together. There are no other planned or approved wind farms within 5 km of the project area.

5.3 Assessment of Participating Receptors

Noise impact on the one "participating" receptor is calculated and presented in this report.

5.4 Prediction Method

Predictions of the total sound power level at a point of reception were carried out using CADNA-A software (version 4.0.135) which is based on the methods described in standard ISO 9613-2.

A sample calculation for a source to receiver pair is included in Appendix E.

5.5 Adjustment for Special Quality of Sound

Adjustment due to tonal nature of sound is not required based on the data provided by GE (which is based on IEC 61400-14 Declaration of Apparent Sound Power Level and Tonality Values).

5.6 Specific Parameters

5.6.1 Integer Wind Speed Values

Calculations were carried out for integer wind speed of 6 m/s (at 10-m height) for the summer night-time scenario (the Adjusted Emission Levels in Table 3.1). At 6 m/s and higher, each turbine is emitting its maximum noise and therefore the noise emissions for 7 to 10 m/s (at 10-m height) are the same as the 6-m/s case.

5.6.2 Atmospheric Absorption

Atmospheric absorption coefficients used by CADNA-A conform to ISO 9613-2 and are those listed in MOE 2008 Table 2 (which are based on 10°C and 70% relative humidity).

5.6.3 Ground Attenuation

A global value of 0.7 for ground attenuation was used.

6. Results and Compliance

6.1 Presentation of Results

Noise impacts at each "Point of Reception" are provided in Tables 6.1 and 6.2.

A map showing noise contours is included in Appendix D (one map, for the 6-m/s, summer night-time case, applicable for all integer values of wind speeds at 10-m height from 6 to10 m/s).

6.2 Compliance

Compliance to the requirements of MOE 2008, Table 1 (40.0 dBA or less at 6 m/s 10-m height) is met for all points of reception. Maximum noise at an existing dwelling that is non-participating is 40.0 dBA (receptor 211). Maximum noise at a receptor placed on a vacant lot is 40.0 dBA (number 259).

Noise impacts at higher wind speeds (7 to 10 m/s at 10-m height) are the same as the 6 m/s case and are all compliant with MOE 2008.

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
1	Dwelling	4.5	620	Macleod-4	39.8	40.0	43.0	45.0	49.0	51
2	Dwelling	4.5	649	Macleod-4	39.5	40.0	43.0	45.0	49.0	51
3	Dwelling	4.5	673	Macleod-4	39.3	40.0	43.0	45.0	49.0	51
4	Dwelling	4.5	702	Macleod-4	39.0	40.0	43.0	45.0	49.0	51
5	Dwelling	4.5	890	Macleod-5	36.6	40.0	43.0	45.0	49.0	51
6	Dwelling	4.5	957	Macleod-5	36.2	40.0	43.0	45.0	49.0	51
7	Dwelling	4.5	962	Macleod-5	36.1	40.0	43.0	45.0	49.0	51
8	Dwelling	4.5	923	Macleod-5	37.1	40.0	43.0	45.0	49.0	51
9	Dwelling	4.5	879	Macleod-5	36.8	40.0	43.0	45.0	49.0	51
10	Dwelling	4.5	734	Macleod-5	36.6	40.0	43.0	45.0	49.0	51
11	Dwelling	4.5	581	Macleod-5	38.7	40.0	43.0	45.0	49.0	51
12	Dwelling	4.5	580	Macleod-5	39.1	40.0	43.0	45.0	49.0	51
13	Dwelling	4.5	698	Macleod-5	38.1	40.0	43.0	45.0	49.0	51
14	Dwelling	4.5	777	Macleod-5	37.3	40.0	43.0	45.0	49.0	51
15	Dwelling	4.5	695	Macleod-5	37.9	40.0	43.0	45.0	49.0	51
16	Dwelling	4.5	623	Macleod-5	38.7	40.0	43.0	45.0	49.0	51
17	Dwelling	4.5	762	Macleod-5	36.9	40.0	43.0	45.0	49.0	51
18	Dwelling	4.5	721	Macleod-5	37.2	40.0	43.0	45.0	49.0	51
20	Dwelling	4.5	850	Kent-1	39.5	40.0	43.0	45.0	49.0	51
21	Dwelling	4.5	635	Kent-3	39.2	40.0	43.0	45.0	49.0	51
22	Dwelling	4.5	939	Kent-4	37.0	40.0	43.0	45.0	49.0	51
23	Dwelling	4.5	961	Kent-4	37.3	40.0	43.0	45.0	49.0	51
24	Dwelling	4.5	1083	Macleod-3	36.4	40.0	43.0	45.0	49.0	51
25	Dwelling	4.5	1052	Macleod-3	36.4	40.0	43.0	45.0	49.0	51
26	Dwelling	4.5	1213	Macleod-3	33.9	40.0	43.0	45.0	49.0	51
27	Dwelling	4.5	1145	Macleod-3	33.7	40.0	43.0	45.0	49.0	51
28	Dwelling	4.5	676	Macleod-3	38.1	40.0	43.0	45.0	49.0	51
29	Dwelling	4.5	777	Macleod-3	37.0	40.0	43.0	45.0	49.0	51

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
30	Dwelling	4.5	1060	Macleod-3	35.0	40.0	43.0	45.0	49.0	51
31	Dwelling	4.5	1028	Macleod-3	35.2	40.0	43.0	45.0	49.0	51
32	Dwelling	4.5	956	Macleod-3	35.4	40.0	43.0	45.0	49.0	51
33	Dwelling	4.5	1188	Macleod-3	34.3	40.0	43.0	45.0	49.0	51
34	Dwelling	4.5	1165	Macleod-3	34.2	40.0	43.0	45.0	49.0	51
35	Dwelling	4.5	1238	Macleod-3	33.7	40.0	43.0	45.0	49.0	51
36	Dwelling	4.5	1337	Macleod-3	33.5	40.0	43.0	45.0	49.0	51
37	Dwelling	4.5	1634	Macleod-4	31.8	40.0	43.0	45.0	49.0	51
38	Dwelling	4.5	1593	Macleod-3	32.1	40.0	43.0	45.0	49.0	51
39	Dwelling	4.5	1613	Macleod-4	32.0	40.0	43.0	45.0	49.0	51
40	Dwelling	4.5	1992	Kent-3	27.4	40.0	43.0	45.0	49.0	51
41	Dwelling	4.5	2006	Kent-3	27.4	40.0	43.0	45.0	49.0	51
42	Dwelling	4.5	2010	Kent-3	27.4	40.0	43.0	45.0	49.0	51
43	Dwelling	4.5	2024	Kent-3	27.3	40.0	43.0	45.0	49.0	51
44	Dwelling	4.5	2062	Kent-3	27.2	40.0	43.0	45.0	49.0	51
45	Dwelling	4.5	2320	Kent-3	26.2	40.0	43.0	45.0	49.0	51
46	Dwelling	4.5	2685	Kent-3	25.0	40.0	43.0	45.0	49.0	51
47	Dwelling	4.5	3287	Kent-1	24.0	40.0	43.0	45.0	49.0	51
48	Dwelling	4.5	2230	Kent-1	26.2	40.0	43.0	45.0	49.0	51
49	Dwelling	4.5	2215	Kent-1	26.6	40.0	43.0	45.0	49.0	51
50	Dwelling	4.5	948	Kent-1	34.9	40.0	43.0	45.0	49.0	51
51	Dwelling	4.5	1106	Kent-1	33.8	40.0	43.0	45.0	49.0	51
52	Dwelling	4.5	1411	Kent-1	32.3	40.0	43.0	45.0	49.0	51
53	Dwelling	4.5	1558	Kent-1	31.6	40.0	43.0	45.0	49.0	51
54	Dwelling	4.5	1718	Kent-1	31.3	40.0	43.0	45.0	49.0	51
55	Dwelling	4.5	1771	Kent-1	31.1	40.0	43.0	45.0	49.0	51.0
56	Dwelling	4.5	1898	Kent-3	29.8	40.0	43.0	45.0	49.0	51.0
57	Dwelling	4.5	2033	Kent-3	28.7	40.0	43.0	45.0	49.0	51.0

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
58	Dwelling	4.5	1423	Kent-3	30.8	40.0	43.0	45.0	49.0	51.0
59	Dwelling	4.5	1112	Kent-3	33.0	40.0	43.0	45.0	49.0	51.0
60	Dwelling	4.5	1125	Kent-1	33.8	40.0	43.0	45.0	49.0	51.0
61	Dwelling	4.5	1553	Kent-1	31.8	40.0	43.0	45.0	49.0	51.0
62	Dwelling	4.5	1661	Kent-1	31.4	40.0	43.0	45.0	49.0	51.0
63	Dwelling	4.5	1797	Kent-1	31.1	40.0	43.0	45.0	49.0	51.0
64	Dwelling	4.5	1915	Kent-1	30.8	40.0	43.0	45.0	49.0	51.0
65	Dwelling	4.5	1922	Kent-1	31.0	40.0	43.0	45.0	49.0	51.0
66	Dwelling	4.5	2115	Macleod-5	30.4	40.0	43.0	45.0	49.0	51.0
67	Dwelling	4.5	2069	Macleod-5	30.6	40.0	43.0	45.0	49.0	51.0
68	Dwelling	4.5	1996	Macleod-5	29.4	40.0	43.0	45.0	49.0	51.0
69	Dwelling	4.5	1827	Macleod-5	29.9	40.0	43.0	45.0	49.0	51.0
70	Dwelling	4.5	2434	Kent-1	27.9	40.0	43.0	45.0	49.0	51.0
71	Dwelling	4.5	2442	Kent-1	27.5	40.0	43.0	45.0	49.0	51.0
72	Dwelling	4.5	2470	Kent-1	27.1	40.0	43.0	45.0	49.0	51.0
73	Dwelling	4.5	2468	Kent-1	27.2	40.0	43.0	45.0	49.0	51.0
74	Dwelling	4.5	2417	Kent-1	27.1	40.0	43.0	45.0	49.0	51.0
75	Dwelling	4.5	2293	Kent-1	27.3	40.0	43.0	45.0	49.0	51.0
76	Dwelling	4.5	656	Macleod-1	39.9	40.0	43.0	45.0	49.0	51.0
77	Dwelling	4.5	901	Macleod-1	37.9	40.0	43.0	45.0	49.0	51.0
78	Dwelling	4.5	1047	Macleod-1	37.1	40.0	43.0	45.0	49.0	51.0
79	Dwelling	4.5	1068	Macleod-1	37.2	40.0	43.0	45.0	49.0	51.0
80	Dwelling	4.5	1136	Macleod-1	36.8	40.0	43.0	45.0	49.0	51.0
81	Dwelling	4.5	1071	Macleod-5	37.0	40.0	43.0	45.0	49.0	51.0
82	Dwelling	4.5	946	Macleod-5	36.8	40.0	43.0	45.0	49.0	51.0
83	Dwelling	4.5	951	Macleod-5	37.0	40.0	43.0	45.0	49.0	51.0
84	Dwelling	4.5	739	Macleod-5	38.0	40.0	43.0	45.0	49.0	51.0
85	Dwelling	4.5	741	Macleod-5	37.5	40.0	43.0	45.0	49.0	51.0

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
86	Dwelling	4.5	1021	Macleod-5	33.5	40.0	43.0	45.0	49.0	51.0
87	Dwelling	4.5	1272	Macleod-5	31.6	40.0	43.0	45.0	49.0	51.0
88	Dwelling	4.5	1344	Macleod-5	31.1	40.0	43.0	45.0	49.0	51.0
89	Dwelling	4.5	1398	Macleod-5	30.7	40.0	43.0	45.0	49.0	51.0
90	Dwelling	4.5	1729	Macleod-5	30.1	40.0	43.0	45.0	49.0	51.0
91	Dwelling	4.5	1849	Macleod-5	28.1	40.0	43.0	45.0	49.0	51.0
92	Dwelling	4.5	2195	Macleod-5	26.4	40.0	43.0	45.0	49.0	51.0
93	Dwelling	4.5	2306	Macleod-5	26.0	40.0	43.0	45.0	49.0	51.0
94	Dwelling	4.5	2450	Macleod-5	25.6	40.0	43.0	45.0	49.0	51.0
95	Dwelling	4.5	2459	Macleod-5	25.5	40.0	43.0	45.0	49.0	51.0
96	Dwelling	4.5	2471	Macleod-5	25.2	40.0	43.0	45.0	49.0	51.0
97	Dwelling	4.5	2480	Macleod-5	25.2	40.0	43.0	45.0	49.0	51.0
98	Dwelling	4.5	2489	Macleod-5	25.2	40.0	43.0	45.0	49.0	51.0
99	Dwelling	4.5	2503	Macleod-5	25.1	40.0	43.0	45.0	49.0	51.0
100	Dwelling	4.5	2516	Macleod-5	25.1	40.0	43.0	45.0	49.0	51.0
101	Dwelling	4.5	2524	Macleod-5	25.1	40.0	43.0	45.0	49.0	51.0
102	Dwelling	4.5	2542	Macleod-5	25.0	40.0	43.0	45.0	49.0	51.0
103	Dwelling	4.5	2554	Macleod-5	25.0	40.0	43.0	45.0	49.0	51.0
104	Dwelling	4.5	2594	Macleod-5	24.9	40.0	43.0	45.0	49.0	51.0
105	Dwelling	4.5	2706	Macleod-5	24.6	40.0	43.0	45.0	49.0	51.0
106	Dwelling	4.5	3019	Macleod-5	23.7	40.0	43.0	45.0	49.0	51.0
107	Dwelling	4.5	3050	Macleod-5	23.6	40.0	43.0	45.0	49.0	51.0
108	Dwelling	4.5	3239	Macleod-5	22.6	40.0	43.0	45.0	49.0	51.0
109	Dwelling	4.5	2864	Macleod-5	25.1	40.0	43.0	45.0	49.0	51.0
110	Dwelling	4.5	2778	Macleod-5	25.5	40.0	43.0	45.0	49.0	51.0
111	Dwelling	4.5	2745	Macleod-5	25.6	40.0	43.0	45.0	49.0	51.0
112	Dwelling	4.5	2734	Macleod-5	25.7	40.0	43.0	45.0	49.0	51.0
113	Dwelling	4.5	2664	Macleod-5	26.0	40.0	43.0	45.0	49.0	51.0

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
114	Dwelling	4.5	2677	Macleod-5	26.0	40.0	43.0	45.0	49.0	51.0
115	Dwelling	4.5	2808	Macleod-5	25.5	40.0	43.0	45.0	49.0	51.0
116	Dwelling	4.5	2635	Macleod-5	26.3	40.0	43.0	45.0	49.0	51.0
117	Dwelling	4.5	2516	Macleod-5	26.9	40.0	43.0	45.0	49.0	51.0
118	Dwelling	4.5	2429	Macleod-5	27.2	40.0	43.0	45.0	49.0	51.0
119	Dwelling	4.5	2458	Macleod-5	27.1	40.0	43.0	45.0	49.0	51.0
120	Dwelling	4.5	2471	Macleod-5	27.1	40.0	43.0	45.0	49.0	51.0
121	Dwelling	4.5	2487	Macleod-5	27.0	40.0	43.0	45.0	49.0	51.0
122	Dwelling	4.5	2496	Macleod-5	27.0	40.0	43.0	45.0	49.0	51.0
123	Dwelling	4.5	2461	Macleod-5	27.3	40.0	43.0	45.0	49.0	51.0
124	Dwelling	4.5	2403	Macleod-5	27.7	40.0	43.0	45.0	49.0	51.0
125	Dwelling	4.5	2374	Macleod-5	27.9	40.0	43.0	45.0	49.0	51.0
126	Dwelling	4.5	2467	Macleod-4	27.3	40.0	43.0	45.0	49.0	51.0
127	Dwelling	4.5	2425	Macleod-4	27.7	40.0	43.0	45.0	49.0	51.0
128	Dwelling	4.5	2343	Macleod-4	28.1	40.0	43.0	45.0	49.0	51.0
129	Dwelling	4.5	2295	Macleod-4	28.3	40.0	43.0	45.0	49.0	51.0
130	Dwelling	4.5	2248	Macleod-4	28.5	40.0	43.0	45.0	49.0	51.0
131	Dwelling	4.5	2193	Macleod-4	28.7	40.0	43.0	45.0	49.0	51.0
132	Dwelling	4.5	2166	Macleod-4	28.9	40.0	43.0	45.0	49.0	51.0
133	Dwelling	4.5	2095	Macleod-4	29.2	40.0	43.0	45.0	49.0	51.0
134	Dwelling	4.5	2001	Macleod-4	29.7	40.0	43.0	45.0	49.0	51.0
135	Dwelling	4.5	2023	Macleod-4	29.6	40.0	43.0	45.0	49.0	51.0
136	Dwelling	4.5	1961	Macleod-4	29.9	40.0	43.0	45.0	49.0	51.0
137	Dwelling	4.5	2039	Macleod-4	29.5	40.0	43.0	45.0	49.0	51.0
138	Dwelling	4.5	1900	Macleod-4	30.2	40.0	43.0	45.0	49.0	51.0
139	Dwelling	4.5	2028	Macleod-4	29.5	40.0	43.0	45.0	49.0	51.0
140	Dwelling	4.5	1962	Macleod-4	29.9	40.0	43.0	45.0	49.0	51.0
141	Dwelling	4.5	1930	Macleod-4	30.0	40.0	43.0	45.0	49.0	51.0

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
142	Dwelling	4.5	1870	Macleod-4	30.4	40.0	43.0	45.0	49.0	51.0
143	Dwelling	4.5	1813	Macleod-4	30.6	40.0	43.0	45.0	49.0	51.0
144	Dwelling	4.5	1789	Macleod-4	30.8	40.0	43.0	45.0	49.0	51.0
145	Dwelling	4.5	1861	Macleod-4	30.4	40.0	43.0	45.0	49.0	51.0
146	Dwelling	4.5	1811	Macleod-4	30.7	40.0	43.0	45.0	49.0	51.0
147	Dwelling	4.5	1755	Macleod-4	31.1	40.0	43.0	45.0	49.0	51.0
148	Dwelling	4.5	1798	Macleod-4	30.8	40.0	43.0	45.0	49.0	51.0
149	Dwelling	4.5	1702	Macleod-4	31.3	40.0	43.0	45.0	49.0	51.0
150	Dwelling	4.5	1469	Macleod-3	32.9	40.0	43.0	45.0	49.0	51.0
151	Dwelling	4.5	1529	Macleod-4	32.5	40.0	43.0	45.0	49.0	51.0
152	Dwelling	4.5	2833	Macleod-4	25.9	40.0	43.0	45.0	49.0	51.0
153	Dwelling	4.5	2513	Macleod-3	27.1	40.0	43.0	45.0	49.0	51.0
154	Dwelling	4.5	2467	Macleod-3	27.5	40.0	43.0	45.0	49.0	51.0
155	Dwelling	4.5	2454	Macleod-3	27.4	40.0	43.0	45.0	49.0	51.0
156	Dwelling	4.5	2322	Macleod-3	27.9	40.0	43.0	45.0	49.0	51.0
157	Dwelling	4.5	2269	Macleod-3	28.0	40.0	43.0	45.0	49.0	51.0
158	Dwelling	4.5	2157	Macleod-3	28.0	40.0	43.0	45.0	49.0	51.0
159	Dwelling	4.5	2386	Macleod-3	28.5	40.0	43.0	45.0	49.0	51.0
160	Dwelling	4.5	2141	Kent-4	29.2	40.0	43.0	45.0	49.0	51.0
161	Dwelling	4.5	2148	Kent-3	26.3	40.0	43.0	45.0	49.0	51.0
162	Dwelling	4.5	2201	Kent-3	26.7	40.0	43.0	45.0	49.0	51.0
163	Dwelling	4.5	2063	Kent-3	25.9	40.0	43.0	45.0	49.0	51.0
164	Dwelling	4.5	2058	Kent-3	27.4	40.0	43.0	45.0	49.0	51.0
165	Dwelling	4.5	2034	Kent-3	27.5	40.0	43.0	45.0	49.0	51.0
166	Dwelling	4.5	2019	Kent-3	27.6	40.0	43.0	45.0	49.0	51.0
167	Dwelling	4.5	1995	Kent-3	27.7	40.0	43.0	45.0	49.0	51.0
168	Dwelling	4.5	1936	Kent-3	28.0	40.0	43.0	45.0	49.0	51.0
169	Dwelling	4.5	1890	Kent-3	28.2	40.0	43.0	45.0	49.0	51.0

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
170	Dwelling	4.5	1688	Kent-3	29.5	40.0	43.0	45.0	49.0	51.0
171	Dwelling	4.5	1638	Kent-3	29.7	40.0	43.0	45.0	49.0	51.0
172	Dwelling	4.5	1585	Kent-3	30.1	40.0	43.0	45.0	49.0	51.0
173	Dwelling	4.5	1536	Kent-3	30.4	40.0	43.0	45.0	49.0	51.0
174	Dwelling	4.5	1404	Kent-3	31.3	40.0	43.0	45.0	49.0	51.0
175	Dwelling	4.5	1518	Kent-3	30.6	40.0	43.0	45.0	49.0	51.0
176	Dwelling	4.5	1038	Kent-3	35.7	40.0	43.0	45.0	49.0	51.0
177	Dwelling	4.5	945	Kent-4	36.5	40.0	43.0	45.0	49.0	51.0
178	Dwelling	4.5	897	Kent-4	36.7	40.0	43.0	45.0	49.0	51.0
179	Dwelling	4.5	794	Kent-4	37.5	40.0	43.0	45.0	49.0	51.0
180	Dwelling	4.5	1096	Kent-4	36.6	40.0	43.0	45.0	49.0	51.0
181	Dwelling	4.5	1122	Macleod-3	35.8	40.0	43.0	45.0	49.0	51.0
182	Dwelling	4.5	1525	Macleod-3	33.6	40.0	43.0	45.0	49.0	51.0
183	Dwelling	4.5	1001	Kent-3	34.8	40.0	43.0	45.0	49.0	51.0
184	Dwelling	4.5	1478	Kent-3	30.7	40.0	43.0	45.0	49.0	51.0
185	Dwelling	4.5	1758	Kent-3	28.9	40.0	43.0	45.0	49.0	51.0
186	Dwelling	4.5	1884	Kent-3	28.2	40.0	43.0	45.0	49.0	51.0
187	Dwelling	4.5	1914	Kent-3	28.1	40.0	43.0	45.0	49.0	51.0
188	Dwelling	4.5	1963	Kent-3	27.8	40.0	43.0	45.0	49.0	51.0
189	Dwelling	4.5	1998	Kent-3	27.6	40.0	43.0	45.0	49.0	51.0
190	Dwelling	4.5	2009	Kent-3	27.6	40.0	43.0	45.0	49.0	51.0
191	Dwelling	4.5	2017	Kent-3	27.5	40.0	43.0	45.0	49.0	51.0
192	Dwelling	4.5	1976	Kent-3	27.7	40.0	43.0	45.0	49.0	51.0
193	Dwelling	4.5	1945	Kent-3	27.8	40.0	43.0	45.0	49.0	51.0
194	Dwelling	4.5	2160	Kent-3	26.8	40.0	43.0	45.0	49.0	51.0
195	Dwelling	4.5	1628	Macleod-5	30.1	40.0	43.0	45.0	49.0	51.0
196	Dwelling	4.5	1474	Macleod-5	30.7	40.0	43.0	45.0	49.0	51.0
197	Dwelling	4.5	1497	Macleod-5	30.1	40.0	43.0	45.0	49.0	51.0

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
198	Dwelling	4.5	1391	Macleod-5	30.8	40.0	43.0	45.0	49.0	51.0
199	Dwelling	4.5	1732	Macleod-5	29.4	40.0	43.0	45.0	49.0	51.0
200	Dwelling	4.5	1643	Macleod-5	29.9	40.0	43.0	45.0	49.0	51.0
201	Dwelling	4.5	1622	Macleod-5	30.1	40.0	43.0	45.0	49.0	51.0
202	Dwelling	4.5	1574	Macleod-5	30.4	40.0	43.0	45.0	49.0	51.0
203	Dwelling	4.5	1591	Macleod-5	30.4	40.0	43.0	45.0	49.0	51.0
204	Dwelling	4.5	1349	Macleod-5	31.9	40.0	43.0	45.0	49.0	51.0
205	Dwelling	4.5	1299	Macleod-5	32.2	40.0	43.0	45.0	49.0	51.0
206	Dwelling	4.5	1259	Macleod-5	32.5	40.0	43.0	45.0	49.0	51.0
207	Dwelling	4.5	1113	Macleod-5	33.9	40.0	43.0	45.0	49.0	51.0
208	Dwelling	4.5	1166	Macleod-5	33.6	40.0	43.0	45.0	49.0	51.0
209	Dwelling	4.5	1115	Macleod-5	34.1	40.0	43.0	45.0	49.0	51.0
210	Dwelling	4.5	1146	Macleod-5	32.7	40.0	43.0	45.0	49.0	51.0
211	Dwelling	4.5	730	Kent-5	40.0	40.0	43.0	45.0	49.0	51.0
212	Dwelling	4.5	782	Kent-5	39.6	40.0	43.0	45.0	49.0	51.0
213	Dwelling	4.5	819	Kent-5	39.3	40.0	43.0	45.0	49.0	51.0
214	Potential Receptor (Vacant Lot)	4.5	1958	Kent-3	30.0	40.0	43.0	45.0	49.0	51.0
215	Potential Receptor (Vacant Lot)	4.5	1429	Kent-1	31.3	40.0	43.0	45.0	49.0	51.0
216	Potential Receptor (Vacant Lot)	4.5	1447	Kent-1	31.2	40.0	43.0	45.0	49.0	51.0
217	Potential Receptor (Vacant Lot)	4.5	1544	Kent-1	32.0	40.0	43.0	45.0	49.0	51.0
218	Potential Receptor (Vacant Lot)	4.5	1245	Kent-1	33.0	40.0	43.0	45.0	49.0	51.0
219	Potential Receptor (Vacant Lot)	4.5	1340	Kent-1	32.8	40.0	43.0	45.0	49.0	51.0
220	Potential Receptor (Vacant Lot)	4.5	1949	Macleod-5	30.2	40.0	43.0	45.0	49.0	51.0
221	Potential Receptor (Vacant Lot)	4.5	1880	Macleod-5	28.3	40.0	43.0	45.0	49.0	51.0
222	Potential Receptor (Vacant Lot)	4.5	1955	Macleod-5	27.5	40.0	43.0	45.0	49.0	51.0
223	Potential Receptor (Vacant Lot)	4.5	2041	Macleod-5	27.1	40.0	43.0	45.0	49.0	51.0
224	Potential Receptor (Vacant Lot)	4.5	1796	Macleod-5	28.4	40.0	43.0	45.0	49.0	51.0
225	Potential Receptor (Vacant Lot)	4.5	2203	Macleod-5	26.6	40.0	43.0	45.0	49.0	51.0

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
226	Potential Receptor (Vacant Lot)	4.5	2140	Macleod-5	27.0	40.0	43.0	45.0	49.0	51.0
227	Potential Receptor (Vacant Lot)	4.5	2113	Macleod-4	29.1	40.0	43.0	45.0	49.0	51.0
228	Potential Receptor (Vacant Lot)	4.5	2283	Macleod-5	28.0	40.0	43.0	45.0	49.0	51.0
229	Potential Receptor (Vacant Lot)	4.5	2340	Macleod-5	27.4	40.0	43.0	45.0	49.0	51.0
230	Potential Receptor (Vacant Lot)	4.5	2463	Kent-4	28.7	40.0	43.0	45.0	49.0	51.0
231	Potential Receptor (Vacant Lot)	4.5	2372	Kent-4	28.9	40.0	43.0	45.0	49.0	51.0
232	Potential Receptor (Vacant Lot)	4.5	2312	Kent-4	28.9	40.0	43.0	45.0	49.0	51.0
233	Potential Receptor (Vacant Lot)	4.5	2280	Kent-4	28.9	40.0	43.0	45.0	49.0	51.0
234	Potential Receptor (Vacant Lot)	4.5	2302	Kent-4	28.4	40.0	43.0	45.0	49.0	51.0
235	Potential Receptor (Vacant Lot)	4.5	1649	Kent-3	29.6	40.0	43.0	45.0	49.0	51.0
236	Potential Receptor (Vacant Lot)	4.5	1567	Kent-3	29.8	40.0	43.0	45.0	49.0	51.0
237	Potential Receptor (Vacant Lot)	4.5	1594	Kent-3	29.7	40.0	43.0	45.0	49.0	51.0
238	Potential Receptor (Vacant Lot)	4.5	2105	Kent-3	27.0	40.0	43.0	45.0	49.0	51.0
239	Potential Receptor (Vacant Lot)	4.5	2163	Kent-3	27.6	40.0	43.0	45.0	49.0	51.0
240	Potential Receptor (Vacant Lot)	4.5	2085	Kent-3	28.1	40.0	43.0	45.0	49.0	51.0
241	Potential Receptor (Vacant Lot)	4.5	1988	Kent-3	29.0	40.0	43.0	45.0	49.0	51.0
242	Potential Receptor (Vacant Lot)	4.5	1930	Kent-3	29.4	40.0	43.0	45.0	49.0	51.0
243	Potential Receptor (Vacant Lot)	4.5	1875	Kent-3	30.3	40.0	43.0	45.0	49.0	51.0
244	Potential Receptor (Vacant Lot)	4.5	1713	Kent-1	31.0	40.0	43.0	45.0	49.0	51.0
245	Potential Receptor (Vacant Lot)	4.5	1604	Kent-1	31.7	40.0	43.0	45.0	49.0	51.0
246	Potential Receptor (Vacant Lot)	4.5	1466	Kent-1	32.1	40.0	43.0	45.0	49.0	51.0
247	Potential Receptor (Vacant Lot)	4.5	889	Kent-1	35.4	40.0	43.0	45.0	49.0	51.0
248	Potential Receptor (Vacant Lot)	4.5	804	Kent-1	36.1	40.0	43.0	45.0	49.0	51.0
249	Potential Receptor (Vacant Lot)	4.5	825	Kent-1	35.9	40.0	43.0	45.0	49.0	51.0
250	Potential Receptor (Vacant Lot)	4.5	1273	Kent-1	32.8	40.0	43.0	45.0	49.0	51.0
251	Potential Receptor (Vacant Lot)	4.5	1251	Kent-1	33.1	40.0	43.0	45.0	49.0	51.0
252	Potential Receptor (Vacant Lot)	4.5	1432	Kent-3	30.7	40.0	43.0	45.0	49.0	51.0
253	Potential Receptor (Vacant Lot)	4.5	1325	Kent-3	31.4	40.0	43.0	45.0	49.0	51.0

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
254	Potential Receptor (Vacant Lot)	4.5	1068	Kent-3	33.4	40.0	43.0	45.0	49.0	51.0
255	Potential Receptor (Vacant Lot)	4.5	809	Kent-3	35.9	40.0	43.0	45.0	49.0	51.0
256	Potential Receptor (Vacant Lot)	4.5	1549	Kent-3	30.2	40.0	43.0	45.0	49.0	51.0
257	Potential Receptor (Vacant Lot)	4.5	692	Kent-3	38.4	40.0	43.0	45.0	49.0	51.0
258	Potential Receptor (Vacant Lot)	4.5	897	Kent-3	39.1	40.0	43.0	45.0	49.0	51.0
259	Potential Receptor (Vacant Lot)	4.5	676	Macleod-1	40.0	40.0	43.0	45.0	49.0	51.0
260	Potential Receptor (Vacant Lot)	4.5	736	Macleod-1	39.0	40.0	43.0	45.0	49.0	51.0
261	Potential Receptor (Vacant Lot)	4.5	966	Macleod-1	37.6	40.0	43.0	45.0	49.0	51.0
262	Potential Receptor (Vacant Lot)	4.5	858	Macleod-5	37.3	40.0	43.0	45.0	49.0	51.0
263	Potential Receptor (Vacant Lot)	4.5	1310	Macleod-5	31.5	40.0	43.0	45.0	49.0	51.0
264	Potential Receptor (Vacant Lot)	4.5	1272	Macleod-5	31.6	40.0	43.0	45.0	49.0	51.0
265	Potential Receptor (Vacant Lot)	4.5	1437	Macleod-5	31.2	40.0	43.0	45.0	49.0	51.0
266	Potential Receptor (Vacant Lot)	4.5	1533	Macleod-5	30.6	40.0	43.0	45.0	49.0	51.0
267	Potential Receptor (Vacant Lot)	4.5	1665	Macleod-5	30.1	40.0	43.0	45.0	49.0	51.0
268	Potential Receptor (Vacant Lot)	4.5	1007	Macleod-5	35.0	40.0	43.0	45.0	49.0	51.0
269	Potential Receptor (Vacant Lot)	4.5	1831	Macleod-4	30.5	40.0	43.0	45.0	49.0	51.0
270	Potential Receptor (Vacant Lot)	4.5	1081	Macleod-5	34.5	40.0	43.0	45.0	49.0	51.0
271	Potential Receptor (Vacant Lot)	4.5	977	Macleod-5	36.2	40.0	43.0	45.0	49.0	51.0
272	Potential Receptor (Vacant Lot)	4.5	923	Macleod-3	35.9	40.0	43.0	45.0	49.0	51.0
273	Potential Receptor (Vacant Lot)	4.5	685	Macleod-3	37.9	40.0	43.0	45.0	49.0	51.0
274	Potential Receptor (Vacant Lot)	4.5	817	Macleod-3	36.7	40.0	43.0	45.0	49.0	51.0
275	Potential Receptor (Vacant Lot)	4.5	1091	Macleod-3	34.5	40.0	43.0	45.0	49.0	51.0
276	Potential Receptor (Vacant Lot)	4.5	893	Macleod-3	35.8	40.0	43.0	45.0	49.0	51.0
277	Potential Receptor (Vacant Lot)	4.5	1467	Macleod-3	32.6	40.0	43.0	45.0	49.0	51.0
278	Potential Receptor (Vacant Lot)	4.5	1168	Kent-5	36.8	40.0	43.0	45.0	49.0	51.0
279	Potential Receptor (Vacant Lot)	4.5	1302	Kent-4	35.9	40.0	43.0	45.0	49.0	51.0
280	Potential Receptor (Vacant Lot)	4.5	919	Kent-4	37.1	40.0	43.0	45.0	49.0	51.0
281	Potential Receptor (Vacant Lot)	4.5	859	Kent-4	36.9	40.0	43.0	45.0	49.0	51.0

Table 6.1 Wind Turbine Noise Impact Summary - Points of Reception - Non-Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to 10 m/s (dBA)	Sound Level Limit (dBA)				
						6 m/s	7 m/s	8 m/s	9 m/s	10 m/s
282	Potential Receptor (Vacant Lot)	4.5	895	Kent-4	36.7	40.0	43.0	45.0	49.0	51.0
283	Potential Receptor (Vacant Lot)	4.5	698	Kent-4	38.8	40.0	43.0	45.0	49.0	51.0
284	Potential Receptor (Vacant Lot)	4.5	735	Kent-4	38.1	40.0	43.0	45.0	49.0	51.0
285	Potential Receptor (Vacant Lot)	4.5	811	Kent-4	37.5	40.0	43.0	45.0	49.0	51.0
286	Potential Receptor (Vacant Lot)	4.5	909	Kent-4	37.0	40.0	43.0	45.0	49.0	51.0
287	Potential Receptor (Vacant Lot)	4.5	1073	Kent-3	34.8	40.0	43.0	45.0	49.0	51.0
288	Potential Receptor (Vacant Lot)	4.5	990	Kent-3	35.0	40.0	43.0	45.0	49.0	51.0
289	Potential Receptor (Vacant Lot)	4.5	1166	Kent-3	33.4	40.0	43.0	45.0	49.0	51.0
290	Potential Receptor (Vacant Lot)	4.5	1060	Kent-3	34.1	40.0	43.0	45.0	49.0	51.0
291	Potential Receptor (Vacant Lot)	4.5	814	Kent-5	39.5	40.0	43.0	45.0	49.0	51.0
292	Potential Receptor (Vacant Lot)	4.5	685	Macleod-3	40.0	40.0	43.0	45.0	49.0	51.0

Table 6.2 Wind Turbine Noise Impact Summary - Participating Receptors

Point of Reception ID	Description	Height (m)	Distance to Nearest Turbine	Nearest Turbine ID	Calculated Sound Level at Selected Wind Speeds 6 to10 m/s (dBA)
19	Dwelling (Participating)	4.5	332	Macleod-1	45.8

7. References

[MOE 2008] Ontario Ministry of Environment, *Noise Guidelines for Wind Farms*, October 2008.

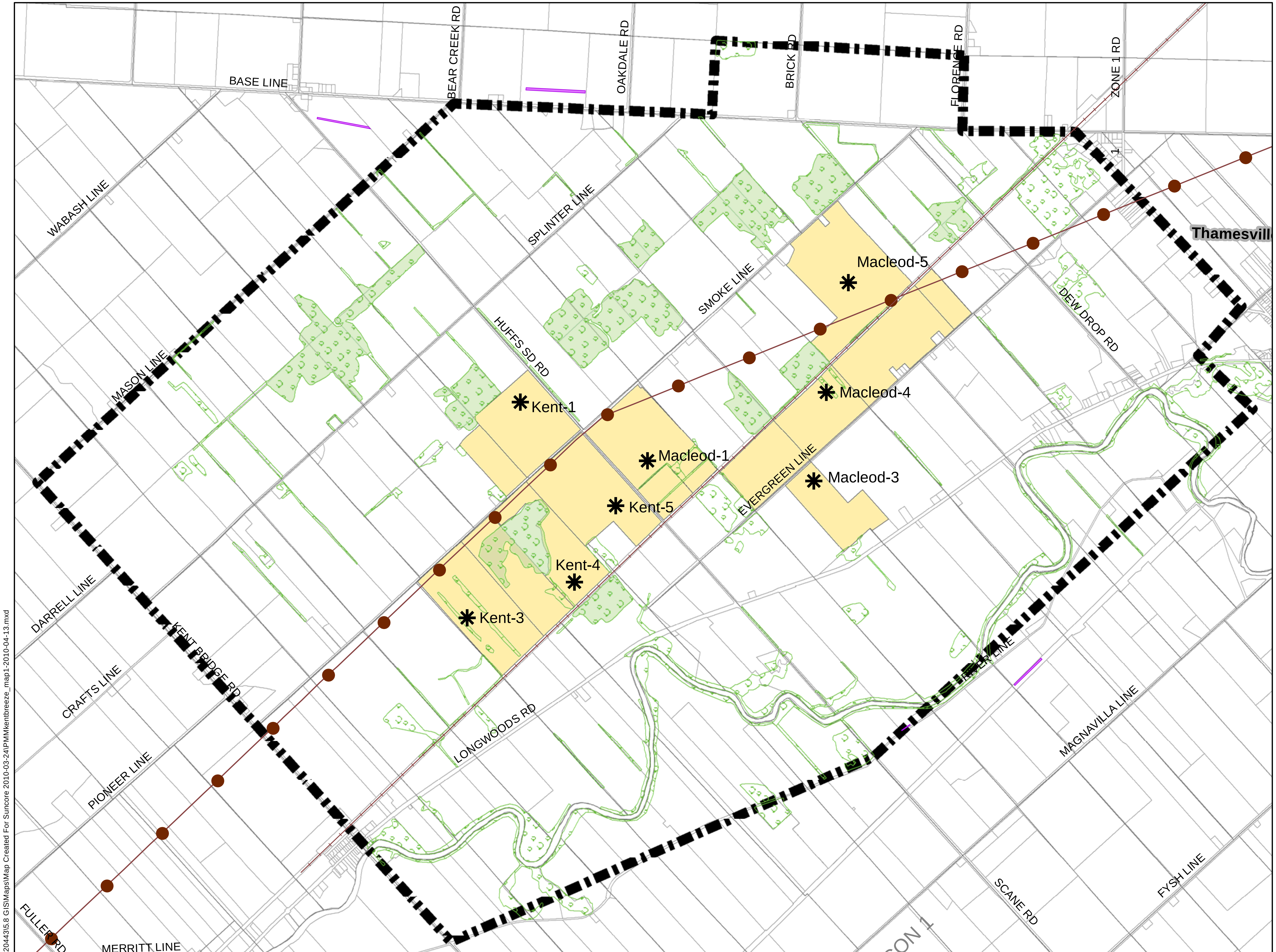
[GE 2009 Sound] GE Energy, Commercial Documentation Wind Turbine Generator Systems GE 2.5xl 60Hz, *Product Acoustic Specifications, Canada Specific, Normal Operation According to IEC61400-11*.

International Organization for Standardization, *ISO 9613-2,* “Acoustics - Attenuation of Sound During Propagation Outdoors - Part 2: General Method of Calculation”, December 15, 1996.

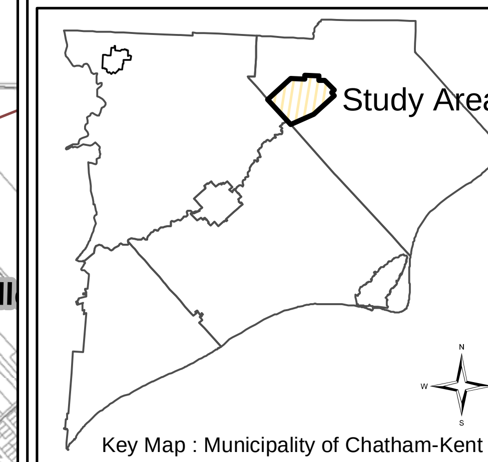
Canadian Standards Association / National Standard of Canada, *CAN/CSA-C61400-11-07*, “Wind Turbine Generator Systems - Part 11: Acoustic Noise Measurement Techniques”, 2007.

