

Figure 3

# Adelaide Wind Energy Centre Project Area and Water Bodies (Northern Project Area)



**Legend**

- Project Area (120m)
- Turbine
- MET
- Access Road
- Collector System (Underground Cabling)
- Transmission Line (Aboveground Cabling)
- Project Location
- Staging Area
- Substation
- Operations & Maintenance Buildings
- Existing Transmission Line
- Railroad
- Permanent
- Intermittent
- Waterbody
- Watershed
- Provincially Significant Wetland (PSW)
- Other Wetland
- ANSI, Life Science
- ANSI, Earth Science



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Project: 1230 Date: August 20, 2012	NAD83 - UTM Zone 17 Scale: 1:50,000 (11x17")

## 2.0 REA Requirements

Ontario Regulation (O. Reg.) 359/09 – *Renewable Energy Approvals Under Part V.0.1 of the Act*, (herein referred to as the REA Regulation) made under the *Environmental Protection Act (EPA)* identifies the requirements for the development of renewable energy projects in Ontario. In accordance with REA Regulation, the Adelaide Wind Energy Centre, classified as a Class 4 wind facility, is required to complete a REA submission.

Section 29 of the REA Regulation requires proponents of Class 4 wind projects to undertake a water assessment which involves a records review in order to identify whether the project location is:

1. in a water body;
2. within 120 meters of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity;
3. within 300 meters of the average annual high water mark of a lake trout lake that is at or above development capacity;
4. within 120 meters of the average annual high water mark of a permanent or intermittent stream; or
5. within 120 meters of a seepage area.

Section 1.1 of the REA Regulations defines a “water body” as a lake, a permanent stream, an intermittent stream, and as a seepage area, but does not include:

- a) grassed waterways;
- b) temporary channels for surface drainage, such as furrows or shallow channels that can be tilled and driven through;
- c) rock chutes and spillways;
- d) roadside ditches that do not contain a permanent or intermittent stream;
- e) temporary ponded areas that are normally farmed;
- f) dugout ponds; and
- g) artificial bodies of water intended for storage, treatment or recirculation of runoff from animal yards, manure storage facilities and sites and outdoor confinement areas

Subsection 2 of Section 30 of the REA Regulation requires the proponent to prepare a report “setting out a summary of the records searched and the results of the analysis” (O. Reg. 359/09). This *Water Body Records Review Report* has been prepared for the Adelaide Wind Energy Centre to meet these requirements.

### 3.0 Records Review Methodology

In accordance with the REA Regulation, NRSI biologists consulted several information sources and agencies for the purposes of assessing water bodies within 120m (and 300m) of the project location. The results of this consultation process have been documented throughout the following report, and have been summarized in Table 1 below.

**Table 1. Summary of Records Consulted for the Adelaide Wind Energy Centre.**

Information Source	Consultation Date(s)	Type of Records Obtained
Ministry of Natural Resources, Aylmer District	August 30, 2011	Fish data records
Middlesex County	August 9, 2011	No relevant information received
Ausable Bayfield Conservation Authority	September 15, 2011 September 27, 2011	Watershed Report Cards (Middle Ausable) Fish Habitat Management Plan Ausable River Fisheries Survey Report
St. Clair Region Conservation Authority	September 13, 2011 November 2, 2011	Township of Adelaide-Metcalf Municipal Drain Classification Mapping (CA-DFO Classification Scheme) Watershed Report Cards (Sydenham Headwaters, Upper Sydenham, Brown Creek)
Ministry of Natural Resources, NHIC and Biodiversity Explorer	July 22, 2011	Species of Special Concern records
Ministry of Natural Resources, LIO Base mapping	September 6, 2011	Watercourse mapping, surficial geology mapping

All water body features initially located within the project area were identified using OMNR watercourse base mapping and digital air photos. These features are shown in Figures 1-3.

## 4.0 Records Review Findings

For the purposes of the records review reporting, NRSI has examined available background information to identify any lakes, intermittent or permanent watercourses, and seepage areas within 120m of the project location as well as Lake Trout Lakes within 300m of the project location. Information obtained relating to identified water bodies is provided in Sections 4.1 through to 4.5.

