

# **ALCONA SOUTH SECONDARY PLAN**

## **ENVIRONMENT**

**November 14, 2011**

***Prepared For:***  
*The Town of Innisfil*

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## **1.0 INTRODUCTION**

The Town of Innisfil is undertaking a review of the Alcona South Planning Area (Figure 1). This area is identified as Urban Settlement Expansion Area in Official Plan Amendment 1 to the Town's Official Plan (2009). Technical studies examining the environmental features and outlining constraints to development have been submitted to the Town by the landowners' consultants. North-South Environmental Inc. (NSE) was retained by the Town of Innisfil to peer review these studies and provide recommendations to assist with the development of a Secondary plan. The Secondary Plan is being prepared by Sorensen Gravely Lowes Planning Associates Inc.

### **1.1 Objectives**

Our main objectives were to assess the significance of natural features in the Alcona South Area through reconnaissance site visits, aerial photography interpretation, assessment of available mapping, and thorough examination of any environmental reports provided to us. This assessment formed the basis of determining whether any data gaps exist, and whether the analysis and conclusions in the landowners' consultants reports were consistent with environmental constraints in the context of provincial and municipal policies. Environmental reports prepared for planning purposes should thoroughly investigate all features of the landscape, including documentation of soil and water interactions, and an inventory of the plants and wildlife that inhabit the area. Based on the significance of identified natural environmental features, current policy can then be reviewed and applied to the relevant features. Through this review, our task was to comment on submitted environmental reports and provide recommendations, conclusions, and comment on the environmental features that are protected under current policies.

## **2.0 APPROACH**

In order to provide comments and recommendations with respect to potential issues associated with the development and natural heritage protection, we conducted reconnaissance site visits, reviewed the Landowners' environmental reports, and compared these reports with environmental constraints in the context of provincial and municipal policies.

### **2.1 Site Visits**

A reconnaissance site visit was completed on October 12, 2010 in order to verify the mapping and characterization of vegetation communities reported in the environmental reports prepared by the landowner's consultants. This visit revealed a number of areas that had been misclassified and require further examination. These are discussed in section 3.0 of this report.





# Alcona South Secondary Plan

## Figure 1: Location of Planning Area







## 2.2 Review of Landowners' Consultant Environmental Reports

Following the site visit the Landowners' consultant's environmental reports (Table 1) were reviewed by NSE. The various methods used for field investigations, timing of field work, and any recommendations and conclusions were scrutinized in order to determine if any gaps or conflicts existed with respect to the natural environmental features. Any vegetation communities and environmental features (*e.g.* watercourses, seepages) described in the reports were reviewed to ensure that they were updated and mapped appropriately. All flora and fauna species observed and listed in the reports were screened to determine if any were considered nationally or provincially rare according to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Committee on the Status of Species at Risk in Ontario (COSSARO). The Natural Heritage Information Centre's Biodiversity Explorer (now updated to 2010) was reviewed to identify records of significant species that have been recorded by other observers in the area in the past.

Table 1. Environmental reports/letters reviewed for the Alcona South Area.

Report
1. Master Environmental Report for the Lefroy Belle Ewart Secondary Planning Area, Town of Innisfil, County of Simcoe. March 2005. Prepared for: Meridian Planning Consultants Inc. Prepared by: Azimuth Environmental Consulting Inc.
2. Master Environmental Report for the Lefroy Belle Ewart Secondary Planning Area (North of 6 <sup>th</sup> Line), Town of Innisfil, County of Simcoe. May 2006. Prepared for: Meridian Planning Consultants Inc. Prepared by: Azimuth Environmental Consulting Inc.
3. Master Environmental Report, Alcona South Secondary Plan, Town of Innisfil, County of Simcoe. June 2008. Prepared for: Masongsong Associates Engineering Limited. Prepared by: Azimuth Environmental Consulting, Inc.
4. Draft Environmental Impact Assessment, Part of Lot 21 and 22, Concession 6, Town of Innisfil, County of Simcoe. January 2011. Prepared for: Previn Court Homes. Prepared by: Azimuth Environmental Consulting, Inc.

## 2.3 Natural Heritage Policies

The following policies were reviewed in order to determine the environmental features that would be protected by each policy and what level of protection each feature would be afforded by the relevant policy:

- Town of Innisfil Official Plan (2006)
- Provincial Policy Statement (2005)
- Lake Simcoe Protection Plan (2009)
- Greenbelt Plan Technical Paper 2 (2005)
- Lake Simcoe Region Conservation Authority Watershed Development Policies (2008)

Landscape-level and County initiatives relevant to natural heritage protection that may not have been considered in the Landowners' consultant's reports were also assessed. Mapped environmental features were examined to ensure they conformed with the Town's Official Plan policies for Natural Environmental Areas (Appendix 2 in the OP – Figure 2 in this report).







# Appendix 2: Natural Areas

## Innisfil Official Plan

### Legend

-  Innisfil Municipal Boundary
-  Big Bay Point OPA
-  Roads
-  Streams
-  Stream Corridors
-  Significant Woodlands
-  Lakes

 Appeal #63  
As it relates to the Significant Woodlands

Big Bay Point Resort  
(see OPA 17 approved  
by OMB Dec. 14, 2007)

Kempenfelt Bay

Big Bay Point

Lake Simcoe

Barrie

Thornton

Belle Ewart

DeGrassi Point

Churchill

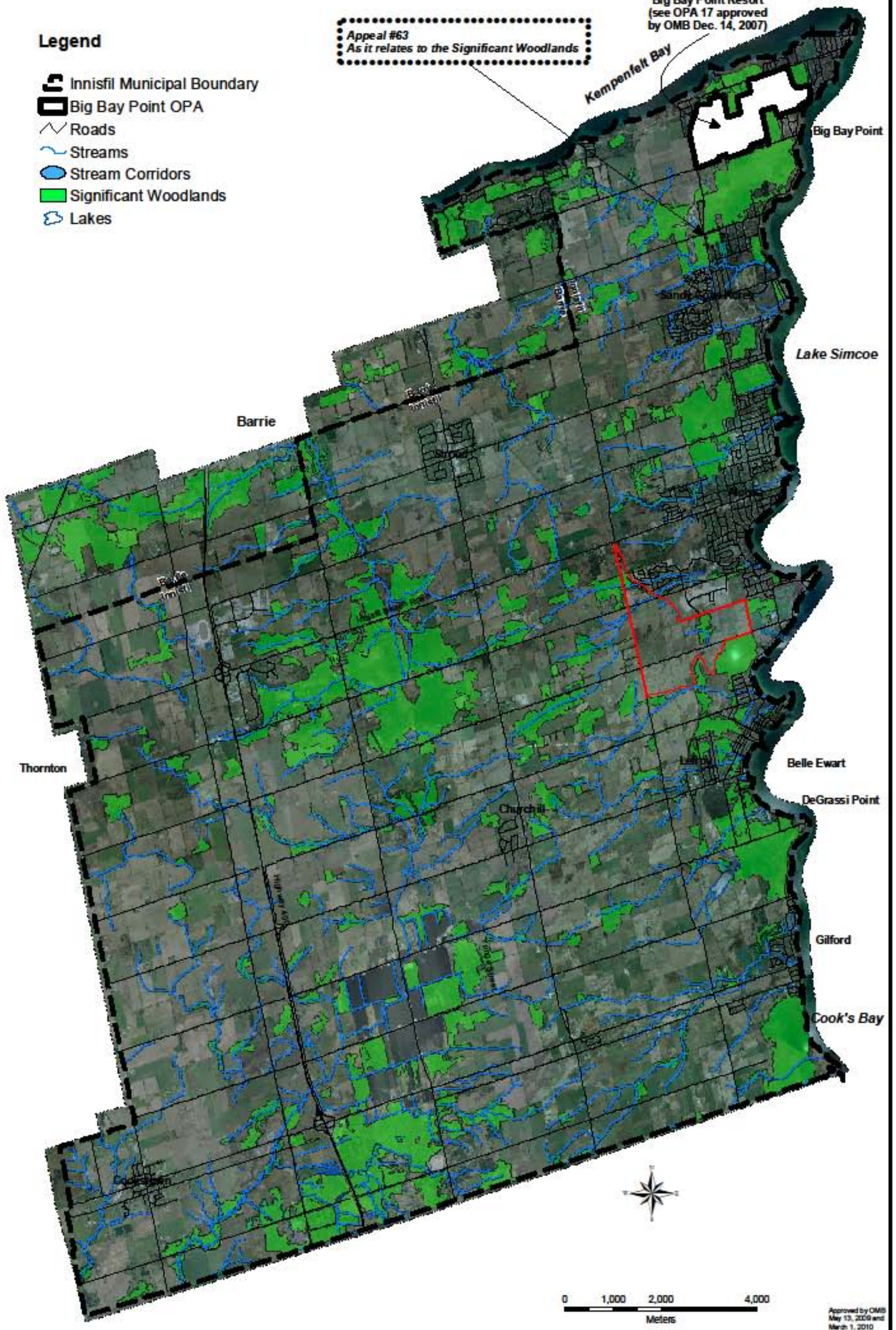
Gilford

Cook's Bay



0 1,000 2,000 4,000  
Meters

Approved by OMB  
May 13, 2009 and  
March 1, 2010







Policies that are relevant to the natural heritage features identified in the Alcona North area are outlined as follows:

### **2.3.1 Town of Innisfil Official Plan**

Section 3.1 of the Official Plan (OP) (2006) provides policies that are relevant to natural heritage. Section 3.1.1.1 lists the following *Natural Environmental Areas* (NEA) for which development is restricted:

- *Environmentally Significant Areas (excluding Hydrogeologically Significant Areas);*
- *Provincially Significant wetlands;*
- *Other wetlands;*
- *Areas of Natural and Scientific Interest (ANSI's);*
- *Valleylands*
- *Significant Woodlands*
- *Significant wildlife habitat;*
- *Significant habitat of endangered species and threatened species;*
- *The Lake Simcoe shoreline; and*
- *Stream corridors including fish habitat and buffers.*

*3.1.1.2 In addition to the features in 3.1.1.1, linkages may also be included in the designation as identified through studies as described in Sections 2.4.1 and 2.4.4.*

*2.4.1 The boundaries of the Natural Heritage System, as shown on Schedule A, are schematic and shall be refined if and when land use changes are proposed. At that time, the spatial extent and functional requirements of linkages shall be determined through a watershed plan, Secondary Plan and /or Environmental Impact Study (EIS) process and the boundaries of the NHS refined using the principles provided in Section 2.4.7. Where such studies delineate lands to be protected from development in order to maintain the linkage function, these areas may be designated Natural Environmental Area as per Section 3.1 and shown on Schedules B and B1 to B14.*

*2.4.4 Through a watershed plan, Secondary Plan and /or Environmental Impact Study (EIS) additional linkages between Natural Environmental Area designations may be identified using the principles of 2.4.7. These linkages will be considered to form part of the Natural Heritage System and shall be protected from development. Lands comprising the linkage may also be designated Natural Environmental Area as per Section 3.1.1.2.*

*2.4.7 The following general principles shall be used for delineating the Natural Heritage System:*

- *Incorporate Natural Environmental Area designated features, as set out in Section 3.1, among which functional linkages can be established.*
- *Preserve, and where possible improve, functional connections among natural heritage features;*
- *In particular, maintain connections between open water features (e.g., ponds and small lakes) and upland woods;*
- *Include local level connections where ever practical and ecologically desirable;*



- *Wherever possible, include coldwater streams, headwater wetlands and associated woodlands;*
- *Provide for linkages that extend outside of the Town boundaries as generally delineated on Schedule A;*
- *Link woodlands that occur along watercourses; and*
- *Evaluate the role of smaller woodlands and meadows, and the linkages among them and other Natural Environmental Area features, and incorporate them into the Natural Heritage System where appropriate.*

**3.1.1.3** *A woodland shall be considered significant where it satisfies one or more of the following three criteria:*

*a. Any woodland that supports valued species of flora or fauna including any of the following:*

- i) any G1, G2, G3, S1, S2, or S3 plant or animal species, or community as designated by the Natural Heritage Information Centre (NHIC); or*
- ii) any species designated by the Committee On the Status of Endangered Wildlife In Canada (COSEWIC) or the Committee On the Status of Species At Risk in Ontario (COSSARO)*

*b. Any woodland over 2 ha that is:*

- i) within 100 metres of another feature identified in Section 3.1.1.1; or*
- ii) within 30 metres of a natural watercourse, surface water feature or other wetland.*

*c. Any woodland that is greater than or equal to 10 ha in size.*

**3.1.1.6** *The general boundaries of the Natural Environmental Areas are delineated on Schedule B, and B1 through B14. These boundaries are based on the best available mapping and are not intended to be precise. The boundaries of Natural Environmental Areas shall be confirmed and refined through an environmental analysis during the Secondary Plan process, and / or through the review of any site specific development applications through an Environmental Impact Study (EIS). The precise delineation of the Natural Environmental Areas shall occur through the staking of the limits of the area as part of environmental studies in support of Secondary Plans, or development applications. Such staking will be undertaken in co-operation with the Town, the applicable conservation authority and the County.*

**3.1.1.8** *No development or site alteration are permitted in provincially significant wetlands, or significant habitat of endangered species and threatened species.*

**3.1.1.10** *Where development, site alteration or uses are proposed within the Natural Environmental Area designation or the Natural Heritage System, set out in Section 2.4, other than those features referred to in Section 3.1.1.8 and the uses permitted in Section 3.1.1.4, or where development is proposed on lands adjacent to Natural Environmental Area designations, or the Natural Heritage System, the proponent shall undertake an Environmental Impact Study (EIS) as outlined in Section 9.10 of this Plan. The Environmental Impact Study shall be completed to the satisfaction of the Town in consultation with the County and the applicable conservation authority. Development or*



*site alteration will not be permitted within or adjacent to a Natural Environmental Area designation or the Natural Heritage System, and such lands will not be designated to an alternative designation, unless the EIS demonstrates to the satisfaction of the Town in consultation with the County and the applicable conservation authority that there will be no negative impacts on the natural feature or its ecological function including functional linkages.*

*3.1.1.13 Refinements to the boundaries of the Natural Environmental Area designation, where permitted based on justification through an approved Environmental Impact Statement, shall not require an amendment to this Plan. The adjoining land use designation(s) shall be deemed to apply to the lands removed from a Natural Environmental Area designation and the Natural Environmental Area policies shall be deemed to apply to lands added to such designations.*

*3.1.1.21 A minimum setback of 30 metres shall be established from the high water marks of watercourses and Lake Simcoe, and these lands shall be included within the Natural Environmental Area designation. A reduction of the 30 metre buffer may be permitted on a site specific basis without amendment to this plan, provided that it is demonstrated to the satisfaction of the Town and applicable conservation authority that there will be no impact to fish habitat or the water quality from a lesser setback.*

### **2.3.2 Provincial Policy Statement**

Section 2.1 of the PPS (2005) outlines the natural features that are restricted from development. The Natural Heritage Reference Manual for Natural Heritage Policies of the PPS (2005) Second Edition (2010), provides technical guidance and approaches for implementing the PPS. The following policies of the PPS are reviewed with respect to the natural features in the Alcona South planning area.

*2.1.1 Natural features and areas shall be protected for the long term.*

*2.1.2 The diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.*

*2.1.3 Development and site alteration shall not be permitted in:*

- a) significant habitat of endangered species and threatened species;*
- b) significant wetlands in Ecoregions 5E, 6E and 7E<sup>1</sup>; and*
- c) significant coastal wetlands.*

*2.1.4 Development and site alteration shall not be permitted in:*

- a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E<sup>1</sup>;*
- b) significant woodlands south and east of the Canadian Shield<sup>2</sup>;*
- c) significant valleylands south and east of the Canadian Shield<sup>2</sup>;*
- d) significant wildlife habitat; and*
- e) significant areas of natural and scientific interest*



*unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.*

*2.1.5 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.*

*2.1.6 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.3, 2.1.4 and 2.1.5 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.*

### **2.3.3 Lake Simcoe Protection Plan**

Section 6, *Shorelines and Natural Heritage*, includes policies relevant to the natural features in the Alcona South planning area. The Lake Simcoe Protection Plan (LSPP) does not contain criteria for designating *significant woodlands*. However, the criteria outlined in the Greenbelt Plan Technical Paper 2 are recommended by the MOE to be used in implementing the LSPP in the absence of any technical papers for the LSPP.

*6.21-DP Key natural heritage features are wetlands, significant woodlands, significant valleylands, and natural areas abutting Lake Simcoe.*

*6.22-DP Key hydrologic features are wetlands, permanent and intermittent streams, and lakes other than Lake Simcoe.*

*6.23-DP Development or site alteration is not permitted within a key natural heritage feature, a key hydrologic feature and within a related vegetation protection zone referred to in policy 6.24, except in relation to the following:*

- a. Forest, fish, and wildlife management;*
- b. Stewardship, conservation, restoration and remediation undertakings;*
- c. Existing uses as specified in policy 6.45;*
- d. Flood or erosion control projects but only if the projects have been demonstrated to be necessary in the public interest after all alternatives have been considered;*
- e. Retrofits of existing stormwater management works (i.e. improving the provision of stormwater services to existing development in the watershed where no feasible alternative exists) but not new stormwater management works;*
- f. New mineral aggregate operations and wayside pits and quarries pursuant to policies 6.41 – 6.44;*
- g. Infrastructure, but only if the need for the project has been demonstrated through an Environmental Assessment of other similar environmental approval and there is no reasonable alternative; and*
- h. Low-intensity recreational uses that require very little terrain or vegetation modification and few, if any, buildings or structures, including but not limited to the following:*
  - i. non-motorized trail use;*
  - ii. natural heritage appreciation;*
  - iii. unserviced camping on public and institutional land; and*
  - iv. accessory uses to existing buildings or structures.*





**6.24-DP** The minimum vegetation protection zone for all key natural heritage features and key hydrologic features is the area within 30 metres of the key natural heritage feature and key hydrologic feature, or larger if determined appropriate by an evaluation required by policy 6.25.

**“Significant” means:**

- a. In regard to wetlands, an area identified as provincially significant by the Ontario Ministry of Natural Resources using evaluation procedures established by the Province, as amended from time to time;
- b. In regard to the habitat of endangered species and, threatened species, means the habitat, as approved by the Ontario Ministry of Natural Resources, that is necessary for the maintenance, survival, and/or the recovery of naturally occurring or reintroduced populations of endangered species or, threatened species, and where those areas of occurrence are occupied or habitually occupied by the species during all or any part(s) of its life cycle;
- c. In regard to woodlands, an area which is ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history. The Province (Ministry of Natural Resources) identifies criteria relating to the forgoing (Greenbelt Plan); and

**2.3.4 Greenbelt Plan Technical Paper 2**

Technical Paper 2 of the Greenbelt Plan (2005) provides “criteria for identifying *significant woodlands* in the Natural Heritage System of the Greenbelt Plan’s Protected Countryside” (Greenbelt, 2005). These criteria are recommended by the MOE to be used in implementing the LSPP in the absence of any technical papers for the LSPP. Section 3 of Technical Paper 2 (Greenbelt Plan, 2005) provides the following table with criteria for identifying *significant woodlands*.