Appendix A

Project Layout Maps



Kent Breeze Wind Farms & Macleod Windmill Project Environmental Assessment



Map 1
Project Areas & Study Area

Legend

- Turbine
- Project Area
- Study Area
- Parcel
- Significant Woodlot (As per Official Plan)
- Other Vegitation
- Private Airstrip
- Utility Line
- Railroad

0 0.75 1.5
Kilometres
(11x17 Layout) 1:30,000

April 30, 2010

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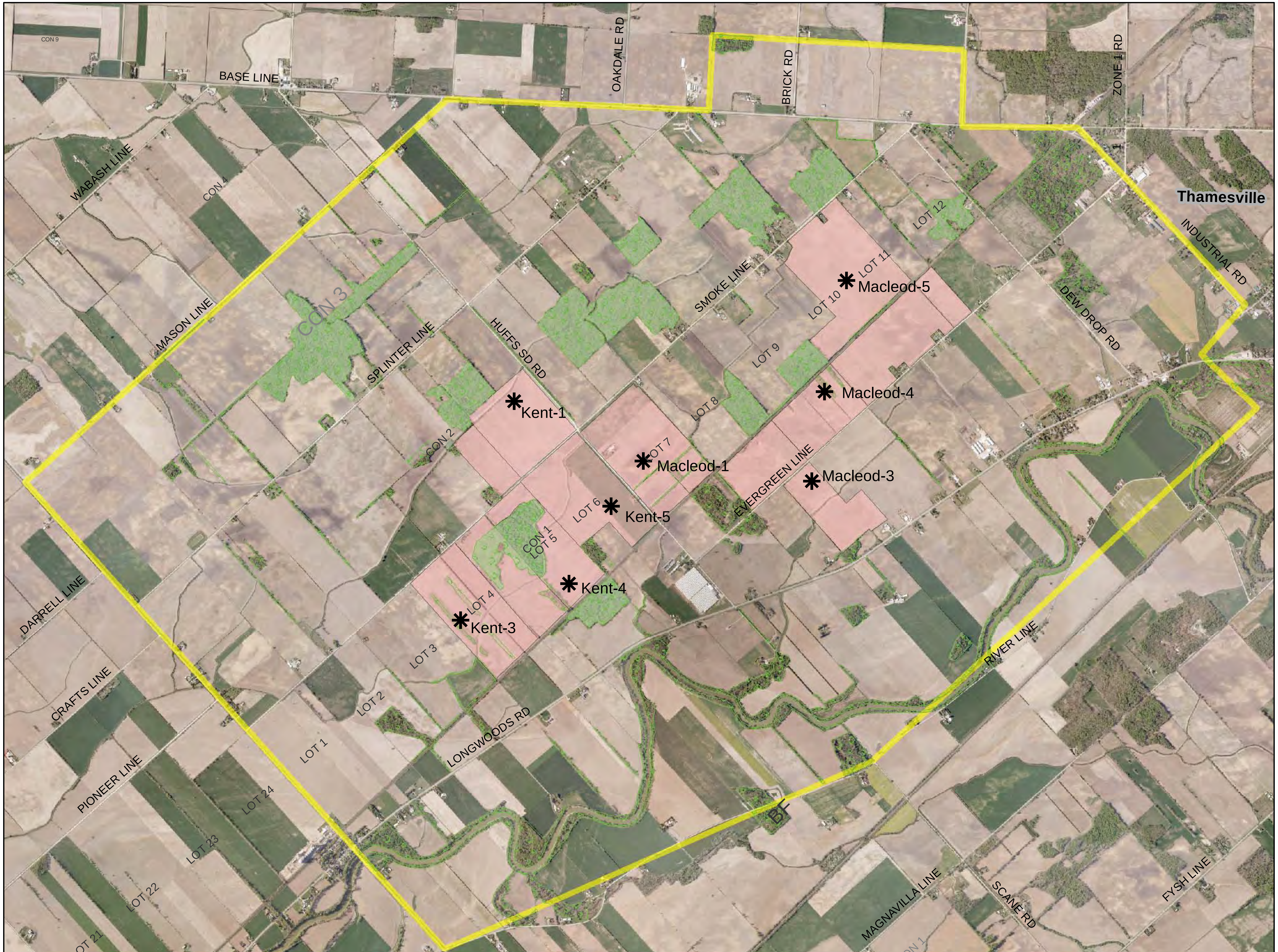
Kent Breeze Wind Farms & Macleod Windmill Project Environmental Assessment

Key Map : Municipality of Chatham-Kent

Study Area

Map 2
Aerial Photo



Legend

- Turbine
- Project Area
- Study Area
- Significant Woodlot (As per Official Plan)
- Other Vegitation

Aerial Photo: Chatham - Kent Ortho 2006

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(11x17 Layout) 1:30,000

April 30, 2010

IBI GROUP

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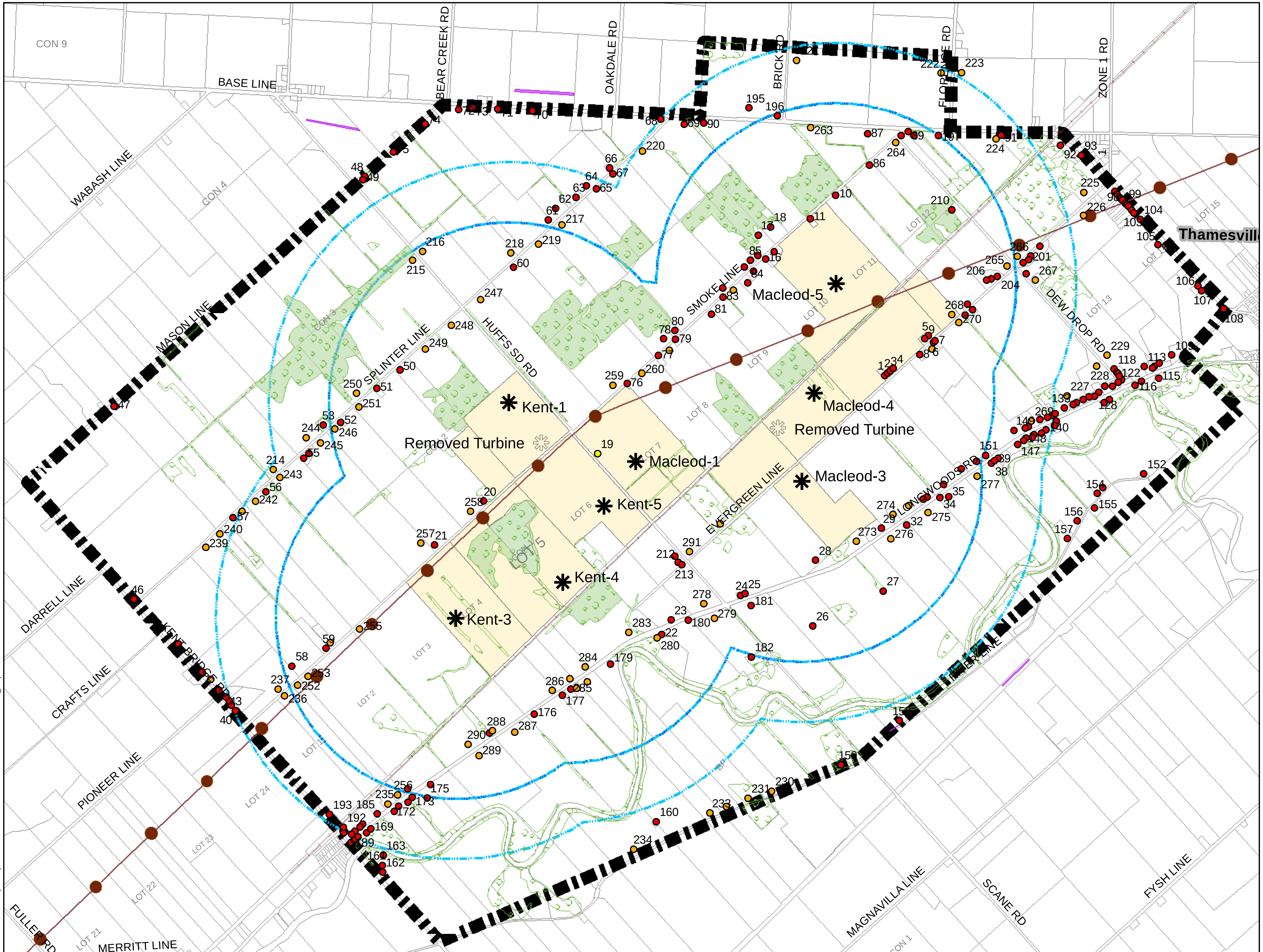
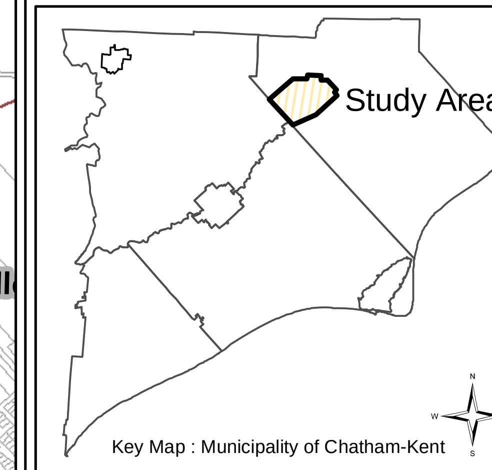


Kent Breeze Wind Farms & Macleod Windmill Project Environmental Assessment



Map 3
Receptor Locations

Legend

- Turbine
- Turbine
- 1.5km Turbine Buffer
- 2km Turbine Buffer
- Points of Reception - Existing Dwelling, Participating
- Points of Reception - Vacant Lot
- Points of Reception - Existing Dwelling, Non Participating
- Project Area
- Study Area
- Parcel
- Private Airstrip
- Significant Woodlot (As per Official Plan)
- Other Vegetation
- Utility Line

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Kilometres
(11x17 Layout) 1:30,000

April 30, 2010

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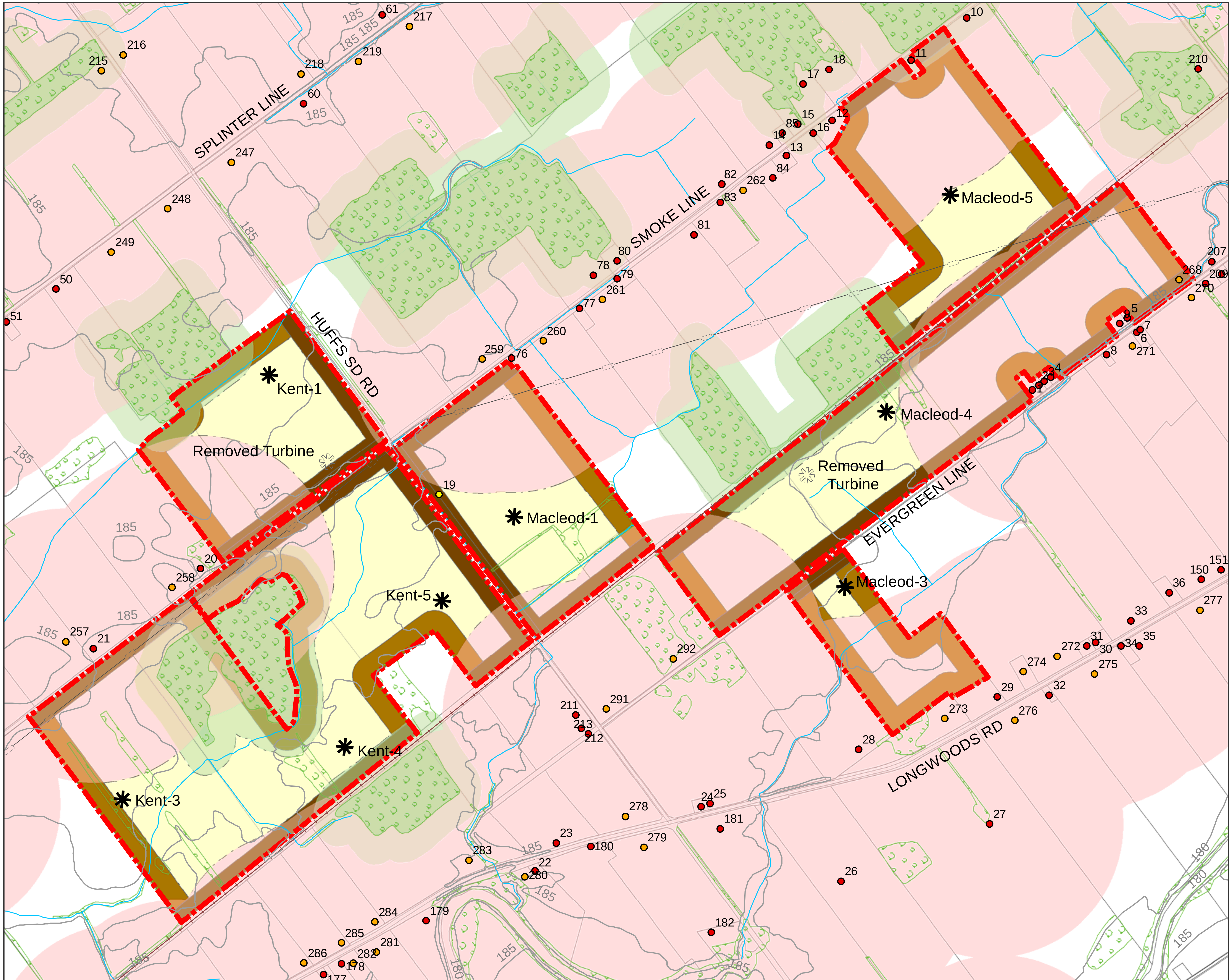
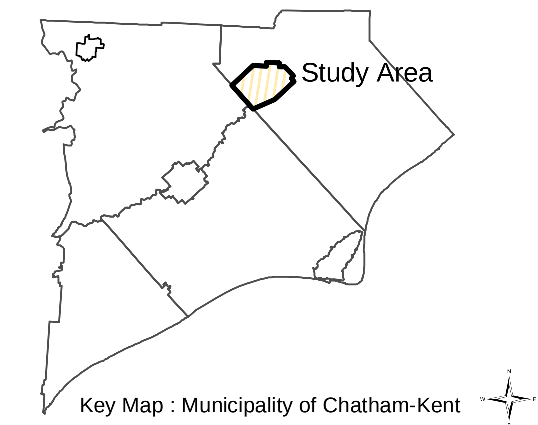


Kent Breeze Wind Farms & Macleod Windmill Project Environmental Assessment



Map 4
Renewable Energy Approval Setbacks

Legend

- Turbine
- Removed Turbine
- Points of Reception - Existing Dwelling, Non Participating
- Points of Reception - Vacant Lot
- Points of Reception - Existing Dwelling, Paticipating
- 85m Lot Line Setback
- 60m Road / Railway Setback
- 550m Off Site Receptor Setback
- Building_Envelope
- Significant Woodlot (As per Official Plan)
- Other Vegetation
- 120m Significant Woodlot Setback
- Project Area
- Utility Line
- Contour Line
- Railroad
- Road
- Watercourse

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Metres
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April 30, 2010

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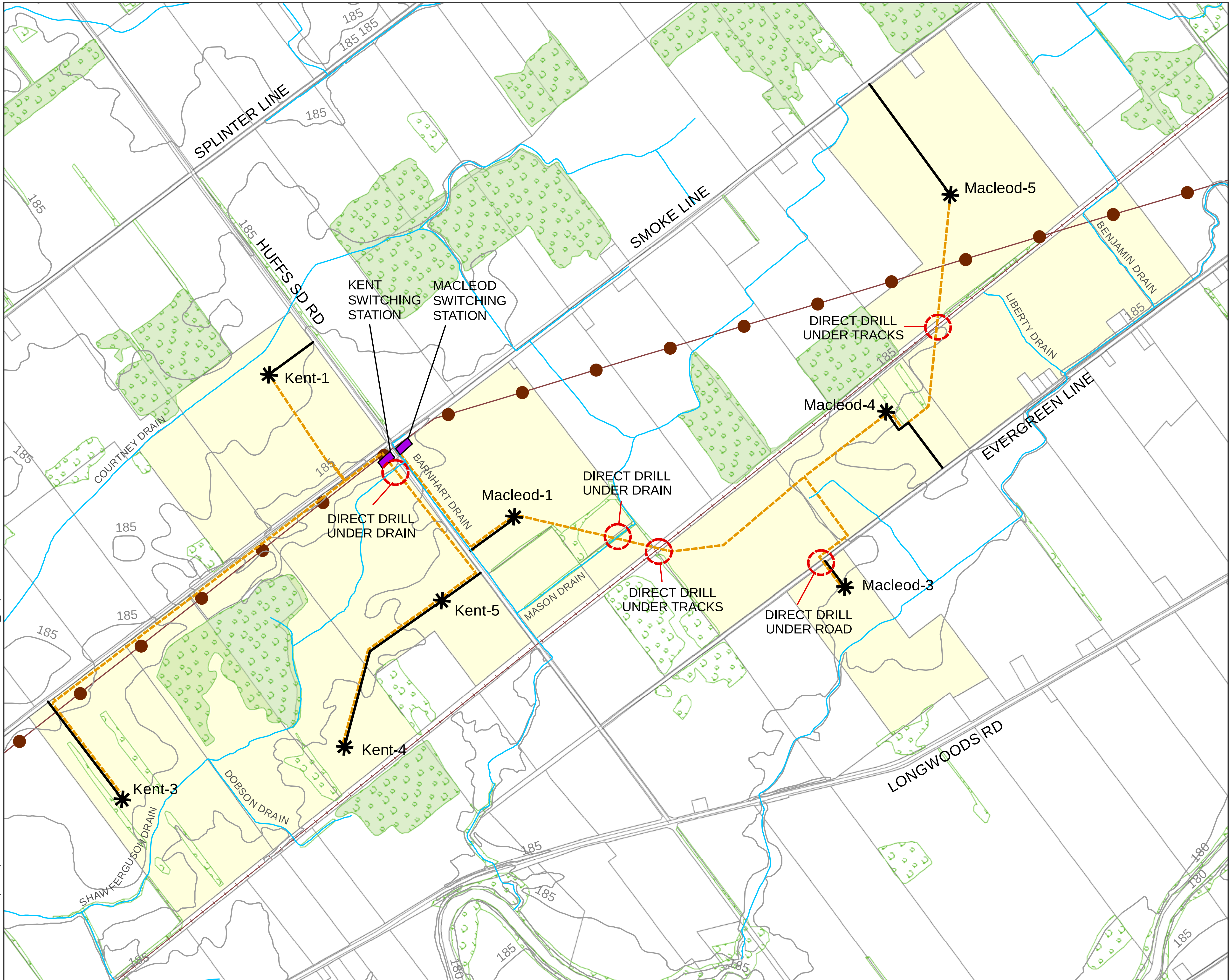
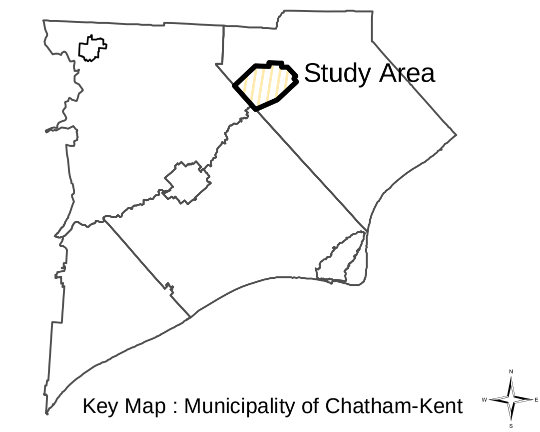
Kent Breeze Wind Farms & Macleod Windmill Project Environmental Assessment





Map 5
Project Infrastructure

Legend

- Turbine
- Access Road
- Underground Cable
- Utility Line
- Significant Woodlot (As per Official Plan)
- Other Vegitation
- Contour Line
- Railroad
- Road
- Watercourse

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Metres

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April 30, 2010

IBI GROUP

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GE Energy

Commercial Documentation
Wind Turbine Generator Systems
GE 2.5xl - 60 Hz

Product Acoustic Specifications

Canada Specific
Normal Operation according to IEC 61400-11

GE imagination at work

2.5xl Noise information

2 GE 2.5xl Product Normal Operation Apparent Sound Power Level

The **Table 1** provides GE 2.5xl wind turbine equipped with 48.7 m blades (100 m rotor) acoustic specifications relative to wind speed V_{10m}, operating at **Normal Operations** (NO) specifically for Canada, per IEC 61400-11 standard:

Wind speed at V_{10m} [m/s]	$L_{WA,k}$[1] Apparent sound power level [dBA RE. 10^{-12} W]	σ_P product variability [dB]
3	≤ 93	-
4	≤ 96	-
5	≤ 99	-
6	≤ 102	-
7	≤ 104.5	-
8	≤ 105	0
9	≤ 105	-
10	≤ 105	-
11- cut out	≤ 105	-

The **nominal acoustic performances** for GE 2.5xl wind turbine being specified at **95% rated electrical power** per IEC 61400-11 shall be specifically for Canada:

- The **maximum** apparent sound power level **$Lw_{A,K}$ ≤ 105.0dBA** (referenced to 1E-12W) at 95% rated electrical per IEC 61400-11

Tonal noise relative level **$\Delta L_{a,k}$ < 2 dB** at 95% rated electrical per IEC 61400-11.

Wind speed at 100m hub height $V_{HH=100}$ [m/s]	Wind speed at 85m hub height $V_{HH=85}$ [m/s]	$L_{WA,k}$* Apparent sound power level [dBA RE. 10^{-12} W]	σ_P product variation [dB]
4.2	4.1	≤ 93	-
5.6	5.5	≤ 96	-
7.0	6.8	≤ 99	-
8.4	8.2	≤ 102	-
9.8	9.6	≤ 104.5	-
11.2	10.9	≤ 105	0
12.6	12.3	≤ 105	-
14.0	13.7	≤ 105	-
15.4	15.1	≤ 105	-

Table 2: Normal operations, GE 2.5xl wind turbine, 48.7 m blades (100 m rotor) apparent sound power level at wind speed V_{HH}

Octave Band Power Spectra (for information only)

		Normalized wind speed V_{10m} [m/s]						
		4	5	6	7	8	9	Uncertainty
Apparent Sound Power Level L_{WA} [dBA re 1E-12W]		**95.7**	**98.6**	**102.1**	**104.1**	**104.2**	**103**	**0.9**
Octave Band Apparent Sound Power Level LwA [dBA re 1E-12W]	**63**	74.7	75.9	79.4	83.3	85.9	84.7	-
	125	83.7	85.7	88.7	92.1	92.4	91.9	-
	250	88.0	90.8	95.1	97.6	98.6	96.6	-
	500	89.1	92.3	97.6	99.8	99.2	97.9	-
	1000	91.0	93.9	96.5	97.6	97.5	96.7	-
	2000	88.2	91.2	92.4	93.8	94.2	93.6	-
	4000	78.6	82.1	82.8	85.8	86.4	85.5	-
	8000	65.9	69.1	69.4	76.0	70.0	72.5	-

Table 3: Normal operations GE 2.5xl measured apparent sound power level and octave band apparent sound power level as a function of normalized wind speed V_{10m}

Appendix C

Adjustment to Wind Turbine Generator Acoustic Emissions for Wind Speed Profile

HATCH Calculation Report

Client	Kent Breeze Corporation
Project	Kent Breeze Wind Farm and Macleod Windmill Project
Project No.	H335112

Document Type:	Calculation Report
Document Title:	**Adjusted Noise Emissions For GE 2.5xl**
Document No.	na.

Revision	Signature	Date	Details
Rev: 1	Preparer J. M. Reviewer	11-May-10	Issued with Noise Impact Assessment Report
	Preparer Reviewer		

Seal if Required:

LICENSED PROFESSIONAL ENGINEER
R. SKINNER
90333998
May 11/2010
PROVINCE OF ONTARIO

Client Acceptance

By ______________________ Title ______________________ Date: ____________

HATCH™ Calculation Report

Client	Kent Breeze Corporation
Project	Kent Breeze Wind Farm and Macleod Windmill Project
Project No.	H335112

Document Type:	Calculation Report
Document Title:	**Adjusted Noise Emissions For GE 2.5xl**
Document No.	na.

Revision	Signature	Date	Details
Rev: 1	Preparer J. M Reviewer	11-May-10	Issued with Noise Impact Assessment Report
	Preparer Reviewer		

Seal if Required:

LICENSED PROFESSIONAL ENGINEER
R. SKINNER
90333998
May 11/2010
PROVINCE OF ONTARIO

Client Acceptance

By ______________________ Title ______________________ Date: ____________

Kent Breeze Wind Farm and Macleod Windmill Project

Method For Adjusting GE's Apparent Sound Power Levels Per MOE Requirements

Calculation By: R. Skinner
Checked: J. Moran
Date: May 11, 2010

1. Background

1.1 MOE Noise Guidelines require the Manufacturer's Emissions Levels to be adjusted to reflect summer night-time conditions. The manufacturer in this case is GE, their 2.5xl model, at 85 m hub height. Manufacturer's data [1] is presented two ways:

1. Maximum apparent sound power levels ("A" weighted), by normalized wind velocities (experienced at 10m).
2. Octave band power spectra, 63 to 8000 hz, by normalized wind velocities (10m)

1.2 This calculation walks the reader through the steps used to arrive at "Adjusted Emission Levels" in Table 3.1 of the Noise Assessment Report Adjustment is required for two reasons:

1. The underlying wind shear that formed the basis for the manufacturer noise data is different than the summer night wind shear at this site.
2. Manufacturer's noise emissions by octave band did not include uncertainty, this is added.

[1] Commercial Documentation, Wind Turbine Generator Systems GE2.5xl - 60 Hz, Product Acoustic Specifications, Canada Specific, Normal Operation According to IEC 61400-11

2. Calculations

2.1 Step 1: Obtain the relationship between sound power level and wind speeds at hub height in Manufacturer's Data

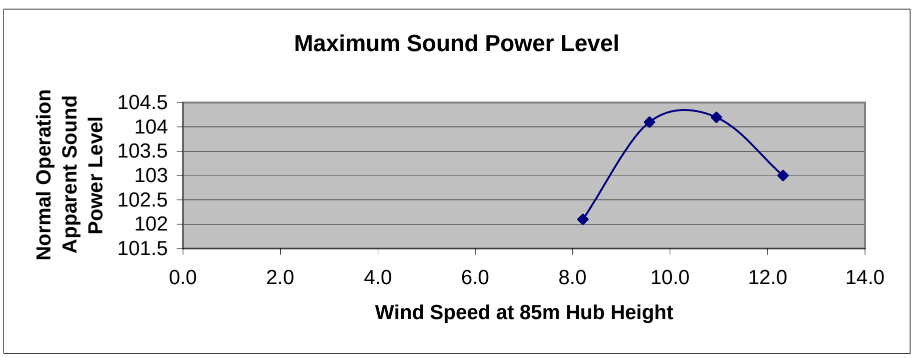
2.1.1 Calculate the wind speeds at hub height that correspond to the published noise figures expressed at wind speeds at 10m height. Assume logarithmic profile with a roughness length of 0.03.

Logarithmic Profile defined as:
u/ur = ln(z/z0) / ln(zr/z0)

where

Data and Results (calculated results are in bold)

u = windspeed at hub height (m/s) (calc)	**8.2**	**9.6**	**10.9**	**12.3**	
ur = windspeed at reference height zr (m/s)	6	7	8	9	
z = hub height (m)	85	85	85	85	
z0 = roughness length (m)	0.03	0.03	0.03	0.03	
GE Apparent Sound Power Level (dBA)	102.1	104.1	104.2	103.0	Derived from Octave Band Spectra Data



2.1.3 Power law relationship is also calculated (for information):

Power law (wind shear calculation):
u/ur = z/zr^alpha

where

Data and Results (calculated results are in bold)

u = windspeed at hub height (m/s) (calc)	8.2	9.6	10.9	12.3
ur = reference windspeed at height zr (m/s)	6	7	8	9
z = hub height (m)	85	85	85	85
zr = reference height (m)	10	10	10	10
alpha = wind shear coefficient	**0.161**	**0.161**	**0.161**	**0.161**

Kent Breeze Wind Farm and Macleod Windmill Project

Method For Adjusting GE's Apparent Sound Power Levels Per MOE Requirements

Calculation By: R. Skinner
Checked: J. Moran
Date: May 11, 2010

2.2 Step 2 - Calculate wind shear for summer night-time case

Average Velocity For Period:

June 21 to Sept 20, 11pm to 7am data:

	WS_40m	WS_60m	West WS_80m	South WS_80m
Rows with Data (A)	4380	4380	4380	4380
Sum of Rows with Data (B)	15211	19911	22614	22660
Average WindSpeed (B/A)	3.5	4.5	5.2	5.2

where: WS - wind speed
West - west anemometer
South - south anemometer

2.2.1 Wind Data Used

See the attachment to this calculation for information on the wind measurement campaign and a selection of the wind data used. The entire summer wind data set consists of over 13000 rows of data and is not printed with this calcualation.

2.2.2 Curve Data To Use:

Hub Height (m)	40	60	80
Wind Speed (m/s)	3.5	4.5	5.2

2.2.3 Curve Fit:

	Power Law	Log Law
Ref Height, m	80	80
Speed, m/s	5.2	5.2
Alpha or Zo variables:	0.42	7.0
	Alpha	Z0, m

Height m	Power Law Calc'd m/s	Log Law Calc'd m/s	Average For Period m/s	Power Law Error	Log Law Error
10	2.17	0.76			
40	3.89	3.72	3.5	0.39	0.22
60	4.61	4.59	4.6	0.01	-0.01
80	5.20	5.20	5.2	0.00	0.00
85	5.33	5.33			

Note to user: iterate until targets are reached and error minimized

Comment on result - this analysis chose to curve fit the wind shear between 60 and 80 m (minizing the interpolation error at 60m).

2.3 Step 3 Use summer night-time wind shear to calculate wind velocity at hub height and corresponding velocity at 10m height.

Using wind shear calculated above, calculate velocity at 10 m height that would correspond to 10.9 m/s at hub height; this is the wind speed that produces the maximum noise. This is obtained by power law method, below:

Hub height (m)	85	85
Speed, m/s	**10.9**	**11.4**
wind shear	0.42	0.3

Height m	Calc'd m/s	Calc'd m/s
10	**4.44**	**6.00**

At a wind speed of 4.4m/s (10m height), the machine produces its maximum noise.

Kent Breeze Wind Farm and Macleod Windmill Project

Method For Adjusting GE's Apparent Sound Power Levels Per MOE Requirements

Calculation By: R. Skinner
Checked: J. Moran
Date: May 11, 2010

2.3.1 Manufacturer's Noise Emissions Adjusted for Wind Shear

For modeling purposes, use GE's maximum noise emissions for all wind speed at 10m 6m/s or greater with a summer night wind shear of 0.42.

2.4 Step 4 - Revise manufacturer's data by octave band levels to match its maximum apparent sound power levels adjusted for wind shear

To adjust measured emissions to values used for modeling, 0.9 dB was added to each apparent sound power level by frequency band to account for uncertainty. Vendor's highest noise emission occurs at V10 8m/s (in a 0.161 wind shear situation)

Normalized Speed Speed	8 m/s	8 m/s
	LwA	LwA
Frequency (Hz)	NO	NO.adj
63	85.9	86.8
125	92.4	93.3
250	98.6	99.5
500	99.2	100.1
1000	97.5	98.4
2000	94.2	95.1
4000	86.4	87.3
8000	70.0	70.9
Apparent SPL dBA	104.2	105.1

Normalized Wind Speed - at 10m height
LwA - Apparent Sound Power Level (dBA re 1E-12)
SPL - sound power level
NO - normal operations
adj - adjusted to account for uncertainty

GE NO - Normal operations GE2.5xl measured apparent sound power level and octave band apparent sound power level at the stated normalized wind speed (at 10m)

2.4.1 Generate the Wind Turbine Acoustic Emissions Summary (Table 3 of MOE's Noise Guidelines document)

Table C.1 Wind Turbine Acoustic Emissions Summary										
Make and Model:	GE 2.5xl									
Electrical Rating (kW):	2500									
Hub Height (m)	85									
Wind Shear Coefficient	0.42									
	Octave Band Sound Apparent Power Level LwA (dBA re 1E-12W)									
	Manufacturer's Emissions Levels (dBA ref 10^-12)					Adjusted Emissions Levels				
V10 Wind Speed (m/s)	6	7	8	9	10	6	7	8	9	10
Frequency (Hz)			[1]							
63	-	-	86.8	-	-	86.8	86.8	86.8	86.8	86.8
125	-	-	93.3	-	-	93.3	93.3	93.3	93.3	93.3
250	-	-	99.5	-	-	99.5	99.5	99.5	99.5	99.5
500	-	-	100.1	-	-	100.1	100.1	100.1	100.1	100.1
1000	-	-	98.4	-	-	98.4	98.4	98.4	98.4	98.4
2000	-	-	95.1	-	-	95.1	95.1	95.1	95.1	95.1
4000	-	-	87.3	-	-	87.3	87.3	87.3	87.3	87.3
8000	-	-	70.9	-	-	70.9	70.9	70.9	70.9	70.9
Apparent SPL dBA	-	-	105.1	-	-	105.1	105.1	105.1	105.1	105.1
Note										
[1] Only the manufacturer's maximum noise emissions were modeled.										
[2] This table is also Table 3.1 of the main report.										

3. Conclusions and Summary

In a wind shear of .42, the wind turbine experiences winds of 10.9 m/s at hub height when the V10m speed is 4.4m/s. At this hub height velocity the machine produces its maximum noise. Noise impacts at V10 speeds of 6-10m/s, under a summer night wind shear are required to be modeled. The sound power level for the GE 2.5xl machine actually goes down after passing through its maximum at 10.9m/s hub velocity. To be conservative, the sound modeled was the machine's maximum for all wind speed cases (V10m = 6 to 10m/s).

In addition, the manufacturer's octave band power spectra was adjusted upwards by 0.9dB each so that when aggregated into a single A-weighted value, the total is 105.1dBA. The 0.9dB adjustment = the uncertainty in their noise emissions data reported by GE.

To sum up then, two adjustments were made to the manufacturer's noise emissions, one for wind shear, and the other to manufacturer's octave band sound power level data. The A-weighted noise to be modelled is 105.1 dbA for wind speeds >= 6 m/s at 10m height and summer night wind shear of 0.42.

Kent Breeze Wind Farm and Macleod Windmill Project

Wind Measurement Data

Attachment to Calculation: Method For Adjusting GE's Apparent Sound Power Levels Per MOE Requirements

Calculation By: R. Skinner

Checked: J. Moran

Date: May 11, 2010

Note to User - See columns Y-AB for data manipulation to filter for "night" (10pm to 7am).

ZEPHYR NORTH - TN2 PROGRAM SERIES

Kent Breeze Wind Monitoring

Period: 2009 June 21 0:00 to 2009 Sept 20 23:50
Location: DeMeter 80 m WM (DMtr)

Fields in each record are as follows:

1. Year
2. Month
3. Day
4. Hour and minute as hhmm
5. Wind Speed W (m/s) at 40.00 m
6. Std.Dev. Wind Speed W (m/s) at 40.00 m
7. Gust Wind Speed W (m/s) at 40.00 m
8. Wind Speed W (m/s) at 60.00 m
9. Std.Dev. Wind Speed W (m/s) at 60.00 m
10. Gust Wind Speed W (m/s) at 60.00 m
11. Wind Direction (degt) at 60.00 m
12. Std.Dev. Wind Dir. (deg) at 60.00 m
13. Wind Speed W (m/s) at 80.00 m
14. Std.Dev. Wind Speed W (m/s) at 80.00 m
15. Gust Wind Speed W (m/s) at 80.00 m
16. Wind Speed S (m/s) at 80.00 m
17. Std.Dev. Wind Speed S (m/s) at 80.00 m
18. Gust Wind Speed S (m/s) at 80.00 m
19. Wind Direction (degt) at 79.00 m
20. Std.Dev. Wind Dir. (deg) at 79.00 m
21. Air Temperature (C) at 2.00 m
22. Station Pressure (kPa) at 2.00 m

-999 signifies datum is not available

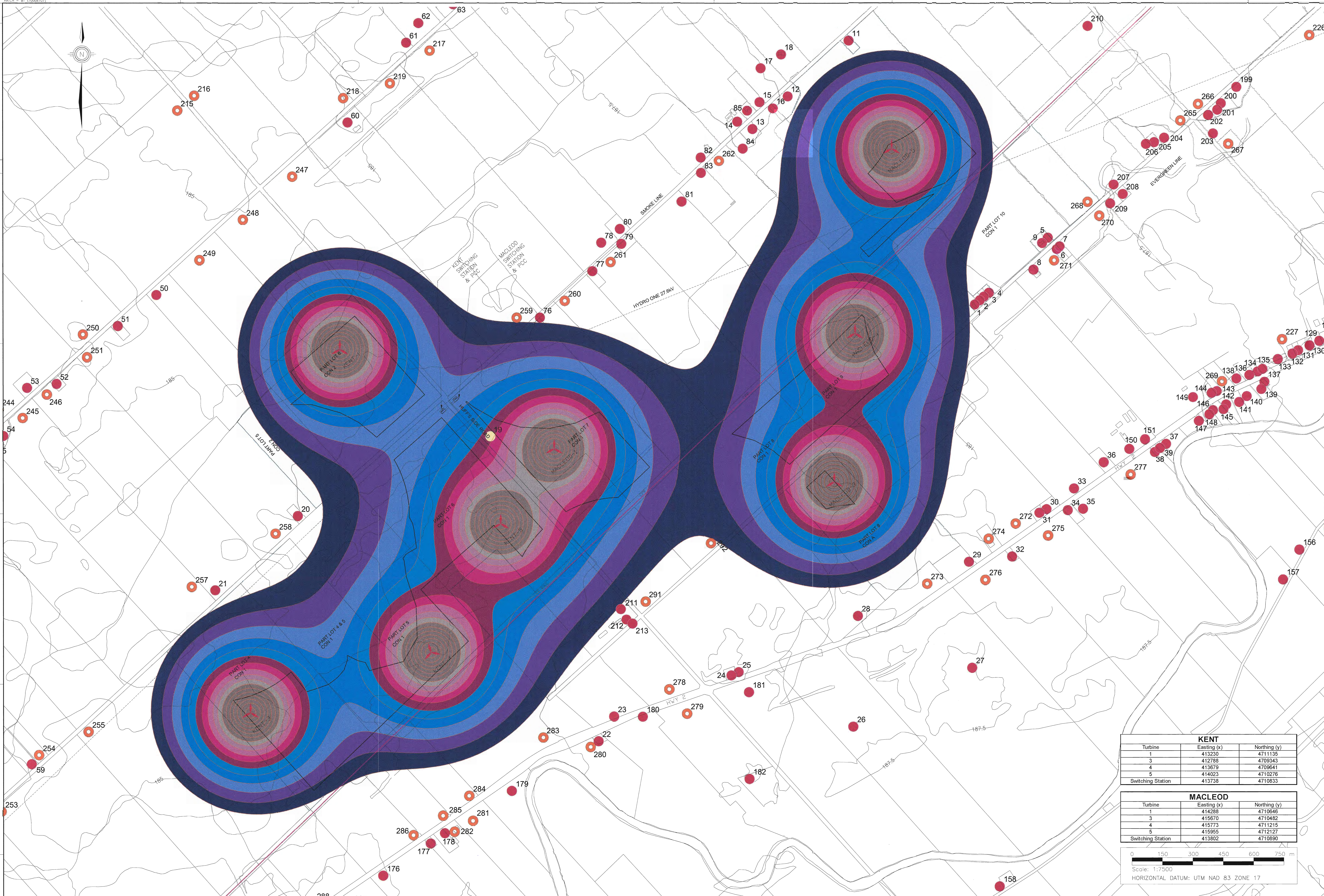
Flags: 0 - datum not available or marked bad
1 - datum good
2 - datum estimated

****

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Year	Month	Day	Hour	WS_40m	WS_Sdev_	Gust_WS_	WS_60m	WS_Sdev_	Gust_WS_	WD_60m	WD_Sdev_	WS_80m_\	WS_Sdev_	Gust_WS_	WS_80m_!	WS_Sdev_	Gust_WS_	WD_79m	WD_Sdev_	Temp	Pres
2009	6	21	520	3.5	0.613	5.3	3.77	0.535	4.96	339.6	7.6	3.87	0.493	4.93	3.3	0.614	4.57	339.9	5.4	15.5	98.5
2009	6	21	530	3.27	0.538	4.16	3.73	0.61	5.33	340.3	9	3.97	0.515	5.69	3.41	0.516	4.95	340.8	9.4	15.5	98.5
2009	6	21	540	3.23	0.729	4.93	3.45	0.757	4.96	359.6	7.6	3.55	0.667	4.93	3	0.588	4.57	355.5	5.1	15.4	98.5
2009	6	21	550	2.42	0.472	3.79	2.78	0.535	3.82	5.3	10.3	3.01	0.493	4.17	2.66	0.539	3.8	359.2	9.9	15.5	98.5
2009	6	21	600	2.68	0.493	4.16	3.07	0.379	3.82	355.8	6.4	3.21	0.319	3.79	2.64	0.473	3.8	354.1	4	15.5	98.5
2009	6	21	610	3.14	0.38	4.16	3.16	0.332	3.82	351	8.7	3.17	0.306	3.79	2.85	0.415	3.8	342.2	3.6	15.2	98.5
2009	6	21	620	2.69	0.515	3.79	2.81	0.559	3.82	341.5	6.1	2.81	0.515	3.79	2.42	0.563	3.8	340.3	11.2	15.2	98.5
2009	6	21	630	2.65	0.515	3.79	3.02	0.431	3.82	352	12.2	3.12	0.38	4.17	2.48	0.494	3.8	342.5	6.4	15.2	98.5
2009	6	21	640	2.9	0.493	4.16	3.06	0.513	4.19	358.5	8.7	2.96	0.493	4.17	2.54	0.415	3.8	357	6.4	15.3	98.5
2009	6	21	650	1.78	0.83	3.79	2.1	0.637	3.82	8.9	8.7	2.11	0.612	3.79	2.05	0.516	3.8	4.5	6.7	15.3	98.5
2009	6	21	700	3.54	0.83	5.3	3.81	0.79	5.33	342.7	9.9	3.76	0.865	5.69	3.27	0.762	4.95	342.7	10.8	15.3	98.6
2009	6	21	710	3.69	0.562	4.93	4.11	0.45	5.33	355.3	7.3	4.3	0.433	5.31	3.65	0.614	5.32	352.2	6.4	15.3	98.6
2009	6	21	720	3.28	0.761	4.55	3.64	0.61	4.96	352.2	6.7	3.64	0.561	4.93	3.12	0.588	4.57	342.5	5.1	15.6	98.6

Data filtered for "night" (hours 2300 to 700)

Filter, 1= "night"	WS_40m	WS_60m	WS_80m_\	WS_80m_S
1	3.5	3.77	3.87	3.3
1	3.27	3.73	3.97	3.41
1	3.23	3.45	3.55	3
1	2.42	2.78	3.01	2.66
1	2.68	3.07	3.21	2.64
1	3.14	3.16	3.17	2.85
1	2.69	2.81	2.81	2.42
1	2.65	3.02	3.12	2.48
1	2.9	3.06	2.96	2.54
1	1.78	2.1	2.11	2.05
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0



KENT		
Turbine	Easting (x)	Northing (y)
1	413230	4711135
3	412788	4709343
4	413679	4709641
5	414023	4710276
Switching Station	413738	4710833

MACLEOD		
Turbine	Easting (x)	Northing (y)
1	414288	4710646
3	415670	4710482
4	415773	4711215
5	415955	4712127
Switching Station	413802	4710890

0 150 300 450 600 750 m

Scale: 1:7500

HORIZONTAL DATUM: UTM NAD 83 ZONE 17

LEGEND:

- 40dBA – 40.9dBA
- 41dBA – 41.9dBA
- 42dBA – 42.9dBA
- 43dBA – 43.9dBA
- 44dBA – 44.9dBA
- 45dBA – 45.9dBA
- 46dBA – 46.9dBA
- 47dBA – 47.9dBA
- 48dBA – 48.9dBA
- 49dBA – 49.9dBA
- ≥ 50dBA
- ID EXISTING DWELLING NOT PARTICIPATING
- ID EXISTING DWELLING PARTICIPATING
- ID VACANT LOT
- WIND TURBINE LOCATION

REFERENCE DRAWINGS

DRAWING NO.	DRAWING TITLE

REVISIONS

NO.	DESCRIPTION	CHK'D	APP'D	DATE
B	IDENTIFIED VACANT LOT RECEPTORS SEPARATELY	RS		

ISSUE AUTHORIZATION

REV.	ISSUE FOR	AUTH. BY	DATE
B	ISSUED FOR PERMIT	RS	10-05-12
A	ISSUED FOR PERMIT	RS	10-05-06

HATCH

KENT BREEZE CORPORATION

KENT BREEZE WIND FARM AND MACLEOD WINDMILL PROJECT

DESIGNED BY: J. MORAN, DATE 10-03-25	DRAWN BY: G. COCHRANE, DATE 10-03-25
CHECKED BY: R. SKINNER	DISCIP. ENGR.: R. SKINNER
PROJ. DES. COORD.	PROJ. ENGR.
PROJ. MGR.: R. SKINNER	PROJECT NUMBER: 335112

GE 2.5MW – 85m HUB ISO-dB MAP FOR WIND SHEAR 0.42 (SUMMER 11PM–7AM) AND 6–10m/s WIND SPEED AT 10m HEIGHT

SCALE: NONE

DRAWING NO.: H335112-0000-10-014-0004

REVISION: B

DWG. NO. H335112-0000-10-014-0004 REVISION B

May 14, 2010 - 12:48pm Login name: Cost54540 Layout: Layout1
Drawing Name: P:\SUNCOR\335112\CAD\C\335112-0000-10-014-0004.dwg

Appendix E

Noise Impact Sample Calculation

HATCH™ Calculation Report

Client	Kent Breeze Corporation
Project	Kent Breeze Wind Farms and Macleod Windmill Project
Project No.	H335112

Document Type:	Calculation Report
Document Title:	**Calculated Noise Levels Based on ISO 9613-2**
Document No.	na.