### 4.1 Lakes

#### 4.1.1 Lake Trout Lakes

No Lake Trout lakes are present within 300m of the project location.

#### 4.1.2 Other Lakes

No lakes are present within the project area.

### 4.2 Permanent or Intermittent Watercourses

NRSI biologists have used available resources, including agency consultation and a variety of available mapping layers (satellite imagery, air photos, OMNR Land Information Ontario watercourse mapping) to identify the presence of potential intermittent/permanent watercourse features within the Adelaide Wind Energy Centre project area. Findings of this review indicated a number of potential 'water bodies' (permanent or intermittent watercourses) are located within the project area. These watercourses have been divided into their respective watersheds (Ausable River and Sydenham River watersheds) and are discussed based on their associated drainage areas. For the Ausable River watershed, they include Adelaide Creek, Mud Creek, Lenting Drain, Big Swamp Drain, Ptsebe Creek and the main branch of the Ausable River. Within the Sydenham River watershed, watercourses discussed are associated with the Sydenham River itself.

The majority of the project area falls within the jurisdictional area the ABCA (Ausable River watershed) with minor portions of the southern boundaries overlapping with the jurisdictional area of the SCRCA (Sydenham River watershed). The entire project area is within the OMNR Alymer District. The majority of watercourse features within the

project area have been identified as municipal drains and headwater tributaries. Based on air photo interpretation, these watercourse features are highly influenced by historic and present agricultural activities (i.e. channelization).

No fish collection record data was provided from local OMNR, ABCA or SCRCA as part of the records review, therefore, information related to fish communities in the associated watercourses is limited. General thermal and fish community designations for some watercourses within the project area were provided in municipal drain classification mapping (SCRCA & DFO 2004), watershed report cards (ABCA 2007) as well as the *Fish Habitat Management Plan* (Veliz 2001). Watercourse flow regime designations were also not provided, although, general descriptions of flow are provided within the same reference documents for some watercourses. This information will be referenced when determining water bodies from non-water bodies. Municipal drain classification mapping is provided in Appendix I. The classification of 'intermittent' within the mapping may not be consistent with definitions used by the REA regulation, and may include other non-water body features, such as 'ephemeral' and 'grassed' features. NRSI will conduct a site investigation of all features within 120m of the project location to further assess which features should be considered water bodies.

Water quality within the associated water bodies is currently influenced by the existing agricultural land use with noted elevations in Total Phosphorus and *E.coli* (ABCA 2007). Benthic invertebrate communities within the watercourses also indicate degraded water quality (ABCA 2007).

More information, specific to each of the watersheds and subwatersheds, is provided in the following sections. For the purpose of this report, unnamed watercourses have been given designations in alphabetical order (i.e. Tributary A).

#### 4.2.1 Ausable River Watershed

##### 4.2.1.1 Ausable River

The main branch of the Ausable River flows east to west, north of the proposed wind energy center project area. It crosses the proposed transmission line route along

Kerwood Road, south of Elm Tree Drive. The Ausable River continues to flow west before ultimately draining into Lake Huron.

The main branch of the Ausable River is designated as a warmwater fishery with top predator sport fish species such as Northern Pike (*Esox lucius*) and Walleye (*Sander vitreus*) (Veliz 2001). The river also contains a Lake Huron migratory Rainbow Trout (*Oncorhynchus mykiss*) population (Veliz 2001). The majority of the tributaries that drain into the Ausable River are also designated as warmwater with warmwater baitfish species, however, there are some exceptions including the Lenting Drain which is discussed below (ABCA 2007).

This records review has identified that the main branch of the Ausable River as well as 8 unnamed tributaries (Ausable Trib A – Trib H) are located within the project area. These watercourses are shown on Figures 2 and 3.

#### 4.2.1.2 Adelaide Creek

Adelaide Creek is a tributary to the Ausable River. The creek flows in a northerly direction where it drains into the Ausable River just east of Kerwood Road. Its drainage area is situated within the southwestern limb of the Seaforth moraine which is characterized by pale brown, hard, calcareous, fine-textured till, with a moderate degree of stoniness, as well as within the Ekfrid clay plain (Chapman and Putnam 1984).