Table 2. Greenbelt Plan Technical Paper 2 (2005) criteria for identifying *significant woodlands*. The Ministry of the Environment recommends these criteria are followed until the technical papers are completed for the LSPP. A woodland that meets any one of the criteria below is considered *significant*.

Criteria	Description	*North Area	*South Area
Size	Any woodlands of this size or greater are <i>significant</i> ; or	10 hectares or more	4 hectares or more
Natural Composition	Any woodlands containing this area of naturally occurring (not planted) trees listed in Table A that meet the definition of “woodland”; or	4 hectares or more	1 hectare or more



Criteria	Description	*North Area	*South Area
<i>Linkage</i>	Any <i>woodlands</i> of this size or greater that provide a connecting “stepping stone” link between any two features, e.g., wetland, fish habitat, lake, stream, <i>significant</i> valleyland or <i>significant</i> woodland, each of which is within 120 metres of the woodland; or	4 hectares or more	1 hectare or more
<i>Age or Tree Size</i>	Any <i>woodlands</i> of this size with <i>trees</i> greater than 100 years old or containing a <i>basal area</i> of at least 8 square metres per hectare in native <i>trees</i> that are 40 cm or more in <i>diameter</i> ; or	4 hectares or more	1 hectare or more
<i>Proximity</i>	Any <i>woodlands</i> of this size wholly or partially within the 30 m vegetative protection zone of a wetland, seepage area or spring, fish habitat, stream, lake, significant habitat of woodland wildlife, <i>significant</i> valleyland or <i>significant</i> woodland, or	0.5 hectare or more	0.5 hectare or more
<i>Rarity</i>	Any <i>woodlands</i> of this size containing a provincially “rare treed vegetation community” with an S1, S2 or S3 in its ranking by the Ministry of Natural Resources Natural Heritage Information Centre (NHIC) or important habitat of a woodland species with an 8, 9, or 10 in its southern Ontario Coefficient of Conservatism by the NHIC.	0.5 hectare or more	0.5 hectare or more

\* North Area and South Area refer to the division of the Greenbelt Plan area into two geographic areas to account for differences in forest cover. The north area “includes the areas north of the Oak Ridges Moraine Conservation Plan area, west of the Niagara Escarpment Plan Area, and north of Highways #5 and #8” (Greenbelt Plant Technical Paper 2, 2005), where tree cover is higher. Innisfil is north of the northern area and therefore the criteria for the north area of the Greenbelt Plan Area have been applied to the Alcona South planning area.

### 2.3.5 Lake Simcoe Region Conservation Authority Watershed Development Policies

The policies guiding development within the LSRCA watershed relevant to the Alcona South planning area include but are not limited to the following sections.

- 4.2 *The Authority will require an undisturbed vegetative buffer strip running consistently along both sides of all watercourses. The buffer is to be measured perpendicularly outward from both watercourse banks (i.e. the annual highwater mark) as follows:*
- (a) *a minimum 15 metre buffer for all warmwater watercourses (a minimum 30 metres in total).*
  - (b) *If the creek is within Oak Ridges Moraine Conservation Plan (ORMCP) lands, a minimum 30 metre buffer will be required on each side.*
  - (c) *a minimum 30 metre buffer for all coldwater or marginally coldwater (coolwater) watercourses (a minimum of 60 metres in total). Where watercourses have not been studied as to thermal regimes or fish population, the 30 metre buffer would be required.*



Section 7.1 of the LSRCA Watershed Development Policies provides restrictions and regulations for development within the regulatory floodplain. The Alcona South planning area does contain floodplain that is regulated by the LSRCA. Mapping and consideration of the floodplain is beyond the scope of this environmental review.

### **3.0 GAP ANALYSIS OF LANDOWNERS' CONSULTANT REPORTS**

In general, the report produced by Azimuth in 2008 (report #3 in Table 1) provided a thorough description of the environmental features and constraints to development. The following is a summary of the gaps identified and provided to the landowners' consultants for consideration:

1. Review species lists and update status of species. For example, the status of the Bobolink has been changed to Threatened on the Species at Risk in Ontario (SARO) list.
2. Review Significant Wildlife Habitat analysis; the analysis does not take into consideration concentrations of locally rare species.
3. Mapping prepared by Azimuth does not indicate the location of vernal ponds on their mapping, nor does it indicate connections between these vernal pools and their adjacent habitats.
4. Further investigation of the wooded area in northwest corner of the site for significant species and their breeding habitats is required as surveys have not been completed in this area. The report indicates that this portion of the site was added later, after investigation of the site was already underway. This site was also surveyed by another consultant who has not submitted the results of their field investigations.
5. Generally need to review conclusions and compare with recent aerial photography and up-to-date significant species and significant areas mapping.
6. Review mapping of significant and sensitive wildlife species: e.g. at amphibian sampling points 2, 5, and 6. It is not clear what species are located in what direction of the arrow. This is important for protecting breeding habitat and connecting it with habitat occupied in later life stages.

In addition to these points, during the November 3<sup>rd</sup>, 2010 meeting between the Town and the landowners regarding Alcona South, Sal Spitale (North-South Environmental Inc.) spoke with Paul Neals (Azimuth Environmental) about a vegetation community indicated as 'active agriculture' in Figure 3a (Terrestrial Resources) in the Azimuth (2008) report (Point 2 on Figure 4 of this report). Although the ELC mapping provided by Azimuth in their environmental study indicated this area as active agriculture, field reconnaissance by NSE found this area to consist of a complex of swamp thicket, cultural meadow, and cultural thicket vegetation communities. No inventory had been done of this area and it was brought to the attention of Azimuth that this area should be surveyed, the wetland delineated, and the vegetation communities mapped correctly. Due to the potential for amphibian breeding in the wetland in this area, frog surveys were conducted by Azimuth in 2011, as requested by NSE, following the protocols outlined in the Marsh Monitoring Program Participant's Handbook (2008).

In August of 2011 NSE received an additional report (report #4 in Table 1) by Azimuth that was completed in January 2011. This report examined the natural features on the northern half of the lands north of 6<sup>th</sup> line, south of 7<sup>th</sup> line, east of 20<sup>th</sup> Sideroad, and west of the rail line. The gap



analysis completed by NSE was done prior to receiving this report therefore no previous comments or identified gaps were provided to Azimuth with respect to this report.

### 3.1 General Comments

The reports submitted by Azimuth in 2008 and 2011 generally provides a thorough examination of the environmental features and conditions of the Alcona South Planning area. The review provided in the 2008 report takes into consideration current Natural Environmental Areas (NEA) mapping, Appendix 2 of the Town of Innisfil Official Plan (OP) (Figure 2 in this report) and other relevant policies. Azimuth responded to the gaps provide by NSE, noted in Section 3.0 above, in a letter addressed to the Town of Innisfil dated December 21, 2010 (Appendix A). Although the letter provides some clarification and addresses some of the identified gaps (points 1 and 6), the comments do not address all of the gaps.

Point 2 and 3 raises the need to assess significant wildlife habitat. Although the report by Azimuth (2008) does provide general comments on biodiversity and potential for habitat of rare species, their analysis does not go further in ascertaining wildlife habitat as defined by the OP (section 9.20.55): *“areas where plants, animals and other organisms live, and find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a vulnerable point in their annual or life cycle; and areas which are important to migratory or non-migratory species.* Although there is not a set of specific criteria for significant wildlife habitat in the OP, based on this definition and the guidelines for determining significant wildlife habitat as set out in the Significant Wildlife Habitat: Technical Guide (SWHTG) (2000), significant wildlife habitat can be determined and an area can be designated as such. Vernal pools and surrounding woodlands are also critical habitats for amphibians. Mapping of these features would provide a more thorough understanding of how these features function and would be considered significant wildlife habitat. The Natural Heritage Reference Manual for Natural Heritage Policies of the PPS (2005) recognizes that mapping of significant wildlife habitat does not normally exist prior to development. However, significant wildlife habitat should be assessed prior to any development through an Environmental Impact Study. Section 2.1.4 of the PPS states that development and site alteration shall not be permitted in significant wildlife habitat unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions. There is enough information provided in their report about amphibian breeding and the functions of natural features that an assessment can be done and the guidelines applied to assess wildlife habitat as significant. This assessment is discussed further in Section 4 of this report.

Due to the potential for amphibians breeding in the wetland area misclassified as active agriculture (north east of site), Azimuth conducted frog breeding surveys in 2011. However, the vegetation survey and delineation of the wetland were not conducted as was requested by NSE.

With the development of the planning area, there will be a decrease in the amount of permeable surfaces and water recharge to surrounding natural features. There is a potential for negative impacts to adjacent hydrological features, specifically the Little Cedar Point PSW. Changes in hydrogeology can have a negative impact on the functioning of the PSW and any development should be designed to avoid negative impacts to the feature or its function, per the PPS (2005).



A detailed water balance should be undertaken in order to evaluate the changes in the wetland hydrology. Once this has been determined, the change should be analyzed from an ecological perspective to evaluate if the changes will impact flora or fauna, particularly the amount of tree cover and amphibian breeding habitat. This recommendation is reiterated in Section 7.0.