Revision	Signature	Date	Details
Rev: 0	Preparer J. MORAN Reviewer	5-May-10 MAY 06 2010	Issued with Noise Impact Assessment Report
	Preparer Reviewer		

Seal if Required:

LICENSED PROFESSIONAL ENGINEER
R. SKINNER
90333998
May 5/2010
PROVINCE OF ONTARIO

Client Acceptance

By ______________________ Title ______________________ Date: ______________

Calculation of Sound Pressure Levels from Wind Turbine - Based on ISO 9613-2

KentBreeze Project

Background

As requested by the Ministry of Environment in the Noise Guidelines for Wind Farms in Section 6.7 – Appendices (October 2008), a sample calculation should be included in the Noise Assessment Report. The sample calculation must include at least one detailed calculation for a source to receiver "'pair," preferably addressing the closest wind turbine unit, and it must represent all other "'pairs".

For this project, the receptor No. 12 was chosen for the analysis, along with turbine Macleod 5 (closest pair). The coordinates of both receptor and turbine are given in Table 1 (UTM NAD83, Zone 17). Receptor 12 is not participating in the wind project.

	Easting (m)	Northing (m)	Elevation Above Ground (m)
Turbine Macleod 5	415955	4712127	85
Receptor No. 12	415443	4712386	4.5

The calculations are based on ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – General Method of Calculation. The ground attenuation coefficient was assumed as 0.7, as suggested by the MOE Guidelines (Section 6.4.10 – Specific Parameters). The octave band data (guaranteed Sound Power Levels) for the GE 2.5xl wind turbine were provided by the manufacturer and adjusted for wind shear and noise guarantee. To adjust measured emissions to maximum value used for modelling, 0.8 dB was added to the sound emission of each frequency band.

Calculations

Wind Turbine No.: Macleod 5
Receiver No.: 12

Distance between Source and Receiver:

$$d := 579.5\text{m}$$

Wind Turbine Sound Power Levels

Sound Power Level at 63 Hz $L_{wAt\_63} := L_{w\_63} - 26.2 = 86.7$

Sound Power Level at 125 Hz $L_{wAt\_125} := L_{w\_125} - 16.1 = 93.2$

Sound Power Level at 250 Hz $L_{wAt\_250} := L_{w\_250} - 8.6 = 99.4$

Sound Power Level at 500 Hz $L_{wAt\_500} := L_{w\_500} - 3.2 = 100$

Sound Power Level at 1000 Hz $L_{wAt\_1000} := L_{w\_1000} - 0 = 98.3$

Sound Power Level at 2000 Hz $L_{wAt\_2000} := L_{w\_2000} + 1.2 = 95$

Sound Power Level at 4000 Hz $L_{wAt\_4000} := L_{w\_4000} + 1 = 87.2$

Sound Power Level at 8000 Hz $L_{wAt\_8000} := L_{w\_8000} - 1.1 = 70.8$

$Total\_L_{wAt} = 105 \cdot dBA$ A-Weighted Combined Sound Power Level for the Wind Turbine

Sound Pressure Level at the point of reception

Directivity of Source $D := 0$ For source at 85 m above the ground

Attenuation due to geometrical divergence $Att\_div := 20 \cdot \log\left(\frac{d}{1m}\right) + 11$

$Att\_div = 66.3 \cdot dB$

Attenuation due to atmospheric absorption

Attenuation due to atmospheric absorption at 63 Hz $Att\_atm\_63 := 0.1 \frac{dB}{km} \cdot d = 0.058$

Attenuation due to atmospheric absorption at 125 Hz $Att\_atm\_125 := 0.4 \frac{dB}{km} \cdot d = 0.232$

Attenuation due to atmospheric absorption at 250 Hz $Att\_atm\_250 := 1.0 \frac{dB}{km} \cdot d = 0.58$

Attenuation due to atmospheric absorption at 500 Hz $Att\_atm\_500 := 1.9 \frac{dB}{km} \cdot d = 1.101$

Attenuation due to atmospheric absorption at 1000 Hz $Att\_atm\_1000 := 3.7 \frac{dB}{km} \cdot d = 2.144$

Attenuation due to atmospheric absorption at 2000 Hz $Att\_atm\_2000 := 9.7 \frac{dB}{km} \cdot d = 5.621$

Attenuation due to atmospheric absorption at 4000 Hz $Att\_atm\_4000 := 32.8 \frac{dB}{km} \cdot d = 19.008$

Attenuation due to atmospheric absorption at 8000 Hz $Att\_atm\_8000 := 117.0 \frac{dB}{km} \cdot d = 67.802$

Attenuation due to Ground Absorption

Ground Absorption Coefficient $Ga := 0.7$

Ground Absorption at the Source

Attenuation due to ground absorption at 63 Hz $Att\_gr\_s\_63 := -1.5dB$

Attenuation due to ground absorption at 125 Hz $Att\_gr\_s\_125 := -1.5 + Ga\cdot 1.5$

Attenuation due to ground absorption at 250 Hz $Att\_gr\_s\_250 := -1.5 + Ga\cdot 1.5$

Attenuation due to ground absorption at 500 Hz $Att\_gr\_s\_500 := -1.5 + Ga\cdot 1.5$

Attenuation due to ground absorption at 1000 Hz $Att\_gr\_s\_1000 := -1.5 + Ga\cdot 1.5$

Attenuation due to ground absorption at 2000 Hz $Att\_gr\_s\_2000 := -1.5\cdot(1 - Ga)$

Attenuation due to ground absorption at 4000 Hz $Att\_gr\_s\_4000 := -1.5\cdot(1 - Ga)$

Attenuation due to ground absorption at 8000 Hz $Att\_gr\_s\_8000 := -1.5\cdot(1 - Ga)$

Ground Absorption at the Receiver

Attenuation due to ground absorption at 63 Hz $Att\_gr\_r\_63 := -1.5dB$

Attenuation due to ground absorption at 125 Hz $Att\_gr\_r\_125 := -1.5 + Ga\cdot 4.688$

Attenuation due to ground absorption at 250 Hz $Att\_gr\_r\_250 := -1.5 + Ga\cdot 2.890$

Attenuation due to ground absorption at 500 Hz $Att\_gr\_r\_500 := -1.5 + Ga\cdot 1.501$

Attenuation due to ground absorption at 1000 Hz $Att\_gr\_r\_1000 := -1.5 + Ga\cdot 1.500$

Attenuation due to ground absorption at 2000 Hz $Att\_gr\_r\_2000 := -1.5\cdot(1 - Ga)$

Attenuation due to ground absorption at 4000 Hz $Att\_gr\_r\_4000 := -1.5\cdot(1 - Ga)$

Attenuation due to ground absorption at 8000 Hz $Att\_gr\_r\_8000 := -1.5\cdot(1 - Ga)$

Ground Absorption In the Middle

Receiver height $h\_r := 4.5m$

Source height $h\_s := 85m$

$Factor := 30\cdot(h\_r + h\_s) = 2685\,m$

Projected distance between Source and Receiver $dp := 573.9m$

Since dp<Factor, the attenuation in the middle is equal to zero for all frequencies (Table 3)

Total Ground Attenuation for each frequency

Attenuation due to GA at 63 Hz $Att\_gr\_63 := Att\_gr\_s\_63 + Att\_gr\_r\_63 = -3$

Attenuation due to GA at 125 Hz $Att\_gr\_125 := Att\_gr\_s\_125 + Att\_gr\_r\_125 = 1.3$

Attenuation due to GA at 250 Hz $Att\_gr\_250 := Att\_gr\_s\_250 + Att\_gr\_r\_250 = 0.073$

Attenuation due to GA at 500 Hz $Att\_gr\_500 := Att\_gr\_s\_500 + Att\_gr\_r\_500 = -0.9$

Attenuation due to GA at 1000 Hz $Att\_gr\_1000 := Att\_gr\_s\_1000 + Att\_gr\_r\_1000 = -0.9$

Attenuation due to GA at 2000 Hz $Att\_gr\_2000 := Att\_gr\_s\_2000 + Att\_gr\_r\_2000 = -0.9$

Attenuation due to GA at 4000 Hz $Att\_gr\_4000 := Att\_gr\_s\_4000 + Att\_gr\_r\_4000 = -0.9$

Attenuation due to GA at 8000 Hz $Att\_gr\_8000 := Att\_gr\_s\_8000 + Att\_gr\_r\_8000 = -0.9$

Total Attenuation for each frequency $Att := Att\_div + Att\_atm + Att\_gr$

Attenuation at 63 Hz $Att\_63 := Att\_div + Att\_atm\_63 + Att\_gr\_63 = 63.319$

Attenuation at 125 Hz $Att\_125 := Att\_div + Att\_atm\_125 + Att\_gr\_125 = 67.824$

Attenuation at 250 Hz $Att\_250 := Att\_div + Att\_atm\_250 + Att\_gr\_250 = 66.914$

Attenuation at 500 Hz $Att\_500 := Att\_div + Att\_atm\_500 + Att\_gr\_500 = 66.463$

Attenuation at 1000 Hz $Att\_1000 := Att\_div + Att\_atm\_1000 + Att\_gr\_1000 = 67.505$

Attenuation at 2000 Hz $Att\_2000 := Att\_div + Att\_atm\_2000 + Att\_gr\_2000 = 70.982$

Attenuation at 4000 Hz $Att\_4000 := Att\_div + Att\_atm\_4000 + Att\_gr\_4000 = 84.369$

Attenuation at 8000 Hz $Att\_8000 := Att\_div + Att\_atm\_8000 + Att\_gr\_8000 = 133.163$

A-Weighted Sound Pressure Levels at the POR

Sound Pressure Level at 63 Hz $L_{pA\_63} := L_{wAt\_63} - Att\_63 = 23.381$

Sound Pressure Level at 125 Hz $L_{pA\_125} := L_{wAt\_125} - Att\_125 = 25.376$

Sound Pressure Level at 250 Hz $L_{pA\_250} := L_{wAt\_250} - Att\_250 = 32.486$

Sound Pressure Level at 500 Hz $L_{pA\_500} := L_{wAt\_500} - Att\_500 = 33.537$

Sound Pressure Level at 1000 Hz $L_{pA\_1000} := L_{wAt\_1000} - Att\_1000 = 30.795$

Sound Pressure Level at 2000 Hz $L_{pA\_2000} := L_{wAt\_2000} - Att\_2000 = 24.018$

Sound Pressure Level at 4000 Hz $L_{pA\_4000} := L_{wAt\_4000} - Att\_4000 = 2.831$

Sound Pressure Level at 8000 Hz $L_{pA\_8000} := L_{wAt\_8000} - Att\_8000 = -62.363$

$\boxed{Total\_L_{pA} = 37.8 \cdot dBA}$ A-Weighted Sound Pressure Level at the Point of Reception

Conclusions

Based on the calculation procedure provided in ISO 9613-2 and the parameters suggested by the Ministry of Environment in the Noise Guidelines for Wind Farms, Section 6.4.10 (October 2008), the estimated sound pressure level at the point of reception was 37.8 dBA, equal to the prediction of CADNA-A for the same receptor (37.8 dBA).

It is important to note that Receptor 12 receives sound contributions from several sources, and the level shown above (37.8 dBA) corresponds only to the contribution from Turbine Macleod 5. The total sound pressure level at Receptor 12 is 39 dBA.

Both the air and ground attenuation components were included and calculated based on ISO 9613.

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Niagara Falls, Ontario, Canada L2E 6W1
Tel 905 374 5200 • Fax 905 374 1157

APPENDIX D

Public Consultation Report

Kent Breeze Corporation
MacLeod Windmill Project Inc.

KENT BREEZE WIND FARMS

REA Consultation Report

FEBRUARY 2010

IBI GROUP

TABLE OF CONTENTS

1. INTRODUCTION

This report describes the stakeholder consultation methodology as well as the key issues identified by any such stakeholders.

2. PUBLIC CONSULTATION

2.1 Process

The public consultation process is mandated by the Renewable Energy Approvals process under Ontario Regulation 359/09. The public consultation process is determined by the proponents but must include specific mandatory notifications, and must be designed to give appropriate opportunities and forums for the public to participate in the screening process. A summary of the public consultation undertaken for the project is as follows:

Action	Date
Notice of Commencement of Environmental Screening	October 8 & 15, 2008 (Newspaper – Thamesville Herald)
	October 8, 2008 (Canada Post mail)
Informal Discussions with public (phone / email)	October – December 2008
1st Public Information Centre	December 3, 2008
Public Information Centre Formal Follow-ups (email)	January 21 – 23, 2009
Continued consultation	January – March 2009
2nd Public Information Centre / Public Meeting	January 11, 2010

2.2 List

A Notice of Commencement and invitation to the first Public Information Centre was placed in the local newspaper and mailed to a list of 363 recipients. The mailing list included all registered landowners within the geographic Study Area. A GIS shape file of the Study Area was sent to the Municipal Property Assessment Corporation who identified all of the registered landowners and forwarded the mailing addresses. The full list of properties can be seen in **Appendix 1**.

2.3 Concerns Following Notice of Commencement

Several public comments were received after issuing the Notice of Commencement. These were as follows:

- Landowner within Study Area - Doesn't want to see them / Stray voltage concerns / Property devaluation. Was invited to public information centre to review actual turbine layout and learn more about the project.

- Landowner within Study Area – Wanted more information about project and to know exact turbine locations. Was informed that turbine locations were not finalized and invited to public information centre when probable locations of turbines would be available.

- Two separate landowners outside of Study Area wanted information on potential impacts to their private airplane landing strips. Also identified a third landing strip for analysis. The three (3) local private landing strips were mapped and landowners were provided with approximate distances to proposed turbine locations. All were satisfied with expected distances which in each case exceeded 1.5 kilometres.

2.4 Public Information Centre #1

As part of the Notice of Commencement an invitation to a Public Information Centre (PIC) was mailed out and advertised in the local newspaper. The PIC was held on December 3rd, 2008 from 6-9pm at the Brunner Community Centre in nearby Thamesville.

The PIC was conducted as an open house allowing members of the public to view displayed project information and ask questions of various members of the project team.

A sign-in sheet was provided and comment sheets were encouraged to be used to have a document of all identified questions and concerns. A total of 27 persons signed in, and 8 comment sheets were completed. A summary of the key items on the completed comment sheets are as follows:

- 5 requests for a copy of the presentation boards displayed at the PIC to be emailed;

- Concern about interruption to wireless internet signal;

- Sound and infrasound concerns;

- Vibration concerns;

- Potential impacts to water table;
- Stray voltage / grounding standards;
- Shadow flicker;
- Several requests to discuss the project with Council;
- Property devaluation;

All of these questions/concerns were replied to individually by e-mails on January 21, 2009. As a result of these comments, all of these issues have been summarized and addressed in this report.

2.5 Public Information Centre #2

A second PIC was held on January 11, 2010. Notice was given by the same list used for the first PIC (Appendix 1) and was advertised in the Thamesville Herald. Information pertaining to the second PIC related to the final layout of the project as a result of internal changes made based on the results of background environmental studies and changes made by the Green Energy Act and REA process.

Three requests for copies of the Project Description Report were received and provided for prior to the PIC. In addition, one phone call was received prior to the PIC to express concerns over the project. The phone call raised concerns over noise, stray voltage, impacts to birds, and how the project could be opposed. The member of the public was informed of what the background studies found in relation to his concerns, where such answers could be found, and what the REA appeals process involved. The member of the public was invited to the PIC but did not attend.

The PIC was conducted as an open house allowing members of the public to view displayed project information and ask questions of various members of the project team. This was followed by a sit-down question and answer session where team members responded to questions from the public.

A sign-in sheet was provided and comment sheets were encouraged to be used to have a document of all identified questions and concerns. A total of 16 persons signed in, and 4 comment sheets were completed. A summary of the key items on the completed comment sheets are as follows:

- Effects on property values;
- Expected benefits to community (ie. Local construction personnel, lodging);

- How are health issues addressed?
- How are conflicts and complaints addressed?
- Concern about noise;
- Dust from heavy traffic causing health issues (ie. Asthma);
- Low level sound concerns;
- Aesthetic issues in terms of not wanting to see wind turbines.

All of these questions/concerns were replied to during the January 11 meeting during the Q&A session. No changes were made as a result of any comments or concerns from the PIC.

2.6 Post – PIC Public Inquiries

One member of the public expressed regrets that they could not attend the PIC and wanted information on what had changed as well as more information on perceived health effects that have been reported through various media portals. A summary of the PIC and significant changes from the first to second PIC's was presented including a copy of the Draft Project Description Report, as well as information regarding potential reasons for sickness and how we would ensure public safety through compliance with new Provincial regulations particularly through noise modelling and setbacks. This exchange of information took place by eight (8) separate emails from February 2 to February 8, 2010 and is documented in Appendix 2. No changes were made as a result of these inquiries.

2.7 Response to Public Comments / Concerns

The following is a summary of the oral or written responses to public comments and concerns that were raised throughout the consultation period.

- ***Private airplane landing strips*** – All operators were satisfied through analysis of distance between facilities which was relayed via telephone conversations;
- ***Interruption to wireless internet signal*** – The appropriate agencies associated with radiocommunications, radar, and seismoacoustic monitoring have been consulted as suggested by the Radio Advisory Board of Canada and the Canadian Wind Energy Association with no concerns raised. In addition, the guidelines associated with siting turbines indicate that no such interference should occur based on the required setbacks. Where unexpected interference occurs, there are suitable mitigation measures which may be undertaken to correct situations.

- ***Sound and infrasound concerns*** – The Ministry of the Environment have developed guidelines to ensure wind turbines are setback appropriately from sensitive land uses to ensure public health and safety associated with wind turbine. Information regarding the development of these guidelines are available from the MOE website under the heading "Development of Noise Setbacks for Wind Farms". Construction noise mitigation is outlined in the Construction Plan Report.

- ***Vibration concerns*** – Studies indicate that there is nothing unique or detectable associated with wind turbines and ground-level vibration that would suggest potential health concerns could be encountered at sensitive land use sites, particularly at setbacks driven by noise safety levels.

- ***Potential impacts to water table*** – The majority of turbine foundations are wide and shallow with an average depth of 3 metres (10') below ground level. As such, it is not anticipated that any impact to ground water tables will be encountered.

- ***Stray voltage / grounding standards*** – Stray voltage is caused by changing current patterns in electrical distribution lines and is commonly associated with aging electrical lines. Hydro One and the Ontario Electrical Safety Authority ensure the safety of any new electrical components associated with wind energy generation projects. In addition, this project is directly connected to existing overhead electrical transmission lines and will not be associated with any local distribution lines.

- ***Shadow flicker*** – Shadow flicker is a phenomenon normally encountered seasonally in early morning or late afternoon when sun levels are low on the horizon and a wind turbine is located between a stationary sensitive land use and the sun, which in turn creates a slow-moving "flicker" effect of sun/shadow. Indications are that shadow flicker will not be an issue at the project area given the required 550 metre setback for noise purposes. However, should unexpected situations arise, common mitigation measure may be employed to avoid flicker nuisances such as window treatments, awnings, or tree planting.

- ***Several requests to discuss the project with Council*** – At the time this concern was raised, the public was informed that a municipal public meeting would be scheduled at a future date. Since this time, the REA has exempted renewable energy undertakings from municipal approval. However, we are committed to informing the municipality of the project who will inform Council of the project as per their standard practices and procedures.

- ***Property devaluation*** – There is no evidence to suggest that house prices surrounding wind facilities are consistently, measurably, or significantly affected by the view of, or the distance from, wind turbines. The most recent study was conducted by the US Department of Energy and can be found at: http://eetd.lbl.gov/ea/EMS/reports/lbnl-2829e.pdf.

- ***Expected benefits to community*** – Temporary direct economic benefits could be realized during the construction phase as a result of employing local contractors where possible; the use of local aggregates/sand/cement; and overnight accommodations, meals, etc. Benefits may also be realized through the increased tax assessment to the Municipality combined with the lack of municipal services and facilities. Benefits may also be realized through road improvements where identified as required by the Municipality.

- ***How are health issues addressed?*** – Health issues are addressed through compliance with MOE regulations and appropriate protocols to prevent and/or address potential health concerns. An Emergency Response Protocol and Dispute Resolution Protocol are included in the Design and Operations Report.

- ***How are conflicts and complaints addressed?*** A Dispute Resolution Protocol is included in the Design and Operations Report which addresses complaints associated with noise.

- ***Dust from heavy traffic causing health issues (ie. Asthma)*** – The Construction Plan Report outlines methods for reducing dust which will be standardized through an agreement with the Municipality.

2.8 Appendices

Appendix 2 includes a copy of all the documentation outlined in Section 2.4 of this report. Names and addresses of individual landowners have been withheld for privacy purposes.

3. MUNICIPAL CONSULTATION

The project was first presented to the Municipality of Chatham-Kent on February 19, 2008 through the Municipality's Green Energy Committee. This meeting served as an introduction to the developers; a review of the activities undertaken to date at that point including Hydro One Connection Impact Assessments, applications to the Ontario Standard Offer Contract program, meteorological testing tower erection and avian studies.

Liaisons via phone and email have occurred intermittently since this time with both Municipal planning staff and the Municipal contract planner. The focus of these conversations revolved around obtaining supportive letters for the Natural Resources Canada EcoEnergy Application, and the municipal permitting process (since superceded by the REA).

On October 29, 2009 we met with municipal staff to discuss the matters of consultation required through the REA process and to initiate preparation of the REA Municipal Consultation Form. The Part A completed form was presented to the Municipality on December 16, 2009. The Municipality met on January 19th, 2010 internally to review the draft REA package. The form was completed and returned (as separate MS Word document) on February 9, 2010. The form is included as **Appendix 3** to this report.

To summarize, the Municipality outlines a number of requirements prior to issuing building permits, but does not raise any concerns with the project. Such requirements include

- Road entrance permits, a traffic management plan, and pre-construction surveys of roads;
- Finalization of Emergency Plan;
- Detailed construction drawings;
- Building permits

4. ABORIGINAL CONSULTATION

4.1 Reserves, Claims or Treaty Rights

There are no First Nations Reserves within the Study Area. In addition, there are no First Nations claims on the subject lands. The closest First Nations Reserve is the 1,285 hectare Moravian of the Thames reserve located 8 kilometres east of the project area along the Thames River.

4.2 List

The following aboriginal groups and agencies were contacted about this project:

- INAC - Environmental Unit Lands and Trusts Services
- INAC - Specific Claims Branch
- INAC - Treaties and Aboriginal Government
- INAC - Litigation Management and Resolution
- INAC - Office of the Federal Interlocutor for Metis and non-status Indians
- INAC - Aboriginal and Ministry Relationships Branch
- INAC - Comprehensive Claims Branch
- INAC - Environment Unit & Natural Resources Lands and Trusts Services
- INAC - Financial Issues and Cost Sharing
- INAC - Lands and Trust Services
- INAC - Specific Claims Branch
- Ontario Secretariat for Aboriginal Affairs
- Delaware Nation (Moravian of the Thames)
- Bkejwanong Territory (Walpole Island First Nation)
- Munsee-Delaware Nation
- Chippewas of the Thames First Nation
- Oneida Nation of the Thames
- Caldwell First Nation
- Ontario Ministry of Aboriginal Affairs

4.3 Responses

The Ontario Ministry of Aboriginal Affairs, is the only aboriginal agency to respond to correspondence on this project, and indicated the project is not in an area where First Nations may have existing or asserted rights.

As part of the application made for the ecoEnergy for Renewable Energy Program, Natural Resources Canada has indicated that they will be contacting Aboriginal groups that may have an interest in the project.

4.4 Direct Consultation with First Nations

4.4.1 BKEJWANONG TERRITORY (WALPOLE ISLAND FIRST NATION)

A draft REA package was hand delivered to Bkejwanong Territory on November 9, 2009 to the attention of Chief Joseph Gilbert and Dr. Dean Jacobs. This package included a project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed project.

Follow up telephone conversations occurred on February 1, 2010 discussing the status of any review or forthcoming comments. No comments have been provided to date by this community.

4.4.1.1 Stage 2 Archaeological Assessment

On November 30, 2009, Stage 2 Archaeological fieldwork was conducted by Golder Associates with the assistance of Leroy Altiman, a Bkejwanong observer.

4.4.2 MORAVIAN OF THE THAMES FIRST NATION

A draft REA package was hand delivered to Moravian of the Thames First Nation on November 9, 2009 to the attention of Chief Gregory Peters. This package included a project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed project.

A follow up phone call and message was left on February 2, 2010. No comments have been provided to date by this community.

4.4.3 MUNSEE-DELAWARE NATION

A draft REA package was couriered to Munsee-Delaware Nation on December 21, 2009 to the attention of Band Council and Chief Patrick Waddilove. This package included a project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed project.

Follow up telephone conversations occurred on February 2, 2010 discussing the status of any review or forthcoming comments. Chief Patrick Waddilove stated that they would probably not review based on time constraints, but directed the request to Paul Henry for possible review. No comments have been provided to date by this community.

4.4.4 CHIPPEWAS OF THE THAMES FIRST NATION

A draft REA package was couriered to Chippewas of the Thames First Nation on December 21, 2009 to the attention of Band Council and Chief Vaughn Albert. This package included a project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed project.

A follow up phone call and message was left on February 1, 2010. No comments have been provided to date by this community.

4.4.5 ONEIDA NATION OF THE THAMES

A draft REA package was couriered to Oneida Nation of the Thames on December 21, 2009 to the attention of Band Council and Chief Joel Abram. This package included a project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed project.

A follow up phone call and message was left on February 3 and February 25, 2010. No comments have been provided to date by this community.

4.4.6 CALDWELL FIRST NATION

A draft REA package was couriered to Caldwell First Nation on December 21, 2009 to the attention of Band Council and Chief Louise Hillier. This package included a project description including information on First Nations land claims and rights, as well as all other required information. A cover letter summarizing the information found in the package was included which requested that the community comment on any adverse impacts associated with the proposed project.

A follow up phone call and message was left on February 2, 2010. No comments have been provided to date by this community.

4.5 Concerns

Based on the aboriginal consultation undertaken to date, there are no outstanding concerns that have not either been fully addressed through correspondence or proposed mitigation measures. A copy of all written correspondence related to Aboriginal Consultation is found in **Appendix 4**.

5. OTHER CONSULTATION

5.1 Federal Agencies

5.1.1 LIST

Not including First Nation representatives, the following federal agencies were contacted about this project:

- Canadian Environmental Assessment Agency
- Natural Resources Canada
- Department of Fisheries and Oceans
- Canadian Wildlife Service
- Transport Canada
- Parks Canada
- Environment Canada
- Health Canada
- Technical Standards and Safety Authority

5.1.2 RESPONSES

Natural Resources responded via letter on January 29, 2009 to state that the Notice of Project Application under the ecoEnergy program met the basic criteria for eligibility in the program (Reg. #5911-K8-1).

5.2 Provincial Agencies

5.2.1 LIST

The following Provincial ministries, agencies and representatives were contacted about this project:

- Ministry of Aboriginal Affairs
- Ministry of Agriculture and Food – Southwestern Region
- Ministry of Attorney General
- Ministry of Citizenship and Immigration
- Ministry of Culture
- Ministry of Economic Development
- Ministry of the Environment
- Ministry of Energy and Infrastructure
- Ministry of Government Services
- Ministry of Municipal Affairs and Housing
- Ministry of Natural Resources
- Ministry of Northern Development and Mines
- Ministry of Tourism
- Ministry of Transportation
- Ontario Energy Board

- Legislative Assembly of Ontario - MPP
- Ontario Realty Corporation

5.2.2 RESPONSES

5.2.2.1 Ministry of Aboriginal Affairs

The Ministry of Aboriginal Affairs responded on February 10. 2009 that the project does not appear to be located in an area where First Nations may have existing or asserted rights that could be impacted by the project and provided contacts for First Nations in proximity to the project area.

5.2.2.2 Ministry of Natural Resources

A letter of clearance was obtained from the Ministry of Natural Resources on __________, 2010. The letter and recommended conditions of approval can be found in Appendix 5.

5.2.2.3 Ministry of Culture

A letter of clearance was obtained from the Ministry of Natural Resources on __________, 2010. The letter and recommended conditions of approval can be found in Appendix 5.

5.3 Systems Consultation

5.3.1 LIST

The following telecommunications and radar systems agencies were contacted:

- Radio Advisory Board of Canada
- Canadian Forces - Radio Communication Users
- RCMP
- Environment Canada
- Navigation Canada
- Department of Fisheries and Oceans (Coast Guard)
- Natural Resources Canada

5.3.2 RESPONSES

We received written correspondence on January 7, 2009 and January 15, 2009 from Canadian Forces divisions that software modeling of proposed turbine locations indicates no conflict with any current radar installations, nor do they have any issues with respect to the Department of National Defence’s telecommunication systems.

We have received written correspondence on January 8, 2009 from the Canada Coast Guard that the proposed turbine locations are approximately 21 km from the nearest Coast Guard communications site and as such will not cause any interference to Coast Guard Communications.

We received written correspondence on January 28, 2009 from Environment Canada that any impacts to weather radars by the project would be *minimal* and they have no concerns.

5.4 Other Agency Consultation

5.4.1 LIST

Other agencies contacted as part of the ESR are as follows:

- Lower Thames Valley Conservation Authority
- St. Clair River Conservation Authority
- Canadian Pacific Railway

5.4.2 RESPONSES

We received technical mapping information from both conservation authorities to assist in the Natural Heritage Background Study undertaken. Both CA's have been contacted to review the draft ESR and provide comments.

6. APPENDICES

Appendix 5 includes a copy of all of the stakeholder consultation records.

APPENDIX 1 – PROPERTY NOTIFICATION LIST

APPENDIX 2 – PUBLIC CONSULTATION RECORD

APPENDIX 3 – MUNICIPAL CONSULTATION

APPENDIX 4 – ABORIGINAL CONSULTATION

APPENDIX 5 – STAKEHOLDER CONSULTATION RECORD

APPENDIX 1 – PROPERTY NOTIFICATION LIST

ROLL NO.	ADDRESSS	POSTAL CODE	NAME	C/O	MAIL 2	TOWN	PC 2
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365036000227600	LONGWOODS RD	N0P 2K0	INCOMPLETE			THAMESVILLE ON	
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365021000101300	RIVER LINE	N0P 2K0	INCOMPLETE HARRY BROUWER FARMS II	C/O HARRY BROUWER	RR 6	THAMESVILLE ON	N0P 2K0
365036000231500	EVERGREEN LINE	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000238500	SMOKE LINE		INCOMPLETE			THAMESVILLE ON	
365036000248400	SPLINTER LINE	N0P 2K0	INCOMPLETE '617987 ONTARIO INC	C/O JERRY PRELAZ	RR 6	THAMESVILLE ON	N0P 2K0
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365036000244700	SMOKE LINE		INCOMPLETE			THAMESVILLE ON	
365036000228500	LONGWOODS RD	N0P 2K0	INCOMPLETE			THAMESVILLE ON	
365036000233600		'N0P 2K0	INCOMPLETE 'PETER JENNEN FARMS INC		RR 7	THAMESVILLE ON	N0P 2K0
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365036000246500	SPLINTER LINE		INCOMPLETE			THAMESVILLE ON	
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365036000251200	MASON LINE		INCOMPLETE			THAMESVILLE ON	
365036000251405	12044 MASON LINE	N0P 2K0	RETURNED			THAMESVILLE ON	
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365036000251700	MASON LINE		INCOMPLETE			THAMESVILLE ON	
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365021000102900	RIVER LINE		INCOMPLETE			THAMESVILLE ON	
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365036000244200	SMOKE LINE	N0P 2K0	INCOMPLETE '1114364 ONTARIO LIMITED	C/O CLARENCE NYWENING	RR 1	THAMESVILLE ON	N0P 2K0
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365036000251100	MASON LINE	N0P 2K0	INCOMPLETE CRYDERMAN FARMS LTD	C/O JOHN A CRYDERMAN	RR 1	THAMESVILLE ON	N0P 2K0
365036000248301	12013 SPLINTER LINE	N0P 2K0	RETURNED '1103154 ONTARIO LTD	C/O JOHN W TUCK	RR 3	KENT BRIDGE ON	N0P 1V0
365036000230210	SMOKE LINE		INCOMPLETE			THAMESVILLE ON	
365036000228600	LONGWOODS RD	N0P 2K0	INCOMPLETE			THAMESVILLE ON	
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365036000251500	MASON LINE		INCOMPLETE			THAMESVILLE ON	
365036000250000	BASE LINE		INCOMPLETE			THAMESVILLE ON	
365036000209600	LONGWOODS RD	N0P 2K0	INCOMPLETE			THAMESVILLE ON	
365036000215200	DEW DROP RD		INCOMPLETE			THAMESVILLE ON	
365036000216000	13288 EVERGREEN LINE	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000229200	23667 KENT BRIDGE RD	N0P 1V0	RETURNED			THAMESVILLE ON	
365036000229300	23663 KENT BRIDGE RD	N0P 1V0	RETURNED			THAMESVILLE ON	
365036000231601	EVERGREEN LINE		INCOMPLETE			THAMESVILLE ON	
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365036000246202	11860 SPLINTER LINE	N0P 2K0	RETURNED			THAMESVILLE ON	
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365038000144200	LONDON RD		INCOMPLETE			THAMESVILLE ON	
365036000248500	12187 SPLINTER LINE	N0P 2K0	RETURNED			THAMESVILLE ON	
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365036000245600	SMOKE LINE		INCOMPLETE			THAMESVILLE ON	
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365036000217900	23546 INDUSTRIAL RD	N0P 2K0	RETURNED			THAMESVILLE ON	
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365036000230300	11844 SMOKE LINE	N0P 2K0	RETURNED '617987 ONTARIO INC		RR 6	THAMESVILLE ON	N0P 2K0
365036000231400	HUFF'S SIDE RD	N0P 2K0	1025127 ONTARIO INC	C/O RAY MACLEOD	RR 6	THAMESVILLE ON	N0P 2K0
365036000231600	EVERGREEN LINE	N0P 2K0	RAY MACLEOD LIMITED	C/O RAY MACLEOD	RR 6	THAMESVILLE ON	N0P 2K0
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365036000229900	11665 LONGWOODS RD	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000230100	11689 LONGWOODS RD	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000208300	13116 LONGWOODS RD	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000207600	12936 LONGWOODS RD	N0P 2K0	RETURNED			THAMESVILLE ON	

ROLL NO.	ADDRESSS	POSTAL CODE	NAME	C/O	MAIL 2	TOWN	PC 2
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365036000218400	23412 INDUSTRIAL RD	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000227400	11666 LONGWOODS RD	N0P 1V0	RETURNED			THAMESVILLE ON	
365036000227900	11792 LONGWOODS RD	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000228200	11850 LONGWOODS RD	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000206400	LONGWOODS RD	N0P 2K0	RAY MACLEOD LIMITED	C/O RAY MACLEOD	12412 LONGWOODS R	THAMESVILLE ON	N0P 2K0
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365036000227200	11654 LONGWOODS RD	N0P 1V0	RETURNED			THAMESVILLE ON	
365031000326400	RAILROAD	L5C 4R3	CANADIAN PACIFIC RAILWAY	C/O PROPERTY TAX DEPARTMENT	1290 CENTRAL PKY W	MISSISSAUGA ON	L5C 4R3
365021000100500	11813 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000101100	12067 RIVER LINE	N0P 2K0	HARRY BROUWER FARMS INC	C/O HARRY BROUWER	RR 6	THAMESVILLE ON	N0P 2K0
365021000102410	12555 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000102500	RIVER LINE	N0P 2K0	B W GRAINGER FAMILY FARM INC		RR 6	THAMESVILLE ON	N0P 2K0
365021000102600	RIVER LINE	N0P 2K0	B W GRAINGER FAMILY FARM INC		RR 6	THAMESVILLE ON	N0P 2K0
365021000102715	12713 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000102800	RIVER LINE	N0P 2K0	B W GRAINGER FAMILY FARM INC		RR 6	THAMESVILLE ON	N0P 2K0
365036000206200	12266 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000206600	12472 LONGWOODS RD	N0P 2K0	DIELEMANS FARMS LIMITED		RR 6	THAMESVILLE ON	N0P 2K0
365036000206900	12692 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000207410	12918 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000207500	12930 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000207900	12966 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000208200	13074 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000208400	13122 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000209200	12411 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000209300	12513 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000209800	12741 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000210500	12979 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000210600	12983 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000211000	13023 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000211500	13037 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000211600	13045 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000211900	23356 DEW DROP RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000212300	23365 DEW DROP RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000212500	23355 DEW DROP RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000213810	13153 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	