The fine-textured till and clay within the project area have low permeability and thus there is limited potential for infiltration and shallow groundwater discharge to support baseflow in streams. Discharge is therefore variable with short periods of high flows and long periods of low base flows (ABCA 2001).

Adelaide Creek is classified as warmwater with the presence of top predator species and has not been channelized in the last 10 years (ABCA & DFO 2004). Adelaide Creek's associated tributaries are also designated as warmwater with warmwater baitfish species (Veliz 2001) (ABCA & DFO 2004, ABCA 2007).

A total of 19 potential watercourses associated with Adelaide Creek have been identified within the project area. This includes the main branch of Adelaide Creek, 6 unnamed

tributaries (Adelaide Trib A – Trib F), Cleland Drain, Brent Drain A, Wilson Drain, Brown Drain and its two branches, Branch A & B, Morgan Drain and a single branch, Branch A, Down Drain, Branton Drain, Rombout Drain, and Seeds Drain. These features are shown on Figures 2 and 3.

#### 4.2.1.3 Mud Creek

Although the main channel of Mud Creek isn't within the project area, several of its associated tributaries are. They are located in the north eastern section of the project area and drain to the northeast into the main channel of Mud Creek, and ultimately into the Ausable River. The Mud Creek drainage area shares similar surficial geology as Adelaide Creek (see section 4.2.1.1), and originates from primarily from tile drain outlets. Discharge within the Mud Creek drainage area is variable with short periods of high flows and long periods of low base flows.

The associated tributaries of Mud Creek are designated as warmwater (Veliz 2001) with warmwater baitfish species (ABCA & DFO 2004, ABCA 2007). This records review has identified a total of 4 potential watercourses associated with Mud Creek within the project area. This includes Dodman's Drain, Walker Drain, Sutherland Drain, and Vangeffen Drain. These features are shown on Figure 2.

#### 4.2.1.4 Lenting Drain

The Lenting Drain is located along the proposed transmission line running north along Kerwood Road. The drain is a tributary to Adelaide Creek. It flows in a predominantly northern direction towards the main channel of Adelaide Creek. Much of its drainage area is occupied by coarse-textured deposits (in moraines, kames, eskers and crevasse fills; sandy deposits) with higher permeability, which is conducive to surface water/groundwater interactions and to the presence of cool or coldwater habitat.

Lenting Drain is unique in the area as it is designated as cool/coldwater with the presence of sensitive coldwater salmonids species (SRCA & DFO 2004).

This records review has identified a single watercourse (Lenting Drain) within the project area that is associated with the Lenting Drain drainage area. The drain is shown on Figures 2 and 3.

#### 4.2.1.5 Big Swamp Drain

Big Swamp Drain is located in the eastern portion of the project area. It flows in a southerly direction from the Big Swamp Wetland, ultimately draining into the Ausable River.

This records review has identified a total of one potential water body, Big Swamp Drain, within the project area. Big Swamp Drain is shown in Figure 3. This feature is designated as warmwater with warmwater baitfish species (ABCA 2007).

#### 4.2.1.6 Ptsebe Creek

Ptsebe Creek is a tributary to Parkhill Creek. Ptsebe Creek and its associated tributaries generally flow in a northerly direction draining into Parkhill Creek, northwest of the Town of Parkhill, before ultimately flowing into the Ausable River. Ptsebe Creek originates from a combination of runoff and tile drainage outlets. Within the project area, potential watercourses are limited to the headwater tributaries of Ptsebe Creek.

The Wyoming Moraine is most dominant physiographic land feature present within this drainage area. Ptsebe Creek drains the north side of the Wyoming Moraine and is located at the northern limit of the project area, along the Nairn Road section of the proposed transmission line route. The drainage area is dominated by clay tills with overall poor infiltration (ABCA 2001). Runoff can therefore cause variable discharge rates with short periods of high flows and long periods of low base flows.