#### 4.0 REVIEW OF NATURAL HERITAGE FEATURES

The Natural Environmental Areas designation based on Appendix 2 from the Town of Innisfil Official Plan (Figure 2 of this report), illustrates *significant woodlands* and watercourses. Section 3.1.1.6 of the OP allows the boundaries of NEAs to be refined during the Secondary Plan process. These NEAs are considered with respect to their assessment by Azimuth (2008) and the application of relevant policies by NSE. The report produced by Azimuth in 2008 maps the candidate natural environmental areas in Figure 4 of their report (Figure 3 in this report). The areas reference in Figure 3 form the basis of discussion for this section. Those features which meet the criteria provided in the OP for NEA's (*significant woodlands, significant wildlife habitat, watercourse, etc.*) and are considered by the LSPP as Key Natural Heritage or Key Hydrologic Features (*e.g. wetlands, significant woodlands, and permanent and intermittent streams*) are discussed below and illustrated in Figure 4. In addition there are some natural features that require further study prior to development and these features and the required studies are discussed further in section 6.0.

**Area 1** - This unit is mapped as a Natural Environmental Area in the OP, meets the criteria of a *significant woodland* outlined in section 3.1.1.3 of the OP, contains a wetland, has a watercourse running along the southern edge, and is part of a larger *significant woodland* on the west side of Sideroad 20. This woodland would also be considered significant under the LSPP because it is larger than 0.5ha and is within the 30 meter vegetative protection zone of a stream and *significant woodland*. The woodland on the west side of Sideroad 20 is larger than 10 ha and would also be considered significant under the LSPP. A 30 m minimum vegetation buffer is required in section 6.24-DP of the LSPP and is mapped in Figure 4.

**Area 2** - This feature is a woodland unit that is part Sugar Maple – American Beech forest with areas of Poplar Deciduous Forest, Ash Lowland Deciduous Forest, and a Scotch Pine Plantation. Within this unit are several vernal pools providing breeding habitat for four species of woodland frogs. Due to the natural forest composition of the majority of the woodland unit and the woodland amphibian breeding habitat this woodland was assessed as *significant woodland* and *significant wildlife habitat*. This woodland fulfills the criteria for *significant woodlands* and *significant wildlife habitat* according to the OP, PPS, and LSPP.

##### Lake Simcoe Protection Plan

The criteria for *significant woodlands* under the LSPP are expected to be similar to those outlined by the Greenbelt Plan Technical Paper 2 (2005). This woodland meets the criteria for 'natural composition' provided in Table 2 (Greenbelt Plan Technical Paper 2 (2005) criteria for identifying *significant woodlands*) of this report and would therefore be *significant* under the LSPP.





Town of Innisfil Official Plan

The criteria for identifying *significant woodlands* as outlined in the Town of Innisfil’s OP (2006) includes any woodlands that contain species that have been designated by COSSARO or COSEWIC. This woodland contains a high abundance (20 individuals) of western chorus frog, a species listed as threatened with COSEWIC. This woodland contains the habitat necessary for chorus frog to breed and hibernate (vernal pools, any breeding habitat, and adjacent upland forest) and meets the definition of *significant woodlands* under the criteria outlined in the OP.

Provincial Policy Statement

Section 2.1.4 of the PPS (2005) prohibits development in significant wildlife habitat. The Natural Heritage Reference Manual was developed to provide information on technical issues related to natural heritage features of the PPS including significant wildlife habitat. The Significant Wildlife Habitat Technical Guide (SWHTG) (2000) was developed to support the Natural Heritage Reference Manual (Ontario Ministry of Natural Resources, 2010) and to identify, describe, and prioritize significant wildlife habitat. Based on application of the minimum standards evaluation method established for determining significant wildlife habitat for amphibian woodland breeding ponds (Table Q-2 - SWHTG 2000) the woodland complex should be considered *significant wildlife habitat*.

Table 3. Minimum standards evaluation method as applied from the SWHTG (2000) for amphibian woodland breeding ponds.

<b>Minimum Standard</b>	<b>Criteria Met</b>
Provision of significant wildlife habitat	Yes – breeding and upland habitat
Degree of permanence	Yes - Moderate
<b>Species diversity of pond</b>	Yes – supports 4 of 4 woodland breeding frog species
<b>Total Number of Amphibians</b>	Yes - 31 (high)
<b>Presence of rare species*</b>	Yes - chorus frog (2-20) is listed with COSEWIC
Size and number of ponds	Several (more than 3)
Diversity of submergent and emergent vegetation	Not specifically noted
Presence of shrubs, edge of pond	Not specifically noted
Adjacent forest habitat	Yes
Water quality	Good
Level of disturbance	Moderate – some dumping, logging trail

\* numbers in brackets (e.g. 2-20) denote the calling code recorded based on Marsh Monitoring program (2008) protocols. Bolded minimum standards are those noted in the SWHTG as having the greatest significance to ponds.



In summary, this woodland unit would be considered *significant woodland* under the OP and LSPP and would also be considered as *significant wildlife habitat* under the PPS and OP according to criteria provided by the SWHTG (2000). This woodland wood be restricted from development and a 30 m minimum vegetation buffer is required in section 6.21-DP of the LSPP and is mapped in Figure 4.

Table 4. Summary of significant wildlife habitat and significant woodlands criteria met based on relevant policies.

Policy	Criteria	Criteria Met
Lake Simcoe Protection Plan – Significant Woodland (Greenbelt Plan)	Natural stand 4 hectares or greater	Yes – over 4 hectares
Innisfil Official Plan – Significant Woodland	Supports species listed with COSSARO or COSEWIC	Yes – chorus frog listed with COSEWIC
Innisfil Official Plan – Significant Wildlife Habitat	Not defined so refer to PPS and SWHTG	Yes – see table 3
Provincial Policy Statement – Significant Wildlife Habitat	Outlined in table 3	Yes – see table 3

This woodland also contains butternut (*Juglans cinerea*) which is listed as endangered and is currently protected under Ontario’s *Endangered Species Act* (2007). Section 9 of the *Endangered Species Act* (2007) provides protection to Butternut and prohibits damage or removal of these trees. However, exemptions to this Act may be provided when the specimens are affected by Butternut Canker and are not considered retainable after assessment by a certified Butternut Assessor and the Ministry of Natural Resources (MNR). The Butternut were not found to be retainable by Azimuth in 2009 which was accepted by the MNR. The presence of butternut in this woodland was therefore not used in designating this woodland as significant.

A potential linkage feature had been identified by Azimuth in their 2008 report between the larger woodland and a small cultural thicket to the east. According to section 2.4.3 of the OP, linkage features can be assigned during the Secondary Plan process. Section 2.4.7 of the OP provides general principles for delineating the Natural Heritage System including preserving and improving functional connections among natural heritage features. Since this smaller unit contains four species of breeding frogs, including a moderate abundance of chorus frog, this unit would provide additional breeding habitat for frogs breeding in the woodlands to the west. Until such time that this linkage feature is assessed between the larger woodlot and the smaller parcel to the east, no development within this unit or within 30 meters adjacent to this unit should be permitted. It is recommended that the Secondary Plan recognize this feature as an area for further study. This feature is also discussed in section 6.0 of this report.

**Area 3** - This area is currently mapped as a *significant woodland* in the OP because it is over 10ha in size, which would also qualify this woodland as *significant* under the LSPP. This woodland also contains significant wildlife habitat due to the high concentration of calling amphibians, several vernal pools, and a high concentration of rare plants. This feature would also be considered *significant woodland* under Section 3.1.1.3 (a) of the OP due to the presence



of Western Chorus Frog, a species listed as federally threatened in this area by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The 30 m minimum vegetation buffer is required in section 6.24-DP of the LSPP and is mapped in Figure 4.

**Area 4** - Although outside the boundary of the Secondary Plan Area, this woodland is over 10 ha and is considered a *significant woodland* under the OP and the criteria for *significant woodlands* of the LSPP. The 30 m minimum vegetation buffer is required in section 6.24-DP of the LSPP and is mapped in Figure 4.

**Area 5** - This area contains a cultural thicket and Cedar Creek (N. Tributary), which flows through a ditch to the north of this community (south side of 6<sup>th</sup> line). A 30 m buffer is required from the top of bank for coldwater streams according to section 4.2 of the Lake Simcoe Region Conservation Authority Watershed Development Policies, and a minimum 30m buffer is required for Key Hydrologic features under section 6.24 of the LSPP. This watercourse currently acts as a linkage feature to the Little Cedar Point Provincially Significant Wetland (PSW). The cultural thicket community does not contain any significant features that would restrict development in this area. However, this community also likely functions as a linkage feature for faunal movement and floral dispersal between the PSW and the swamp to the north of 6<sup>th</sup> Line. Currently Cedar Creek (North Tributary) flows east along the ditch south of 6<sup>th</sup> Line. The required buffer of 30 meters on each side of the creek would be bisected by the road. Rather than providing a 30m buffer on each side of the creek, the buffer area can be shifted to the area 60m to the south side of the watercourse thereby resulting in a wider linkage feature. This recommendation is further discussed in section 7.0.

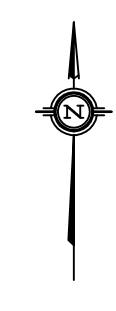
**Area 6, 7, 8** - These woodlands would be considered *significant woodlands* under the LSPP because they are larger than 0.5ha and are contiguous, therefore within the 30 meter vegetative protection zone of the Little Cedar Point PSW, a proximity criteria used for designating *significant woodlands* under the Greenbelt Plan Technical Paper 2 (2005). A 30 m minimum vegetation buffer is required in section 6.24-DP of the LSPP and is mapped in Figure 4.

**Area 9** - This woodland would also be considered significant under the LSPP because it is larger than 0.5ha and is within the 30 meter vegetative protection zone of a stream (criteria of proximity to *significant woodland* under the Greenbelt Plan Technical Paper 2 for significant woodlands). It is also mapped as a Natural Environmental Area on Appendix 2 – Natural Areas, of the OP. A 30 m minimum vegetation buffer is required in section 6.24-DP of the LSPP and is mapped in Figure 4.