ROLL NO.	ADDRESSS	POSTAL CODE	NAME	C/O	MAIL 2	TOWN	PC 2
365036000214101	13175 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000214400	EVERGREEN LINE	N0P 2K0	DEMETER FARMS CORPORATION	C/O RAY MACLEOD	RR 6	THAMESVILLE ON	N0P 2K0
365036000228300	11954 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000230400	11941 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000243102	24043 KENT BRIDGE RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000243301	24017 KENT BRIDGE RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000246203	SPLINTER LINE	N0P 2K0	DEPENCIER GLEN JOHN ESTATE		RR 6	THAMESVILLE ON	N0P 2K0
365036000200100	13189 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000210200	12851 - 12853 LONGWOODS RD	N0P 2K0	ANNVAN FARMS LTD	C/O MARGARET ANNE VAN ROBOYS	RR 6	THAMESVILLE ON	N0P 2K0
365036000211800	13059 LONGWOODS RD	N0P 2K0	POISSANT FARMS LIMITED		RR 6	THAMESVILLE ON	N0P 2K0
365036000227800	11766 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000238000	LONGWOODS RD	N0P 2K0	617987 ONTARIO INC		RR 6	THAMESVILLE ON	N0P 2K0
365036000207000	12720 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000230205	11719 LONGWOODS RD	N0P 2K0	KENT BRIDGE MINOR BALL INC	C/O H CASIER	RR 2	KENT BRIDGE ON	N0P 1V0
365036000238310		N7G 3P9	ST CLAIR REGION CONSERVATION FOUNDATION		205 MILL POND CRES	STRATHROY ON	N7G 3P9
365036000244100	SMOKE LINE	N0P 1M0	PEACEFUL ACRES LIMITED	C/O PHIL RICHARDS	RR 3	DRESDEN ON	N0P 1M0
365036000206405	23532 HUFFS SD RD	N0P 2K0	1458160 ONTARIO LIMITED		RR 7	THAMESVILLE ON	N0P 2K0
365036000214800	12918 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000215110	13016 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000218000	23540 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000218001	23532 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000218200	23468 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000218500	23360 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000232200	12857 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000233101	12925 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000233500	13061 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000233601	13067 EVERGREEN LINE	N0P 2K0	OCCUPANT				
365036000233800	DEW DROP RD E/S	N0P 2K0	PETER JENNEN FARMS INC		RR 7	THAMESVILLE ON	N0P 2K0
365036000238700	23845 HUFF'S SIDEROAD		OCCUPANT			THAMESVILLE ON	
365036000239000	12674 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000241500	23751 DEW DROP RD	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000245000	12613 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000245401	12811 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000245402	12829 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000245500	12847 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000246400	12024 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000246600	12104 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000246800	12224 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000247100	12490 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000247400	12712 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	

ROLL NO.	ADDRESSS	POSTAL CODE	NAME	C/O	MAIL 2	TOWN	PC 2
365036000247501		N0P 2K0	FORD FARMS LTD		RR 7	THAMESVILLE ON	N0P 2K0
365036000249100	12503 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000249200	12599 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000249600	12665 SPLINTER LINE	N0P 2K0	1118515 ONTARIO LTD	C/O MARK ELLIOTT GRAHAM	RR 7	THAMESVILLE ON	N0P 2K0
365036000249700	12709 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000251900	12400 MASON LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000252000	12468 MASON LINE	N0P 2K0	1058443 ONTARIO INC	C/O WINNIFRED ROSS	RR 7	THAMESVILLE ON	N0P 2K0
365036000252200	12250 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000218100	23528 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000231100	23622 - 23626 HUFFS SIDE RD	N0P 2K0	R & B GEERTSEMA FAMILY FARM INC	C/O ROB GEERTSEMA	RR 7	THAMESVILLE ON	N0P 2K0
365036000239100	12712 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000247500	12734 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000158100	12613 BASE LINE	N0P 2K0	CRYDERMAN FARMS LTD	C/O JOHN CRYDERMAN	RR 1	THAMESVILLE ON	N0P 2K0
365036000158300	29145 OAKDALE RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000161100	12725 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000161200	12775 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000241300	12990 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000217100	23588 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000230110	LONGWOODS RD	N0P 2K0	SECORD FARMS LTD	C/O FLOYD K SECORD	RR 2	THAMESVILLE ON	N0P 2K0
365036000241700	23696 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000246300	11930 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000220100	13339 JANE ST		OCCUPANT			THAMESVILLE ON	
365036000228000	11786 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000103002	RIVER LINE	N0P 2K0	DAHKIIHAAKAN INC		PO BOX 217	THAMESVILLE ON	N0P 2K0
365021000103300	RIVER LINE	N0P 2K0	DAHKIIHAAKAN INC		PO BOX 217	THAMESVILLE ON	N0P 2K0
365021000103400	RIVER LINE	N0P 2K0	DAHKIIHAAKAN INC		PO BOX 217	THAMESVILLE ON	N0P 2K0
365036000228400	12020 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000211850	DEW DROP RD	N0P 2K0	THAMES SALES YARD LTD		PO BOX 419	THAMESVILLE ON	N0P 2K0
365036000213700	13135 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365038000144000	LONDON RD	N0P 2K0	THAMES SALES YARD LIMITED		PO BOX 419	THAMESVILLE ON	N0P 2K0
365036000218700	23318 INDUSTRIAL RD	N0P 2K0	THAMES SALES YARD LIMITED		PO BOX 419	THAMESVILLE ON	N0P 2K0
365036000243500	11781 - 11783 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000249900	12500 BASE LINE	N0P 2K0	JOHN C BADDER ENTERPRISES LIMITED		PO BOX 46	THAMESVILLE ON	N0P 2K0
365036000206100	12162 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000207300	12862 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000207400	12872 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000207800	12956 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000208100	12986 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000208500	13142 LONGWOODS RD	N0P 2K0	CALS MOTOR VEHICLE REPAIR LIMITED		PO BOX 243	THAMESVILLE ON	N0P 2K0
365036000210100	12819 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	

ROLL NO.	ADDRESSS	POSTAL CODE	NAME	C/O	MAIL 2	TOWN	PC 2
365036000210250	12923 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000210300	12937 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000210900	13019 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000212100	13093 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000212900	13119 LONGWOODS RD	N0P 2K0	CRYDERMAN MOTORS LIMITED		PO BOX 189	THAMESVILLE ON	N0P 2K0
365036000215300	23575 DEW DROP RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000217700	23554 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000217800	23552 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000228100	11812 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000228410	12072 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000230000	11683 LONGWOODS RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000230200	11711 LONGWOODS RD	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000209400	12605 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000241900	EVERGREEN LINE	N0P 2K0	509990 ONTARIO LIMITED	C/O E HUBBELL & SONS	PO BOX 118	THAMESVILLE ON	N0P 2K0
365036000242000	23646 INDUSTRIAL RD	N0P 2K0	E S HUBBELL & SONS LTD		PO BOX 118	THAMESVILLE ON	N0P 2K0
365036000246100	24141 KENT BRIDGE RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000248300		N0P 1M0	GERALD VANEK FARMS INC		29409 DAWN MILLS RD	DRESDEN ON	N0P 1M0
365036000248900	12459 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000252300	12278 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000227700	11750 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000249800	BASE LINE	N0P 2K0	JOHN C BADDER ENTERPRISES LIMITED		72 VICTORIA ST	THAMESVILLE ON	N0P 2K0
365036000242100	13235 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000210800	12997 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000200200	13172 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000227620	11734 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000217500	23566 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000166100	12971 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000243300	23995 KENT BRIDGE RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000206300	12310 - 12322 LONGWOODS RD	N0P 2K0	DEMETER FARMS CORPORATION		12412 LONGWOODS R	THAMESVILLE ON	N0P 2K0
365036000209510	12651 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000243400	23999 KENT BRIDGE RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000207110	12756 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000209900	12747 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000243100	24089 KENT BRIDGE RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000210400	12969 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000243304	24011 KENT BRIDGE RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000228412	12098 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000207700	12946 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000210000	12783 LONGWOODS RD	N0P 2K0	RETURNED			THAMESVILLE ON	
365036000206700	12596 LONGWOODS RD	N0P 2K0	DIELEMANS FARMS LIMITED		12596 LONGWOODS R	THAMESVILLE ON	N0P 2K0

ROLL NO.	ADDRESSS	POSTAL CODE	NAME	C/O	MAIL 2	TOWN	PC 2
365036000207100	12768 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000227300	11664 LONGWOODS RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000227100	11652 LONGWOODS RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000217400	23570 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000214000	13163 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000243200	24023 KENT BRIDGE RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000241800	23668 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000212200	23340 DEW DROP RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000252100	12538 MASON LINE	N0P 1M0	OCCUPANT			THAMESVILLE ON	
365036000207200	12854 LONGWOODS RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365021000100300	11757 - 11759 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000100800	11925 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000100900	11939 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000100901	11986 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000101503	12252 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000101600	12339 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000102110	12441 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000103001	12758 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000103401	12833 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000103600	12871 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000161300	29184 BRICK RD	N0P 2K0	CRYDERMAN FARMS LTD		12613 BASE LINE RD F	THAMESVILLE ON	N0P 2K0
365036000212600	23347 DEW DROP RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000214600	12900 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000214900	12928 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000215000	12936 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000215400	13114 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000217300	23576 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000229100	23701 KENT BRIDGE RD	N0P 1V0	OCCUPANT			THAMESVILLE ON	
365036000231900	12833 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000232100	12849 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000233102	12929 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000233300	13015 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000233602	13081 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000241400	13046 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000238800	12502 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000238900	12608 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000238803	12570 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000239300	12758 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000239301	12770 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000245300	12781 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	

ROLL NO.	ADDRESSS	POSTAL CODE	NAME	C/O	MAIL 2	TOWN	PC 2
365036000239400	12802 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000239405	12830 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000239700	12894 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000239800	12966 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000241100	13114 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000241200	13004 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000243600	11841 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000244301	12207 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000244310	12097 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000244900	12595 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000245100	12725 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000245410	12791 SMOKE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000245700	12934 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000246401	12028 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000246605	12104 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000246900	24036 HUFF'S SIDEROAD		OCCUPANT			THAMESVILLE ON	
365036000248401	12077 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000249400	12631 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000249500	12637 SPLINTER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
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365036000251800	12392 MASON LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000252400	12322 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000102100	12437 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000211810	13055 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000220150	JANE ST	N7M 5M1	UNION GAS LIMITED	C/O PROPERTY TAX DEPARTMENT	50 KEIL DR N PO BOX :	CHATHAM ON	N7M 5M1
365036000229000	KENT BRIDGE RD	N7M 5M1	UNION GAS LIMITED	C/O PROPERTY TAX DEPARTMENT	50 KEIL DR N PO BOX :	CHATHAM ON	N7M 5M1
365036000215600	13136 EVERGREEN LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000103100	12775 - 12783 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000103500	RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000243101		N0P 1M0	1573903 ONTARIO LTD		11080 BASE LINE RR 6	DRESDEN ON	N0P 1M0
365036000241600	13154 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000217600	23560 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000210301	12943 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000209100	12293 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000249850	12586 BASE LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000211820	13067 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365021000101401	12184 RIVER LINE	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000209700	12681 LONGWOODS RD	N0P 2K0	D M EQUIPMENT RENTALS LIMITED		9610 CURRIE RD RR 1	WALLACETOWN O	N0L 2M0
365036000217200	23584 - 23586 INDUSTRIAL RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000247600	12618 BASE LINE	N0P 2K0	1114364 ONTARIO LIMITED	C/O CLARENCE NYWENING	12618 BASE LINE RR 1	THAMESVILLE ON	N0P 2K0

ROLL NO.	ADDRESSS	POSTAL CODE	NAME	C/O	MAIL 2	TOWN	PC 2
365036000212400	23357 DEW DROP RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000233700	23752 DEW DROP RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	
365036000207405	12902 LONGWOODS RD	N0P 2K0	OCCUPANT			THAMESVILLE ON	

APPENDIX 2 – PUBLIC CONSULTATION RECORD

NOTICE OF COMMENCEMENT OF AN ENVIRONMENTAL SCREENING PROCESS KENT BREEZE WIND FARMS & MACLOED WINDMILL PROJECT GEOGRAPHIC TOWNSHIP OF CAMDEN, MUNICIPALITY OF CHATHAM-KENT

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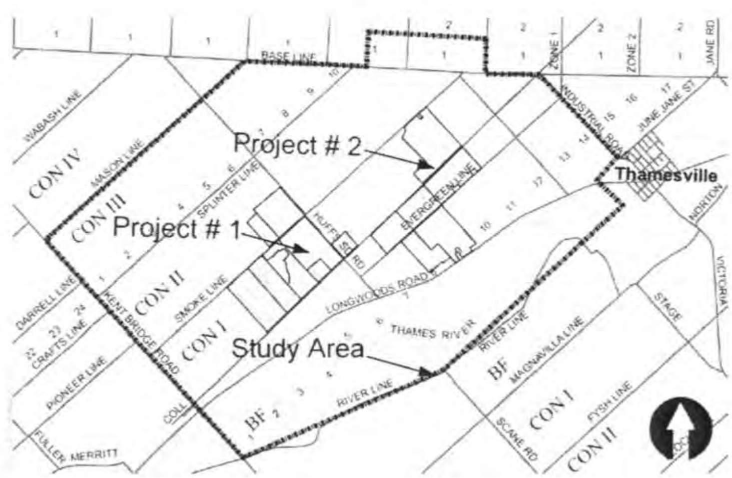

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Teresa Newland
Project Co-ordinator
Kent Breeze Corporation
7997 Tenth Line, R.R.#1
CHARING CROSS, ON. N0P 1G0
Tel: 519-380-9063
Fax: 519-351-2043
Email: tnewland@ciaccess.com

FOR SALE

34' Class A Mallard Motorhome. Onan generator,roof air, toilet, bath, shower, and queen size bed, fridge, stove, microwave, tons of storage. This is a clean, well taken care of motorhome...$17,000 or best offer. Call 519-692-3792.

Graco baby swing, battery operated, plays music or nature sounds, 6 speeds, has a teddy bear mobile attached. $50. Teddy bear mobile $5. Girl's clothes 6 - 18 months, snowsuit size 18 months, best offer. Phone 519-692-9880.

VHS or DVD or CD cabinet with doors, in exc. condition, woodgrain color, if interested, please call or leave message at 519-692-4654 anytime.

1959 Meteor "Rideau" Montcalm V8, door, auto, light green, good body, many extra parts, ready to tow, orig. manual, Alberta car. 519-692-5461.

1 Blue Tick Coon Hound running and treeing. Airamatic Cedar, White Ash, Cherry, Oak for sale. Phone 519-692-4870.

Bissel electric broom vacuum hardly used $15, Baker's rack wrought iron & oak shelf $75 brand new but now $45, seldom used. Moved out of country. 519-692-3994.

Convertible new futon with metal frame and mattress for sitting & sleeping. Paid $262, asking $150. Phone 519-695-3989.

Cheers & Jeers

CHEERS: To the number of people out walking and bike riding.

JEERS: To Jeers to the train crossing on Hwy 2 by grocery store. This was at one time a smooth crossing for a vehicle, however if a driver is unaware of this area it could be a unpleasant surprise as their vehicle rocks across. We cross here twice daily and it is in need of repair. Who can we call?

You can fax or email your cheers or jeers to 519-692-9515
thamesvilleherald@sympatico.ca

Savanna Bonnie Harper

Wayne & Stacey Harper (nee Gillet), thank God for the safe arrival of their first born, a daughter, Savanna Bonnie, born July 14, 2008, weighing 8 lbs. 4 oz. Proud grandparents are Randy and Susan Gillet of Dover Centre and Dennis & Sheila Harper of Thamesville. Great grandparents are George & Loretta Stefik and Ray and Bonnie Gillet, all of Dover Centre, and Donna Harper of Thamesville and Richard Burrell of Croton.

Happy 1st Birthday Taryn DeCook September 17th

Also sharing in Taryn's special day is Great Grandpa, Steve Markowski. Happy 71st

Love Mom, Dad, & Big Sister Mataya

PUBLIC NOTICE

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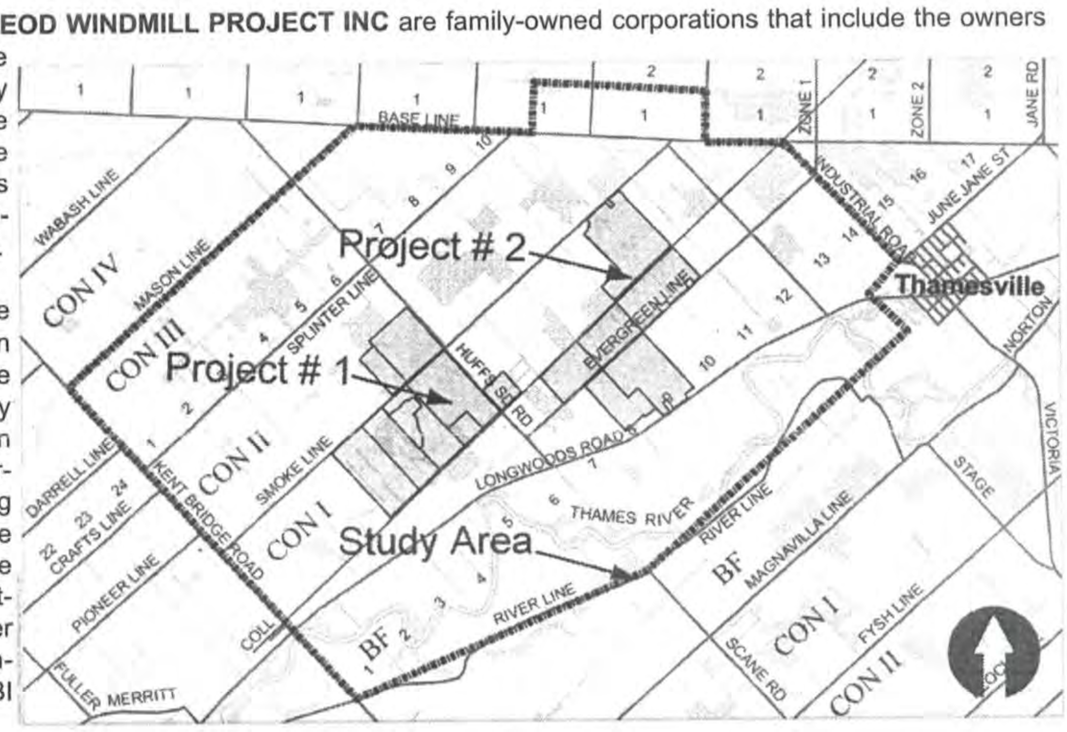

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FOR SALE

34' Class A Mallard Motorhome. Onan generator,roof air, toilet, bath, shower, and queen size bed, fridge, stove, microwave, tons of storage. This is a clean, well taken care of motorhome...$17,000 or best offer. Call 519-692-3792.

Graco baby swing, battery operated, plays music or nature sounds, 6 speeds, has a teddy bear mobile attached. $50. Teddy bear mobile $5. Girl's clothes 6 - 18 months, snowsuit size 18 months, best offer. Phone 519-692-9880.

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1959 Meteor "Rideau" Montcalm V8, 4 door, auto, light green, good body, many extra parts, ready to tow, orig. manual, Alberta car. 519-692-5461.

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Convertible new futon with metal frame and mattress for sitting & sleeping. Paid $262, asking $150. Phone 519-695-3989.

FOR SALE

Large white rocking chair, ashwood, mennonite made, new. Paid $150, asking $75. Phone 519-695-3989.

14 foot boat, 6 Hp motor, 800 lb. trailer, complete package $1,400. Phone 519-683-4556.

Black pick up truck topper made by Raider. Asking $600. Call 519-692-3906 between 8:00 a.m. and 5:00 p.m. Monday to Friday.

BABYSITTER

Responsible thirteen year old looking for babysitting jobs. References available. Call Bailey Humphrey at 519-692-3198.

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Email: tnewland@ciaccess.com

Cheers & Jeers

CHEERS: To my children who came home early and surprised me for Thanksgiving.

'EERS: To the Capitol Theatre project being approved for more money. When will the taxpayers burden be over with?

You can fax or email your cheers or jeers to 519-692-9515
thamesvilleherald@sympatico.ca

AN INVITATION TO A PUBLIC INFORMATION CENTRE FOR THE KENT BREEZE WIND FARMS & MACLOED WINDMILL PROJECT GEOGRAPHIC TOWNSHIP OF CAMDEN, MUNICIPALITY OF CHATHAM-KENT

YOU ARE INVITED to a Public Information Centre on **December 3, 2008** from **6:00 – 9:00pm** at the **Brunner Community Centre** located in **Ferguson Park on Wallace Street**, in the **Village of Thamesville** to discuss the Kent Breeze Wind Farms and MacLeod Windmill Project. The purpose of the information centre is to review the background studies completed to date as part of the Environmental Assessment process; as well as gain a better understanding of the construction and operation of the wind turbines.

THE PROPOSED WIND FARMS are located approximately 2.5 km west of Thamesville and north of Longwoods Road generally centered on the intersection of Smoke Line and Huff's Side Road, the in the geographic Township of Camden, in the Municipality of Chatham-Kent and will consist of 6 turbines in each project area. Project #1, the Kent Breeze Corporation Wind Farm is located in Part Lots 4-6, Concession 1 & 2, on lands west of Huffs Side Road. Project #2, the MacLeod Windmill Project Inc is located in Part Lots 7-11, Concession 1, east of Huff's Side Road. A map showing the project areas and overall Study Area is shown below.

IBI GROUP is undertaking the Environmental Screening process on behalf of the owners. Representatives from IBI Group, the development team, and subconsultants representing specific areas of expertise will be on hand to answer questions about the projects.

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Project Manager
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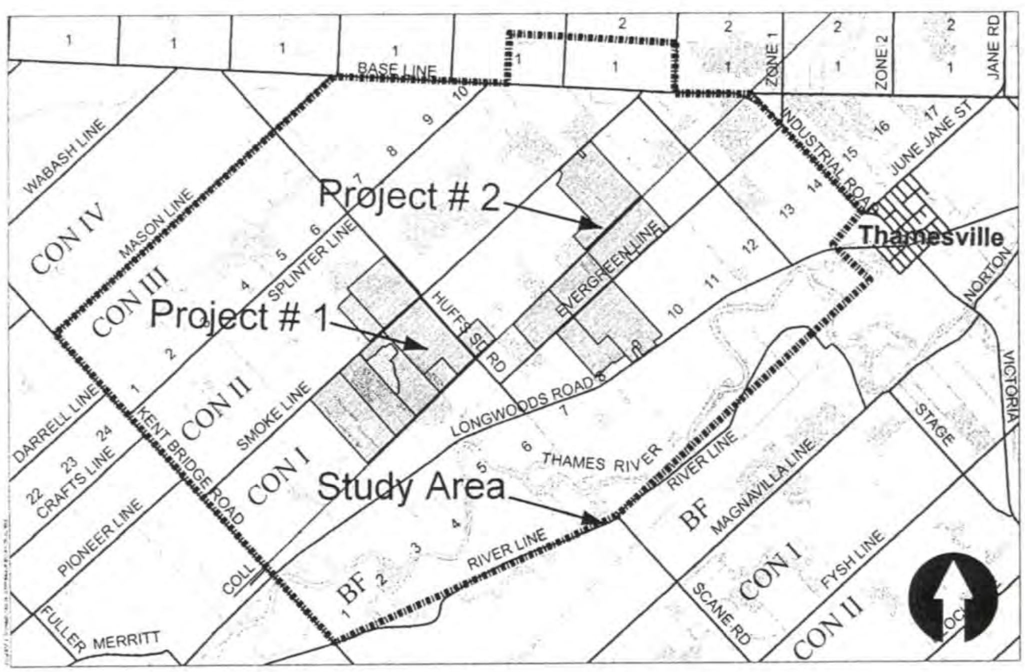


Public Response – By Telephone

Public Response:	October 14, 2008	Method:	Telephone
Name	Gary Noorenberghe		
Address	23845 Huffs Sideroad – Pt. Lot 7, Concession 1		
Comments:	• Doesn't want to see them • Stray voltage • Property devaluation		
Action Taken:	• Invited to public information centre to review actual turbine layout		

Public Response – By Telephone

Public Response:	November 28, 2008	Method:	Telephone
Name	Harry Hill		
Address	519-809-0932 Cell 519-692-5187 Home		
Comments:	• Would like more information re: impact to private airstrip		
Action Taken:	• Confirmed over phone that turbine locations would not impact his private airstrip that was located south of the Thames River		


WELCOME
Kent Breeze Wind Farms &
MacLeod Windmill Project
Public Information Centre
6:00pm – 9:00pm

IBI
GROUP

Project Descriptions

- The projects consist of two 10Mw wind energy projects that will harness wind energy for electricity generation on the Hydro One network
- Each project consists of a maximum of six (6) turbines arrayed across 435.74 hectares of land that is owned by Demeter Farms;
- The turbines will be connected by underground cabling to a substation located near the southwest corner of Huffs Side Road and Smoke Line
- The substation will provide the point of connection with the existing Hydro One lines that currently run through the project area

Purpose of the Meeting?

- To offer an understanding into the construction and operation of the proposed wind farm projects
- To identify any issues you might have with the projects relating to impacts on you and the surrounding environment

Next Steps

- Accumulate and assess potential negative effects raised by public as a result of this information centre;
- Develop mitigation and impact management measures;
- Follow-up consultation with public to address any issues

Team Members

KENT BREEZE

Members of Kent Breeze include the owners of the project area and are responsible for overall management of the project.

IBI GROUP

The IBI Group was retained to undertake the Environmental Assessment as well as Municipal land use planning approvals. Their role includes overseeing the environmental assessment process and co-ordinating the various subconsultants and background components required by the Province and the Municipality of Chatham-Kent in order to obtain required approvals for the projects. IBI Group is also involved in the noise modelling for the projects.

GREEN BREEZE

Green Breeze is responsible for the design and layout of the wind farm; and will be responsible for overseeing construction of the project.

BIOLOGIC

The firm of Biologic was contracted to conduct a study of the natural heritage background information and conduct life science field studies as they apply to the wind farms. Their main focus is on the aquatic, floral, and faunal components of the study area.

NEIL MORRIS ENVIRONMENTAL

The firm of Neil Morris Environmental was contracted to conduct a study of the natural heritage background information specifically related to avian (bird) components.

ARCHAEOLOGIX

Archaeologix was responsible for preparing a Stage 1 archaeological and cultural heritage assessment for the study area. During this assessment, the potential for archaeological findings was considered moderate to high given the history and geographic context of the project area. As such, Stage 2, or further exploratory assessment is being recommended prior to construction of the projects.

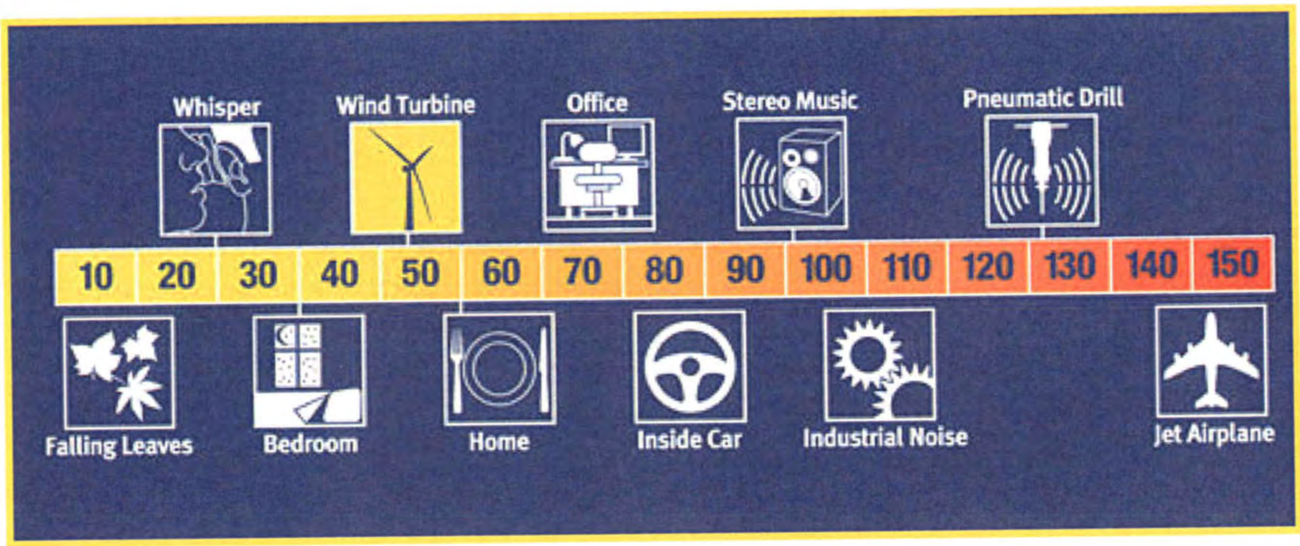
HATCH ENERGY

Hatch Energy was retained to undertake shadow flicker assessment of the turbines on surrounding land uses as part of the environmental assessment, and as required by the Municipality of Chatham-Kent. Results of this assessment are not yet available, but will be made public on their finalization.

Wind Myths

Myth: Wind farms are noisy.

Fact: The evolution of wind farm technology over the past decade has rendered mechanical noise from turbines almost undetectable with the main sound being the aerodynamic swoosh of the blades passing the tower. There are strict guidelines on wind turbines and noise emissions to ensure the protection of residential amenity. The best advice for any doubter is to go and hear for yourself.



Myth: Wind farms won't help climate change.

Fact: Wind power is a clean, renewable source of energy which produces no greenhouse gas emissions or waste products. Power stations are the largest contributor to carbon emissions. We need to switch to forms of energy that do not produce CO^2. Just one modern wind turbine will save over 4,000 tonnes of CO^2 emissions annually.

Myth: Wind farms kill birds

Fact: Today, the wind energy industry has put procedures in place to enhance our understanding of birds and how they interrelate with wind turbines. The modern wind farm undergoes a series of environmental assessments before being approved. In this process, the proposed site will be monitored and bird populations evaluated. What kinds of birds are on site? What are their habits, flight patterns? Do they nest in the area or simply fly through? Questions like these are answered in an effort to better understand on-site bird populations and to mitigate their potential interactions with wind turbines. Once built, further monitoring takes place to better understand the ongoing relationship between birds and the wind farm. A real concern for birds is noted in the 2004 study in *Nature* that estimated that up to a quarter of all bird species could become extinct by 2054 due to global climate change, for which wind energy is one of the solutions.

Wind Myths

Myth: Wind farms are dangerous to humans.

Fact: Wind energy is a benign technology with no associated emissions, harmful pollutants or waste products. In over 25 years and with more than 68,000 turbines installed around the world, no member of the public has ever been harmed by wind turbines. In response to recent unscientific accusations that wind turbines emit infrasound and cause associated health problems, Dr Geoff Leventhall, Consultant in Noise Vibration and Acoustics and author of the Defra Report on Low Frequency Noise and its Effects, says: "*I can state quite categorically that there is no significant infrasound from current designs of wind turbines. To say that there is an infrasound problem is one of the hares which objectors to wind farms like to run. There will not be any effects from infrasound from the turbines.*"

Myth: Building a wind farm takes more energy than it ever makes.

Fact: A wind turbine produces enough clean electricity in six months to offset all of the greenhouse gas emissions emitted in its manufacture – and it will produce clean electricity for another 20-25 years. This compares favourably with coal or nuclear power stations, which take about six months. A modern wind turbine is designed to operate for more than 20 years and at the end of its working life, the area can be restored at low financial and environmental costs.

Myth: Wind farms are inefficient; they are only operational 30% of the time.

Fact: A modern wind turbine produces electricity 70-85% of the time, but it generates different outputs dependent on wind speed. Over the course of a year, it will generate about 30% of the theoretical maximum output. This is known as its load factor. The load factor of conventional power stations is on average 50%. A modern wind turbine will generate enough to meet the electricity demands of more than a thousand homes over the course of a year.

Myth: Wind energy needs back-up to work.

Fact: All forms of power generation require back up and no energy technology can be relied upon 100%. Variations in the output from wind farms are barely noticeable over and above the normal fluctuation in supply and demand, seen when the nation's workforce goes home, or if lightning brings down a high-voltage transmission line. Therefore, at present there is no need for additional back-up because of wind energy.

Wind Myths

Myth: Wind power is expensive.

Fact: The cost of generating electricity from wind has fallen dramatically over the past few years. Between 1990 and 2002, world wind energy capacity doubled every three years and with every doubling prices fell by 15%. Wind energy is competitive with new coal and new nuclear capacity, even before any environmental costs of fossil fuel and nuclear generation are taken into account. As gas prices increase and wind power costs fall - both of which are very likely - wind becomes even more competitive, so much so that some time after 2010 wind should challenge gas as the lowest cost power source. Furthermore, the wind is a free and widely available fuel source, therefore once the wind farm is in place, there is no fuel or waste related costs.

Myth: We should invest in other renewable energy technologies and energy efficiency instead of wind power.

Fact: Wind energy's role in combating climate change is not a matter of either-or. We will need a mix of new and existing renewable energy technologies and energy efficiency measures, and as quickly as possible. Wind energy is the most cost effective renewable energy source available to generate clean electricity and help combat climate change right now. Furthermore, developing a strong wind industry will facilitate other renewable technologies which have not reached commercialisation yet, accumulating valuable experience in dealing with issues such as grid connection, supply chain and finance.

Myth: Wind farms should all be put out at sea.

Fact: At present, onshore wind is more economical than development offshore. However, more offshore wind farms are now under construction in other countries. Offshore wind farms take longer to develop, as the sea is a more hostile environment. To expect offshore to be the only form of wind generation allowed would therefore be to condemn us to missing our renewable energy targets and commitment to tackle climate change.

Myth: Wind farms are ugly and unpopular.

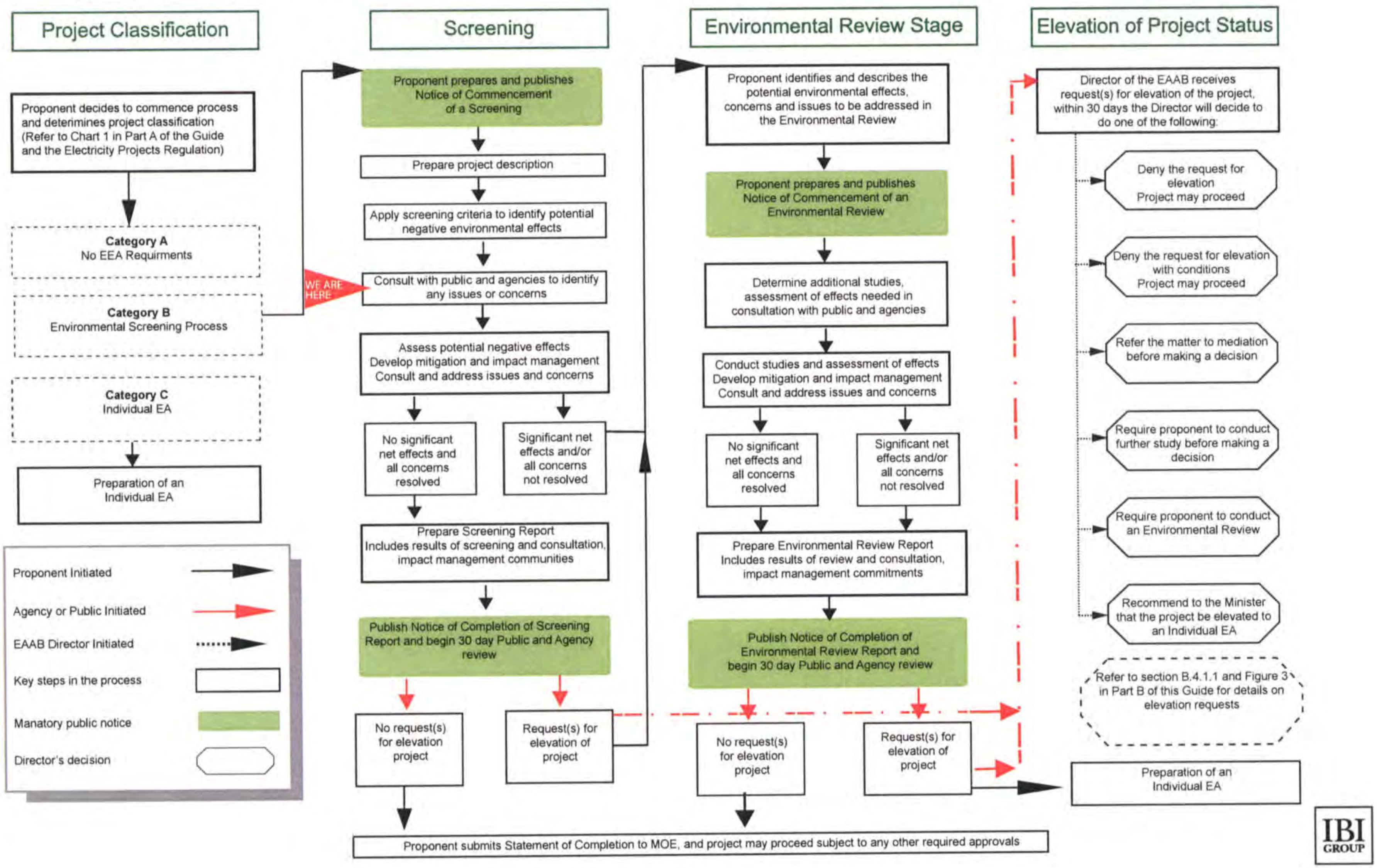
Fact: Beauty is in the eye of the beholder, and whether you think a wind turbine is attractive or not will always be your personal opinion. However, studies regularly show that most people find turbines an interesting feature of the landscape. On average 80% of the public support wind energy, less than 10% are against it, the remainder are undecided. Surveys conducted near existing wind farms have consistently found that most people are in favour of wind energy.

Text courtesy of CANWEA

canwea

IBI GROUP

ENVIRONMENTAL SCREENING PROCESS



Screening Criteria

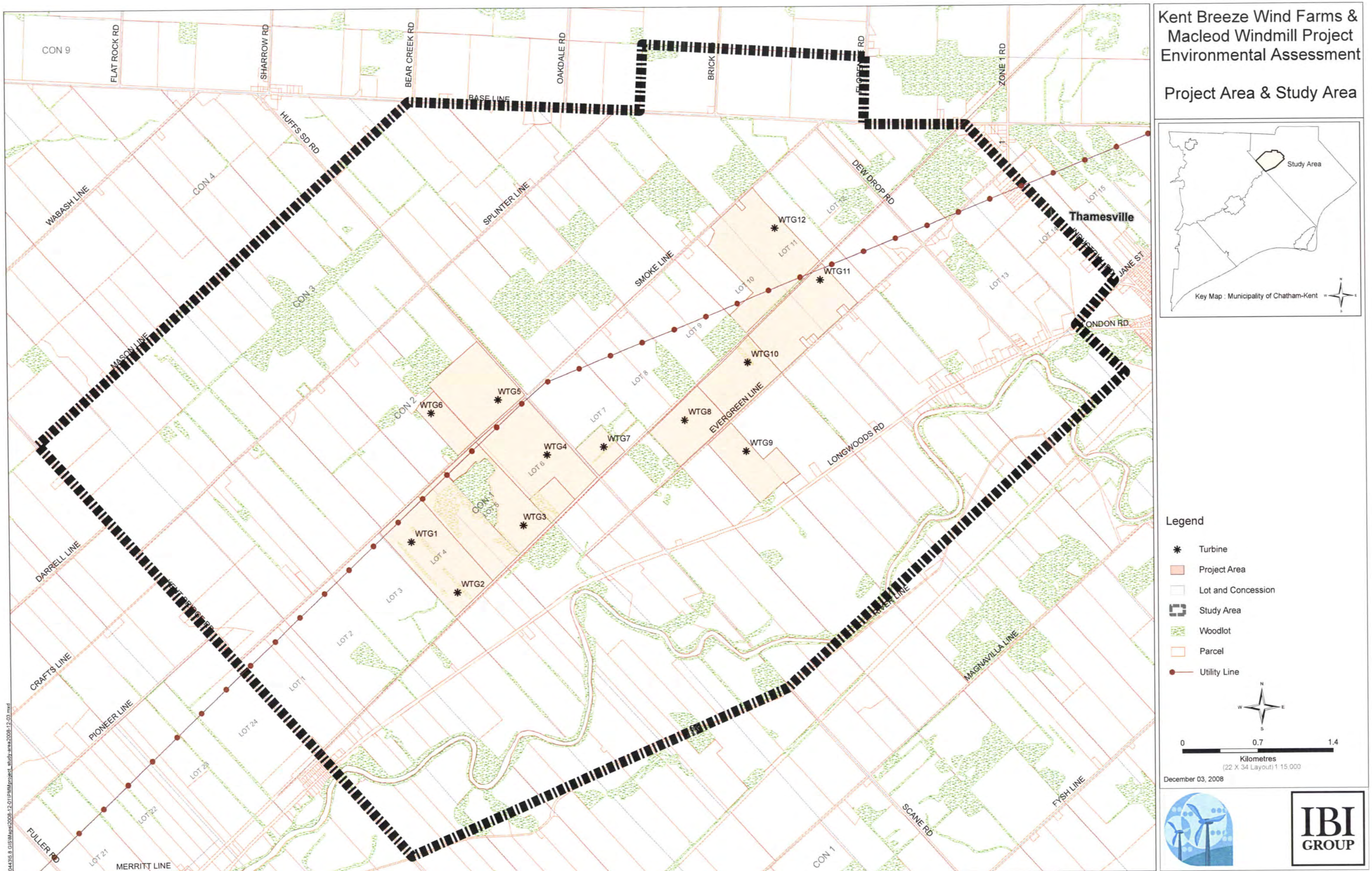
Will the Project...