This creek and associated tributaries are designated as warmwater (Veliz 2001) with warmwater baitfish species (ABCA 2007). The Ausable-Bayfield Conservation Authority (2001) has noted that “fish communities are typically limited in these intermittent streams”.

This records review has identified a total of 13 headwater tributaries associated with Ptsebe Creek within the project area. All of these features are, to our knowledge, unnamed and have been assigned alphabetical designations (Ptsebe Trib A – Trib M). These features are shown in Figure 3.

## 4.2.2 Sydenham River Watershed

### 4.2.2.1 Sydenham River

The Sydenham River drainage area is located along the southern limit of the project area, generally draining in a southern direction towards the Sydenham River. It shares similar surficial geology to Adelaide Creek (see section 4.2.1.1), and is dominated by tilled agricultural fields. The potential watercourses within the project area are all headwater drainage features, more specifically municipal drains. The tributaries are designated as warmwater (Veliz 2001) with warmwater baitfish species (ABCA 2007).

This records review has identified a total of 7 headwater tributaries, (all municipal drains) associated with the Sydenham River that are within the project area. These features include the Stevenson Drain, Sullivan Drain, Sydenham Trib A, Dortman's Drain, Richardson's Early Drain, Johnson Drain Branch A, and the Raply Drain. These features are shown in Figures 2 and 3.

## 4.3 Seepage Areas

NRSI biologists reviewed a variety of available background resources, including review of online resources, surficial geology mapping, elevation data, and digital aerial photography. No seepage areas were identified in the project area through the comprehensive records review of the Adelaide Wind Energy Centre.

## 4.4 Species of Conservation Concern

Species of conservation concern include all species that have been designated as a species of Special Concern according to the provincial Species At Risk in Ontario (SARO) and/or the federal Committee on the Status of Endangered Wildlife in Canada (COSEWIC), have been given a provincial S-Rank of S1-S3, or have been designated by COSEWIC as Threatened or Endangered but have not been designated as either Endangered or Threatened within Ontario.

Records review findings have identified no species of conservation concern within or near the Adelaide Wind Energy Centre project area.

## 5.0 Summary of Records Review

In accordance with the REA Regulation, NRSI has completed a comprehensive records review for the proposed Adelaide Wind Energy Centre project area. The project area was examined to ensure all water bodies in the vicinity of the proposed wind energy generating facility were considered. This records review included correspondence with provincial agency staff, and a review of available online and published resources. The results of this records review have been summarized in Table 2 below.

**Table 2. Summary of Water Bodies Records Review of the Adelaide Wind Energy Centre Project Area.**

Criteria	Associated Water Body Features
i. In a water body	<p>The records review has identified 38 potential water bodies to be overlapping the project location, including 37 within the large Ausable River watershed and 1 within the Sydenham River watershed.</p> <p>These overlaps typically represent proposed crossing locations for access roads, transmission line or cabling. All of these water bodies represent potential permanent or intermittent watercourses. All of which are designated as warmwater fisheries containing warmwater baitfish species, with the exception of Lenting Drain which is classified as a cool/coldwater watercourse.</p> <p>Each of these potential water bodies will be examined in more detail during the site investigation phase of this project.</p>
ii. Within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity	None
iii. Within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity	None
iv. Within 120 m of the average annual high water mark of a permanent or intermittent stream	<p>The records review has identified 54 potential water bodies located within 120m of the project location, including 47 within the large Ausable River watershed and 7 within the Sydenham River watershed. All of these water bodies represent potential permanent or intermittent watercourses. Most of these water bodies are designated as warmwater fisheries, with the exception of the Lenting Drain which is classified as cool/coldwater.</p>
iv. Within 120 m of a seepage area	None

## 6.0 References

### *Publications*

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St. Clair Region Conservation Authority. 2004. Township of Adelaide-Metcalf Municipal Drain Classification Map.

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### *Internet Sources*

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Ontario Ministry of Natural Resources. 2006. Inland Ontario Lakes Designated for Lake Trout Management. Available at: <http://www.ontla.on.ca/library/repository/mon/14000/262222.pdf>. Accessed December 9, 2010

**Appendix I**  
Municipal Drainage Mapping

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