**Area 10** - This feature is the Little Cedar Point PSW. As a PSW and key hydrologic feature this wetland is restricted from development under section 6.23 of the LSPP, section 3.1.1.10 of the OP, section 2.1.3 of the PPS and would also be restricted from development by the LSRCA. A 30 m minimum vegetation buffer is required in section 6.24-DP of the LSPP and is mapped in Figure 4.







SCALE 1: 7,500  
75m 0 150m 300m

- LEGEND:**
- Study Area
  - - - Study Area - 50m Buffer
  - Watercourses
  - Little Cedar Pointe PSW (MNR 2006)
  - (1-10) Candidate Natural Environmental Areas



**CANDIDATE NATURAL ENVIRONMENTAL AREAS**

**ALCONA SOUTH SECONDARY PLAN**

Date Issued:	June 2008	<b>4</b>
Created By:	PHD	
Project No.:	07-013	
Reference:	First Base Solutions	

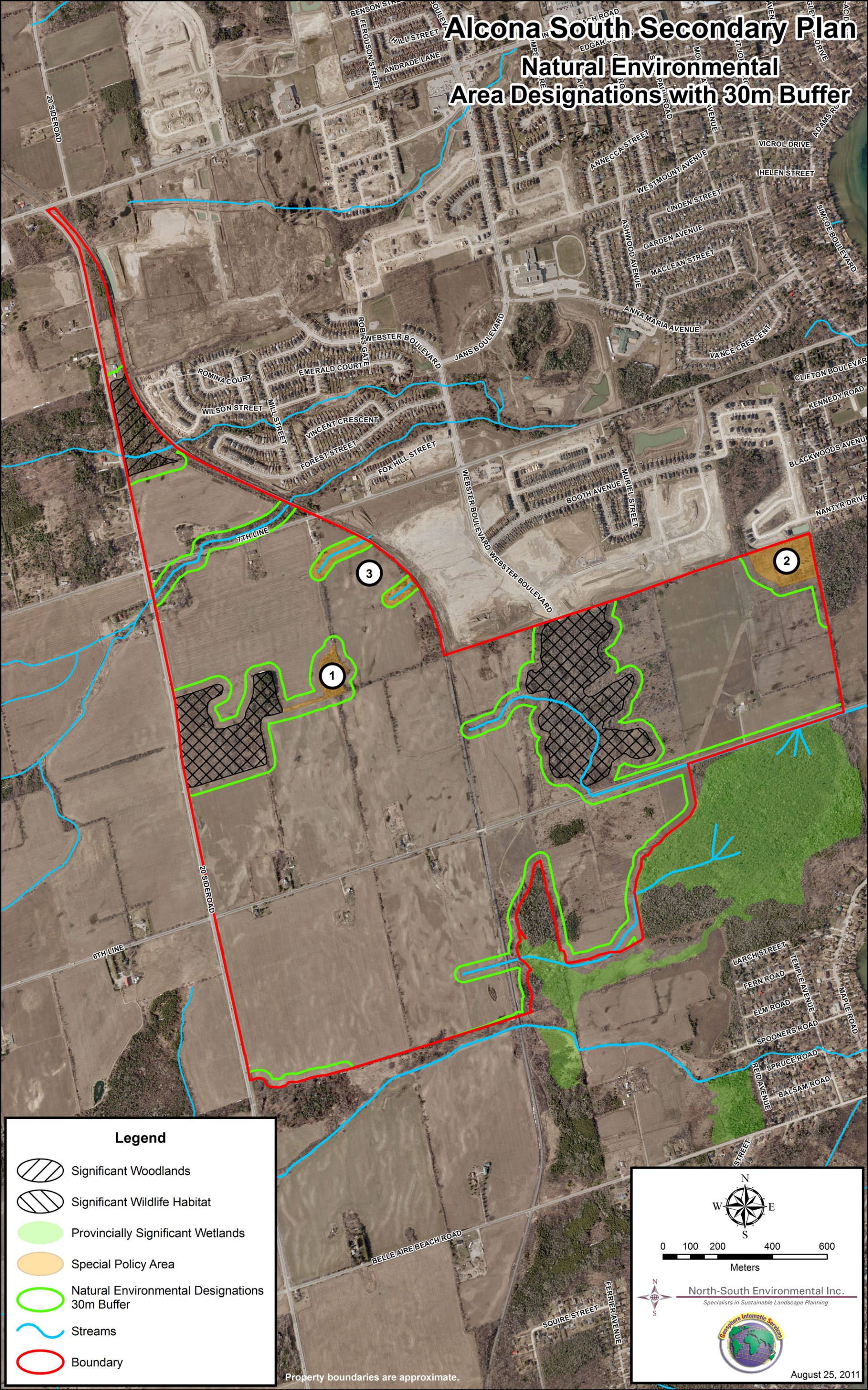













# Alcona South Secondary Plan


## Natural Environmental Area Designations with 30m Buffer



### Legend


-  Significant Woodlands
-  Significant Wildlife Habitat
-  Provincially Significant Wetlands
-  Special Policy Area
-  Natural Environmental Designations 30m Buffer
-  Streams
-  Boundary

Property boundaries are approximate.



0 100 200 400 600  
Meters

**North-South Environmental Inc.**  
*Specialists in Sustainable Landscape Planning*



August 25, 2011





## 5.0 COMMENT ON PROPOSED WATERCOURSE STORM FLOW DIVERSION

Through the development of the Alcona South planning area options have been considered in order to attenuate the flooding of the homes in Belle Ewart as a result of the storm event flows conveyed in watercourse #7/Belle Aire Creek (Figure 3). One of these options is to divert all storm flows with a peak greater than the 25mm-24 hour storm into watercourse #6/Cedar Creek (S. Tributary) which discharges into the Little Cedar Point PSW and continues east into Lake Simcoe. The studies to date on the impacts of this diversion into the PSW only include modelling of water levels and drawdown times. A storm water report completed by Greenland International Consulting Ltd. (Greenland), described in the Master Environmental Report produced by Azimuth in 2008 for the Alcona South Secondary Plan, produced a table of depth of water and drawdown times based on modelling storm events. Although comments on the impact of the change in water level fluctuations in the PSW as a result of the diversion of storm flows were provided by Azimuth in a letter to Sorensen Gravely Lowes, Dated June 14<sup>th</sup>, 2011 (Appendix B), there have been no studies on the impacts of this diversion. Further, the letter provided by Azimuth provides a revised table reporting changes in drawdown times and water levels based on a 2 year storm event. This letter omits the modelled changes in water level and drawdown times of a five, 10, 25, and 50 year storm. For a 25 year storm event, a diversion of storm flows into the PSW would result in an increase of 60cm of water above normal levels and a drawdown time of 233.38 hours (10 days) in addition to the 22.5 hours that drawdown takes under existing conditions. Opinions expressed in the report and letter provided by Azimuth do not take into consideration the impact of the larger storm events to the ecology of the PSW. By only considering smaller storm events one would be led to believe the impacts are minimal. Because thorough studies have not been conducted on the impacts of the change in normal conditions of water level fluctuations and drawdown times it is premature to provide opinions on the impacts to the ecology of the PSW.

Further studies are required in order to determine the likely impacts to the ecology of the wetland as a result of the storm flow diversion into the PSW. The following is a list of studies that should be considered before alteration of the natural conditions of the PSW is considered:

1. Assess the impact of increased flooding to vegetation, particularly trees. The vegetation communities noted in the PSW include Silver Maple Organic Deciduous Swamp (SWD6-2) and Ash Mineral Deciduous Swamp Ecosite (SWD2). Although these vegetation communities are currently subjected to changes in water level and are seasonally flooded, there has not been a thorough analysis or any studies to date that look at the potential impacts to the health and survivorship of the trees in the wetland under conditions were flooding events would be longer. A study examining the impact to trees should be researched and examined under modelled conditions based on storm flow diversion into the PSW modelled changes. A study of this type should consider current conditions and the effect of the changing hydrology to the tree species currently found in the PSW.
2. Assess the impact to fauna, particularly area sensitive birds. This study should also examine the potential changes to the habitat for area sensitive birds (*i.e.* interior forest bird species) as a result of possible decline in tree cover. Currently the swamp provides habitat to sensitive interior forest bird species. Eight area sensitive bird species were



observed in the Alcona South area and this wetland provides important habitat for these species. A potential for a decline in canopy cover could result in the loss of interior forest habitat for these area-sensitive bird species. A study examining this potential impact should be undertaken.

3. Research the impact to the diversity of vegetation and effect of non-native species to the ecological function of the wetland. Changes to the diversity and number of non-native species has been described in previous studies (listed in Table 8 of the article produced by Wright *et. al.* (2008), titled Direct and Indirect Impacts of Urbanization on Wetland Quality), which have reported consistent declines in floral diversity often with increases in the abundance and number of invasive species. There have been nine populations of locally and regionally rare flora species located in the wetland. The potential for changes to the floral diversity and occurrences of rare species should be researched and examined under modelled conditions from the storm flow diversion into the PSW.
4. Assess the impact of the changes in hydrology to amphibian breeding. There is a high concentration of frogs breeding in the PSW. The potential for movement of predatory fish into the wetland should be examined. In addition, the study should examine the potential for higher flows washing out of amphibian larvae in the early spring.
5. Examine the potential for impact as a result of larger flows to the form and function of watercourse #6/Cedar Creek (S. Tributary). The increase in volume of water flowing into the wetland has the potential to cause erosion as a result of increased flows along watercourse #6, the formation of channels, or the formation of gulleys in the wetland. The potential to impact to current stream conditions should be assessed under proposed designs.