Criterion		Yes	No	Additional Information
1	Surface and Groundwater			
1.1	have negative effects on surface water quality, quantities or flow?	✓		**Construction period only** - Impacts created by crossing municipal/agricultural drains during construction of access roads / cabling.
1.2	have negative effects on groundwater quality, quantity or movement?	✓		**Construction period only** - Minimal impacts created by construction of turbine bases; **Construction period only** - Low potential for oil/fuel spills of machinery used during construction.
1.3	cause significant sedimentation, soil erosion or shoreline or riverbank erosion on or off site?		✗	None expected due to geographic location of the site.
1.4	cause potential negative effects on surface or groundwater from accidental spills or releases to the environment?	✓		**Construction period only** - Low potential for oil/fuel spills of machinery used during construction.
2	Land			
2.1	have negative effects on residential, commercial or institutional land uses within 50 meters of the site?	✓		**Construction period only** - Construction activities may have temporary impacts on surrounding land uses
2.2	be inconsistent with the Provincial Policy Statement, provincial land use or resoruce management plans?		✗	Provincial Policy Statement Section 1.8.3 supports renewable energy systems in prime agricultural areas
2.3	be inconsistent with municipal land use policies, plans and zoning by-laws?		✗	Chatham-Kent policies support wind energy systems in agricultural designations; Turbines will comply with all applicable zoning by-law regulations.
2.4	use hazard lands or unstable lands subject to erosion?		✗	No hazard lands or unstable lands will be constructed upon.
2.5	have potential negative effects related to the remediation of contaminated land?		✗	The only known use on the subject lands is agricultural and there is no known contamination of these lands
3	Air and Noise			
3.1	have negative effects on air quality due to emissions of nitrogen dioxide, sulphur dioxide, suspended particulates, or other pollutants?	✓		**Construction period only** - wind farm will require heavy machinery (ie. trucks/cranes) which will exhaust such pollutants; Operation of wind farms will not result in any noxious air emissions.
3.2	cause negative effects from the emission of greenhouse gases (CO_2, methane)?	✓		**Construction period only** - wind farm will require heavy machinery (ie. trucks/cranes) which will exhaust such pollutants; Operation of wind farms will not result in any noxious air emissions.
3.3	cause negative effects from the emission of dust or odour?	✓		**Construction period only** - wind farm will require heavy machinery (ie. trucks/cranes) which will create dust during this time period; Operation of wind farms will not result in any dust or odour emissions.
3.4	cause negative effects from the emission of noise?	✓		**Construction period only** - wind farm will require heavy machinery (ie. trucks/cranes) which will create noise during this time period; Operation of wind farms will create sound from blades passing tower and ambient sound from substation facility.
4	Natural Environment			
4.1	cause negative effects on rare, threatened or endangered species of flora or fauna or their habit?		✗	Site visits and Natural Heritage Information Centre research confirms no presence of such faunal species; NHIC research indicates presence of two floral species of concern, but they are located in woodlands that will not be affected by the propsoed development.
4.2	cause negative effects on protected natural areas such as ANSIs, ESAs or other significant natural areas?		✗	There are no such protected areas within the vicinity of the project areas.
4.3	cause negative effects on wetlands?		✗	There are no wetlands within the vicinity of the project areas.
4.4	have negative effects on wildlife habitat, populations, corridors or movement?	✓		**Construction period only** - this period may result in temporary impacts to wildlife habitat and movements; No permanent effects would be created by the development.
4.5	have negative effects on fish or their habitat, spawning, movement or environnmental conditions (e.g., water temperature, turbidity, etc.)?	✓		**Construction period only** - Improvements of water crossings to accommodate havy construction machinery and maintenance access may impact fish habitat.
4.6	have negative effects on migratory birds, including effects on their habitat or staging areas?	✓		Southwestern Ontario considered to be part of Atlantic migration corridor with evidence of migratory birds over subject lands; Impacts are not significant given low concentration of migratory birds compared to elsewhere in southwestern Ontario.
4.7	have negative effects on locally important or valued ecosystem or vegetation?		✗	No rare or specialized habitat was identified on the ecosystems and/or vegetation communities found in the project area.

Screening Criteria

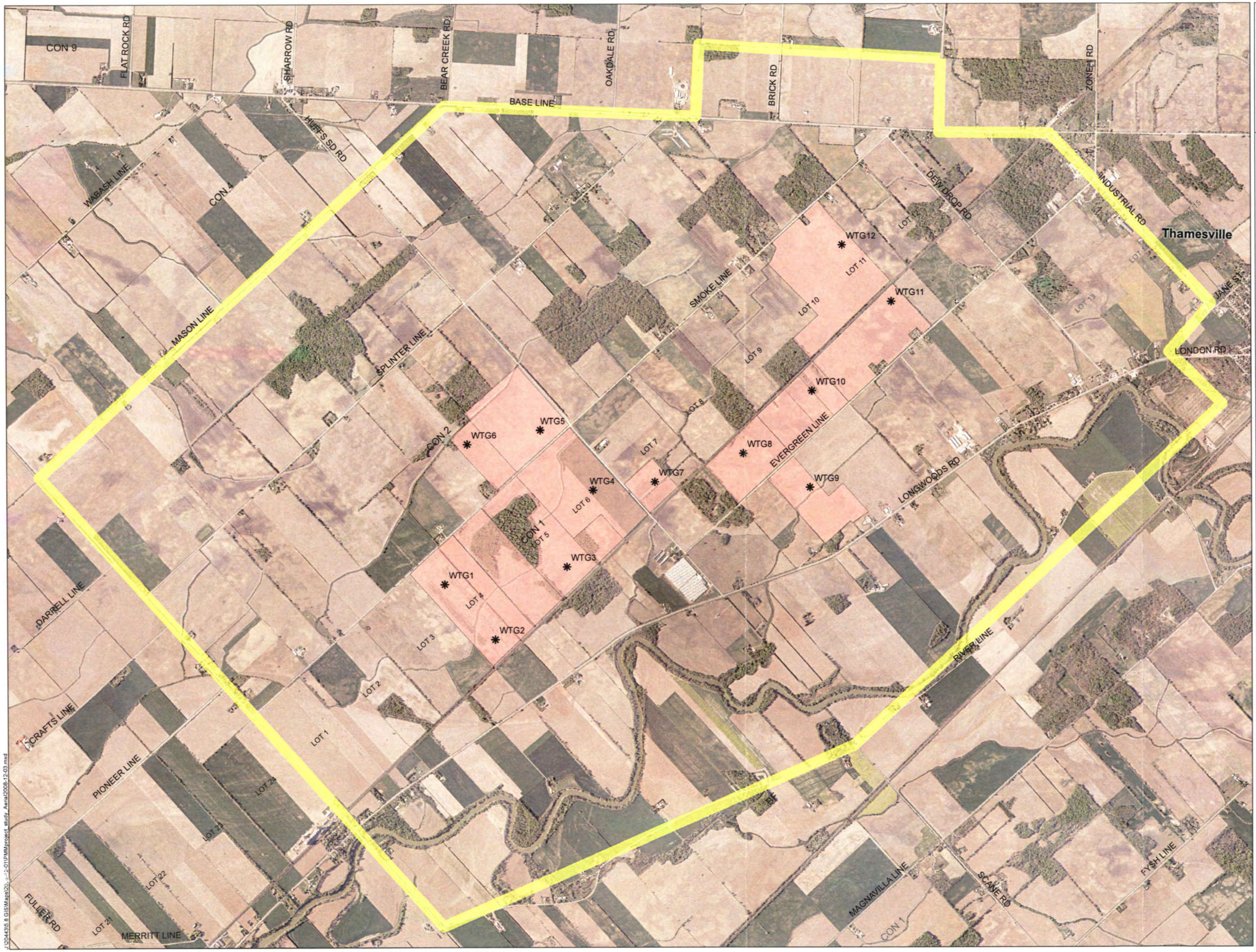
Will the Project...

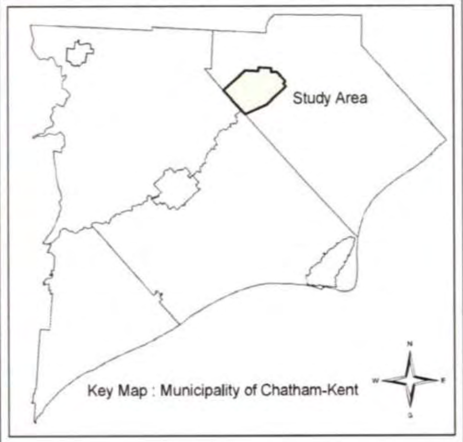
Criterion		Yes	No	Additional Information
5	**Resources**			
5.1	result in inefficient (below 40%) use of a non-renewable resource (efficiency is defined as the ratio of output energy to input energy, where outpout energy includes electricity produced plus useful heat captured)?		X	The result of the proposed development will utilize a renewable resource for electrical generation; No non-renewable resources are used in the operation of the wind farms.
5.2	have negative effects on the use of Canada Land Inventory Class 1-3, specialty crop or locally significnt agricultural lands?	✓		The wind turbines and permanent access roads will require a small amount of CLI Class 2 soils to be taken out of agricultural production.
5.3	have negative effects on existing agricultural production?	✓		The wind turbines and permanent access roads will require a small amount of CLI Class 2 soils to be taken out of agricultural production; No subsequent impacts will be created on agricultural activities.
5.4	have negative effects on the availability of mineral, aggregate or petroleum resources?		X	There are no identified mineral, aggregate, or petroleum resources in the project areas.
5.5	have negative effects on the availability of forest resources?		X	There is no proposed temporary or permanent features associated with the construction or operation of the wind turbines within forested areas.
5.6	have negative effects on game and fishery resources, including negative effects caused by creating access to previously inaccessible areas?		X	All temporary and permanent components of the wind farms will be contained on privately held agricultural land that is not used for game or fishery resources.
6	**Socio-Economic**			
6.1	have negative effects on neighbourhood or community character?		X	The effect of wind turbines on the character of a community is subjective in nature; Turbines will alter an agricultural landscape where there are currently no turbines present.
6.2	have negative effects on local businesses, institutions or public facilities?		X	No such impacts would be created as a result of the project's agricultural locale.
6.3	have negative effects on recreation, cottaging or tourism?		X	No such impacts would be created as a result of the project's agricultural locale.
6.4	have negative effects related to increases in the demand on community services and infrastructure?		X	No such impacts would be created by the construction and operation of a wind farm.
6.5	have negative effects on the economic base of a municipality or community?		X	Industrial tax revenues will increase the assessment base for the municipality; Construction of the wind farms will benefit local service-based businesses for a period of time.
6.6	have negative effects on local employment and labour supply?		X	The construction phase could positively impact employment on a short-term basis; No long-term employment uses are likely.
6.7	have negative effects related to traffic?	✓		**Construction period only -** Construction and delivery traffic will result in temporary short-term disruptions for local traffic; No long-term traffic issues are likely.
6.8	cause public concerns related to public health and safety?	✓		**Construction period only -** Vehicular accidents related to construction are a possibility; Low probability of turbine malfunction may cause safety concerns.
7	**Heritage and Culture**			
7.1	have negative effects on heritage buildings, structures or sites, archaeological resources, or cultural heritage landscapes?	✓		Stage 1 archaeological assesment identified areas of high archaeological potential; Stage 2 assessments have been recommended as part of any development agreements.
7.2	have negative effects on scenic and aesthetically pleasing landscapes or views?		X	While turbines are a significant presence on an agricultural landscape, their effect on landscapes and/or viewsheds is subjective; There are no identified cultural heritage landscapes within the viewshed of the project area.
8	**Aboriginal**			
8.1	cause negative effects on First Nations or other Aboriginal communities?		X	The closest First Nations community is located approximately 20 km to the east.
9	**Other**			
9.1	result in the creation of waste materials requiring disposal?	✓		**Construction period only -** Construction activities will result in use of lubricating and hydraulic fluids that require proper disposal.
9.2	cause any other negative environmental effects not covered by the criteria outlined above?		X	No other affects have been identified.


Kent Breeze Wind Farms & Macleod Windmill Project Environmental Assessment
Project Area & Study Area
Study Area
Key Map : Municipality of Chatham-Kent
Legend
Turbine
Project Area
Lot and Concession
Study Area
Woodlot
Parcel
Utility Line
N
W
E
S
0
0.7
1.4
Kilometres
(22 X 34 Layout) 1:15,000
December 03, 2008
IBI GROUP
Thamesville
CON 9
FLAT ROCK RD
SHARROW RD
BEAR CREEK RD
OAKDALE RD
BRICK
ZONE 1 RD
BASE LINE
HUFFS SD RD
WABASH LINE
CON 4
SPLINTER LINE
DEW DROP RD
SMOKE LINE
CON 3
MASON LINE
CON 2
CON 1
EVERGREEN LINE
LONGWOODS RD
JANE ST
LONDON RD
DARRELL LINE
CRAFTS LINE
PIONEER LINE
FULLER RD
MERRITT LINE
MAGNAVILLA LINE
FYSH LINE
SCANE RD
WTG1
WTG2
WTG3
WTG4
WTG5
WTG6
WTG7
WTG8
WTG9
WTG10
WTG11
WTG12
LOT 1
LOT 2
LOT 3
LOT 4
LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
LOT 11
LOT 12
LOT 13
LOT 15
LOT 21
LOT 22
LOT 23
LOT 24

Kent Breeze Wind Farms & Macleod Windmill Project Environmental Assessment

Project Area & Study Area Aerial Photo





Legend

- Turbine
- Project Area
- Lot and Concession
- Study Area

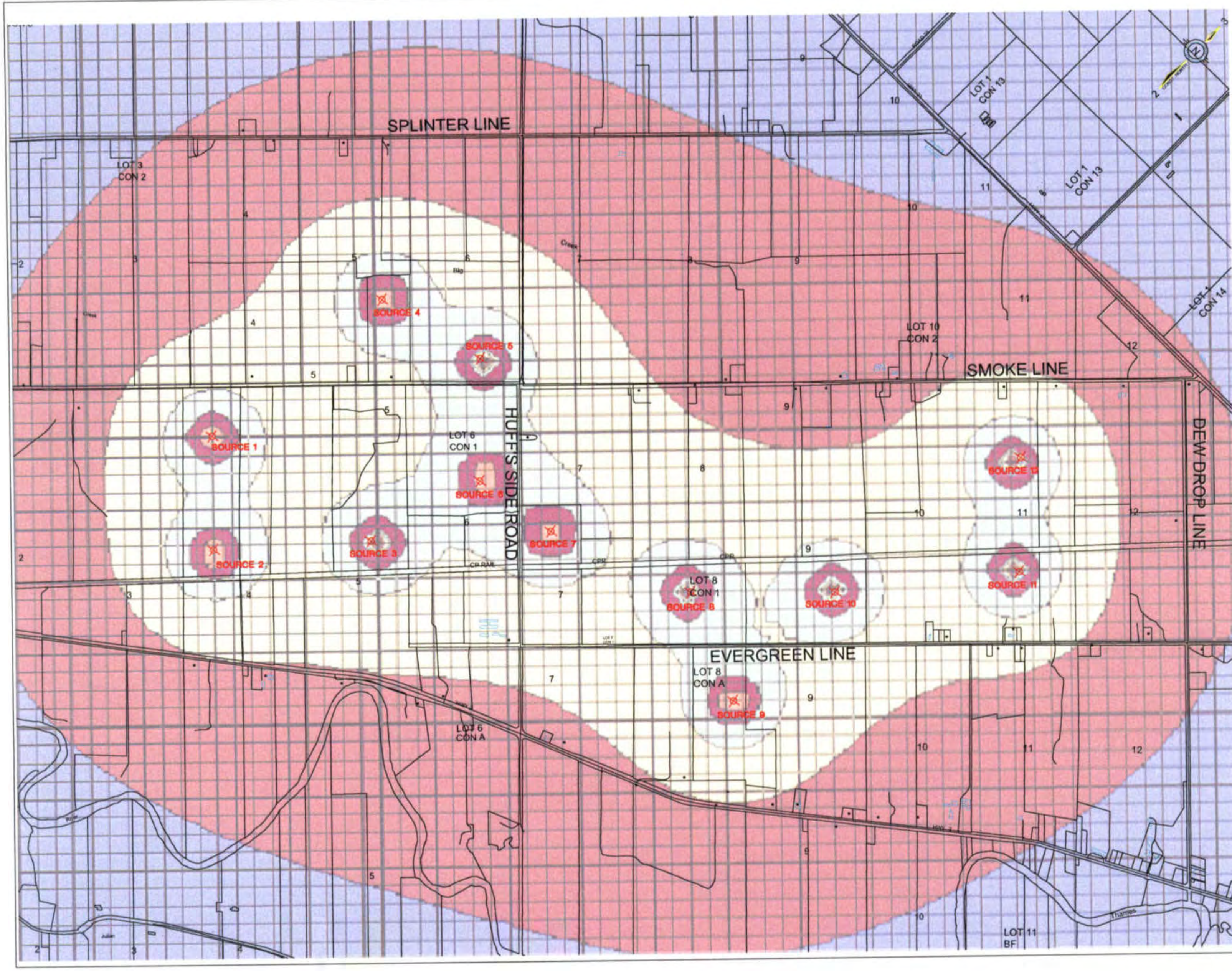
Aerial Phot: Chatham - Kent Ortho 2006

0 0.75 1.5

Kilometres

(22 X 34 Layout) 1:15,000

December 03, 2008



Kent Breeze Wind Farms & MacLeod Windmill Project Environmental Assessment

Draft Noise Contours
Wind Speed - 8.9 metres per second

Permitted Max. sound level - 49 dba

- 55.00-60.00
- 50.00-55.00
- 45.00-50.00
- 40.00-45.00
- 35.00-40.00
- 30.00-35.00

0 0.5km 1km

DECEMBER 3, 2008

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SIGN-IN SHEET

Kent Breeze Wind Farms and MacLeod Windmill Project

Public Information Centre
December 3, 2008 ~ 6:00 p.m. to 9:00 p.m.

Please sign-in to assist us in keeping a record of those who have an interest in this project.

NAME / ORGANIZATION (Please Print)	ADDRESS (Street, City, Postal Code)	TELEPHONE
Peter Bousek	12847 Smoke line	519-692-5135
FRANK BOUSEK	"	"
BOB HOMENIUK	12459 SPLINTER	354-7920
Allison VanderVeen	12028 Splinter	692-4245
MAZUREK	BASE LINE	692 5309
MICHELLE MACDONALD	13067 EVERGREEN LINE	692-5560
Dave Mufflin	12392 Mason Line	6923994
JAMES & ROSE WELCH	13061 EVERGREEN LINE	692-4456
Wayne Emelson	Smoke Line 12770	809-1325
L & R Meekhuish	" " 12829	692-5598
Doug Noorenbergh	23845 HUFF SIDE ROAD	692-5985
David Simon	12709 Splinter Line	692-4657

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NAME / ORGANIZATION (Please Print)	ADDRESS (Street, City, Postal Code)	TELEPHONE
Joseph M Curran	RR6 Thamesville 12747	519-6924653
Stephen Molyneaux	12872 Longwoods	692 3404
Tina Pumfrey	12605 Longwoods Rd. N0P 2K0	692-9962
Louis Roesch	10910 Northwood Line N0P1V0	351-7711
Ralph Bos	12966 Smoke Line	692-5432
Ken Koster	29164 Florence Rd	692-5022
Brad Vopper	13114 Evergreen Line	692-5194
Heather MacLeod		
Ken Bee	532 Sydenham St, Dresden	683-2423
Jodi Tricker	12979 Longwoods Rd.	
Pam Langford	12293 Longwoods RD	692 5837
Brenda Pumfrey	12513 Longwoods Rd.	692-5233

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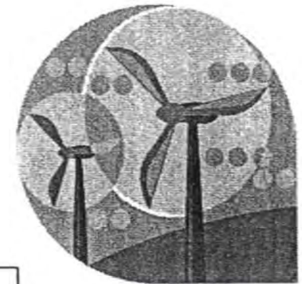
SIGN-IN SHEET

Kent Breeze Wind Farms and
MacLeod Windmill Project



Public Information Centre
December 3, 2008 ~ 6:00 p.m. to 9:00 p.m.

Please sign-in to assist us in keeping a record of those who have an interest in this project.

NAME / ORGANIZATION (Please Print)	**ADDRESS** (Street, City, Postal Code)	**TELEPHONE**
Elsie Howes	RG, Thamesville	692-3758

KENT BREEZE WIND FARMS AND MACLEOD WINDMILL PROJECT

Public Information Centre
December 3, 2008 ~ 6:00 p.m. to 9:00 p.m.

A Public Information Centre was held December 3, 2008. Twenty-seven people signed-in and a total of eight comments sheets were received.

Summary of Comments Received To-Date

• I value my life over a quick buck	
• Concern of Wi-Fi signal disruption	
• Concern regarding vibration	
• Ground, have perched water table, cause vibration on ground shallow ground water table.	
• Stray voltages or surges concerns. Is there going to be tested at nearby homes? If so how often?, How much is there now and how much after?	3
• Concerns re: distance to home, specifically WTG9	2
• Strobe effect	3
• Would appreciate a forum to ask questions with Council, property owners, developers	3
• Will you follow new grounding standards?	
• Property devaluation (Can you provide statistics from Dufferin County / Shelbourne?)	2
• Some statistics regarding health concerns from infrasound.	2
• Please email meeting information	5

COMMENT SHEET

Kent Breeze Wind Farms and
MacLeod Windmill Project

Public Information Centre
December 3, 2008 ~ 6:00 p.m. to 9:00 p.m.

IBI Group has been retained to complete an Environmental Assessment Study for the Kent Breeze Wind Farms and MacLeod Windmill Project. Your comments and opinions would be greatly appreciated in assisting the consulting team to complete an informed and comprehensive Environmental Assessment.

We request your comments and opinions be received in our office by **December 17, 2008** to our office. If you have any questions or require further information please contact us.

IBI GROUP
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3

Derek Dudek
(t) 1.519.472.7328
(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

Please email the demoboard info to mrsmac13067@aol.com

(Use reverse side or attach additional comments)

NAME: MICHELLE MACDONALD

ADDRESS: 13067 EVERGREEN LINE
THAMESVILLE, ON N0P 2K0

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GROUP

COMMENT SHEET

Kent Breeze Wind Farms and
MacLeod Windmill Project

Public Information Centre
December 3, 2008 ~ 6:00 p.m. to 9:00 p.m.

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350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3

Derek Dudek
(t) 1.519.472.7328
(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

Can I please have a copy of the
presentation by email: @
jtricker@ojwslaw.com

(Use reverse side or attach additional comments)

NAME:

ADDRESS:

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COMMENT SHEET

IBI GROUP

Kent Breeze Wind Farms and
MacLeod Windmill Project

Public Information Centre
December 3, 2008 ~ 6:00 p.m. to 9:00 p.m.

Peter Bousek
R, R # 7, Thamesville,
Ontario, Canada

TSSA Certified (taas.org)
Fourth Class Engineer
Compressor Operator

Pager 1-519-380-7542
~~Fax 1-519-692-3944~~
E-mail pbousek@lycos.com

e an Environmental Assessment Study for the Kent Breeze Wind
our comments and opinions would be greatly appreciated in assisting
med and comprehensive Environmental Assessment.

; be received in our office by **December 17, 2008** to our office. If you
ormation please contact us.

Derek Dudek
(t) 1.519.472.7328
(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

- like a copy of map of propose location of windmills. - (all maps at meeting.)
- I value my life over a quick buck.
- concen of ~~distat~~ about wi-Fi signal to house.
- concen about sound & vibration generation.
- ground, have perched water table, cause vibration on ground ~~wd~~ shallow ground water table.

(Use reverse side or attach additional comments)

NAME: Peter Bousek

ADDRESS: 12847 Smoke line.
N0P 2K0
pbousek@lycos.com.

IBI GROUP

COMMENT SHEET

Kent Breeze Wind Farms and
MacLeod Windmill Project

Public Information Centre
December 3, 2008 ~ 6:00 p.m. to 9:00 p.m.

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LONDON, ON N6H 1T3

Derek Dudek
(t) 1.519.472.7328
(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS Please send to me presentation
garynbarb@gmail.com

I would like more info (1) re: distance
(2) - stray voltage (current #'s) vs future
(3) - strobe effect - @lot
(4) We would appreciate a forum to
ask questions -
(5) will you follow new grounding standards?

(Use reverse side or attach additional comments)

NAME: Barb Noorenberghe
ADDRESS: RR7
Thamesville, ON. N0P2K0.

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COMMENT SHEET

Kent Breeze Wind Farms and
MacLeod Windmill Project

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LONDON, ON N6H 1T3

Derek Dudek
(t) 1.519.472.7328
(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

1) terryhardy@hotmail.com

please send me tonites presentation - maps & info, etc.

2) would like an open discussion meeting in future c council - sit down & have an open forum, etc.

3) stray voltage - how much is there now + how much after. Strobe effect?

(Use reverse side or attach additional comments)

NAME: Terry Hardy / Dave Mifflin

ADDRESS: 12392 Mason Line @ Huff

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I've already attended an open house in summer @ Pt-Alma + actually visited the turbine for noise, etc.

Some stats show health concerns from infrasound yet you say no problems – who's telling the truth

Again – would've like to have seen an open discussion group here tonite. Disappointed.

Terry

COMMENT SHEET

IBI GROUP

Kent Breeze Wind Farms and
MacLeod Windmill Project

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LONDON, ON N6H 1T3

Derek Dudek
(t) 1.519.472.7328
(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

Would've been beneficial to have a discussion group c̄ area property owners + your groups.

info well presented HOWEVER: are you telling us what we want to hear to smooth some ruffled feathers?

I'm concerned about property devaluation. Can you not provide stats from Dufferin County / Shelbourne. (Port Alma's too early I presume)

(Use reverse side or attach additional comments)

NAME: Dave Mifflin / Terry Ross-Hardy

ADDRESS: 12392 Mason Line @ Huff Side Rd.

OVER

IBI GROUP

COMMENT SHEET

Kent Breeze Wind Farms and
MacLeod Windmill Project

Public Information Centre
December 3, 2008 ~ 6:00 p.m. to 9:00 p.m.

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350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3

Derek Dudek
(t) 1.519.472.7328
(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

My husband and I are currently building a new house at 12605 Longwoods Rd. WTG9 will be situated behind our house. I have three main concerns: (a) shadow flicker on my home/yard (b) any potential stray voltage, and (c) any possible negative impact on property values. I do not object to the presence of the wind turbines, but I do want these concerns to be satisfactorily addressed.
Thank you.

(Use reverse side or attach additional comments)

NAME: Tina Pumfrey + Edward Pumfrey

ADDRESS: 12605 Longwoods Rd., RR#6
Thamesville, Ont.
N0P 2K0

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pumfreyfamily@gmail.com - please send maps

COMMENT SHEET

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Derek Dudek
(t) 1.519.472.7328
(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

Is the stray voltage or surges going to be tested at near by homes? If so how often?

(Use reverse side or attach additional comments)

NAME: Don Simion

ADDRESS: 12709 Splinter Line

692-4657

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(1)

Derek Dudek

From: William Pol [wpol@ibigroup.com]
Sent: November 2, 2008 7:05 PM
To:
Cc: tnewland@ciaccess.com
Subject: RE: Wind Farm

Dear

Thank you for your response.

Derek Dudek from our office will provide information as requested.

Regards,

William Pol MPA MCIP RPP
Associate

IBI Group
Suite 203 - 350 Oxford Street West
LONDON ONTARIO
N6H 1T3 Canada

tel 519 472 7328 fax 519 472 9354
wpol@ibigroup.com www.ibigroup.com

-----Original Message-----
From:
Sent: October 31, 2008 6:26 PM
To: wpol@ibigroup.com; tnewland@ciaccess.com
Subject: Wind Farm
Importance: High

Hi,

In response to your notice in the paper for the Kent Breeze and Macloed Wind Projects please be advised that there are 2 private airstrips in or adjacent to the bounded area shown. One is at Huffs Sideroad and Base Line and the other is on Base Line between Splinter line and Mason Line. Both strips have been in operation more than 20 years and run more or less parallel to Base Line. We own the one on Base Line. Our normal circuit pattern is to the north of Base Line but the other one is to the south of Base Line to avoid Wabash. That circuit will be in your bounded zone. Our approach/departure to the East will be in your bounded zone.

Could we have more details on what you wish to accomplish so we may overlay the airspace intrusions on our own maps to determine the proposed impact? We would need the actual proposed location of the turbines and their overall heights (to the top of the blade at its highest possible point).

Thanks.

2

(3)

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: November 11, 2008 4:18 PM
To:
Cc: 'wpol@ibigroup.com'; 'Teresa Newland'
Subject: Kent Breeze Wind Farms
Attachments: PTRnoc&pic2008-10-28.doc; PISairstrips2008-11-11.pdf

Thank you for your interest in the Kent Breeze Wind Farm projects. I have attached a pdf map outlining approximate distances to what we believe are the airstrip locations you spoke of in your email dated October 31, 2008 to William Pol in our office. The closest turbines to each of these locations is approximately 2.5km metres southeast in each instance. The total turbine heights (blade included) are 121 metres.

We encourage you to come to our public information centre to discuss the matter in person if necessary. I have attached a copy of the invitation which will also be appearing in the newspaper shortly. Please do not hesitate to contact myself in the meantime.

Derek Dudek, MCIP, RPP
Planner
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

(4)

Derek Dudek

From:
Sent: November 11, 2008 6:56 PM
To: ddudek@ibigroup.com
Subject: RE: Kent Breeze Wind Farms

Thanks for the info Derek. It appears that the turbine locations as proposed will not prevent air operations at either strip.

Sincerely,

From: Derek Dudek [mailto:ddudek@ibigroup.com]
Sent: November 11, 2008 4:18 PM
To:
Cc: wpol@ibigroup.com; 'Teresa Newland'
Subject: Kent Breeze Wind Farms

Thank you for your interest in the Kent Breeze Wind Farm projects. I have attached a pdf map outlining approximate distances to what we believe are the airstrip locations you spoke of in your email dated October 31, 2008 to William Pol in our office. The closest turbines to each of these locations is approximately 2.5km metres southeast in each instance. The total turbine heights (blade included) are 121 metres.

We encourage you to come to our public information centre to discuss the matter in person if necessary. I have attached a copy of the invitation which will also be appearing in the newspaper shortly. Please do not hesitate to contact myself in the meantime.

Derek Dudek, MCIP, RPP
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5

Derek Dudek

From: William Pol [wpol@ibigroup.com]
Sent: October 15, 2008 7:53 AM
To: ddudek@ibigroup.com
Subject: FW: Additional Information

From:
Sent: October 14, 2008 7:42 PM
To: tnewland@ciaccess.com
Cc: wpol@ibigroup.com
Subject: Additional Information

Dear

Being a concerned resident of your "Proposed Study Area", I would be interested in knowing more specifics on the locations in "Project # 2", also if the lands that are designated for your project are currently being lived on by the owners?

Respectfully,

(6)

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: October 15, 2008 11:14 AM
To:
Cc: 'Teresa Newland'
Subject: Kent Breeze Wind Farms

Thank you for your interest in the Kent Breeze Wind Farm projects. We will be scheduling a Public Information Centre in the near future. You will be personally notified of when and where this will take place. We look forward to meeting you at this event. If you have any questions in the meantime do not hesitate to contact the undersigned.

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7

Derek Dudek

From:

Sent: October 15, 2008 1:28 PM

To: ddudek@ibigroup.com

Subject: Re: Kent Breeze Wind Farms

I appreciate the response but, I did ask two questions that you did not respond too and your last sentence (If you have any questions in the meantime do not hesitate to contact the undersigned.) Why have this statement attachment to your Public Notice in the paper and on your E-mails if you are not going to answer questions?

As a concerned resident living in the area looking for additional information, it does not sit well with the **residents** when a company is already dodging question. If questions and concerns are only being met with typical political answers, you certainly are doing a good job of putting our backs against the wall without even putting a shovel in the ground yet.

As a resident that was sitting on the fence of this proposed venture I sure am leaning to one side when met with a brick wall.

Again Respectfully,

Please consider your environmental responsibility before printing this e-mail.

(8)

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]

Sent: October 16, 2008 8:44 AM

To: ı'

Subject: RE: Kent Breeze Wind Farms

Sorry for not answering your specific questions. The turbine locations in both projects areas are not yet finalized, but in Project #2 there are:
two proposed turbines in Part Lot 11, Conc 1
one in Part Lot 9, Conc 1
one in Part Lot 8, Conc 1
one in Part Lot 7, Conc 1
and one in Part Lot 8, Broken Front

Again these are not yet finalized but appear to be probable locations.

With respect to the second question, the owner of the lands lives in the Study Area, but not on one of the parcels proposed to have a turbine situated on it.

Hope to see you at the Public Information Centre.

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ddudek@ibigroup.com
www.ibigroup.com

From:
Sent: October 15, 2008 1:28 PM
To: ddudek@ibigroup.com
Subject: Re: Kent Breeze Wind Farms

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As a concerned resident living in the area looking for additional information, it does not sit well with the **residents** when a company is already dodging question. If questions and concerns are only being met with typical political answers, you certainly are doing a good job of putting our backs against the wall without even putting a shovel in the ground yet.

As a resident that was sitting on the fence of this proposed venture I sure am leaning to one side when met with a brick wall.

9

Again Respectfully,

Please consider your environmental responsibility before printing this e-mail.

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11

Derek Dudek

From: Teresa Newland [tnewland@ciaccess.com]
Sent: November 28, 2008 12:11 PM
To: ddudek@ibigroup.com
Subject: Concerned Resident

Hi Derek,

A ie questions about an ultra light aircraft he owns. He is very nice and not apposed to windfarms he just has a couple of questions I can't answer.
He can be reached at the evenings a

Thanks,
Teresa

12

Public Response – By Telephone

Public Response:	November 28, 2008	Method:	Telephone
Name			
Address	5 5		
Comments:	• Would like more information re: impact to private airstrip		
Action Taken:	• Confirmed over phone that turbine locations would not impact his private airstrip that was located south of the Thames River		

(13)

Derek Dudek

From:

Sent: December 6, 2008 9:16 AM

To: ; ddudek@ibigroup.com

Subject: thamesville meeting?

derek:
well, i guess it wasn't really a meeting, but i was there anyways. i am requesting, along with others ofcourse who don't have the time or energy to put fingers to keys, for a MEETING where we sit down like grown adults and converse back and forth, with questions [ours] and answers [hopefully yours]. when i asked you about this in person, the group felt you became quite defensive and clearly wanted to only chat, one on one; no we want to hear and see everything from everyone! you said, so what are your questions? we have many sir, and would you be kind enough to address them in a semi-formal presentation? it is nice to put up boards and maps and wander around; watching us flit from group to group, hoping we are not missing anything. not fair! and i believe you owe us the courtesy of dealing with this issue of the windmill farms in an adult setting of a 'town meeting'.
i have also called stephen pinsonneault, our c-k council man, and expressed this same request to him. he'd like for us to attend the c-k meeting in council chambers, that is nice, but we want to speak with your group, specifically.
awaiting your reply and with thanks for your time in reading this email. you may also reply to barbara, the other cc on this email....she was there too along with her spouse and have many concerns which were not covered sufficiently, for you to proceed with this adventure. like i said, it is not fair for us to have to run from one group to the other, in order to find out what is really going on!

(14)

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]

Sent: January 23, 2009 11:43 AM

To:

Subject: Kent Breeze Wind Farms follow up

As per my earlier correspondence, the purpose of this email is to follow up directly re: the comment sheet you filled out at the Kent Breeze PIC held on December 3, 2008. The following comments were made on your behalf:

1. *requested copy of maps shown at PIC* – Our records indicate these were forwarded to you on December 11, 2008

2. *a forum to ask questions with Council* – The purpose of the Public Information Centre held on December 3, 2008 was a forum for the public to ask questions of the developers and the related experts. This is a standard method to conduct such public forums through the Environmental Assessment process. A public meeting with CK Council will be undertaken at a later date through the rezoning process and you will be notified by the municipality when this will take place. The Environmental Assessment process is a different process altogether spearheaded by the developer of a given project.

3. *stray voltage* – The issue of stray voltage will not be studied because in most cases it is not an issue. However, the developers will be required to enter into various protocols (safety/operations/dispute resolution) with the Municipality of Chatham-Kent to ensure public health and safety is maintained and would be required to remedy the situation if it is deemed to be a result of this project. Issues of stray voltage are a construction issue and not a wind turbine electricity generation issue per se; and as such can be remedied if encountered.

For all of your concerns where there is no discernable impact created by the project, additional studies will not be undertaken up front to confirm such outcomes. However, the developers will be required to enter into various protocols (safety/operations/dispute resolution) with the Municipality of Chatham-Kent to ensure public health and safety is maintained.

We hope this addresses your concerns. Please contact me directly if you have any additional concerns.

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15

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]

Sent: January 23, 2009 12:02 PM

To:

Subject: Kent Breeze - 2nd comment sheet

Hello agair ,
As per my earlier correspondence, the purpose of this email is to follow up directly re: the second comment sheet you filled out at the Kent Breeze PIC held on December 3, 2008. The additional comments were made on your second comment sheet:

1. *property devaluation* – I offer the following research that is available regarding property valuation that we have used in different projects in southern Ontario:

> **The issue of property valuation in areas near wind farms is often raised as a concern by the public. The following parameters should be considered when discussing the issue of property devaluation:**
>
> 1. **The land use planning process does not directly address the issue of property valuation. Through the establishment of land use designations, zones, and setbacks, sound land use planning reduces land use incompatibility and allows for enjoyment and intended use of all parcels of land. This is addressed in Chatham-Kent Official Plan policies, as well as Zoning By-law regulations for wind turbines.**
> 2. **This concern is not relevant to settlement areas where large turbine setbacks, increased building heights and density, and higher noise levels effectively negate any known impacts from wind turbines located outside of an urban area.**
>
> **Property devaluation and wind turbine locations has been studied on a limited basis. A recent study undertaken for the Dufferin County area (*Property Value Study, The Relationship of Windmill Development and Market Prices, Blake, Matlock, and Marshall Ltd, 2006*) studied the differences in property values in two comparable municipalities, where one municipality had experienced a recent wind farm development (Melancthon - 47 turbines) and one had not (East Luther Grand Valley [ELGV]). This study indicated prices in Melancthon rose higher in comparison to ELGV after the project began operation and that prices rose marginally across the County during the period before and after the wind farm began operation. Based on the study, the large scale energy initaitve has not seen to have created diminished property values. The study is limited in that it includes property values outside of the viewsheds of the wind farm development as well.**
>
> **The most comprehensive report available is a U.S. study (*The Effect of Wind Development on Local Property Values, Sterzinger, Beck & Kostiuk, 2003*) that looks at the effects of wind turbine placement and its effects on properties within the viewshed of turbines, as well as surrounding communities. The project is comprehensive in scope looking at property values:**
>
> 1. **for a three year period before and after a project began operation both in the viewshed and surrounding areas;**
> 2. **for a three year period before and after a project began operation in the viewshed only; and**
> 3. **for the period only after a project began operation in the viewshed and surrounding area.**
>
> **These three scenarios were studied at 10 different project locations in California, New York, Wisconsin, Pennsylvania, Vermont, Texas and Iowa. Under Scenario 1, eight of the ten projects saw higher property values within the viewshed compared to the surrounding communities. Under Scenario 2, nine of the ten project areas saw greater property values within the viewsheds after operation, compared to growth prior to operation of the wind farm.**

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Similarly, Scenario 3 saw nine of the ten project areas experience higher values within the viewshed than the surrounding community. The Study concludes that under 30 different scenarios, the growth rate was higher within the viewshed after project commencement on 26 occasions, and in no case did property values decrease in the viewshed or surrounding areas.

2. *infrasound* –The issue of infrasound has arisen around wind turbines as a potential concern to be addressed through siting of turbines. Infrasound is acoustic waves that are below the level of perception of human hearing. Our review indicates that there is no credible evidence to suggest that vibrations and infrasound levels created by wind turbines are strong enough to create health problems. Infrasound levels that could invoke nausea, dizziness, fatigue, are generally found at levels 1000 times higher than produced by wind turbines.

We hope this addresses your concerns. Please contact me directly if you have any additional concerns.

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Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: December 11, 2008 10:32 AM
To:
Subject: Kent Breeze Presentation Boards
Attachments: PTRinformation-package_reduced2008-12-01.pdf

Information package from the Public Information Centre as requested on comment sheets. Map to follow as separate file.

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(18)

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: December 11, 2008 10:36 AM
To:

n'

Subject: Kent Breeze Map
Attachments: PMMproject_study-area2008-12-03.pdf

Map with proposed turbine locations attached.

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Public Response – By Telephone

Public Response:	October 14, 2008	Method:	Telephone
Name			
Address			
Comments:	• Doesn't want to see them • Stray voltage • Property devaluation		
Action Taken:	• Invited to public information centre to review actual turbine layout		

(20)

Derek Dudek

From:
Sent: January 21, 2009 11:14 AM
To: ddudek@ibigroup.com
Cc:
Subject: windfarms

Hello Derek -

Will your company be organizing another meeting with the landowners in the area re: the proposed windfarm.

A couple of our neighbours who also own land in close proximity 100+ acres were not notified of the information session.

There are a number of people in the neighbourhood who still have some unanswered questions, that would appreciate some clarification on some of the current issues surrounding Wind Farms.

Thank You

(21)

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: January 21, 2009 11:39 AM
To:
Cc:
Subject: RE: windfarms

I will be contacting you all individually shortly to address any concerns that were raised at the Public Information Centre (PIC). We were not planning on holding another PIC as part of our Environmental Screening process, but that may change. There will be public meetings with the Municipality as part of the rezoning process for certain.

Not certain how any landowners were missed through the notification process as we received all landowner mailing addresses through the Municipal Property Assessment Corporation. Please have these people contact me by phone or email to discuss any concerns they might have or if they wish to receive the information that was presented at the PIC.

We are currently working on more noise modeling and shadow flicker studies for the turbine locations as well as the proposed switch station. You also may be pleased to know that Turbine No. 4 that was proposed across from your place of residence on the opposite side of Huffs Side Road has been relocated to Part Lot 10, Concession 1.

Thank you,

Derek Dudek, MCIP, RPP
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Sent: January 21, 2009 11:14 AM
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Cc:
Subject: windfarms

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22 There are a number of people in the neighbourhood who still have some unanswered questions, that would appreciate some clarification on some of the current issues surrounding Wind Farms.

Thank You

23

Derek Dudek

From:
Sent: January 22, 2009 3:06 PM
To: ddudek@ibigroup.com
Subject: Re: windfarms

Hello Derek

thanks for the update!

On 1/21/09, **Derek Dudek** <ddudek@ibigroup.com> wrote:

I will be contacting you all individually shortly to address any concerns that were raised at the Public Information Centre (PIC). We were not planning on holding another PIC as part of our Environmental Screening process, but that may change. There will be public meetings with the Municipality as part of the rezoning process for certain.

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Thank you,

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24

From
Sent: January 21, 2009 11:14 AM
To: ddudek@ibigroup.com
Cc
Subject: windfarms

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A couple of our neighbours who also own land in close proximity 100+ acres were not notified of the information session.

There are a number of people in the neighbourhood who still have some unanswered questions, that would appreciate some clarification on some of the current issues surrounding Wind Farms.

Thank You

25

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: January 23, 2009 11:33 AM
To:
Subject: Kent Breeze Follow Up

Hell

As per my earlier correspondence, the purpose of this email is to follow up directly re: the comment sheet you filled out at the Kent Breeze PIC held on December 3, 2008. The following comments were made on your behalf:

1. *more information re: distance* – Assuming you mean distance to your residence, I noted to you earlier that Turbine #4 directly across the street from you has been removed because it could not meet the noise requirements from your dwelling. As such, the closest turbine to your dwelling now is Turbine No. 5 approximately 511 metres away on the NW corner of Smoke/Huffs. Turbine 7 is approximately 570 metres to the south along Huffs Side Road. Both of these turbines meet the noise requirements of the Ministry of Environment. Please let me know if this answers this specific question
2. *stray voltage* – The issue of stray voltage will not be studied because in most cases it is not an issue. However, the developers will be required to enter into various protocols (safety/operations/dispute resolution) with the Municipality of Chatham-Kent to ensure public health and safety is maintained and would be required to remedy the situation if it is deemed to be a result of this project. Issues of stray voltage are a construction issue and not a wind turbine generation issue per se; and as such can be remedied if encountered.
3. *strobe effect* – A "shadow flicker" study is being undertaken by the developers. However, it will not be undertaken until we are satisfied with the turbine locations in relation to the noise modeling which is not yet complete. I will follow up with you regarding "shadow flicker".
4. *a forum to ask questions* – The purpose of the Public Information Centre held on December 3, 2008 was a forum for the public to ask questions of the developers and the related experts. This is a standard method to conduct such public forums. You may be referring to a public meeting with CK Council. This is undertaken at a later date through the rezoning process and you will be notified by the municipality when this will take place. The Environmental Assessment process is a different process altogether spearheaded by the developer of a given project.
5. *new grounding standards* – All construction will have to be in compliance with the Ontario Building Code as wind turbines are now subject to the building permit process. If you require further information I can ask our construction team to clarify.

For all of your concerns where there is no discernable impact created by the project, additional studies will not be undertaken up front to confirm such outcomes. However, the developers will be required to enter into various protocols (safety/operations/dispute resolution) with the Municipality of Chatham-Kent to ensure public health and safety is maintained.

We hope this addresses your concerns. Please contact me directly if you have any additional concerns.

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Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: January 23, 2009 10:53 AM
To:
Subject: Follow Up to Kent Breeze PIC

Hello
The purpose of this email is to follow up re: the comment sheet you filled out at the Kent Breeze PIC held on December 3, 2008. The following comments were made on your behalf:

1. *requested copy of maps shown at PIC* – Our records indicate these were forwarded to you on December 11, 2008
2. *concern over quality of life vs developers investment in project* – We can only assure you that every effort will be made to minimize any impacts created by the project in accordance with all local an Provincial regulations and requirements.
3. *concern over interference with wi-fi signal* – As part of the Environmental Assessment process we have contacted Industry Canada who is the review agency responsible for assessing impacts of wind turbines on Canada's wireless signal providers. To date we have had no response from Industry Canada regarding any concerns with the project. We will be following up shortly with these agencies to confirm the suitability of our turbine locations.
4. *concern about sound and vibration* - If I recall correctly, your dwelling is located on the north side of Smoke Line, between Huffs and DewDrop. The closest proposed turbine to any of the cluster of dwellings in this section is approximately 680 metres away. Our initial noise modeling indicated compliance with the Ministry of Environment's noise guidelines for rural areas. These studies are being finalized and will be made available to the public upon completion. With respect to vibration, the Ministry of Environment has stated that vibration impacts that could be detected by humans at a distance of 50 metres from the base of the turbine. It is therefore safe to assume there will be no vibration impacts to humans in this area based on setback requirements which greatly exceed this distance.
5. *concern about impacts on water table* – As above there it is safe to assume there will be no impacts on your well due to vibration.

For all of your concerns where there is no discernable impact created by the project, additional studies will not be undertaken up front to confirm such outcomes. However, the developers will be required to enter into various protocols (safety/operations/dispute resolution) with the Municipality of Chatham-Kent to ensure public health and safety is maintained.

We hope this addresses your concerns. Please contact me directly if you have any additional concerns.

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www.ibigroup.com

(27)

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]

Sent: January 23, 2009 1:30 PM

To:

Subject: Kent Breeze Wind Farms - follow up

Hell

Not sure if we actually met at the Public Information Centre for the Kent Breeze Wind Farms, but the purpose of this email is to follow up directly re: the comment sheet you filled out at the Kent Breeze PIC held on December 3, 2008. The following comments were made on your behalf:

1. *shadow flicker* – A shadow flicker study is being undertaken by the developers. However, it will not be undertaken until we are satisfied with the turbine locations in relation to the noise modeling which is not yet complete. I will follow up with you regarding shadow flicker. However, on initial glance, your new home will be south of all of the proposed turbine locations and therefore unlikely to be impacted by any shadow flicker.

2. *stray voltage* – The issue of stray voltage will not be studied because in most cases it is not an issue. However, the developers will be required to enter into various protocols (safety/operations/dispute resolution) with the Municipality of Chatham-Kent to ensure public health and safety is maintained and would be required to remedy the situation if it is deemed to be a result of this project. Issues of stray voltage are a construction issue and not a wind turbine generation issue per se; and as such can be remedied if encountered. Again, at initial glance, your new dwelling (exact location unknown) would be in excess of 500 metres from turbine #9, and all cabling associated with the wind farms is located north of turbine #9.

3. *property devaluation* – I offer the following research that is available regarding property valuation that we have used in different projects in southern Ontario:

    The issue of property valuation in areas near wind farms is often raised as a concern by the public. The following parameters should be considered when discussing the issue of property devaluation:

    1. **The land use planning process does not directly address the issue of property valuation. Through the establishment of land use designations, zones, and setbacks, sound land use planning reduces land use incompatibility and allows for enjoyment and intended use of all parcels of land. This is addressed in Chatham-Kent Official Plan policies, as well as Zoning By-law regulations for wind turbines.**

    2. **This concern is not relevant to settlement areas where large turbine setbacks, increased building heights and density, and higher noise levels effectively negate any known impacts from wind turbines located outside of an urban area.**

    Property devaluation and wind turbine locations has been studied on a limited basis. A recent study undertaken for the Dufferin County area (*Property Value Study, The Relationship of Windmill Development and Market Prices, Blake, Matlock, and Marshall Ltd, 2006*) studied the differences in property values in two comparable municipalities, where one municipality had experienced a recent wind farm development (Melancthon - 47 turbines) and one had not (East Luther Grand Valley [ELGV]). This study indicated prices in Melancthon rose higher in comparison to ELGV after the project began operation and that prices rose marginally across the County during the period before and after the wind farm began operation. Based on the study, the large scale energy initaitve has not seen to have created diminished property values. The study is limited in that it includes property values outside of the viewsheds of the wind farm development as well.

    The most comprehensive report available is a U.S. study (*The Effect of Wind Development on*

28

***Local Property Values, Sterzinger, Beck & Kostiuk, 2003*)** **that looks at the effects of wind turbine placement and its effects on properties within the viewshed of turbines, as well as surrounding communities. The project is comprehensive in scope looking at property values:**

1. for a three year period before and after a project began operation both in the viewshed and surrounding areas;

2. for a three year period before and after a project began operation in the viewshed only; and

3. for the period only after a project began operation in the viewshed and surrounding area.

These three scenarios were studied at 10 different project locations in California, New York, Wisconsin, Pennsylvania, Vermont, Texas and Iowa. Under Scenario 1, eight of the ten projects saw higher property values within the viewshed compared to the surrounding communities. Under Scenario 2, nine of the ten project areas saw greater property values within the viewsheds after operation, compared to growth prior to operation of the wind farm. Similarly, Scenario 3 saw nine of the ten project areas experience higher values within the viewshed than the surrounding community. The Study concludes that under 30 different scenarios, the growth rate was higher within the viewshed after project commencement on 26 occasions, and in no case did property values decrease in the viewshed or surrounding areas.

For all of your concerns where there is no discernable impact created by the project, additional studies will not be undertaken up front to confirm such outcomes. However, the developers will be required to enter into various protocols (safety/operations/dispute resolution) with the Municipality of Chatham-Kent to ensure public health and safety is maintained.

We hope this addresses your concerns. Please contact me directly if you have any additional concerns.

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dult Language and Learning

Celebrating 25 years serving Chatham-Kent

The Adult Learning and Language is celebrating 25 years of serving Chatham-Kent and are inviting the ublic to an Open House in honor of the anniversary.

They are a community based not-for-profit organization (formerly known as Adult Basic Education) who ave grown from a staff of 4 to 22 over the past 25 years. They are holding this Open House to celebrate their uccess and growth. The organization continues to promote and foster personal growth and adjustment for all dults including immigrants to Chatham-Kent, through further education, training and opportunities that support independence and employment.

Their adult programs include Literacy and Essential Skills, Language Training, Settlement services for nmigrants, Job Search Workshops and on-site child care centres for learners. All Services are funded by the iovernment of Canada through the Department of Citizenship and Immigration Canada and Employment)ntario through the Ministry of Training Colleges and Universities.

The Open House celebration will take place on Thursday, November 19th from 2:00 p.m. - 6:00 p.m. at 8 Fifth Street in Chatham.

CKHA Emergency Departments Open Flu Clinics to Support Overflow

Acting Medical Officer of lealth, Dr. David Colby, has certiied that the demand for primary are services in Chatham-Kent is uch that an alternate model of ıfluenza assessment, treatment nd referral is needed to meet atient needs for influenza care.

Chatham-Kent Health ılliance has opened "influenza verflow" clinics to help local resdents who may wish assessment bout their or their family memer's symptoms of influenza, and eel it is necessary to seek medical ttention. These clinics are intendd to temporarily address the ıcreases in patients seeking care ı the Emergency Departments in 'hatham and Wallaceburg for ıfluenza-like illness, and to educe wait times for patients with ymptoms of influenza.

Beginning immediately, Flu 'linics will be held daily from:

Daily from 5 pm to 9 pm at 'KHA's Chatham campus

Weekends from 10 am to 2 pm at ydenham Campus in Vallaceburg.

During these peak times, ED taffing is increased. Patients preenting to the Emergency Departments will be screened by a iage nurse, registered and rediected to the Flu Clinic where they will be treated by a Nurse Practitioner or Physician.

Chief of Staff, Dr. Gary Tithecott said, "The first point of contact for public with Flu symptoms is their primary care provider (family physician or family health team) so that the Emergency Departments are not overrun with non-urgent conditions. However, we urge patients to seek urgent medical attention if they have the emergency warning signs of flu sickness." Emergency treatment is recommended as follows:

In children:
- Fast breathing or trouble breathing
- Bluish skin color
- Not drinking enough fluids
- Not waking up or not interacting
- Being so irritable that the child does not want to be held
- Flu-like symptoms improve but then return with fever and worse cough
- Fever with a rash

In adults:
- Difficulty breathing or shortness of breath
- Pain or pressure in the chest or abdomen
- Sudden dizziness
- Confusion
- Severe or persistent vomiting

CKHA's Pandemic Steering Committee meets twice weekly and monitors indicators such as ED volumes, in-patient volumes, and staff absenteeism. The committee will evaluate and communicate, any adjustments as might be necessary to the Flu Clinic hours or services.

NEW TIME AND DATE
FOR AN
INVITATION TO A PUBLIC MEETING
FOR THE
KENT BREEZE WIND FARM & MACLEOD WINDMILL PROJECT
GEOGRAPHIC TOWNSHIP OF CAMDEN, MUNICIPALITY OF CHATHAM-KENT

PLEASE BE ADVISED that the dates in the previous notice for public meetings on December 7th, 2009 and February 8th, 2010 have been **cancelled** and will be rescheduled as a single meeting.

AS SUCH YOU ARE INVITED to a public meeting to be held at the **Brunner Community Centre** located in **Ferguson Park on Wallace Street**, in the **Village of Thamesville** on **January 11th, 2010** from **6:00pm - 9:00pm** to discuss the proposed final layout and comment on the background studies which will be made available immediately following the first meeting.

THE BACKGROUND STUDIES are available for viewing in the **Thamesville Library** located at **3 London Road**, in the **Village of Thamesville**. A Project Description Report provides a summarization of the background studies and is available at the library or by email by contacting the Project Manager (Derek Dudek) below. The Project Description Report is approximately 1.4mb in size.

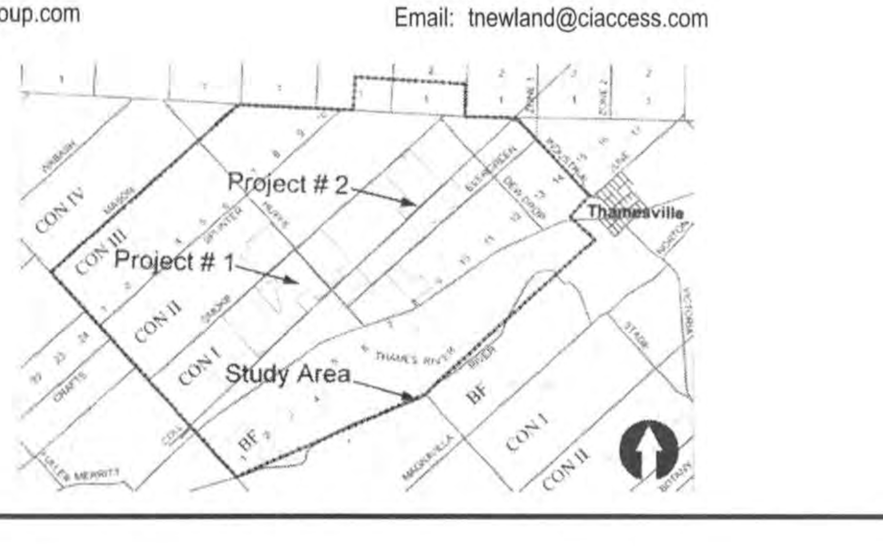
THE PROPOSED WIND FARMS are located approximately 2.5 km west of Thamesville and north of Longwoods Road generally centered on the intersection of Smoke Line and Huff's Side Road, the in the geographic Township of Camden, in the Municipality of Chatham-Kent and will consist of 5 turbines in each project area. Project #1, the Kent Breeze Corporation Wind Farm is located in Part Lots 4-6, Concession 1 & 2, on lands west of Huffs Side Road. Project #2, the MacLeod Windmill Project Inc is located in Part Lots 7-11, Concession 1, east of Huff's Side Road. A map showing the project areas and overall Study Area is shown below.

IBI GROUP is undertaking the Renewable Energy Approvals (REA) process on behalf of the owners. Representatives from IBI Group and the development team will be on hand to answer questions about the projects.

ANY ADDITIONAL INFORMATION relating to the projects may be obtained by contacting the following:

Derek Dudek, MCIP, RPP
Project Manager
IBI Group
#203 - 350 Oxford Street West
LONDON, ON. N6H 1T3
Telephone: (519) 472-7328
Fax: (519) 472-9354
Email: ddudek@ibigroup.com

Teresa Newland
Project Co-ordinator
Kent Breeze Corporation
7997 Tenth Line, R.R.#1
CHARING CROSS, ON. N0P 1G0
Tel: 519-380-9063
Fax: 519-351-2043
Email: tnewland@ciaccess.com



Wabash W.I. Meeting

y Ruth Reid

Ruby Williams, acting Chair in the absence of Shirley Phillips, eeted the members and 4 guests at 9:30 a.m., November 5 at the hall. fter opening with the Institute Ode and Mary Stewart Collect, our onthly motto was noted: "It isn't the load that breaks us down, it's the ay we carry it." The volunteer hours were recorded as the roll was lled. The Secretary's and Treasurer's reports were accepted. Betty 'ebster gave another excellent report of the 60th Annual Convention of uthwestern Area WI. Kay Hooyer, Secretary, read a congratulatory tter from Federated W.I. of Ontario on our 2nd place finish in gaining :w members in the past year which is a compliment to Wabash when any branches are closed or closing. Our regular Christmas donations ere approved and Connie Martin (Treasurer) was instructed to send the ıeques. Hats, mittens and socks for local schoolchildren were brought

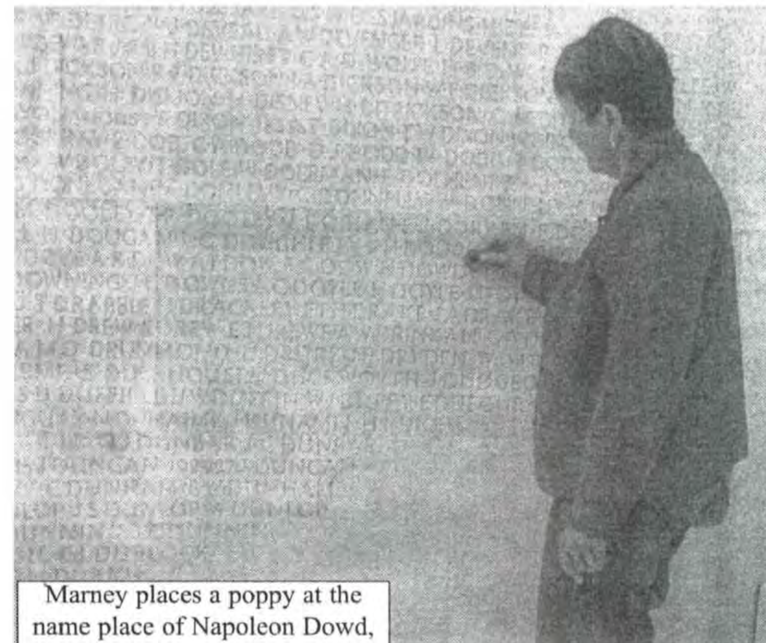
Christmas comes early, Dec. 3, with a catered dinner at the Institute all. The exchange of "secret pal" gifts will end the mystery for anoth- year.

Marie Plank introduced the ROSE Program and we enjoyed a :monstration of beauty products by Mary Kay representative Elizabeth uston of Blenheim.

Hostesses Marianna Badder and Betty Webster treated us to a lunch

Thamesville couple photograph tour of War sites

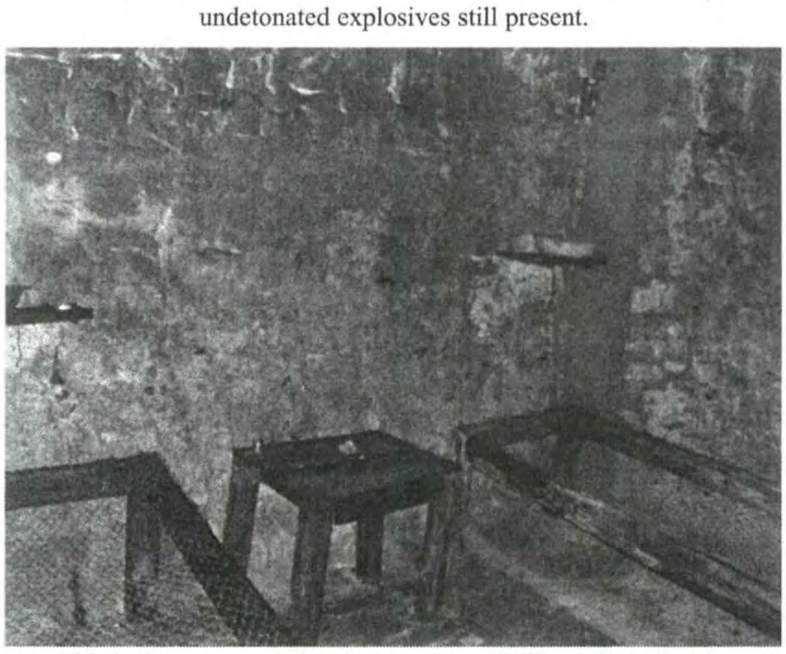
Marney placed a poppy at Joan Jackman's father's grave. Joan's father was W. T. Aylott and was buried in Arras, France at St. Nicolas British Cemetery.



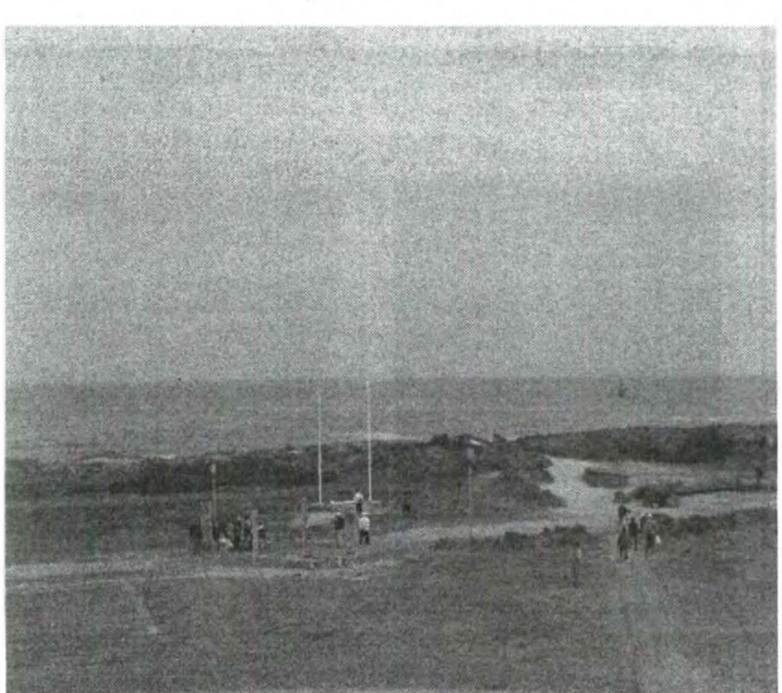
Marney places a poppy at the name place of Napoleon Dowd, who is Marney's great uncle and grew up outside of Thamesville, and was killed at Vimy on October 8, 1916.

In honour of Remembrance Day, these photos depict the route taken by soldiers lucky enough to return home, as well as the many who weren't that lucky.

This is a photo of the trenches that can still be seen at the Beaumont-Hamel Memorial Site. One area is wired off with the warning of undetonated explosives still present.



This is the preserved sleeping quarters of officers in a tunnel at Vimy Ridge.



Juno Beach in Normandy.

Public Response – By Telephone

Public Response:	January 7, 2010	Method:	Telephone
Name	Ralph Erickson		
Address	23845 Huffs Sideroad – Pt. Lot 7, Concession 1		
Comments:	• Doesn't want to see them • Stray voltage • Property devaluation		
Action Taken:	• Invited to public information centre – did not attend • No changes as a result of comments		

IBI GROUP

SIGN-IN SHEET

Kent Breeze Wind Farms and MacLeod Windmill Project

2nd Public Information Centre / Meeting
January 11, 2010 ~ 6:00 p.m. to 9:00 p.m.

Please sign-in to assist us in keeping a record of those who have an interest in this project.

NAME / ORGANIZATION (Please Print)	ADDRESS (Street, City, Postal Code)	TELEPHONE
AL-MAR HOME IMP AL-WEIBERG	11812 LONGWOODS RD R#6 THAMESVILLE	519-351-1717.
Peter Bouse Frank Bouse	12847 Smoke Line. R #7 thamsville	519-692-5158
Stephen Molyneaux	12872 Longwoods Thamesville	692-3404
MARTY VANOR	13015 Evergreen Line	692-9616
Michel + Lisa Michaud	23752 Dew Drop Rd. RR#7 Thamesville	692-9200
LINDA & BOB HOMENIUK	12459 SPLINTER LINE R.R.7 Thamesville	692-4607
Richard + Lorraine Vantomme	30359 Jane Rd Thamesville	692-5348
PATRICK HERBERT	29581 FLORENCE R	6923357
LORETTA HERBERT	29581 Florence Rd	"
MYLES ELLIS	12849 EVERGREEN	519 692 3610
BRAD ERICKSON	12758 SMOKE LINE	519-809-5865
ROBERT MELHUISH	12829 SMOKE LINE	519-692-5598.

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IBI GROUP

COMMENT SHEET

Kent Breeze Wind Farms and
MacLeod Windmill Project

2nd Public Information Centre / Meeting
January 11, 2010 ~ 6:00 p.m. to 9:00 p.m.

IBI Group has been retained to obtain Renewable Energy Approvals (REA) for the Kent Breeze Wind Farms and MacLeod Windmill Project. Your comments and opinions would be greatly appreciated in assisting the consulting team to complete an informed and comprehensive assessment of the projects .

We request your comments and opinions be received in our office by January 20, 2010 to our office. If you have any questions or require further information please contact us.

IBI GROUP
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3

Derek Dudek
(t) 1.519.472.7328
(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

- How will this possibly affect property Values?
Who will help us if we decide to sell but no one buys because of this
- How does this project possitivly ~~[illegible]~~ benifit our Community
- How can local homeowners benifit our Electrical Consumption
- ~~How~~ What do we do if we experience Health problems?
1-800 #'S can be frustrating and Inefficient.
- Do you need local workers to help construct this?
- Do the workers need lodging? We will make lodging available. We believe in Supporting our Community.

(Use reverse side or attach additional comments)

NAME: Michel + Lisa Michaud.

ADDRESS: 23752 Dew Drop Rd.
RR#7, Thamesville, ON, N0P-2K0
519-692-9200 - 519-358-8108

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(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

- Set up of Conflict Resolution of problems cause and Complaints about disturbance from windmill operation
- ~~still~~ still concern about noise reflection from back of bush.
- ~~al~~ I still don't like it

(Use reverse side or attach additional comments)

NAME: Peter Bousek

ADDRESS: 12847 Smoke line RR#7
Thamesville Ont N0P 2K0

COMMENT SHEET

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(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

Dust from heavy traffic is concern - quality of road gravel is very poor x dusty
- concern for asmatic health issues.

(Use reverse side or attach additional comments)

NAME: Bob & LYNDA HOMENIUK

ADDRESS: R.R. 7 Thamesville
(12459 Splinterline)
Ontario.

IBI GROUP

COMMENT SHEET

Kent Breeze Wind Farms and
MacLeod Windmill Project

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January 11, 2010 ~ 6:00 p.m. to 9:00 p.m.

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(f) 1.519.472.9354
(e) ddudek@ibigroup.com

COMMENTS

I do have concerns over low level noise & I also understand that there are questions regarding health concerns. I would hope that if there are adverse effects of wind turbines that the owners take into account their neighbours and try to rectify the situation. I am happy that I have a home farther away from the turbines. I would definitely be upset if one was in my backyard.

(Use reverse side or attach additional comments)

NAME: Marty V[illegible]

ADDRESS: 13015 [illegible] Line
Thamesville, Ont.

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Derek Dudek

From: Derek Dudek
Sent: Mondav. February 08, 2010 10:06 AM
To: 'terry
Subject: RE: i wasn't able to get to the meeting in january; pn...

Noise can cause health concerns regardless of the source (ie. nausea, hearing loss, etc.). It's the reason some jobs require hearing protection. The idea with the studies we are required to do is to set back the turbines appropriately back from sensitive uses (ie. houses, schools, campgrounds, etc.) so that noise does not become a health concern.

Derek

From: terry
Sent: Friday, February 05, 2010 11:05 PM
To: Derek Dudek
Subject: RE: i wasn't able to get to the meeting in january; pn...

so how do you get ill from the noise? am i stupid or what? i just don't get it!

terry

Subject: RE: i wasn't able to get to the meeting in january; pn...
Date: Fri, 5 Feb 2010 09:11:29 -0500
From: DDudek@IBIGroup.com
To:

Well, they do produce an audible noise albeit at relatively low volumes. If you stood under one and couldn't hear anything it was likely the background noise was louder. It also may depend on where you are standing in relation to the tower (ie downwind).

What we are required to do is measure the projected decibel levels at various wind speeds in connection with the turbine make and location. Different configurations can lead to increased or decreased sound in certain areas.

I've attached our decibel contour map to illustrate what I mean.

Derek

From: terry
Sent: Friday, February 05, 2010 7:26 AM
To: Derek Dudek
Subject: RE: i wasn't able to get to the meeting in january; pn...

ok, so what noise? i have actually stood under one - the merlin area? while it was moving & heard not a thing, so what noise?

terry

Subject: RE: i wasn't able to get to the meeting in january; pn...
Date: Thu, 4 Feb 2010 08:48:07 -0500
From: DDudek@IBIGroup.com
To: terry

With respect to the illnesses reported, there do seem to be legitimate concerns from persons particularly in the Melanchthon and Ripley projects.
Ripley I know had to do with faulty electrical system design, as opposed to wind turbine placement and layout, and is fixable. Melancthon, I believe is related to turbines being located in close proximity to dwellings. However Melancthon was built before the new noise guidelines came out, and also before the new increased setbacks came out with the Green Energy Act regulations. In fact, it is one of the reasons the new stricter noise guidelines and setbacks were developed.

Obviously, we are subject to these new rules and as such, there should not be any negative health effects.

Derek

From: terry
Sent: Wednesday, February 03, 2010 9:46 PM
To: Derek Dudek
Subject: RE: i wasn't able to get to the meeting in january; pn...

ok, thanks; i guess my biggest concern, if i am to have any at all, is why are all these people complaining about illness? how are they getting sick from the air/wind moving aorund? i do not understand this!?
terry

> Subject: RE: i wasn't able to get to the meeting in january; pn...
> Date: Tue, 2 Feb 2010 15:41:51 -0500
> From: DDudek@IBIGroup.com
> To: terry
>
> Hello Terry,
> Yes, I can provide you with some news on the changes.
> At the meeting we presented the changes in an open house type format, then conducted a formal q&a session with those in attendance.
>
> Not much has changed from the overall layout. Perhaps the biggest change is we have decided on a specific turbine which is slightly taller and more powerful, and thereby we reduced the total number of turbines from 12 to 10.
>
> Perhaps the best thing to do is give you the Project Description Report with the maps which shows the final layout we are proposing for submission. Give this a look through and if you have any specific questions, don't hesitate to email or call me.
>
> Derek Dudek MCIP, RPP
>
> IBI Group

> Suite 203 - 350 Oxford Street West
> London ON N6H 1T3 Canada
>
> tel 519 472 7328 ext 230
> fax 519 472 9354
> email ddudek@ibigroup.com
> web www.ibigroup.com
>

> -----Original Message-----
> From: terry
> Sent: Tuesday, February 02, 2010 3:06 PM
> To: Derek Dudek
> Subject: i wasn't able to get to the meeting in january; pn...
>
>
> i wasn't able to get to the meeting in january; pneumonia in the family...can you tell me what transpired? what changes were made? this is for the area @ the huff/splinter/smoke side rds.
>
> ____
>

APPENDIX 3 – MUNICIPAL CONSULTATION

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]

Sent: June 11, 2008 9:57 AM

To: 'TomS@storeysamways.ca'; 'MARSHA_COYNE/cityhall/ck1@city.chatham-kent.on.ca'

Cc: 'wpol@ibigroup.com'

Subject: Kent Breeze

Hello Tom and Marsha,
In working with the Kent Breeze folks, they've identified some difficulties in securing a specific turbine. In terms of moving forward on the ESR, we were wondering what your thoughts were on using a worst case scenario turbine (ie. tallest hub, largest blade) for the ESR background studies. The problem is that a worst case scenario would likely mean fewer turbines and if a smaller turbine is procured, more turbines may be required. Your immediate response would be appreciated on this matter, as the developers are hoping to start with turbine locations this week so we can move forward with the background studies.

Thanks,

Derek Dudek, MCIP, RPP
Planner
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Tom Storey [TomS@storeysamways.ca]
Sent: June 11, 2008 2:28 PM
To: ddudek@ibigroup.com; MARSHA_COYNE/cityhall/ck1@city.chatham-kent.on.ca
Cc: wpol@ibigroup.com
Subject: RE: Kent Breeze

Hi Derek – I am not surprised your client is experiencing that type of problem. Our official approach on zoning right now is to create a fairly generous building envelope based on the setbacks in our generic regs, very similar, if not identical, to the Erie Shores model. In that scenario a change in turbine model characteristics would require you to make limited revisions in your ESR and an update to your noise study, but the turbine should still be able to meet the zoning regs. You may wish to include a contingency site to locate any additional turbines. I would assume we would be able to participate in any changes to the ESR.

However, it may well be that we will be using the Gengrowth approach on future applications whereby each turbine will be located precisely using UTM coordinates with a 50 metre radius envelope around each UTM. In this case you may need to go through another rezoning or minor variance process to accommodate a different turbine model.

I have no objections to your client beginning the ESR process with the turbine manufacturer unknown, as long as they are aware of the risk regarding a potential extra process to accommodate changed turbine locations. My best advice to ensure a scenario one approach would be to keep the neighbours happy. I hope this helps.

Tom

Tom Storey
Storey Samways Planning Ltd.
519-354-4351
519-354-4298 (fax)

From: Derek Dudek [mailto:ddudek@ibigroup.com]
Sent: June 11, 2008 9:57 AM
To: Tom Storey; MARSHA_COYNE/cityhall/ck1@city.chatham-kent.on.ca
Cc: wpol@ibigroup.com
Subject: Kent Breeze

Hello Tom and Marsha,
In working with the Kent Breeze folks, they've identified some difficulties in securing a specific turbine. In terms of moving forward on the ESR, we were wondering what your thoughts were on using a worst case scenario turbine (ie. tallest hub, largest blade) for the ESR background studies. The problem is that a worst case scenario would likely mean fewer turbines and if a smaller turbine is procured, more turbines may be required. Your immediate response would be appreciated on this matter, as the developers are hoping to start with turbine locations this week so we can move forward with the background studies.

Thanks,

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Fax (519) 472.9354
ddudek@ibigroup.com

www.ibigroup.com

Derek Dudek

From:	Derek Dudek [ddudek@ibigroup.com]
Sent:	January 12, 2009 9:09 AM
To:	'marshac@chatham-kent.ca'
Cc:	'Tom Storey'
Subject:	Kent Breeze Wind Farms
Attachments:	PTRnotice_commencement2008-10-03.pdf

Hello Marsha,
In the work we are doing for our client Kent Breeze Corp., we are submitting an application to the federal government for their ecoEnergy grant program. As part of the application we require a "letter from the appropriate municipal authority showing that they have been made aware of the project".

The Notice of Commencement was sent to you, Ralph, and Tom back in October 2008. I've attached a copy to refresh your memory. Also, I believe the proponents made a presentation to the Municipality's Green Energy Committee some time ago.

Could you provide us with such a letter. I've cc'd Tom in case he takes care of this.

Thanks,

Derek Dudek, MCIP, RPP
Planner
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LONDON, ON N6H 1T3
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Fax (519) 472.9354
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MUNICIPALITY OF CHATHAM-KENT
315 KING STREET WEST • P.O. BOX 640 • CHATHAM, ONTARIO • N7M 5K8

COMMUNITY AND DEVELOPMENT SERVICES
PLANNING SERVICES
TELEPHONE: (519) 436-3239 FAX: (519) 436-3250

Chatham-Kent: Celebrating 10 years as a Community of Communities

January 12, 2009
Teresa Newland
Kent Breeze Corporation
7997 Tenth Line, R.R. #1
CHARING CROSS ON N0P 1G0

Dear Ms. Newland:

RE: Kent Breeze Wind Farm Project

Further to your request, I wish to confirm that Chatham-Kent is aware of the Kent Breeze Wind Farm proposal in Chatham-Kent. Chatham-Kent's Official Plan contains policies for the development of wind projects such as the one proposed by Kent Breeze Corporation. Chatham-Kent Council has established a set of four strategic directions, one of which is as follows:

Strategic Direction 2
We will support sustainable growth in business and industry with an emphasis on next generation energy, environmental industries and related technologies.

Goal 2.1

We will attract $3B in sustainable investment in new and existing next generation energy, environmental industries and related technologies.

Goal 2.2

We will support the creation of 3,000 net new jobs.

Goal 2.3
We will partner with other organizations to create a centre of excellence research campus for alternative energy, environmental industries and related technology.

Should you require any further information, please contact me.

Respectfully yours,

M Coyne
Marsha Coyne, MCIP, RPP
Senior Planner

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]

Sent: March 9, 2009 4:56 PM

To: 'Tom Storey'

Subject: Kent Breeze Wind Farm

Hi Tom,
I know you have a pretty good handle on all the planned wind farms out there in CK. I'm not aware of any that would be within 10km of the Kent Breeze project. Do you have a map of planned projects or knowledge of any that are near us.

Derek Dudek, MCIP, RPP
Planner
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LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Tom Storey [TomS@storeysamways.ca]

Sent: March 12, 2009 11:38 AM

To: ddudek@ibigroup.com

Subject: RE: Kent Breeze Wind Farm

Hi Derek - I am out of the office right now, returning Monday. However, if memory serves I believe you are beyond 10 K's from hte nearewst turbine.

Tom

From: Derek Dudek [mailto:ddudek@ibigroup.com]
Sent: Mon 3/9/2009 4:56 PM
To: Tom Storey
Subject: Kent Breeze Wind Farm

Hi Tom,
I know you have a pretty good handle on all the planned wind farms out there in CK. I'm not aware of any that would be within 10km of the Kent Breeze project. Do you have a map of planned projects or knowledge of any that are near us.

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ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Tom Storey [TomS@storeysamways.ca]

Sent: March 30, 2009 3:37 PM

To: McAllister, Bruce; ddudek@ibigroup.com; William Pol; ray@saturnpower.ca; jjmurphy@invenergyservices.com; Nicolas Muszynski; peter.clibbon@res-americas.com; Jay Wilgar; delliott@aimpowergen.com; Cookson, Michael; austen.hughes@windprospect.ca; Andy MacCallum

Cc: marshac@city.chatham-kent.on.ca; ralphp@chatham-kent.ca; David French

Subject: Submission and Meeting Schedule Protocols for Chatham-Kent

To All Active Wind Energy System proponents in Chatham-Kent:

We now have taken 7 different projects to Council for zoning approval. Our process for considering these proposals has evolved, and continues to evolve based on our experiences. We now believe a further refinement is necessary to ensure the best planning outcome in the shortest period of time. Accordingly I am writing to confirm the document submission requirements and timing protocol for upcoming Planning meetings:

1. No special meetings of Council will be considered. All projects will be on the agendas of the regularly scheduled Planning meetings.

2. Prior to a project being scheduled for a specific meeting, we must have received the Notice of Completion and the completed ERR/ESR. Please note that this approach assumes that you have submitted a draft ESR/ERR on which Chatham-Kent and the other agencies involved in the EA process have made comments. Please ensure that all items/issues have been addressed. Shortcomings in the ESR/ERR can significantly delay your planning approval process. We acknowledge that there are some items which can be addressed in a planning justification report rather than the ERR/ESR. Please discuss this with us in advance.

3. In addition to the completed ERR/ESR, we must also have received a sign off from the MOE regarding the noise assessment based on the final turbine layout. Projects in the vicinity of Chatham-Kent Airport and other wind farm projects need to ensure that there has been the appropriate sign offs and documentation.

4. You should plan on having a final local public meeting regarding the final turbine location, preferably within 2 or 3 weeks of the statutory public meeting.

5. In order to ensure that these projects receive the necessary internal vetting of our planning reports and amending documents, we will require the document submission be provided approximately 6 weeks prior to the scheduled Planning meeting. FYI these dates would be as follows:

- May 1 for the June 15th Planning Meeting
- May 29 for the July 13th Planning Meeting
- June 26 for the Aug. 10th Planning Meeting
- Aug. 7 for the Sept. 21 Planning Meeting

Also please be advised that, as is the custom of the Municipality, the July 13 and August 10 meetings are combined with regular Council meetings, so there may be limited agenda space even if you do manage to meet the required dates. Finally I ask that you share this email with any of your colleagues you see fit.