## 6.0 AREAS REQUIRING FURTHER STUDY

The following areas require further study prior to development being permitted to determine if these areas should be considered part of the Natural Environment Area designation and restricted from development or whether development can be permitted. Until the appropriate studies and analysis are conducted no development should be permitted in these areas or on adjacent lands within 30 meters of these features. These features are termed Special Policy Areas (SPAs) and are discussed below and refer to the points illustrated in Figure 4.

### Area 1

Area 1 includes a cultural thicket that contains an amphibian breeding pond with a high diversity of frogs (4 species), including 12 chorus frogs, that were recorded during the 15 April 2009 survey completed by Azimuth (2011). This cultural thicket should be assessed to determine whether it would qualify as significant wildlife habitat and would be afforded protection under Section 3.1.1.1 of the Official Plan. If this feature is found to be significant wildlife habitat it would be considered a NEA under the OP.



A linkage feature has been identified between the *significant woodland* to the west and the cultural thicket in the report produced by Azimuth (2008). Section 3.1.1.2 of the OP allows for linkages to be considered as NEAs. The *significant woodland* contains a high diversity of frogs and particularly a high abundance of chorus frogs (20 individuals heard calling during the 15 April 2009 survey). These features are currently linked by a hedge row that may allow for the movement of frogs between the *significant woodland* and the cultural thicket. Section 2.4.7 of the OP suggests linking open water features (e.g. ponds) and upland woods, and to ‘evaluate the role of smaller woodlands and meadows, and the linkages among them and other Natural Environmental Area features, and incorporate them into the Natural Heritage System where appropriate’. Preserving this feature as a linkage would allow these populations of frogs to interbreed increasing the resilience and overall persistence of these populations. The functionality of this linkage feature should then be assessed as per section 2.4.7 of the Official Plan.

### Area 2

This area has previously been mapped as ‘Active Agriculture’. A reconnaissance visit determined that this area was actually part cultural meadow, cultural thicket, and thicket swamp. These communities have not been surveyed for vegetation and significant wildlife habitat potential has not been assessed. Wetlands greater than 2 ha are considered significant in the OP. A natural heritage evaluation or EIS should be submitted in support of an application for draft plan approval, including an evaluation of whether the feature meets the test of a wetland including the minimum size threshold. These studies should also include a breeding bird survey and a full three season vegetation survey for development to be considered.

### Area 3

These features are mapped as watercourses in Appendix 2 (Figure 2), the Natural Areas mapping in the Innisfil OP. The LSPP and LSRC Watershed Development Policies, require the protection of permanent and intermittent streams and the LSPP defines intermittent streams as “stream-related watercourses that contain water or are dry at times of the year that are more or less predictable, generally flowing during wet seasons of the year but not the entire year, and where the water table is above the stream bottom during parts of the year. (Greenbelt Plan)”. Although these features have not been evaluated, based on their size and location (*i.e.* they appear to travel a short distance and not be connected to any other hydrologic features) they may be intermittent streams or possibly drainage swales. If these features are found to exhibit surface flow at any time during the year, a full year of monitoring of the water table at these features should be conducted to determine if these features meet the full definition of an intermittent stream. This will require the installation of at least one piezometer or transducer in each feature, preferably with the depth of the water table being recorded with a datalogger.

## **7.0 RECOMMENDATIONS**

We identified and evaluated natural heritage features using the descriptions of natural areas provided by Azimuth (2008), supplemented by limited field visits, and applying relevant policies. The features are mapped in Figure 4 with recommended refinements to the NEAs (as discussed in section 4.0 of this report). Special Policy Areas have been assigned to those areas



for which further study is required. The following recommendations should be considered as study requirements in the Secondary Plan to help guide further planning decisions in the area:

1. Complete surveys for area-sensitive grassland birds. Bobolink were observed during both breeding bird surveys in 2005 and 2006. The potential for nesting habitat of Bobolink exists in the Alcona South planning area. Bobolink is listed as a threatened species and its habitat is protected under the Species at Risk Act (2007). Prior to development of grasslands, old fields, meadows, and hayfields, Bobolink surveys should be completed in order to determine Bobolink breeding areas.
2. Stake top of bank of all watercourses. Top of bank staking for all valley land areas and watercourses is required in order to add 30 m buffer to the edge of these features. Staking is required to protect riparian habitat and maintain the hydrologic function of these features in order to ensure the flood attenuation functions are not negatively impacted.
3. Reconsider buffer area of Cedar Creek (North Tributary). Rather than providing a 30m buffer on each side of the Cedar Creek (North Tributary) that flows in the drainage ditch south of 6<sup>th</sup> Line, have the buffer area extend 60m to the south side of the watercourse to increase the size of the linkage feature. Currently the 30 meter buffer area on the north side of the watercourse would be bisected by the road and would not provide the intended function of a buffer area. By shifting the buffer area to include the area 60 meters to the south of 6<sup>th</sup> Sideroad, the ecological function of the linkage feature to the Little Cedar Point PSW and the wetland and *significant woodlands* to the north of 6<sup>th</sup> Sideroad would be enhanced.
4. Improve wildlife movement passages under roads. With an increase in the population of the area increased road traffic will likely result in an increase of mortality of. During any improvements to existing roads wider box culverts should be installed that would allow the movement of wildlife, specifically amphibians. For example, Cedar Creek (North Tributary) currently flows south from a wetland on the north side of 6<sup>th</sup> Sideroad eventually flowing into the Little Cedar Point PSW. This creek would provide a linkage to these features which is likely used as a wildlife movement corridor by amphibians. Both the wetland to the north of 6<sup>th</sup> Sideroad and the PSW were documented as having high concentrations of amphibians.
5. Consider linkage features. Assess the potential for creating linkage features between natural areas. A linkage feature has been identified between the larger woodland and a small woodland to the east (Area 2 on Figure 3) and between the central woodland and the Little Cedar Point PSW. According to section 2.4.3 of the OP linkage features can be assigned during the Secondary Plan process. Section 2.4.7 of the OP provides general principles for delineating the Natural Heritage System including, preserving and improving functional connections among natural heritage features.
6. Consider water balance and recharge to natural features and watercourses. Due to the increase in impermeable surfaces from development and the decrease in groundwater recharge and surface flows, the potential for impact to adjacent hydrological features should be addressed, specifically the Little Cedar Point PSW. Changes in hydrogeology can have a negative impact on the functioning of the PSW and the development should be designed to avoid negative impacts to the feature or its function, per the PPS (2005). A detailed water balance should be undertaken to





enable evaluation of changes in the wetland hydrology. Once this has been determined, the change should be analyzed from an ecological perspective to evaluate if the changes will impact natural features or their functions, particularly amphibian breeding habitat.



## 8.0 REFERENCES

- Lake Simcoe Region Conservation Authority. 2008. Lake Simcoe Region Conservation Authority: Watershed Development Policies. pp. 29 + appendices.
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- Marsh Monitoring Program Participants Handbook for Surveying Amphibians. 2008 Edition. 13 pages. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2008.
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- Ministry of the Environment. 2009. Draft Lake Simcoe Protection Plan. Produced in part by the Ministry of the Environment, Ministry of Natural Resources, and Lake Simcoe Region Conservation Authority. pp. 85 .
- Ontario Ministry of Municipal Affairs and Housing. 2005. Provincial Policy Statement. Queens Printer for Ontario. pp. 38 .
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**APPENDIX A. LETTER FROM AZIMUTH TO THE TOWN OF INNISFIL, DATED  
DECEMBER 21, 2010, REGARDING RESPONSE TO GAP ANALYSIS.**

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Environmental Assessments & Approvals

December 21, 2010

AEC 07-013

Town of Innisfil  
2101 Innisfil Beach Rd.  
Innisfil, ON  
L9S 1A1

Attention: Mr. Ross Cotton  
Manager of Planning

**Re: Alcona South Secondary Plan  
Response to Town of Innisfil Peer Review Comments**

Dear Mr. Cotton:

The Town of Innisfil initiated peer review on the reports prepared by Azimuth as part of the submission for the approval of the Alcona South Secondary Plan. The individual peer reviewers (North South Environmental Inc., AgPlan Limited and Norbert W. Woerns) provided their written comments in September 2010 and attended a meeting on October 1, 2010 at the Town of Innisfil municipal office to discuss their concerns. The following sections are our response to the issues raised by each peer reviewer.

**Norbert W. Woerns (Hydrogeology), September 27, 2010 peer review comments**  
Azimuth Report – Hydrogeological Study Alcona South Secondary Plan (May 2008)

Our response is restricted to the most recent May 2008 report because the October 2006 report was completed for an area that extends beyond the current Alcona South Secondary Plan Area.



1) Hydrogeological Study Alcona South Secondary Plan (Azimuth Environmental May 2008)

**Comment**

Water balance is preliminary, missing specific data on proposed development, provides incomplete documentation, and there are inconsistent development area numbers.

**Response**

At the time the report was prepared the development concept had not be developed to the degree that accurate numbers for impervious vs. pervious surfaces could be included in the water balance calculations. As stated in the introduction of the report the purpose of this study was to evaluate and characterize the current hydrogeological setting and assess the implications of the development on local ground water and surface water features. We state the project is still in the preliminary stages and the report will only provide the background geology and hydrogeology based on the work completed to date.

A ground water monitoring program was implemented through the use of a number of boreholes drilled to depth across the Secondary Plan area. Water levels were measured from November 2007 to January 2009. Consultation with the LSRCA confirmed their acceptance that the duration of monitoring was suitable for future ground water budget analysis for future site development applications.

The application of detailed water budgets and the associated hydrogeological analysis should be undertaken at the draft plan of subdivision stage when the impervious and pervious surfaces can be more accurately calculated and specific mitigation measures applied. It is our experience that the Conservation Authorities require water budgets based on specific lot sizes, roof areas within the development, open space areas, etc. in order to provide a water budget that assesses the post development condition and the associated impacts. In our opinion the level of information provided is sufficient to define a developable area and estimate the associated hydrogeological impacts at the Secondary Plan approval stage.

**Comment**

No discussion of the impact of projected loss of infiltration on the groundwater system, downgradient wetland, and private wells.

**Response**

The prediction of potential impacts to site specific features such as wetlands or private wells would require completion of the ground water monitoring program. As stated in the report, this work was ongoing at the time it was prepared. The report commits to an



update of the report with the monitoring program data to evaluate these site specific impacts when details of the individual development applications are known.

As stated in the report ground water infiltrates on the tablelands to the west of the Secondary Plan area and flows east toward the lake. The borehole logs indicate the surficial soils are low permeability, therefore it is reasonable to expect the overall impact to the hydrogeological regime will be moderate to low. With the application of Low Impact Development techniques to optimize infiltration and other mitigation measures the potential loss of ground water recharge function can be mitigated.

**Comment**

Missing comprehensive report to be provided upon completion of monitoring program (as per page 1, 1<sup>st</sup> paragraph and page 12, last sentence).

**Response**

Based on the monitoring data collected at the subject property which included borehole logs, hydraulic testing data and ground water elevation data over the span of more than a year, it is apparent that the overburden materials beneath the site have limited hydraulic properties (i.e. hydraulic conductivity). The fine grained soils observed across the majority of the site were comprised of very compact silty fine sands (glacial till). The hydraulic testing data yielded results which ranged from  $10^{-4}$  to  $10^{-9}$  m<sup>2</sup>/sec, with the majority of locations having values below  $10^{-6}$ . However, it should be noted that the few locations with more elevated transmissivities had fine-grained materials (silt and clay) present above the saturated sands indicating that these ground water conditions may be at least partially confined.

The ground water elevation data also supports this interpretation as ground elevations at all locations did not show significant response (<0.4m) to climatic events (rainfall, spring melt), which would indicate this area has limited hydrogeological significance.

**Comment**

Missing groundwater level data from on-site monitors and groundwater quality information and analysis.

**Response**

Attached are the manual ground water levels and ground water quality data. Data from the transducers in the boreholes can be provided if required.

**Comment**

Missing discussion on potential aggregate resources on subject lands and implications to the proposed development.

**Response**

The aggregate issue was addressed in Section 4.3 of the Master Environmental Report (June 2008). The aggregate deposit within the Secondary Plan area is located along the CNR railway in an area with portions of the Little Cedar Provincially Significant wetland with Belle Aire Creek and Cedar Creek crossing through the centre of the deposit. The presence of a wetland feature within the deposit would indicate water at or close to surface. Given the presence of the PSW, two watercourses bisecting the deposit, the entire area is regulated by the LSRCA, and the lands being designated Significant Woodlands within the Town of Innisfil Official Plan there is no reasonable expectation the deposit would be developed.

**Comment**

Report missing map showing surficial geology and relate this to water balance analysis and mitigation measures for maintenance of infiltration.

**Response**

Section 6.0 of the report related surficial soils information (illustrated in Figure 2) and the associated drainage characteristics to define the potential change in ground water infiltration post development. Potential mitigation measures were not discussed because without a more detailed development concept that quantifies the post development land use based on a site specific development application, discussions on mitigation measures can only identify measures generally available with no ability to make a quantitative assessment of their effectiveness. Mitigation measures most commonly applied to promote infiltration include infiltration galleries and roof leaders discharged to lot grassed areas. These measures and other possible mitigation measures will be included into the water balance calculations for the site specific development applications when the land use details are available.

**Comment**

Report referenced a well survey scheduled for the spring and summer of 2008 (page 7, 1st paragraph). The information from this well survey should be included in the documentation.

**Response**

The well survey was not undertaken. The requirement for the well survey will be reviewed at the time of preparation of detailed site specific development applications.





**North South Environmental Inc., September 7, 2010, peer review comments**  
Azimuth Report - Master Environmental Report, Alcona South Secondary Plan, Town of Innisfil, County of Simcoe. June 2008.

**Comment**

Review species lists and update status of species (i.e. the status of the bobolink has been changed to Threatened on the Species at Risk in Ontario (SARO) list).

**Response**

We recognize that Bobolink is now considered a threatened species in Ontario. However, as reported by Gahbauer (2007. Bobolink. Pages 586-587 In Cadman et al. Atlas of the breeding birds of Ontario, 2001-2005. Bird Studies Canada, Environmenta Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources and Ontario Nature, Toronto.) Bobolink is the 12<sup>th</sup> most abundant species detected using point count methodology in the Lake Simcoe-Rideau region of southern Ontario and hence we commonly find Bobolink in Simcoe County hay fields and abandoned pastures where grass species are dominant. The natural succession of abandoned pasture and other farm lands used by Bobolink to shrub/forest cover will naturally eliminate Bobolink nesting habitat. The locations where Bobolink were found in the Secondary Plan area are abandoned farmlands that are undergoing successional progression to thicket habitats. Therefore, though Bobolink where present in these areas, they may not represent significant habitat for this species. Azimuth will undertake an assessment of potential impacts to Bobolink habitat and submit the assessment to MNR for their review and approval.

**Comment**

Review Significant Wildlife Habitat analysis; the analysis appears to be incomplete.

**Response**

An analysis of wildlife habitat was undertaken within the report addressing such factors as forest size, interior forest, community biodiversity, potential habitat for rare species and wildlife passage corridors. It is the responsibility of the Town of Innisfil to define significant wildlife habitat as the planning authority. Based on our review the Town of Innisfil Official Plan no specific criteria have been established to define significant wildlife habitat. The current natural heritage area designations under the Official Plan are



limited to wetlands and significant woodlands. The assessment for the presence of significant wildlife function and species was undertaken in Section 5.3 of the report.

**Comment**

Indicate location of vernal ponds on map and connections with other habitats.

**Response**

Vernal pool locations were not recorded. The significance of a habitat for amphibian breeding was based on the concentration of amphibian use based on the number of individuals calling. These areas of amphibian concentration would confirm the presence of vernal pools within the ELC unit identified.

**Comment**

Further investigate wooded area in northwest corner of the site boundary for significant species or breeding habitat.

**Response**

It is our understanding that Cunningham Environmental Associates are investigating natural heritage features and functions associated with the northwest corner of the site boundary.

**Comment**

Need to assess the non-provincially significant wetlands within 750 meters of the Little Cedar Point Provincially Significant Wetland (PSW). Depending on their contribution to the ecological functioning and integrity of the PSW the non-provincially significant wetlands may be complexed into the PSW. There are several wetland communities that have been identified within 750 meters of the PSW.

**Response**

It is our understanding the area was assessed by the Lake Simcoe Region Conservation Authority when the Little Cedar Wetland was designated a PSW and the assessment was accepted by Midhurst District MNR that excluded these areas. We have accepted the assessment of MNR and LSRCA on this matter.



**Comment**

Generally need to review conclusions and compare with recent aerial photography and up-to-date significant species and significant areas mapping.

**Response**

The planning consultant for the project is reviewing the planning documents with regard to their applicability to this Secondary Plan application. When this assessment is completed we will update the report in accordance with the applicable planning policies and associated mapping.

Issues with significant species are evolving within MNR. MNR has yet to define critical habitat for many of the species at risk (e.g., Bobolink). To revise the land use plan prior to review of the critical habitat designations would be premature at this time.

**Comment**

Reconnaissance survey of the study area is required to assess vegetation mapping and compare with existing constraints mapping.

**Response**

None required by peer reviewer upon further discussion with North South Environmental.

**Comment**

Review mapping of significant and sensitive wildlife species: e.g. at amphibian sampling points 2, 5, and 6 it is not clear what species are located in what direction of the arrow. This is important for protecting breeding habitat and connecting it with habitat occupied in later life stages.

**Response**

We document the direction amphibian species were heard from the sampling station and the species recorded in each direction on our field data sheets. The arrows represent the directions or ELC units that were sampled. Figure 3a defines the areas of amphibian concentration based on the results of Table 13. I trust this is sufficient to define those areas where amphibians were most prevalent in the study area.

**Comment**

Review servicing and storm water reports to ensure erosion control measures are in place to protect natural areas.

**Response**

Erosion control measures for servicing and storm water management facilities involve standard mitigation measures with generally predictable results. It is the responsibility of the consulting engineer providing the servicing and storm water component to incorporate erosion control measures during design and construction. Our involvement on this project has been limited to providing the information on the sensitivity of the watercourse to ensure they are aware of the level of control required. Currently both the Town and LSRCA review the proposed servicing and storm water management plans for compliance with erosion control requirements.

**AgPlan Limited, September 22, 2010 peer review comments.**

Azimuth Report - Agricultural Impact Assessment for the Alcona South Secondary Planning Area, Town of Innisfil, County of Simcoe. June 2008.

**Comment**

Undertake road reconnaissance and aerial photography to confirm presence or absence of livestock barns with 2km of the new urban boundary for Type B land use on barn livestock housing capacity only.

**Response**

On October 19<sup>th</sup> I reviewed the livestock barns within 2km of the new urban boundary with Michael Hoffman from AgPlan Limited. We reviewed the building conditions and presence of livestock for all the farmsteads within 2km of the boundary and agreed that the nine locations on the attached figure represent farms with structurally sound barns capable of housing livestock. We undertook Minimum Distance Separation calculations for each location, attached are the MDS reports for each property.

The only properties with a structurally sound barn that did not meet or exceed the MDS requirements was a small horse hobby farm north of the 7<sup>th</sup> Concession Road, west of the 20<sup>th</sup> Side Road and a inactive beef operation on the 6<sup>th</sup> Concession Road west of 20<sup>th</sup> Side Road.