Please call if you have any questions.

Tom

Tom Storey, M.Sc., MCIP, RPP
Principal Planner
Storey Samways Planning Ltd.
330 Richmond St., Suite 204
519-354-4351
519-354-4298 (fax)
toms@storeysamways.ca

Derek Dudek

From: Derek Dudek
Sent: Wednesday, December 16, 2009 10:51 AM
To: marshac@chatham-kent.ca
Subject: Kent Breeze Municipal Consultation Form
Attachments: PTX_mun_consult2009-12-16.pdf

Hi Marsha,
I think I left you a voice message about Kent Breeze and whether or not Staff have had a chance to review our draft background reports. At any rate, I've included the MOE consultation form with Part A completed. Could you call me to discuss.

Thanks,

Derek Dudek MCIP, RPP

IBI Group
Suite 203 - 350 Oxford Street West
London ON N6H 1T3 Canada

tel 519 472 7328 ext 230
fax 519 472 9354
email ddudek@ibigroup.com
web www.ibigroup.com

Derek Dudek

From: marshac@chatham-kent.ca
Sent: Tuesday, January 19, 2010 10:21 AM
To: Derek Dudek
Cc: RYAN_JACQUES/ck1@city.chatham-kent.on.ca
Subject: Re: Kent Breeze

Although Mr. Erickson did not attend the public meeting, am I right in assuming his comments will still be included in the consultation report?

Marsha Coyne, MCIP, RPP
Senior Planner
Phone: (519) 360-1998, ext. 3044
Fax: (519) 436-3237
E-mail: marshac@chatham-kent.ca

"Chatham-Kent is a proud, proactive and progressive community committed to celebrating its diversity and ensuring a high quality of life for all its people."

"Derek Dudek" <DDudek@IBIGroup.com>

19/01/2010 09:16 AM

To: <marshac@chatham-kent.ca>, <ryanj@chatham-kent.ca>

cc:

Subject: Kent Breeze

Hi Marsha, Ryan,
I just wanted to give you an update on the Kent Breeze public meeting we had last week knowing that Ryan, you are meeting today to discuss the project internally. It was a success insomuch as nobody turned up against the project. Not even the gentleman you referred to me Marsha. We were able to address most concerns at the meeting and will hopefully be finishing up our Consultation Report by the end of the month.

There won't be any changes to the layout as a result of our public consultation.

Looking forward to hearing from staff after your meeting.

Thanks,

Derek Dudek MCIP, RPP

IBI Group
Suite 203 - 350 Oxford Street West
London ON N6H 1T3 Canada

tel 519 472 7328 ext 230
fax 519 472 9354
email ddudek@ibigroup.com
web www.ibigroup.com

Derek Dudek

From: Paul Lacina [paull@chatham-kent.ca]
Sent: Tuesday, February 09, 2010 4:08 PM
To: Derek Dudek
Cc: Marsha Coyne; Pat Bruette; Ryan Jacques
Subject: Kent Breeze Wind Farms
Attachments: C-K's entries for Part B.doc

Hi Derek,

Please find attached REA consultation form. Should you have any questions or concerns please contact me at your convenience.

Regards,

Paul Lacina CBO

Ontario

Ministry of the Environment

Renewable Energy Approval
Consultation Form: municipalities, local authorities
ss. 18(2) Ontario Regulation 359/09

Ce formulaire est disponible en français

PART A: TO BE COMPLETED BY THE APPLICANT BEFORE SUBMITTING TO MUNICIPALITY OR LOCAL AUTHORITY

Section 1 - Project Description

1.1 - Renewable Energy Project

Project Name *(Project identifier to be used as a reference in correspondence)*

Kent Breeze Wind Farms

Project Location

Same as Applicant Physical Address? ☐ Yes ☒ No (If no, please provide site address information below)

Civic Address- Street information *(includes street number, name, type and direction)*	Unit Identifier *(i.e. apartment number)*
n/a	

Survey Address *(Not required if Street Information is provided)*

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number.		Part and Reference: used to indicate location within unorganized territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan.	
Lot	Conc.	Part	Reference Plan

Location Information *(includes any additional information to clarify physical location)(e.g. municipality, ward/ township)*

Part Lots 8-11, Concession 1, Camden, Chatham-Kent, south side of Smoke Line, east of Huffs Side Road
Part Lots 4-6, Concession 1 & 2, Camden, Chatham-Kent, north and south side of Smoke Line, west of Huffs Side Road

Geo Reference *(e.g. southwest corner of property)*

Map Datum	Zone	Accuracy Estimate	Geo Referencing Method	UTM Easting	UTM Northing
NAD 83	**17**		**Centroid**	**441522.17355**	**4772353.58869**

Project Phasing *(outline construction, operation and decommissioning activities)*

Construction activities to start - Summer 2010
Operation activities to start - December 2010
Decommissioning of the project - December 2035

1.2 - Environmental Context

Describe any negative environmental effects that may result from engaging in the project *(consider construction, operation and decommissioning activities.)*

No significant negative environmental effects expected - See Draft Background Reports for further details

Propose early avoidance/prevention/mitigation concepts and measures.

Draft Background Reports outline various mitigation measures and monitoring protocols to ensure any negative environmental effects are minimal and are mitigated.

1.3 - Renewable Energy Generation Facility

Type of Facility / Operation *(select all that apply & complete all appropriate sections)*

[X]	Wind Facility (Land Based)	[ ]	Biofuel Facility
[ ]	Wind Facility (Off-Shore)	[ ]	Solar Photo Voltaic Facility
[ ]	Biogas Facility (Anaerobic Digesters)	[ ]	Other Describe :
[ ]	Biomass Facility (Thermal Treatment)	[ ]	Class (if applicable) :

Name Plate Capacity	Expected Generation	Service Area	Total Area of Site *(hectares)*
20MW			**436 hectares**

Provide a description of the facilities equipment or technology that will be used to convert the renewable energy source or any other energy source to electricity.

Ten 2MW Enercon E82 wind turbines on 98 metre towers. The main physical components of the projects are wind turbine structures; concrete foundations; on-site access roads; underground cabling; crane pads (construction only); two electrical switching stations; and a meteorological testing tower (existing).

1.4 – Renewable Energy Generation Activities

Describe the activities that will be engaged in as part of the renewable energy project

Activities include planning and resource assessment (complete); and permitting, detailed design, construction, operations, and decommissioning (not yet undertaken or completed).

Section 2 – Supporting Documents

2.1 – Requirement	Name of Draft documents distributed for consultation	Date available to Municipal or Local Authority Contact
DRAFT Project Description Report	**Kent Breeze Wind Farms Renewable Energy Approval Package**	**November 10, 2009**
DRAFT Design and Operations Report		**November 10, 2009**
DRAFT Construction Plan Report		**November 10, 2009**
DRAFT Decommissioning Plan Report		**November 10, 2009**
List of other Documents		

Location where written draft reports can be obtained for public inspection *(physical location for viewing and the applicants project website if one is available)*:

Municipality of North Middlesex: 229 Main Street, Parkhill / Parkhill Library: 233 Main Street, Parkhill
Township of Adelaide-Metcalfe: 3270 Egremont Drive, Strathroy
County of Middlesex: 399 Ridout Street North, London
Project Website: http://www.CanadianWindProposals.com

Section 3 – Applicant Address and Contact Information

3.1 - Applicant Information *(Owner of project/facility)*

Applicant Name *(legal name of individual or organization as evidenced by legal documents)*	Business Identification Number
Kent Breeze Corporation and MacLeod Windmill Project Inc.	**84867 1327 RT0001 / 85059 7964 RTOO01**

Business Name *(the name under which the entity is operating or trading - also referred to as trade name)* [X] same as Applicant Name

Civic Address- Street information *(includes street number, name, type and direction)*	Unit Identifier *(i.e. apartment number)*
7997 Tenth Line, R.R.#1, CHARING CROSS, ON. N0P 1G0	

Survey Address *(Not required if Street Information is provided)*

Lot and Conc.: used to indicate location within a subdivided township and consists of a lot number and a concession number.

Part and Reference: used to indicate location within an unsubdivided township or unsurveyed territory, and consists of a part and a reference plan number indicating the location within that plan. Attach copy of the plan.

Lot	Conc.	Part	Reference Plan

Municipality	County/District	Province/State	Country	Postal Code

Kent Breeze Wind Farms

PART B: TO BE COMPLETED BY THE MUNICIPALITY OR LOCAL AUTHORITY

Section 4 – Municipal or Local Authority Contact Information

Local Municipality
Name of Municipality – ***Municipality of Chatham-Kent***
Address – ***Civic Centre, 315 King Street West, P.O. Box 640, Chatham ON N7M 5K8***
Phone – ***519-360-1998***
Clerk's Name – ***Elinor Mifflin***
Clerk's Phone/Fax – ***Phone: 519-360-1998 X3200 Fax: 519-436-3237***
E-Mail Address – elinorm@chatham-kent.ca

Please Note: Upper Tier Municipality, Local Roads Area & Board Area do not apply

Section 5: Consultation Requirement

5.1 – Project Location
Provide comment on the project location with respect to infrastructure and servicing.

No comment at this time

5.2 – Project Roads
Provide comment on the proposed project's plans respecting proposed road access.
Project will require entrance permits off municipal roads.

Identify any issues and provide recommendations with respect to road access.
Proponent must meet with Public Works to determine location of each required entrance. There has been no meeting to date to discuss plan detail.

Provide comment on any proposed Traffic Management Plans
Proponent must have a road pre-construction survey completed as well as a structure survey for all structures involved in project development, including all materials delivery routes.

Identify any issues and provide recommendations with respect to the proposed Traffic Management Plans
Have not received Traffic Management Plan for approval as of yet.

5.3 – Municipal or Local Authority Service Connection
Provide comment on the proposed project plans related to the location of and type of municipal service connections, other than roads.

No comment at this time

Identify any issues and provide recommendations with respect to the type of municipal service connections, other than roads.

No issues or recommendations at this time

5.4 – Facility Other

Identify any issues and recommendations with respect to the proposed landscaping design for the facility.

No issues or recommendations at this time

Provide comment on the proposed project plans for emergency management procedures/safety protocols.

1. ***Applicants shall meet with representatives of Fire & Emergency Services to discuss arrangements necessary to complete emergency plans and to review such plans once completed.***

2. ***Location of each turbine for municipal GIS and Civic addressing purposes (provided in spreadsheet format), including:***

   - ***number assigned to turbine***
   - ***access road UTM coordinates (centre point)***
   - ***UTM coordinates of turbine location***
   - ***Lot and Concession***
   - ***roll number of turbine host property***
   - ***roll number of access point (if different from above)***
   - ***municipal road name of access point***

Identify any issues and recommendations with respect to any Easements or Restrictive Covenants associated with the Project Location.

Unaware of any Easements or Restrictive Covenants

5.5 – Project Construction
Identify any issues and recommendations with respect to the proposed rehabilitation of any temporary disturbance areas and any municipal or local authority infrastructure that could be damaged during construction.

Engineering & Transportation Submissions should include the following:

1. ***Plans indicating:***

    - ***all proposed construction sites***
    - ***all proposed transmission lines***
    - ***all municipal roads which will serve as proposed access routes & delivery routes to the site (traced back to the geographic limits of the Municipality of Chatham-Kent)***
    - ***all proposed new driveway or roadway entrances off of municipal roads to serve project sites complete with details, such as hydraulic design associated with sizing of pipe when crossing a municipal drain or roadside ditch***
    - ***all proposed haul roads over private lands complete with details, such as hydraulic design associated with sizing of any structures necessary to provide access across a municipal drain***

2. ***Information associated with delivery of materials & construction, including:***

    - ***turning radii of all large vehicles & any proposed improvements to road cross section or intersection geometry***
    - ***hydraulic design associated with sizing of pipe when modifying intersection at a municipal drain crossing***
    - ***hydraulic design associated with sizing of pipe when modifying intersection at a roadside ditch***
    - ***loads associated with delivery and construction of project (total loads, axle loads, axle spacing etc.)***
    - ***engineered evaluation of all bridges and culverts by a Professional Engineer licensed in the Province of Ontario in accordance with the Canadian Highway Bridge Design Code***
    - ***modifications to any road signage or traffic control signage to facilitate geometry modifications***

* *preliminary traffic and worker protection plans*

3. ***Public Works Submissions should include the following:***

1. ***Shared use agreement with Hydro One or C-K Hydro, in cases where hydro lines meet in municipal right-of-way (ROW)***

2. ***Approval from Transport Canada and Nav Canada in relation to Chatham-Kent Municipal Airport restricted zones***

3. ***Agreement with the Municipality for Hydro transmission or collector lines in the municipal ROW. In situations involving longer distances between high voltage feeds from applicant's transformer to Hydro One main transmission lines for distribution to the power grid, those feeds should be on private property with easements.***

4. ***Application for entrance permits on roadside ditches to access internal service roads to new wind/solar/green energy projects***

5. ***Notification if any municipal roads/intersections need to be improved to allow for construction of the wind/solar/green energy projects (turning radius) etc. Evaluation is to be conducted at the applicant's expense.***

6. ***Application for moving permits for delivery of equipment (such as tower parts and erection cranes). The Half Load By-law No. 245-2004 runs from February 1st to May 1st on the majority of municipal roads.***

4. ***Drainage Services Submissions should include the following:***

1. ***Copy of information provided to Engineering and Transportation (see above)***

2. ***Details on study area. Please provide as soon as possible, since the Drainage Act process can take up to a year.***

3. ***Details concerning locations of wind turbines/solar panels/green energy components, any planned access roads and any proposed road widening***

4. ***Contact information for proponent and contractor. The Drainage Act process is not a permit process, but rather a design, discussion/input and construction/inspection process.***

5. ***Information relating to municipal drains, including:***

    * ***proposed setbacks from municipal drains. All permanent and temporary buildings, foundations, equipment, roads, storage and staging areas, poles, and buried cable will not be constructed or placed closer than 10***

metres to the top of the bank of an open drain or closer than 8 metres horizontally to a buried drain.

- ***installation of buried cables. If installed by open cut, power cables will be placed 1.5 metres below the designed bottom of any buried municipal drain. If directional drilling used, power cables will be placed 2.5 metres below any buried municipal drain. Power cables will be directionally drilled to 2 metres below the bottom of the drain, ensuring that there is no damage to the drain bank. No cables are to be buried within a culvert backfill or across a new or existing crossing.***

- ***crossing of municipal drains will be designed and constructed according to the Drainage Act***

- ***Provision for surface water inlets. Any collection of surface drainage water that outlets to a municipal drain requires conduits that are correctly sized and composed of suitable materials. Consideration must be given to erosion protection of and for municipal drains.***

- ***on-site project review to view and discuss entrances, turns and crossings, especially as they relate to municipal drains***

6. ***Planned construction schedule with mind to foreseeing any conflict with other construction activities and determining compatibility with other time and process restrictions***

Identify any issues and recommendations with respect to the proposed location of fire hydrants and connections to existing drainage, water works and sanitary sewers.

No issues or recommendations at this time

Identify any issues and recommendations with respect to the proposed location of buried kiosks and above-grade utility vaults.

No issues or recommendations at this time

Identify any issues and recommendations with respect to the proposed location of existing and proposed gas and electricity lines and connections.

Project located outside of Chatham-Kent Hydro area, consult with Hydro One.

Provide comment on the proposed project plans with respect to Building Code permits and licenses.

1. ***Building permit application for each property, including:***

    - ***911 and identifying number for each turbine***

- ***soil report for each turbine location***

- ***site plan, showing location of turbine complete with setback dimensions to property lines***

- ***Three sets of drawings for foundations, turbine and accessory buildings [i.e. transfer stations] with signed Ontario structural engineer stamp. Foundations that are atypical due to soil conditions shall be added to the specific building permit application.***

- ***General Review Certificates signed by applicable engineers***

- ***Building permit fees (based on foundation and tower cost)***

Identify any issues and recommendations related to the identification of any significant natural features and water bodies within the municipality or territory.

No issues or recommendations at this time

Identify any issues and recommendations related to the identification of any archaeological resource or heritage resource.

No issues or recommendations at this time, however this response is preliminary in nature and has not benefited from review and comment by the Municipal Heritage Committee (Heritage Chatham-Kent), which has significant local knowledge

APPENDIX 4 – ABORIGINAL CONSULTATION

Ministry of Aboriginal Affairs

Aboriginal and Ministry Relationships Branch

160 Bloor St. East, 9th Floor
Toronto, ON M7A 2E6
Tel: (416) 326-4741
Fax: (416) 326-4017
www.aboriginalaffairs.gov.on.ca

Ministère des Affaires autochtones

Direction des relations entre les autochtones et les ministères

160, rue Bloor Est, 9e étage
Toronto ON M7A 2E6
Tél. : (416) 326-4741
Téléc. : (416) 890-1234
www.aboriginalaffairs.gov.on.ca

Ontario

FEB 10 2009

Reference: ARMB 640
GA0809-640

IBI GROUP
RECEIVED
FEB 17 2009

CIRO	DATE	ACK'D
JAH		
WP		
DD		
SH		
JB		

William Pol, MPA, MCIP, RPP
Associate
IBI Group
#203 – 350 Oxford Street West
London, ON N6H 1T3

Teresa Newland
Project Co-ordinator
Kent Breeze Corporation
7997 Tenth Line, R. R. #1
Charing Cross, ON N0P 1G0

Re: Notice of Commencement of an Environmental Screening Process
Kent Breeze Wind Farms & MacLoed Windmill Project
Geographic Township of Camden, Municipality of Chatham-Kent

Dear Mr. Pol and Ms. Newland:

Thank you for your notice sent on December 17, 2008 regarding the above noted proposal and the request for information to assist in your assessment of the potential for the Crown to engage or consult with Aboriginal peoples regarding this proposal.

The responsibilities of the Ministry of Aboriginal Affairs (MAA) include conducting land claim and related negotiations on behalf of the Province. MAA can provide you with information about land claims that have been submitted to the Ministry, are currently in active negotiations, or are being implemented. We can also advise as to whether there is any litigation with an Aboriginal community that may be relevant to your project.

You should also be aware that many First Nations and Métis communities either have or assert rights to hunt and fish in their traditional territories. These territories often include lands and waters outside of a First Nation reserve. As well, in some instances project work may affect archaeological and burial sites. Aboriginal communities with an interest in such sites may include communities other than those in the vicinity of the proposed project.

With respect to your project, we have reviewed the brief materials you have provided, and can advise that the project does not appear to be located in an area where First Nations may have existing or asserted rights that could be impacted by your project.

For your information, MAA notes that the following First Nations may be interested in your project given the proximity of their community or reserve lands to the area of the proposed project:

Bkejwanong Territory
(Walpole Island)
R.R. #3
WALLACEBURG, Ontario
N8A 4K9

Chief Joseph Gilbert
(519) 627-1481
(Fax) 627-0440
Joseph.gilbert@wifn.org

Delaware Nation
(Moravian of the Thames)
14760 School House Line
R.R. #3
THAMESVILLE, Ontario
N0P 2K0

Chief Gregory Peters
(519) 692-3936
(Fax) 692-5522
gcpeters@mnsi.net

MAA is not the approval or regulatory authority for this project. You should consider the information provided in this letter in light of the statutes and guidance materials provided by the appropriate approval or regulatory authority for consultation requirements with Aboriginal communities on a project such as you are proposing. Should you have questions on the process please contact the appropriate ministry.

The Government of Canada sometimes receives claims that Ontario does not receive, or with which Ontario does not become involved. For information about possible claims in the area, MAA recommends the proponent contact the following federal contacts:

Ms. Janet Townshend
A/Senior Claims Analyst
Research and Policy Directorate
Indian and Northern Affairs Canada
10 Wellington St.
Gatineau, QC K1A 0H4
Tel: (819) 953-4667
Fax: (819) 997-9873

Mr. Kevin Clement
A/Director,
Financial Issues and Cost-Sharing
Indian and Northern Affairs Canada
10 Wellington St. 8th Floor
Gatineau, QC K1A 0H4
Tel: (819) 997-3369
Fax: (819) 997-9147

For federal information on litigation contact:

Jonathan Allen
Litigation Team Leader for Ontario
1430-25 Eddy Street
Gatineau, QC K1A 0H4
Tel: (819) 956-3181
Fax: (819) 953-6143

You should also be awa .hat information upon which the abov ɔmments are based is subject to change. First Nation or Métis communities can make assertions at any time, and other developments can occur that might require additional communities to be notified.

Yours truly,

Pam Wheaton

Pam Wheaton
Director
Aboriginal and Ministry Relationships Branch

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: February 20, 2009 3:50 PM
To: 'gcpeters@mnsi.net'; 'joseph.gilbert@wifn.org'
Subject: Kent Breeze Wind Farms - Request for comments
Attachments: PTRnotice_commencement2008-10-03.pdf

Hello Gentlemen,
The purpose of this email is to solicit comments from First Nations communities with respect to a proposed wind farm project in Chatham-Kent. We have previously mailed a Notice of Commencement to your respective communities (attached again here), but have recently received your direct email addresses from the Ontario Ministry of Aboriginal Affairs as part of their review of the project.
To date we have not received any indication from Provincial or Federal agencies that the wind farm will have any impacts on any First Nations land claims or hunting/fishing rights.
A Stage 1 Archaeological assessment has been conducted on the site and noted that the project areas had moderate to high potential archaeological potential for Aboriginal sites based on proximity to the Thames River and recommended further study prior to construction.

We would very much appreciate hearing from both of your communities regarding any issues (or lack thereof) regarding this project. Feel free to contact me by phone, mail or email at any time if you require any additional information. Comments within the next two weeks would be greatly appreciated.

Thank you,

Derek Dudek, MCIP, RPP
Planner
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Derek Dudek
Sent: Tuesday, November 03, 2009 4:30 PM
To: 'dean.jacobs@wifn.org'; 'Doy.Nahdee@wifn.org'
Subject: Kent Breeze Wind Farm
Attachments: PTLwifn_description2009-11-02.pdf; PTRproject_description2009-09-24.pdf

Dear Dr. Jacobs and Chief Gilbert,
Please find the attached materials in reference to the Kent Breeze Wind Farm and MacLeod Windmill Project near Thamesville, Ontario.
I understand that you are likely inundated with such requests, but ask that you please review these brief materials to determine WIFN interest in our projects.
If there are alternative people within the WIFN that I should be contacting please let me know ASAP.
I will follow up personally via phone within the next couple of days.

Thank you,

Derek Dudek MCIP, RPP

IBI Group
Suite 203 - 350 Oxford Street West
London ON N6H 1T3 Canada

tel 519 472 7328 ext 230
fax 519 472 9354
email ddudek@ibigroup.com
web www.ibigroup.com

Derek Dudek

From: Dean Jacobs [Dean.Jacobs@wifn.org]
To: Derek Dudek
Sent: Tuesday, November 03, 2009 4:45 PM
Subject: Read: Kent Breeze Wind Farm

Your message

To: Dean.Jacobs@wifn.org
Subject:

was read on 11/3/2009 4:45 PM.

Derek Dudek

From: Doy Nahdee [Doy.Nahdee@wifn.org]
To: Derek Dudek
Sent: Wednesday, November 04, 2009 11:30 AM
Subject: Read: Kent Breeze Wind Farm

Your message

To: Doy.Nahdee@wifn.org
Subject:

was read on 11/4/2009 11:30 AM.

IBI GROUP

IBI Group
203 – 350 Oxford Street West
London ON N6H 1T3 Canada
tel 519 472 7328
fax 519 472 9354

December 21, 2009

Oneida Nation of the Thames
Consultation Manager or Band Council

Oneida Nation of the Thames
2212 Elm Avenue
SOUTHWOLD, ON N0L 2G0

To Whom it May Concern:

RENEWABLE ENERGY APPROVAL
KENT BREEZE WIND FARM CONSULTATION PROCESS

The purpose of this letter is to again solicit comments from the WIFN regarding our proposed wind energy projects located on farmland at the following locations:

- Project 1 – Part Lots 8-11, Concession 1, in the geographic Township of Camden, in the Municipality of Chatham-Kent, on the south side of Smoke Line, east of Huffs Side Road; and

- Project 2 – Part Lots 4-6, Concession 1 & 2, in the geographic Township of Camden, in the Municipality of Chatham-Kent, on the north and south side of Smoke Line, west of Huffs Side Road.

Attached to this letter is a draft of the Project Description Report providing details on the projects. In consultation with the Ministry of Aboriginal Affairs (MAA), and upon review of the Bkejwanong claims provided on your website we have verified that the proposed projects do not fall on lands where existing or asserted rights which may be impacted by the wind farm projects. Please see the attached map with the project area identified south of the Treaty #25 area near the Town of Thamesville.

However, we wish to involve the WIFN in the consultation process with respect to our application to the Ministry of the Environment (MOE) for a Renewable Energy Approval (REA), and to invite you to our upcoming public meeting in Thamesville on January 2010 (date to be confirmed).

As part of our submission to the MOE for an REA, we will be including the following documents to support the project. These documents are summarized below and will be made fully available to you and the public immediately following our first public meeting. These reports are as follows:

- Project Description Report – Attached for your review;

- Wind Turbine Specifications Report – This report outlines the details of the wind turbines we have chosen for the Kent Breeze Wind Farms. The turbines we have chosen are Enercon E82 turbines, with hub heights of 98 metres, blade lengths of 41 metres.

Oneida Nation of the Thames
Consultation Manager or Band Council – December 21, 2009

- Construction Plan Report – This report outlines what construction activities will occur including the studies, detailed design work, erection of turbines, laying of access roads and underground cabling; who will be responsible for the activities undertaken; and how off-site issues will be dealt with including traffic management. The report also details construction timelines, which are estimated to take nine (9) months to complete. Finally, the report outlines any negative environmental effects expected as a result of construction activities. Barring any accidents during this phase, and also based on our decision to not locate any turbines within 750 metres of the Thames River, we do not expect any significant negative environmental effects associated with construction.

- Design and Operations Report – This report includes the drawings which illustrate the exact works which will be built on the lands; outlines any potential negative effects associated with the operations phase of the project; and provides details on how emergencies and disputes will be handled between the operators and the public. Due to the location of our turbines within farm fields, and away from any significant natural features, such as the Thames River, woodlands, and water features, we do not expect the projects to have any impacts to any flora or fauna, birds, bats, or fish. We have determined this based on background studies that we have undertaken in this regard, but are committed to conducting any required field monitoring to ensure this is the case.

- Decommissioning Plan Report – This report outlines what construction activities will occur to dismantle the project at the end of its lifespan, including the removal of all components to allow the land to be returned to active agricultural production. As with construction, it is not expected that decommissioning will lead to any significant negative environmental effects and would only take a period of approximately three (3) months to complete.

If you feel that there are any issues we should be considering in these documents particularly in how this project might compromise Bkejwanong treaty rights, we would ask that you please respond in writing either by letter or email to myself prior to the December 7, 2009 meeting. We look forward to your comments and attendance at our meetings.

Sincerely,

IBI GROUP

Derek Dudek, MCIP, RPP
Planner

c: Chief Joel Abram

IBI GROUP

IBI Group
203–350 Oxford Street West
London ON N6H 1T3 Canada

tel 519 472 7328
fax 519 472 9354

December 21, 2009

Caldwell First Nation
Consultation Manager or Band Council

Caldwell First Nation
P.O. Box 388
LEAMINGTON, ON N8H 3W3

To Whom it May Concern:

RENEWABLE ENERGY APPROVAL
KENT BREEZE WIND FARM CONSULTATION PROCESS

The purpose of this letter is to again solicit comments from the WIFN regarding our proposed wind energy projects located on farmland at the following locations:

- Project 1 – Part Lots 8-11, Concession 1, in the geographic Township of Camden, in the Municipality of Chatham-Kent, on the south side of Smoke Line, east of Huffs Side Road; and
- Project 2 – Part Lots 4-6, Concession 1 & 2, in the geographic Township of Camden, in the Municipality of Chatham-Kent, on the north and south side of Smoke Line, west of Huffs Side Road.

Attached to this letter is a draft of the Project Description Report providing details on the projects. In consultation with the Ministry of Aboriginal Affairs (MAA), and upon review of the Bkejwanong claims provided on your website we have verified that the proposed projects do not fall on lands where existing or asserted rights which may be impacted by the wind farm projects. Please see the attached map with the project area identified south of the Treaty #25 area near the Town of Thamesville.

However, we wish to involve the WIFN in the consultation process with respect to our application to the Ministry of the Environment (MOE) for a Renewable Energy Approval (REA), and to invite you to our upcoming public meeting in Thamesville on January 2010 (date to be confirmed).

As part of our submission to the MOE for an REA, we will be including the following documents to support the project. These documents are summarized below and will be made fully available to you and the public immediately following our first public meeting. These reports are as follows:

- Project Description Report – Attached for your review;
- Wind Turbine Specifications Report – This report outlines the details of the wind turbines we have chosen for the Kent Breeze Wind Farms. The turbines we have chosen are Enercon E82 turbines, with hub heights of 98 metres, blade lengths of 41 metres.

- Construction Plan Report – This report outlines what construction activities will occur including the studies, detailed design work, erection of turbines, laying of access roads and underground cabling; who will be responsible for the activities undertaken; and how off-site issues will be dealt with including traffic management. The report also details construction timelines, which are estimated to take nine (9) months to complete. Finally, the report outlines any negative environmental effects expected as a result of construction activities. Barring any accidents during this phase, and also based on our decision to not locate any turbines within 750 metres of the Thames River, we do not expect any significant negative environmental effects associated with construction.

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If you feel that there are any issues we should be considering in these documents particularly in how this project might compromise Bkejwanong treaty rights, we would ask that you please respond in writing either by letter or email to myself prior to the December 7, 2009 meeting. We look forward to your comments and attendance at our meetings.

Sincerely,

IBI GROUP

Derek Dudek, MCIP, RPP
Planner

c: Chief Louise Hillier

IBI GROUP

IBI Group
203–350 Oxford Street West
London ON N6H 1T3 Canada

tel 519 472 7328
fax 519 472 9354

December 21, 2009

Munsee-Delaware Nation
Consultation Manager or Band Council

Munsee-Delaware Nation
R.R. 1
MUNCEY, ON N0L 1Y0

To Whom it May Concern:

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KENT BREEZE WIND FARM CONSULTATION PROCESS

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If you feel that there are any issues we should be considering in these documents particularly in how this project might compromise Bkejwanong treaty rights, we would ask that you please respond in writing either by letter or email to myself prior to the December 7, 2009 meeting. We look forward to your comments and attendance at our meetings.

Sincerely,

IBI GROUP

Derek Dudek, MCIP, RPP
Planner

c: Chief Patrick Waddilove

IBI GROUP

IBI Group
203–350 Oxford Street West
London ON N6H 1T3 Canada

tel 519 472 7328
fax 519 472 9354

December 21, 2009

Chippewas of the Thames
Consultation Manager or Band Council

Chippewas of the Thames First Nation
320 Chippewa Road, R.R. 1
MUNCEY, ON N0L 1Y0

To Whom it May Concern:

RENEWABLE ENERGY APPROVAL
KENT BREEZE WIND FARM CONSULTATION PROCESS

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Chippewas of the Thames
Consultation Manager or Band Council – December 21, 2009

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If you feel that there are any issues we should be considering in these documents particularly in how this project might compromise Bkejwanong treaty rights, we would ask that you please respond in writing either by letter or email to myself prior to the December 7, 2009 meeting. We look forward to your comments and attendance at our meetings.

Sincerely,

IBI GROUP

Derek Dudek, MCIP, RPP
Planner

c: Chief Vaughn Albert

APPENDIX 5 – STAKEHOLDER CONSULTATION RECORD

AGENCIES	Contact Name	Address	City, PR, PC	Email
SYSTEMS				
Radio Advisory Board of Canada				r.a.b.c@on.aibn.com
Canadian Wind Energy Association				info@canwea.ca
Canadian Forces - Radio Communication Users DND				lavoie.mj6@forces.gc.ca
RCMP - Radio Communication Users				Francine.boucher@rcmp-grc.gc.ca
Environment Canada - Weather Radars	Lillian Yao, Engineer, Monitoring Services and Strategies			weatherradars@ec.gc.ca
NavCan - Civilian ATC Radars				FerrisD@navcanada.ca
Canadian Forces - Military Air Defence and ATC Radars				windturbines@forces.gc.ca
DFO - Vessel Traffic System Radars				mojicajf@dfo-mpo.gc.ca
NRCan - Seismological Monitoring Arrays				cormack@seismo.nrcan.gc.ca
NavCanada - AIS Data Collection	Christopher Csatlos			csatloc@navcanada.ca
NavCanada - Environmental Compliance	Anouk Guillaume, National Manager	P.O. Box 3411, Station "D" 77 Metcalfe Street	OTTAWA, ON K1P 5L6	
INAC				
INAC - Environmental Unit Lands and Trusts Services	Glenn Gilbert			gilbertg@inac.gc.ca
INAC - Specific Claims Branch	Fred Hosking			hoskingf@inac.gc.ca
INAC - Treaties and Aboriginal Government	Guy Morin			moringa@ainc-inac.gc.ca
INAC - Litigation Management and Resolution	Franklin Roy			royf@inac.gc.ca
INAC - Office of the Federal Interlocutor for Metis and non-status Indians	Gregg Dahl			dahlg@inac.gc.ca
INAC - Aboriginal and Ministry Relationships Branch	Martin Rukavina			martin.rukavina@ontario.ca
INAC - Research and Policy Directorate	Ms. Janet Townshend	10 Wellington Street	GATINEAU, QC K1A 0H3	
INAC - Litigation Team Leader for Ontario	Jonathan Allen	10 Wellington Street	GATINEAU, QC K1A 0H4	
Indian and Northern Affairs Canada	Mr. Franklin Roy, Director	10 Wellington Street	GATINEAU, QC K1A 0H4	
Indian and Northern Affairs Canada Comprehensive Claims Branch	Ms. Louise Trepanier, Director	10 Wellington Street, 8th Floor	Gatineau, QC K1A 0H4	
Indian and Northern Affairs Canada Environment Unit & Natural Resources Lands and Trusts Services	Mr. Roy Angelo, Acting Manager	25 St. Clair Avenue East, 8th Floor	TORONTO, ON M4T 1M2	
Indian and Northern Affairs Canada Financial Issues and Cost Sharing	Mr. Jean-Francois Tardif, Director	10 Wellington Street, 8th Floor	Gatineau, QC K1A 0H4	
Indian and Northern Affairs Canada Lands and Trust Services	Mr. Shannon Doyle, A/Director	25 St. Clair Avenue East, 8th Floor	TORONTO, ON M4T 1M2	
Indian and Northern Affairs Canada Specific Claims Branch	Mr. Don Boswell, Senior Claims Analyst	10 Wellington Street, Room 1310	Gatineau, QC K1A 0H4	
Indian and Northern Affairs Canada Specific Claims Branch	Ms. Maryanne Pearce, Senior Claims Analyst	10 Wellington Street	GATINEAU, QC K1A 0H4	
Ontario Secretariat for Aboriginal Affairs Office of the Secretary, Negotiations	Mr. Richard Saunders, Director	720 Bay Street	TORONTO, ON M5G 2K1	
Moravian of the Thames First Nation	Chief and Council (c/o Denis Stonefish)	RR#3	THAMESVILLE, ON, N0P 2K0	dstonefish@xplornet.com gcpeters@mnsi.net
Walpole Island First Nation	Chief and Council	RR#3	WALLACEBURG, ON N8A 4K9	joseph.gilbert@wifn.org
FEDERAL				
Canadian Environmental Assessment Agency	Mr. Paul Schafer, Senior Program Officer	55 St. Clair Avenue East, Room 907	TORONTO, ON M4V 2Y7	
Natural Resources Canada Sustainable Development Regulatory Affairs	Ms. Ann Van Dusen, Director of Operations	580 Booth Street, Unit 20A7	OTTAWA, ON K1A 0Y7	
Natural Resources Canada Science and Programs Branch	Mr. Geoff Munro, Director General	580 Booth Street, 7th Floor, Room A7-1	OTTAWA, ON K1A 0E4	
Natural Resources Canada	Mr. Curtis Lockett, Environmental Assessment Officer, WPPI	580 Booth Street	OTTAWA, ON K1A 0E4	
Natural Resources Canada Strategic Policy Branch, Environmental Assessment	Mr. Iannick Lamirande, A/Chief	580 Booth Street, 3rd Floor, Room A9-4	OTTAWA, ON K1A 0E4	
Department of Fisheries and Oceans Canada Fish Habitat Management Program	Ms. Carlene Haché	73 Meg Drive	LONDON, ON N6E 2V2	
Federal Department of Fisheries and Oceans	Mr. Norm Smith, Impact Assessment Biologist	703-201 Front Street North	SARNIA, ON N7T 8B1	
Canadian Wildlife Service	Mr. Rob Read, Environmental Assessment Officer	867 Lakeshore Road, P.O. Box 5050	BURLINGTON, ON L7S 1A1	
Transport Canada Environment and Engineering	Ms. Andrea McDowell	4900 Yonge Street, Suite 300	NORTH YORK, ON M2N 6A5	
Transport Canada, Aviation	Mr. Dave Zeit, Senior Environmental Officer	300-4900 Yonge Street	NORTH YORK, ON M2N 6A5	
Transport Canada – Ontario Region Environmental Affairs, Programs Branch	Ms. Monique Mousseau, Regional Manager	4900 Yonge Street, Suite 300	TORONTO, ON M2N 6A5	
Canadian Environmental Assessment Agency	Ms. Louise Knox, Regional Director	55 St. Clair Avenue East, Suite 907	TORONTO, ON M4T 1M2	
Parks Canada	Mr. Dan Reive, Chief Park Warden	RR#1, 407 Monarch Lane	LEAMINGTON, ON N8H 3V4	
Parks Canada	Ms. Marian Stranak, Superintendent	407 Monarch Lane, RR#1	LEAMINGTON, ON N8H 3V4	
Environment Canada	Mr. Rob Dobos, Head-Assessment	P.O. Box 5050, 867 Lakeshore Road	BURLINGTON, ON L7R 4A6	

AGENCIES	Contact Name	Address	City, PR, PC	Email
Health Canada	Ms. Anjala Puvananathan Regional Environmental Assessment Coordinator	2301 Midland Avenue	TORONTO, ON M1P 4R7	
Technical Standards and Safety Authority	Mr. Glen Palmer, Environmental Coordinator	4th Floor, West Tower, 3300 Bloor Street West	TORONTO, ON M8X 2X4	

AGENCIES	Contact Name	Address	City, PR, PC	Email
ONTARIO MINISTRIES				
Ontario Ministry of Aboriginal Affairs Policy and Relationship Branch	Ms. Pam Wheaton, Director	4th Floor, 720 Bay Street	TORONTO, ON M5G 2K1	
Ontario Ministry of Agriculture and Food – Southwestern Region, Agricultural Land Use	Mr. Drew Cranklaw, Rural Planner	667 Exeter Road, 3rd Floor	LONDON, ON N6E 1L3	
Ontario Ministry of Agriculture, Food and Rural Affairs	Ms. Susan Humphries, Regional Manager	667 Exeter Road	LONDON, ON N6E 1L3	
Ontario Ministry of Attorney General	Mr. Grant Wedge, Council Crown Law Office - Civil	720 Bay Street, 8th Floor	TORONTO, ON M5G 2K1	
Ontario Ministry of Citizenship and Immigration, Ministry of Culture, Ministry of Tourism and Recreation	Mr. George Potter, Southwest Area Regional Manager	4th Floor, Suite 405, 30 Duke Street West	KITCHENER, ON N5H 3W5	
Ontario Ministry of Culture	(Toronto)	900 Bay Street, 5th Floor, Mowat	TORONTO, ON M7A 2E2	
Ontario Ministry of Culture	Mr. Neal Ferris, Heritage Planner / Archaeologist	900 Highbury Avenue	LONDON, ON N5Y 1A4	
Ontario Ministry of Economic Development and Trade	Ms. Catherine Perron, Information Assistant	8th Floor, Hearst Block, 900 Bay Street	TORONTO, ON M7A 2E1	
Ontario Ministry of Energy	Mr. Neil Hutchings, Efficiency Advisor	3rd Floor, 880 Bay Street	TORONTO, ON M7A 2C1	
Ontario Ministry of Energy Renewable Energy Supply	Mr. Perry Cecchini, Manager, Southwest Area	880 Bay Street, 3rd Floor	Toronto, ON M7A 2C1	
Ontario Ministry of Government Services Government Mobile Communications Office iServe Ontario - IT Senior Planner	Mr. Lou Battison, Manager, Technology Liaison	155 University Avenue, 14th Floor	TORONTO, ON M5H 3B7	
Ontario Ministry of Municipal Affairs and Housing	Ms. Daniela Kiguel, Assistant Planner	14th Floor, 777 Bay Street	TORONTO, ON M5G 2E5	
Ontario Ministry of Municipal Affairs and Housing Provincial Planning and Environmental Services Branch	Mr. Usman Ahmed, Senior Planner	777 Bay Street, 14th Floor	Toronto, ON M5G 2ES	
Ontario Ministry of Municipal Affairs and Housing – Southwest Ontario Office	Mr. Bruce Curtis, Manager – Community Planning and Development	659 Exeter Road, 2nd Floor	LONDON, ON N6E 1L3	
Ontario Ministry of Natural Resources Land Use Coordination Section	Mr. Derryk Renton, EBR Coordinator	300 Water Street, 5th Fl P.O. Box 7000	Peterborough, ON K9J 8M5	
Ontario Ministry of Natural Resources – Aylmer Office	District Planner	615 John St. N.	Aylmer, Ontario N5H 2S8	
Ontario Ministry of Northern Development and Mines	Mr. Brian Smithies, Director Corporate Policy Unit	99 Wellesley Street West Whitney Block, Rm 5630	Toronto, ON M7A 1W3	
Ontario Ministry of the Attorney General	Ms. Ria Tzimas, Council Crown Law Office - Civil	720 Bay Street, 8th Floor	TORONTO, ON M5G 2K1	
Ontario Ministry of the Environment	Mr. Craig Newton, Environmental Assessment Coordinator	733 Exeter Road, 2nd Floor	LONDON, ON N6E 1L3	
Ontario Ministry of the Environment	Mr. Bob Agerholm, Environmental Assessment Officer	733 Exeter Road, 2nd Floor	LONDON, ON N6E 1L3	
Ontario Ministry of the Environment Environmental Approvals and Assessment Branch	Mr. James O'Mara, Director	2 St. Clair Avenue West, Floor 12A	TORONTO, ON M4V 1L5	
Ontario Ministry of the Environment – Southwest Region	Mr. Mike Parker, Planning Supervisor	2nd Floor, 733 Exeter Road	LONDON, ON N6E 1L3	
Ontario Ministry of Tourism and Recreation Economic Development Analysis Unit	Mr. Rob Glaister, Manager	900 Bay Street, 6th Fl	Toronto, ON M7A 2E1	
Ontario Ministry of Transportation	Mr. Richard van den Boom, Technical Services Supervisor	870 Richmond Street, P.O. Box 910	CHATHAM, ON N7M 5J5	
Ontario Ministry of Transportation – Southwest Region	Mr. Kevin Bentley, Manager, Engineering Department	659 Exeter Road, 3rd Floor	LONDON, ON N6E 1L3	
Ontario Energy Board	Mr. Neil McKay, Manager Facilities and Licensing	P.O. Box 2319, 2300 Yonge Street	TORONTO, ON M4P 1E4	
Legislative Assembly of Ontario	Mr. Pat Hoy, MPP	100-111 Heritage Road	CHATHAM, ON N7M 5W7	
Ontario Realty Corporation	Mr. John MacKenzie, General Manager	77 Wellesley Street East, Floor 11	TORONTO, ON M7A 2G3	
MUNICIPAL / LOCAL				
Storey Samways Planning, Ltd.	Mr. Tom Storey, Planning Consultant	330 Richmond Street, Suite 204	CHATHAM, ON N7M 1P7	
Essex Region Conservation Authority	Mr. Ken Schmidt, General Manager	360 Fairview Avenue, Suite 311	ESSEX, ON N8M 1Y6	
Lower Thames Valley Conservation Authority	Mr. Jerry Campbell, General Manager	100 Thames Street	CHATHAM, ON N7L 2Y8	
St. Clair Conservation Authority	Jeff Lawrence	205 Mill Pond Crescent	Strathroy, ON N7G 3P9	
Municipality of Chatham-Kent Planning Services	Ralph Pugliese & Marsha Coyne	315 King Street West, P.O. Box 640	CHATHAM, ON N7M 5K8	
Municipality of Chatham-Kent	Randy Hope, Mayor	P.O. Box 640	CHATHAM, ON N7M 5K8	
STAKEHOLDERS				
Municipal Councillor	Jim Brown	48 Ebenezer Street West	RIDGETOWN, ON N0P 2C0	
Municipal Councillor	Steve Pinsonneault	93 Lemuel Street, P.O. Box 32	THAMESVILLE, ON N0P 2K0	
Canadian Pacific Railway	Orest Rojik	#800 - 1290 Central Parkway West	MISSISSAUGA, ON L5C 4R3	
Newspaper	Thamesville Herald Newspaper	105 Elizabeth Street	THAMESVILLE, ON N0P 2K0	

Derek Dudek

From: Rita Monteleone [rmonteleone@ibigroup.com]
Sent: January 8, 2009 9:33 AM
To: ddudek@ibigroup.com
Subject: 20443 Lavoie-DND - no objections

From: MARIO.LAVOIE2@forces.gc.ca [mailto:MARIO.LAVOIE2@forces.gc.ca]
Sent: January 7, 2009 10:40 AM
To: rmonteleone@ibigroup.com
Cc: +WindTurbines@forces.gc.ca
Subject: FW: Environmental Assessment

I have reviewed your proposal in respect to DND's radiocommunication systems, and I have no objections or concerns at this time.

thank you.