**APPENDIX B. LETTER FROM AZIMUTH TO SORENSON GRAVELY LOWES,  
DATED JUNE 14, 2011, REGARDING LITTLE CEDAR WETLAND FLOOD  
ATTENUATION ASSESSMENT.**

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Environmental Assessments & Approvals

June 14, 2011

AEC 07-013

Sorensen Gravely Lowes  
509 Davenport Road  
Toronto, ON  
M4V 1B8

Attention: Paul Lowes

**Re: Alcona South Secondary Plan - Little Cedar Wetland Flood Attenuation  
Assessment**

Dear Mr. Lowes:

The purpose of this correspondence is to discuss the potential effects on the Little Cedar Provincially Significant Wetland (PSW) from the diversion of flows from watercourse No. 7 (WN7) to the wetland and ultimately watercourse No. 6 (WN6). The diversion would route all storm flows with a peak flow greater than the 25mm-24 hour Storm up to and including the 25-Year Storm for the WN7 drainage area upstream of the former CNR tracks into WN6 a portion of which would be detained within a large swamp wetland unit of the Little Cedar PSW. This is being proposed in an effort to reduce the existing flooding of residential properties along WN7 in the community of Belle Ewart.

The analysis is based on the storm water report completed by Greenland International Consulting Ltd. (Greenland), documented in the *Alcona South Secondary Plan Master Servicing Study – Master Drainage Plan Final Study Report (February 2010)*, Chapter 6.0, Section 6.4.2. This section describes the wetland hydrology as it relates to depth/drawdown for the diversion of WN7 flows to the wetland and ultimately WN6 which discharges through the wetland north to a ditch adjacent to the 6<sup>th</sup> Line and east into Lake Simcoe. Greenland use detailed topographic data for the wetland and WN 6 and 7 in conjunction with their storm water modelling for various storm events to define the physical extent of flooding within the wetland, the depth and duration of inundation and the changes in water storage depths from the existing condition.



## **EXISTING CONDITIONS**

During spring freshet and flood events spilled portion of the overflow is conveyed from WN7 into WN6. WN6 conveys this flow into a large (i.e., 25ha) unit of the Little Cedar Wetland before being discharged to Lake Simcoe. A considerable amount of this flow is detained at surface for a relatively long time (i.e., weeks to months depending on spring rainfall amount and frequency) within the wetland unit. Flow conveyed by WN7 discharges to Lake Simcoe through Belle Ewart. The capacity of WN7 is limited by its small dimensions a factor that causes chronic flooding conditions for the community.

## **PROPOSED CONDITIONS**

Greenland's storm water management proposal is to convey all storms with a peak flow greater than the 25mm-24 hour Storm up to and including the 25-Year Storm for the WN7 drainage area to WN6 and ultimately through the wetland. Structures would be placed within the watercourse that would maintain "normal system flows" for the protection and maintenance of the aquatic habitat, but would divert the aforementioned peak flows through the wetland. The flows would be conveyed into the wetland within WN6 in its existing location and discharged from the wetland unit to the ditch along the 6<sup>th</sup> Line in its current location. As per existing conditions the wetland unit would attenuate flows through internal storage in large areas that are currently inundated for several months each year during spring, autumn and following storm events (Note: The flood attenuation capability of the wetland was recognized in the wetland evaluation undertaken by Beacon Environmental in 2006 as it received a maximum score of 100 points for upstream detention and the wetland detention).

. The wetland and the associated watercourse would not be physically altered to facilitate flows within the wetland.

Greenland reviewed the precipitation data which indicated that there are approximately nine (9) events in a year which have a precipitation depths greater than 25mm, where the highest was 38mm and the lowest was 27mm. They modelled the flows through the wetland for these precipitation events to assess the change in the wetland hydrology between existing and proposed diversion through the wetland (Option 3 implementation in Greenland report) to assess potential change the depth and duration of storage of storm flows in the Wetland from the existing conditions.

Table 16 from the Greenland 2010 report (see below) presents a comparison of wetland flood depths and drawdown times for various storm events. Greenland concluded the





maximum change in storage depth and drawdown times are small and of a magnitude immeasurable for storms less than the 38mm event given their variability. The maximum elevation difference with a 2 year storm event from the existing condition was 0.146m (14.6 cm) with an extended drawdown period of 20.51 hours.

**Table 16: Comparison of Wetland Depths and Drawdown Times - Option 3 Versus Existing Conditions**

Storm	Option 3 Max Elevation (m)	Existing Max Elevation (m)	Difference Max Elevation (m)	Option 3 Drawdown Time (hrs)	Existing Drawdown Time (hrs)	Difference Drawdown Time (hrs)
2 Year	225.370	225.224	0.146	37.1	16.6	20.51
38 mm - 24 hour	225.282	225.215	0.067	35.3	14.4	20.88
29 mm - 24 hour	225.216	225.207	0.009	32.1	11.5	20.64
25 mm - 24 hour	225.206	225.204	0.001	29.4	9.3	20.05
25 mm - 4 hour	225.212	225.207	0.005	28.0	11.4	16.68

In addition to the flood attenuation benefits of Option 3, Greenland indicates that there is an added water quality benefit in regard to phosphorus attenuation. They estimate that diversion of peak flows from WN7 for temporary detention within the wetland unit phosphorus loading to Lake Simcoe would be reduced by 30 kg per annum over existing conditions, consistent with the goals and objectives of the *Lake Simcoe Act* and Plan.

## WETLAND ECOLOGY

The Master Environmental Report and the Hydrogeological Study Report provided an assessment of the wetland features and functions based on its natural heritage features and hydrogeological characteristics. These reports have been reviewed by the Town of Innisfil’s peer reviewers under the Secondary Plan process and they are familiar with their findings, therefore we are highlighting the information which is germane to assessing potential negative impacts to wetland composition, structure and composition.

The assessment of the wetland in the Master Environmental Report for the Alcona South Secondary Plan (2008) indicates that the vegetative community within the wetland area that would undergo inundation (see Figure 3a and Table 8) are predominately:



- **Silver Maple Organic Deciduous Swamp (SWD6-2)** - Canopy cover is dominated by Silver Maple/Swamp Maple with Red Ash and Balsam Poplar associates. Understory consists of Silver Maple/Swamp Maple, White Elm and Black Ash. Groundcover consists of a variety of wetland species including Sensitive Fern, Spotted Jewelweed, Broadleaf Enchanter's Nightshade and other fern and grass species. This community has a limited shrub layer in addition to evidence of vernal pooling over large portions of the wetland unit during spring and autumn.
- **Ash Mineral Deciduous Swamp Ecosite (SWD2)** - Community dominated by a combination of Black and Red Ash within the canopy. Associate species include, American Elm, White Birch, Balsam Poplar, and Trembling Aspen. The understory is composed of species including American Elm, Eastern White Cedar, Balsam Fir, Trembling Aspen and shrubs such as Highbush Cranberry and Common Buckthorn. Groundcover consists of species including a variety of ferns such as Sensitive and Marginal Woodfern, Virginia Creeper, and various sedge species.

These ELC communities are established wetland vegetative communities with species that are adapted to high water tables and seasonal inundation. Azimuth installed four piezometers within the wetland from March 2006 – April 2007 to measure water levels under existing conditions (see Table 1 below). Three (#'s 2, 3, 4) were within the large SWD6-2 unit and one (#1) in the SWD2 unit. The monitoring showed that large portions of the wetland are inundated for up to six months a year (i.e., four months in the late winter/spring; two months in the autumn/early winter. Vegetation contained in areas of the wetland that are inundated is clearly adapted to long periods of inundation. The Silver/Swamp Maple and Red Ash which dominate the swamp unit are highly tolerant of seasonal inundation (i.e., both species common in semi-permanently flooded riparian wetlands [Mitsch and Gosselink 2000. Wetlands, 3<sup>rd</sup> Ed. John Wiley & Sons Inc., New York, NY, USA.]) as are associated herbaceous species. Clearly the composition and structure of the plant communities of this wetland unit will not be affected by the additional peak flows diverted to it under Option 3 given that the additional water is predicted to drawdown in approximately 21 hours predicted under a 2 year storm event. Therefore, the proposed diversion (i.e., Option 3) will result in no significant alteration of wetland hydrology and hence there will be no alteration of the composition, structure or functions of the wetland unit (i.e., no site alteration).



**Table 1 – Little Cedar Wetland Surface Water Levels (March 2006 – April 2007)**

<b>Date</b>	<b>Monitor 1 (cm)</b>	<b>Monitor 2 (cm)</b>	<b>Monitor 3 (cm)</b>	<b>Monitor 4 (cm)</b>
March 30/06	8	2	14	9
April 6/06	5.5	0	18	6
April 14/06	11	3	19	6.5
June 1/06	6	0	10	3
July 7/06	0	0	0	0
August 4/06	0	0	0	0
September 13/06	0	0	0	0
October 16/06	0	0	0	0
November 17/06	10	0	0	0
December 18/06	9	0	12	3.5
February 27/07	0	0	0	0
April 19/07	6	0	13	4



## **CONCLUSION**

In our opinion the above data confirms the wetland is capable of attenuating the predicted flows with the proposed diversion without an adverse impact on the wetland features or functions. Therefore utilization of the diversion to reduce the existing flood conditions in the Community of Belle Ewart will not result in an adverse impact to the wetland.

Yours truly,

**AZIMUTH ENVIRONMENTAL CONSULTING, INC.**

Paul Neals, B.Sc.Agr.  
Vice-President

cc: Luka Kot, Cortel Group  
Mike Bissett, Bousfields Inc.