Mr. Mario Lavoie
Spectrum Engineering Technician | Technicien en ingénierie du spectre
Information Management Group | Groupe de gestion de l'information
National Defence | Défense nationale
Ottawa, Canada K1A 0K2
mario.lavoie2@forces.gc.ca
Telephone | Téléphone 613-992-3479
Facsimile | Télécopieur 613-991-3961
Government of Canada | Gouvernement du Canada

From: Rita Monteleone [mailto:rmonteleone@ibigroup.com]
Sent: January 7, 2009 10:10 AM
To: 'CanWEA'; 'Civilian ATC'; 'DND-Air Radar'; 'DND-Radio'; 'Radio Advisory'; 'RCMP-Radio'; 'Seismological'; 'Vessel Radar'; 'Weather Radar'
Cc: 'ddudek@ibigroup.com'
Subject:

Systems / Communications

Attached is a Notice of Commencement regarding a

NOTICE OF COMMENCEMENT OF AN ENVIRONMENTAL SCREENING PROCESS KENT BREEZE WIND FARMS & MACLEOD WINDMILL PROJECT
GEOGRAPHIC TOWNSHIP OF CAMDEN, MUNICIPALITY OF CHATHAM-KENT

If you have any comments or require further information please contact Derek Dudek of our office at ddudek@ibigroup.com

If this is **NOT** an appropriate means of communication please inform our office and we well communicate via regular mail.

Thanks you

Rita Monteleone
Administrative Assistant
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
rmonteleone@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: January 8, 2009 3:35 PM
To: 'WindTurbines@forces.gc.ca'
Subject: 20443 DND Radar Impact
Attachments: KB Turbine Coordinats.xls; PMMproject_study-area2008-12-22.pdf

Hello Mark,
Below and attached is the following information you require for the Kent Breeze Wind Farm and MacLeod Windmill project. I've also included a map for your reference.

- Proposed location (e.g. Lat, Long) of each turbine – see attached
- ground height above sea level for turbine location(s) – approximately 184 – 186 metres above sea level
- vertical distance from the base of turbines to the centre of the nacelle – 81 metres
- the length of the blades – 40 metres

Please let me know if you require any other information.

Derek Dudek, MCIP, RPP
Planner
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From: +WindTurbines@forces.gc.ca
Sent: January 15, 2009 1:51 PM
To: ddudek@ibigroup.com; MARIO.LAVOIE2@forces.gc.ca
Subject: RE: 20443 DND Radar Impact

Hi Derek:

I have analyzed the proposed Kent Breeze Wind Farm and MacLeod Windmill project, with respect to the Department of National Defence, Air Traffic Control and Air Defence Radars.

Our software modelling indicates no conflict with any current radar installations. Should there be changes in the size or location of the wind farm, please re-submit the proposal for further analysis.

Thank you for your consideration of the Dept of National Defence radars and we look forward to assisting you in any future wind turbine endeavours.

Thanks, Mark

Mark Bartley
Engineering Development Officer | Officier de génie de development engineering
ATESS - CCISF | ESTTMA - ESICC
National Defence | Défense nationale
Astra, Canada K0K 3W0
Mark.Bartley@forces.gc.ca
Telephone | Téléphone 613-392-2811 #7042
CSN | RCCC 827-7042
Government of Canada | Gouvernement du Canada

From: Derek Dudek [mailto:ddudek@ibigroup.com]
Sent: Thursday, 8, January, 2009 15:35 PM
To: +WindTurbines@ATESS@TRENTON
Subject: 20443 DND Radar Impact

Hello Mark,
Below and attached is the following information you require for the Kent Breeze Wind Farm and MacLeod Windmill project. I've also included a map for your reference.

- Proposed location (e.g. Lat, Long) of each turbine – see attached
- ground height above sea level for turbine location(s) – approximately 184 – 186 metres above sea level
- vertical distance from the base of turbines to the centre of the nacelle – 81 metres
- the length of the blades – 40 metres

Please let me know if you require any other information.

Derek Dudek, MCIP, RPP
Planner
IBI Group
350 Oxford Street West, Suite 203

LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From:	Derek Dudek [ddudek@ibigroup.com]
Sent:	December 19, 2008 3:28 PM
To:	'Denise_Bessette@cpr.ca'
Subject:	Proposed Wind Farm
Importance:	High
Attachments:	PTRnotice_commencement2008-10-03.pdf

Tracking:

Recipient	Read
'Denise_Bessette@cpr.ca'	Read: 2008-12-19 3:38 PM

Hello Ms. Bessette,
Attached is an Environmental Assessment Notice of Commencement for a proposed wind farm in the Municipality of Chatham-Kent. I believe the main CP Windsor-Montreal express line runs through our project area.
If not yourself, could you direct me to the appropriate person within CPR to contact for EA notification.
Due to the proximity of our project to this rail line, we are very anxious to obtain comments from CPR regarding any concerns / requirements we may need to consider.

Thank you for your time, and do not hesitate to contact me as soon as possible regarding any additional information you may need.

Derek Dudek, MCIP, RPP
Planner
IBI Group
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LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Denise Bessette [Denise_Bessette@cpr.ca]
To: Derek Dudek
Sent: December 19, 2008 3:38 PM
Subject: Read: Proposed Wind Farm

Your message

To: Denise Bessette
Subject: Proposed Wind Farm
Sent: Fri, 19 Dec 2008 13:28:05 -0700

was read on Fri, 19 Dec 2008 13:37:52 -0700

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: January 13, 2009 8:39 AM
To: 'Orest Rojik'
Subject: RE: Proposed Wind Farm

Thank you Orest,
We are very interested in receiving comments from you given the CP mainline that runs through our project site. Is there anything you need from me, or could you provided us with some general information/concerns you may have.

Derek Dudek, MCIP, RPP
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LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

From: Orest Rojik [mailto:Orest_Rojik@cpr.ca]
Sent: January 12, 2009 2:44 PM
To: ddudek@ibigroup.com
Cc: Community Connect; Michel Spenard
Subject: RE: Proposed Wind Farm

I'm the contact at CPR. Contact information is as follows:

Canadian Pacific Railway
1290 Central Parkway West
Suite 800
Mississauga, ON L5C 4R3

(905) 803-3425
(905) 803-3228 FAX

Regards,

Orest Rojik
Area Manager Support
CPR Real Estate
orest_rojik@cpr.ca

From: Community Connect
Sent: Monday, January 12, 2009 2:16 PM
To: Michel Spenard; Orest Rojik
Subject: FW: Proposed Wind Farm
Importance: High

Hello

I may have forwarded this already - Please see below.

Orest - would this be for your review and comments?

Christine

From: Derek Dudek [mailto:ddudek@ibigroup.com]
Sent: December 19, 2008 1:28 PM
To: Denise Bessette
Subject: Proposed Wind Farm
Importance: High

Hello Ms. Bessette,
Attached is an Environmental Assessment Notice of Commencement for a proposed wind farm in the Municipality of Chatham-Kent. I believe the main CP Windsor-Montreal express line runs through our project area.
If not yourself, could you direct me to the appropriate person within CPR to contact for EA notification.
Due to the proximity of our project to this rail line, we are very anxious to obtain comments from CPR regarding any concerns / requirements we may need to consider.

Thank you for your time, and do not hesitate to contact me as soon as possible regarding any additional information you may need.

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Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: February 2, 2009 3:54 PM
To: Orest Rojik
Subject: Kent Breeze
Attachments: PMMproject_study-area2008-12-22.pdf

Hello Orest,
I had emailed you earlier about our proposed wind energy project near Thamesville, Ontario. We were hoping to hear from you regarding any applicable CPR policy about developing within the vicinity of active rail lines. I've attached a map showing the area of our project as well as proposed turbine locations. Could you please advise me if there is any additional information you would like for review or if you are not in a position to provide comments at this time.

Thanks in advance,

Derek Dudek, MCIP, RPP
Planner
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Csatlos, Christopher [csatloc@navcanada.ca]
Sent: January 8, 2009 3:11 PM
To: ddudek@ibigroup.com
Subject: NAV CANADA Land Use Submission
Attachments: NC10-0441_en.dot

Hello Derek,

As we discussed on the phone, please find attached a copy of the NAV CANADA land use proposal submission form. In the 'Details of Proposal' section, you can omit any information that will be included on the spreadsheet of turbine information.

All we need is this form, the spreadsheet (turbine locations, ground elevations, heights) and the turbine farm layout.

Please be advised that when our assessment is complete, any and all airport near the wind farm area will be sent a copy of our evaluation. The information we forward will not include specific details of the wind farm configuration, but will include our comments regarding the project and contact information for your office.

If you have any questions regarding the process, please don't hesitate to contact me.

Best regards,

Christopher Csatlos
Land Use Specialist
AIS Data Collection, NAV CANADA
Tel: (613) 248-4162 or toll free: 1-866-577-0247
Fax: (613) 248-4094
E-Mail: csatloc@navcanada.ca

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: January 8, 2009 4:21 PM
To: 'Csatlos, Christopher'
Subject: RE: NAV CANADA Land Use Submission
Attachments: OT7navcan_landuseproposal2008-01-08.pdf; KB Turbine Coordinats.xls; PMMproject_study-area2008-12-22.pdf

Hello Chris,
Hopefully everything you need is attached. Please let me know otherwise ASAP and I will get it to you.

Derek Dudek, MCIP, RPP
Planner
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350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
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ddudek@ibigroup.com
www.ibigroup.com

From: Csatlos, Christopher [mailto:csatloc@navcanada.ca]
Sent: January 8, 2009 3:11 PM
To: ddudek@ibigroup.com
Subject: NAV CANADA Land Use Submission

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Tel: (613) 248-4162 or toll free: 1-866-577-0247
Fax: (613) 248-4094
E-Mail: csatloc@navcanada.ca

Derek Dudek

From: Csatlos, Christopher [csatloc@navcanada.ca]
Sent: January 8, 2009 4:35 PM
To: ddudek@ibigroup.com
Subject: RE: NAV CANADA Land Use Submission

Hi Derek,

Just two questions.

1. Do you have the ground elevation of each turbine? I only noticed a single elevation on the form.
2. Could you confirm if the UTM coordinates are from zone 17?

Thanks,

Christopher Csatlos
Land Use Specialist
AIS Data Collection, NAV CANADA
Tel: (613) 248-4162 or toll free: 1-866-577-0247
Fax: (613) 248-4094
E-Mail: csatloc@navcanada.ca

From: Derek Dudek [mailto:ddudek@ibigroup.com]
Sent: January 8, 2009 4:21 PM
To: Csatlos, Christopher
Subject: RE: NAV CANADA Land Use Submission

Hello Chris,
Hopefully everything you need is attached. Please let me know otherwise ASAP and I will get it to you.

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From: Csatlos, Christopher [mailto:csatloc@navcanada.ca]
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Tel: (613) 248-4162 or toll free: 1-866-577-0247
Fax: (613) 248-4094
E-Mail: csatloc@navcanada.ca

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: January 8, 2009 4:44 PM
To: 'Csatlos, Christopher'
Subject: RE: NAV CANADA Land Use Submission

Sorry that's just a generic elevation as the area is relatively flat. I can get you a map showing the turbine locations with the labeled contours as well as spot elevations. Let me know.

The UTM co-ordinates are NAD 83, Zone 17

Derek Dudek, MCIP, RPP
Planner
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ddudek@ibigroup.com
www.ibigroup.com

From: Csatlos, Christopher [mailto:csatloc@navcanada.ca]
Sent: January 8, 2009 4:35 PM
To: ddudek@ibigroup.com
Subject: RE: NAV CANADA Land Use Submission

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2. Could you confirm if the UTM coordinates are from zone 17?

Thanks,

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Land Use Specialist
AIS Data Collection, NAV CANADA
Tel: (613) 248-4162 or toll free: 1-866-577-0247
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E-Mail: csatloc@navcanada.ca

From: Derek Dudek [mailto:ddudek@ibigroup.com]
Sent: January 8, 2009 4:21 PM
To: Csatlos, Christopher
Subject: RE: NAV CANADA Land Use Submission

Hello Chris,
Hopefully everything you need is attached. Please let me know otherwise ASAP and I will get it to you.

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ddudek@ibigroup.com
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From: Csatlos, Christopher [mailto:csatloc@navcanada.ca]
Sent: January 8, 2009 3:11 PM
To: ddudek@ibigroup.com
Subject: NAV CANADA Land Use Submission

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If you have any questions regarding the process, please don't hesitate to contact me.

Best regards,

Christopher Csatlos
Land Use Specialist
AIS Data Collection, NAV CANADA
Tel: (613) 248-4162 or toll free: 1-866-577-0247
Fax: (613) 248-4094
E-Mail: csatloc@navcanada.ca

Derek Dudek

From: Goldberg, Lee [Lee.Goldberg@dfo-mpo.gc.ca]
Sent: January 7, 2009 12:05 PM
To: ddudek@ibigroup.com
Subject: Kent Breeze & MacLeod Wind Farms Project

Dear Mr. Dudek:

Would it be possible to obtain the geographic coordinates of the proposed locations? It would help facilitate the Coast Guard's evaluation of this project.

Sincerely yours,

Lee H. Goldberg, P.Eng.
National Systems Integration Engineer / Ingénieur en Intégration des systèmes nationaux
Radio Communication Systems / Systèmes de communications de radio
Integrated Technical Services / Services techniques intégrés
Canadian Coast Guard / Garde Côtière canadienne
520 Exmouth Street / 520 rue Exmouth
Sarnia, Ontario N7T 8B1 / Sarnia, (Ontario) N7T 8B1

Telephone: / Téléphone: (519) 383-1925
Facsimile: / Fac-similé: (519) 383-1990

mailto:lee.goldberg@dfo-mpo.gc.ca

Derek Dudek

From:	Goldberg, Lee [Lee.Goldberg@dfo-mpo.gc.ca]
Sent:	January 8, 2009 1:44 PM
To:	rbarzanjah@ibigroup.com
Cc:	ddudek@ibigroup.com
Subject:	RE: Kent Breeze & MacLeod Wind Farms Project
Importance:	High

Hi Raza,

I think I know what is going on. There were two requests that came in, one after the other. The confusion is all mine. The UTM coordinates that you gave me now make sense for the Kent Breeze & MacLeod Wind Farm Project.

As far as the Kent Breeze & MacLeod Wind Farm projects are concerned, they are approximately 21 km from the nearest Coast Guard communications site and as such will not cause any interference to Coast Guard Communications.

Lee H. Goldberg, P.Eng.
National Systems Integration Engineer / Ingénieur en Intégration des systèmes nationaux
Radio Communication Systems / Systèmes de communications de radio
Integrated Technical Services / Services techniques intégrés
Canadian Coast Guard / Garde Côtière canadienne
520 Exmouth Street / 520 rue Exmouth
Sarnia, Ontario N7T 8B1 / Sarnia, (Ontario) N7T 8B1

Telephone: / Téléphone: (519) 383-1925
Facsimile: / Fac-similé: (519) 383-1990
mailto:lee.goldberg@dfo-mpo.gc.ca

From: Reza Barzanjah [mailto:rbarzanjah@ibigroup.com]
Sent: Wednesday, January 07, 2009 1:42 PM
To: Goldberg, Lee
Cc: ddudek@ibigroup.com
Subject: FW: Kent Breeze & MacLeod Wind Farms Project

Hi Lee,

Please find attached Turbine coordinates for Kent Breeze & MacLeod Wind Farms Project. If you have any question or need more information please don't hesitated to let me know.

Regards,

Reza Barzanjah, C.P.T.
GIS/Planning Technologist
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472-7328, ext. 259
Fax. (519) 472-9354
rbarzanjah@ibigroup.com
www.ibigroup.com

From: Derek Dudek [mailto:ddudek@ibigroup.com]
Sent: Wednesday, January 07, 2009 1:03 PM
To: rbarzanjah@ibigroup.com
Subject: FW: Kent Breeze & MacLeod Wind Farms Project

Reza,
Can you forward the new UTM co-ordinates of the turbine locations for the Kent Breeze project to the person below.
Thanks,

Derek Dudek, MCIP, RPP
Planner
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

From: Goldberg, Lee [mailto:Lee.Goldberg@dfo-mpo.gc.ca]
Sent: January 7, 2009 12:05 PM
To: ddudek@ibigroup.com
Subject: Kent Breeze & MacLeod Wind Farms Project

Dear Mr. Dudek:

Would it be possible to obtain the geographic coordinates of the proposed locations? It would help facilitate the Coast Guard's evaluation of this project.

Sincerely yours,

Lee H. Goldberg, P.Eng.
National Systems Integration Engineer / Ingénieur en Intégration des systèmes nationaux
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Canadian Coast Guard / Garde Côtière canadienne
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Telephone: / Téléphone: (519) 383-1925
Facsimile: / Fac-similé: (519) 383-1990
mailto:lee.goldberg@dfo-mpo.gc.ca

Derek Dudek

From: Rukavina, Martin (MAA) [Martin.Rukavina@ontario.ca]

Sent: December 18, 2008 11:24 AM

To: rmonteleone@ibigroup.com

Cc: ddudek@ibigroup.com

Subject: OTE-ea-Notice of Commencement2008-12-18

Hello, Rita:
Please update your distribution list by replacing Francois' e-mail address with mine.

E-mail is an appropriate form of communication.

Regards,
Martin Rukavina

From: Rita Monteleone [mailto:rmonteleone@ibigroup.com]
Sent: December 17, 2008 4:07 PM
To: Lachance, Francois (MAA); 'Franklin Roy'; 'Fred Hosking'; 'Glenn Gilbert'; 'Gregg Dahl'; 'Guy Morin'
Cc: ddudek@ibigroup.com
Subject: EA Notice of Commencement

December 17, 2008

Attached for your information and file is a notice of commencement for notice of commencement of an environmental screening process Kent breeze Wind Farms & Macleod Windmill Project: Geographic Township of Camden, Municipality of Chatham-Kent.

Please reply to inform us if this an appropriate form of communication

YES [ ]   NO [ ]

Thank you

Rita Monteleone
Administrative Assistant
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON   N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
rmonteleone@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Rita Monteleone [rmonteleone@ibigroup.com]
Sent: January 28, 2009 3:29 PM
To: ddudek@ibigroup.com
Subject: FW: Kent Breeze and Macleod wind farms - preliminary analysis result

---

From: Yao,Lillian [Ontario] [mailto:Lillian.Yao@ec.gc.ca]
Sent: January 28, 2009 9:16 AM
To: rmonteleone@ibigroup.com
Cc: Weather Radars Contact,National Radar Program [Ontario]; Lusk,Sheryl [Ontario]
Subject: Kent Breeze and Macleod wind farms - preliminary analysis result

Hi Rita,

Thank you for contacting the Meteorological Service of Canada regarding your Kent Breeze and Macleod wind energy proposals.

Our preliminary assessment of the information you provided to us via your previous email indicates that any interference that may be created by your projects to the nearby weather radar(s) will be minimal. As a consequence, we have no concerns at this time. We would appreciate if you can provide us the turbine spec and turbine coordinates which may help us conduct future research regarding interference to weather radars.

If you change your plans regarding turbine number, height, placement or materials, please contact us at: weatherradars@ec.gc.ca.

Regards,
Lillian Yao
Engineer, Monitoring Science and Strategies
Meteorological Service of Canada
Tel: 416 514-2648
Fax: 416 739-5721

From: Rita Monteleone [mailto:rmonteleone@ibigroup.com]
Sent: January 7, 2009 10:10 AM
To: 'CanWEA'; 'Civilian ATC'; 'DND-Air Radar'; 'DND-Radio'; 'Radio Advisory'; 'RCMP-Radio'; 'Seismological'; 'Vessel Radar'; 'Weather Radar'
Cc: 'ddudek@ibigroup.com'
Subject:

Systems / Communications

Attached is a Notice of Commencement regarding a

NOTICE OF COMMENCEMENT OF AN ENVIRONMENTAL SCREENING PROCESS KENT BREEZE WIND FARMS & MACLEOD WINDMILL PROJECT
GEOGRAPHIC TOWNSHIP OF CAMDEN, MUNICIPALITY OF CHATHAM-KENT

If you have any comments or require further information please contact Derek Dudek of our office at ddudek@ibigroup.com

If this is **NOT** an appropriate means of communication please inform our office and we well communicate via regular mail.

Thanks you

Rita Monteleone
Administrative Assistant
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
rmonteleone@ibigroup.com
www.ibigroup.com

IBI
GROUP

January 23, 2009

ecoENERGY for Renewable Power
Renewable and Electrical Energy Division
Natural Resources Canada
615 Booth, Room 160
OTTAWA, ON. K1A 0E9

Dear To Whom it May Concern:

NRCan's ecoENERGY for Renewable Power Program Funding

The purpose of this letter is to provide you with the necessary information required under NRCan's ecoENERGY for Renewable Power Program Funding program for the Kent Breeze Corp. and MacLeod Windmill Project Inc. projects, collectively known as Kent Breeze Wind Farms in the municipality of Chatham-Kent. The information included in this binder includes our Notice of Project Application and all other required information outlined in the NPA checklist, including a detailed Project Description.

Please call if you have any questions or comments on the application. We appreciate the opportunity to submit such an application for these renewable energy project and eagerly anticipate your response.

Sincerely,

IBI GROUP

Derek Dudek, MCIP, RPP
Planner

Attachments

J:\20443\2.2 Corres - External\PTLecoenergy2009-01-10.doc\2009-04-14\DD

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: January 28, 2009 10:07 AM
To: 'Jensen, Jack'
Subject: RE: NPA - Kent Breeze Wind Farms (5911-TEMP-281) ON

My mistake. The commissioning date I guess would be about October 2010 based on that construction schedule. Sorry for the confusion.

Derek Dudek, MCIP, RPP
Planner
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

From: Jensen, Jack [mailto:Jack.Jensen@NRCan-RNCan.gc.ca]
Sent: January 28, 2009 9:53 AM
To: ddudek@ibigroup.com
Cc: Royer, Jimmy; Bergeron, Denis (EPS.SPE-Ottawa)
Subject: NPA - Kent Breeze Wind Farms (5911-TEMP-281) ON

Hello Mr. Dudek,

I am reviewing the Notice of Project Application (NPA) submission for the Kent Breeze Wind Farms Project and I have a question before I can complete the review. In the form you note that the commissioning date is January 2010. However, in the Project Description, sections 2.2.1 and 2.2.2 you note that construction will begin in January 2010 and that it will take 9 months to complete. If you could please clarify the actual date of commissioning it would be much appreciated.

If you have any questions or comments please do not hesitate to contact me at any time. I look forward to your timely response.

Regards,

Jack

Jack Jensen
Technical Advisor | Conseiller technique
ecoENERGY for Renewable Power | écoÉNERGIE pour l'électricité renouvelable
Renewable and Electrical Energy Division | Division de l'énergie renouvelable et électrique
Natural Resources Canada | Ressources naturelles Canada
Tel | Tél: 613-943-7008 / Fax | Téléc: 613-995-8343
jjensen@nrcan.gc.ca

Natural Resources Canada | Ressources naturelles Canada

IBI GROUP
RECEIVED
JAN 30 2009

CIRC	DATE	ACK'D
WP		
DD		
SM		
JS		
MB		
PC		

January 29, 2009

Registration # 5911-K8-1

Mr. Derek Dudek
Planner
IBI Group
#2303 - 350 Oxford Street West
London, ON, N6H 1T3

Dear Mr. Dudek,

We are writing to confirm that your Notice of Project Application (NPA) for the Kent Breeze Wind Farms project has met the basic eligibility criteria under the ecoENERGY for Renewable Power (ecoENERGY RP) program.

Natural Resources Canada (NRCan) has assigned a registration number for your project, which can be found at the top right-hand corner of this letter. This number should be used in all future correspondence with NRCan concerning this project.

As indicated in the terms and conditions of the program and on the NPA, NRCan will now post some project information on the Government of Canada's ecoACTION website at www.ecoACTION.gc.ca.

The project description submitted in section "L" of the NPA will be used to determine if the project must undergo an environmental assessment under the *Canadian Environmental Assessment Act*. The project description must contain sufficient information to make this determination. If required, a program environment assessment officer will contact you to seek additional information on your project before beginning the federal environmental assessment process.

NRCan will also be contacting any Aboriginal groups that may have an interest in the project and invite them to identify any issues or concerns regarding the proposed project, particularly any effect the project may have on the environment, traditional use, or any Aboriginal or treaty rights.

NRCan strongly encourages proponents to engage interested Aboriginal groups early in the pre-planning stage of their project and during the environmental assessment process.

Canada

If you have not yet done so, we advise that you contact the three branches of Indian and Northern Affairs Canada (INAC): the Specific Claims Branch, the Litigation Management and Resolution Branch and the Comprehensive Claims Branch. As standard procedure, NRCan may contact INAC to confirm First Nations information during the Environmental Assessment process.

Please note that your project will become eligible for an incentive only when a contribution agreement has been signed by both parties. Although a contribution agreement may be signed prior to completion of an environmental assessment, a positive decision must be rendered prior to NRCan making any payment of the incentive on the production from the project under the contribution agreement.

Please review the attached documents as there have been important changes to Step 2 and Step 3 of the ecoENERGY RP.

If you have additional questions, please do not hesitate to contact the undersigned.

Thank you for your cooperation.

Sincerely,

Denis Bergeron
Program Officer
ecoENERGY for Renewable Power program
615 Booth St., 1st Floor, Room 160
Ottawa, ON K1A 0E9
Telephone: (613) 996-4779
Fax: (613) 995-8343
E-mail: ecoenergyrp@nrcan.gc.ca
Website: www.ecoaction.gc.ca

Enclosure: (5)

Ministry of Aboriginal Affairs

Aboriginal and Ministry Relationships Branch

160 Bloor St. East, 9th Floor
Toronto, ON M7A 2E6
Tel: (416) 326-4741
Fax: (416) 326-4017
www.aboriginalaffairs.gov.on.ca

Ministère des Affaires autochtones

Direction des relations entre les autochtones et les ministères

160, rue Bloor Est, 9e étage
Toronto ON M7A 2E6
Tél. : (416) 326-4741
Téléc. : (416) 890-1234
www.aboriginalaffairs.gov.on.ca

Ontario

FEB 1 0 2009

~~Reference: ARMB 640~~
IBI GROUP 640
RECEIVED
FEB 1 7 2009

CIRC	DATE	ACK'D
JAH		
WP		
DD		
SH		
JB		

William Pol, MPA, MCIP, RPP
Associate
IBI Group
#203 – 350 Oxford Street West
London, ON N6H 1T3

Teresa Newland
Project Co-ordinator
Kent Breeze Corporation
7997 Tenth Line, R. R. #1
Charing Cross, ON N0P 1G0

Re: Notice of Commencement of an Environmental Screening Process
Kent Breeze Wind Farms & MacLoed Windmill Project
Geographic Township of Camden, Municipality of Chatham-Kent

Dear Mr. Pol and Ms. Newland:

Thank you for your notice sent on December 17, 2008 regarding the above noted proposal and the request for information to assist in your assessment of the potential for the Crown to engage or consult with Aboriginal peoples regarding this proposal.

The responsibilities of the Ministry of Aboriginal Affairs (MAA) include conducting land claim and related negotiations on behalf of the Province. MAA can provide you with information about land claims that have been submitted to the Ministry, are currently in active negotiations, or are being implemented. We can also advise as to whether there is any litigation with an Aboriginal community that may be relevant to your project.

You should also be aware that many First Nations and Métis communities either have or assert rights to hunt and fish in their traditional territories. These territories often include lands and waters outside of a First Nation reserve. As well, in some instances project work may affect archaeological and burial sites. Aboriginal communities with an interest in such sites may include communities other than those in the vicinity of the proposed project.

With respect to your project, we have reviewed the brief materials you have provided, and can advise that the project does not appear to be located in an area where First Nations may have existing or asserted rights that could be impacted by your project.

For your information, MAA notes that the following First Nations may be interested in your project given the proximity of their community or reserve lands to the area of the proposed project:

Bkejwanong Territory
(Walpole Island)
R.R. #3
WALLACEBURG, Ontario
N8A 4K9

Chief Joseph Gilbert
(519) 627-1481
(Fax) 627-0440
Joseph.gilbert@wifn.org

Delaware Nation
(Moravian of the Thames)
14760 School House Line
R.R. #3
THAMESVILLE, Ontario
N0P 2K0

Chief Gregory Peters
(519) 692-3936
(Fax) 692-5522
gcpeters@mnsi.net

MAA is not the approval or regulatory authority for this project. You should consider the information provided in this letter in light of the statutes and guidance materials provided by the appropriate approval or regulatory authority for consultation requirements with Aboriginal communities on a project such as you are proposing. Should you have questions on the process please contact the appropriate ministry.

The Government of Canada sometimes receives claims that Ontario does not receive, or with which Ontario does not become involved. For information about possible claims in the area, MAA recommends the proponent contact the following federal contacts:

Ms. Janet Townshend
A/Senior Claims Analyst
Research and Policy Directorate
Indian and Northern Affairs Canada
10 Wellington St.
Gatineau, QC K1A 0H4
Tel: (819) 953-4667
Fax: (819) 997-9873

Mr. Kevin Clement
A/Director,
Financial Issues and Cost-Sharing
Indian and Northern Affairs Canada
10 Wellington St. 8th Floor
Gatineau, QC K1A 0H4
Tel: (819) 997-3369
Fax: (819) 997-9147

For federal information on litigation contact:

Jonathan Allen
Litigation Team Leader for Ontario
1430-25 Eddy Street
Gatineau, QC K1A 0H4
Tel: (819) 956-3181
Fax: (819) 953-6143

You should also be awa .hat information upon which the abov omments are based is subject to change. First Nation or Métis communities can make assertions at any time, and other developments can occur that might require additional communities to be notified.

Yours truly,

Pam Wheaton

Pam Wheaton
Director
Aboriginal and Ministry Relationships Branch

ST. CLAIR REGION CONSERVATION AUTHORITY

205 Mill Pond Crescent, Strathroy, Ontario N7G 3P9

Phone: (519) 245-3710
Fax: (519) 245-3348
E-Mail: stclair@scrca.on.ca
Home Page: www.scrca.on.ca

Date: January 13, 2009

To: William Pol, MPA, MCIP, RPP, IBI Group

From: Heather MacKenzie, SCRCA

Re: Kent Breeze Wind Farms & MacLoed Windmill Project in Township of Camden and Chatham-Kent

Additional Message:

The St. Clair Region Conservation Authority (SCRCA) acknowledges receipt of your letter on December 19, 2008, regarding the above project. We have provided a list of services and associated fees offered by the SCRCA with respect to Environmental Assessments as approved by the SCRCA Board of Directors:

Level	Description	Fee
1	**EA Initiation / Background Information Search** - file search for Natural Heritage / Natural Hazard features that may be impacted by the project - provide list of potentially impacted features such as: Fish Habitat/Municipal Drain Classification Data, MNR Evaluated Wetlands, Environmentally Significant Areas	$100.00
2	**Information Retrieval** - retrieval, replication and delivery of information - includes hard copy mapping (including aerial photography) and data of all features identified in Level 1 - assumes Level 1 task completed	$100.00
3	**Formal EA Review** - detailed review and provision of comments for Final EA Reports - assumes Level 1 & 2 tasks have been completed	$200.00

If you would like the SCRCA to proceed with a review of your project area, please submit the required fee with your request.

Regards,

Heather MacKenzie

Heather MacKenzie

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: January 14, 2009 10:52 AM
To: 'hmackenzie@scrca.on.ca'
Subject: Kent Breeze Wind Farms
Attachments: OTRdraft_nhs_ver1-2008-08-26.pdf

Hi Heather,
Nice to talk to you. Here is a copy of Dave's draft background report. Do not hesitate to contact me if there is anything else you need.
We've advanced to the stage where we have conceptual site plan drawings showing where access roads and underground cabling might be located and may require water crossings.

Thanks for your assistance.

Derek Dudek, MCIP, RPP
Planner
IBI Group
350 Oxford Street West, Suite 203
LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From:	Heather MacKenzie [hmackenzie@scrca.on.ca]
Sent:	January 23, 2009 3:29 PM
To:	ddudek@ibigroup.com
Subject:	RE: Kent Breeze Wind Farms
Attachments:	data_delivery_letter.pdf; information_location_map.pdf; benthic_table.xls; fish_species_table.xls; nhic_species_at_risk_table.xls

Hi Derek

Here is the information you requested. Please call or email if you need anything else.
I will send an invoice for two hundred and twenty-six dollars within the next week.

Thanks,
Heather MacKenzie
Aquatic Systems Biologist

St. Clair Region Conservation Authority
205 Mill Pond Cres., Strathroy, ON N7G 3P9
Tel: 519-245-3710 Fax: 519-245-3348

From: Derek Dudek [mailto:ddudek@ibigroup.com]
Sent: Wednesday, January 14, 2009 11:01 AM
To: Heather MacKenzie
Subject: Kent Breeze Wind Farms

Hi Heather,
Nice to talk to you. Here is a copy of Dave's draft background report. Do not hesitate to contact me if there is anything else you need.
We've advanced to the stage where we have conceptual site plan drawings showing where access roads and underground cabling might be located and may require water crossings.

Thanks for your assistance.

Derek Dudek, MCIP, RPP
Planner
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LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Derek Dudek [ddudek@ibigroup.com]
Sent: January 26, 2009 9:58 AM
To: 'Valerie.Towsley@ltvca.ca'; 'Valerie -LTVCA'
Subject: Kent Breeze Wind Farms
Attachments: PISsite_layout2008-12-17.dwg; KB Turbine Coordinats.xls

Hi Valerie,
I've attached a map in CAD showing all of the proposed turbine locations as well as proposed access roads and cabling routes. The xls provides the turbine co-ordinates if you wish to drop it in a GIS.
SCRCA provided use with tables and maps of natural heritage features and areas; municipal drain classification, SAR, benthic data and sites; fish species and sites. If you could provide us with the same it would be greatly appreciated.
Any other comments or information you feel might be applicable would be greatly appreciated as well.

I assume there is a fee for this type of review. Can you let me know what it is then in all likelihood you can just bill us.

Thanks,
Hope you feel better.

Derek Dudek, MCIP, RPP
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LONDON, ON N6H 1T3
Tel. (519) 472.7328
Fax (519) 472.9354
ddudek@ibigroup.com
www.ibigroup.com

Derek Dudek

From: Jason Wintermute [jason.wintermute@ltvca.ca]
Sent: January 28, 2009 12:40 PM
To: 'Valerie Towsley'
Cc: ddudek@ibigroup.com
Subject: RE: Kent Breeze Wind Farms
Attachments: KentBreezeRequest.pdf

Please find attached a map showing the requested information. The only natural heritage features in the area are woodlots. There are no ANSIs, ESAs or evaluated wetlands. LTVCA has no SAR or benthic data available for this area. The LTVCA has only one fish sampling record in the area. It is upstream on the Cryderman Drain but it appears that this project is not crossing that drain. However, I have included these records at the bottom of this map for your information should that change.

Valerie Towsley will be contacting you shortly to provide additional information regarding this project request.

Jason Wintermute
GIS Specialist / Resource Technician
Lower Thames Valley Conservation Authority
100 Thames St.
Chatham, Ontario, N7L 2Y8
Phone: 519-354-7310 x. 227
Fax: 519-352-3435
Website: www.LTVCA.ca
Email: Jason.Wintermute@LTVCA.ca

From: Derek Dudek [mailto:ddudek@ibigroup.com]
Sent: Monday, January 26, 2009 9:58 AM
To: Valerie.Towsley@ltvca.ca; 'Valerie -LTVCA'
Subject: Kent Breeze Wind Farms

Hi Valerie,
I've attached a map in CAD showing all of the proposed turbine locations as well as proposed access roads and cabling routes. The xls provides the turbine co-ordinates if you wish to drop it in a GIS.
SCRCA provided use with tables and maps of natural heritage features and areas; municipal drain classification, SAR, benthic data and sites; fish species and sites. If you could provide us with the same it would be greatly appreciated.
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Thanks,
Hope you feel better.

Derek Dudek, MCIP, RPP
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Fax (519) 472.9354
ddudek@ibigroup.com

www.ibigroup.com

Derek Dudek

From: Mojica, Jose Fernando [MojicaJF@DFO-MPO.GC.CA]
'o: Rita Monteleone
Sent: January 7, 2009 10:12 AM
Subject: Read:

Your message

To: 'CanWEA'; 'Civilian ATC'; 'DND-Air Radar'; 'DND-Radio';
'"Radio Advisory"'@ibigroup.com; 'RCMP-Radio'; 'Seismological'; Mojica,
Jose Fernando; 'Weather Radar'
Cc: ddudek@ibigroup.com
Sent: Wed, 7 Jan 2009 10:09:42 -0500

was read on Wed, 7 Jan 2009 10:11:49 -0500

At Golder Associates we strive to be the most respected global group of companies specializing in ground engineering and environmental services. Employee owned since our formation in 1960, we have created a unique culture with pride in ownership, resulting in long-term organizational stability. Golder professionals take the time to build an understanding of client needs and of the specific environments in which they operate. We continue to expand our technical capabilities and have experienced steady growth with employees now operating from offices located throughout Africa, Asia, Australasia, Europe, North America and South America.

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