

2223117 Ontario Inc.

**Conn Pit Proposed Expansion
Natural Environment Level 1 & 2
Technical Report**

Report

2223117 Ontario Inc.

Conn Pit Proposed Expansion Natural Environment Level 1 & 2 Technical Report

Prepared by:

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Project Number:

60431371

Date:

December, 2015

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AECOM Signatures

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December 22, 2015

Mr. Patrick Townes
MHBC Planning, Urban Design & Landscape Architecture
113 Collier Street,
Barrie, Ontario L4M 1H2

Dear Mr. Townes:

Project No: 60431371
Regarding: Conn Pit Proposed Expansion
Natural Environment Level 1 & 2
Technical Report

We are pleased to provide you with the following Natural Environment Level 1 & 2 Technical Report prepared for the proposed expansion at the Conn Pit, in Town of Blue Mountains, Grey County, Ontario.

Should you have any questions regarding the content of this report or any other matters concerning the property, do not hesitate to contact me.

Sincerely,
AECOM Canada Ltd.



James Kamstra, B.Sc., M.E.S
Senior Ecologist
James.Kamstra@aecom.com

JK:mm
Attach

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1. Introduction

1.1 Background and Objectives

AECOM Canada Inc. (AECOM) has been retained by 2223117 Ontario Inc. to prepare a Natural Environment Level 1 and 2 Technical Report for a proposed expansion of their existing pit near Collingwood, Ontario. This report is part of their application for Category 1-Class "A" Pit (Below Water) license, under the Aggregate Resources Act (ARA) and Planning Act application to the County of Grey and Township of Blue Mountains. The objective of this project is to carry out a Level 1 natural environment assessment as required under the ARA to determine if there are significant environmental features (as identified by the Provincial Policy Statement) within 120 m of the site. If so, a Level 2 assessment will be required to determine impacts and proposed appropriate mitigation measures. It is also intended to be consistent with the Provincial Policy Statement, and conform to the environmental requirements of the Grey County Official Plan and the Township of Blue Mountains. The study area is shown in Figure 1.

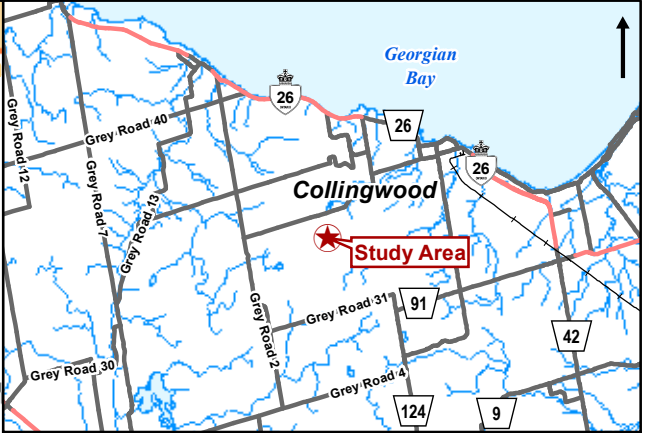
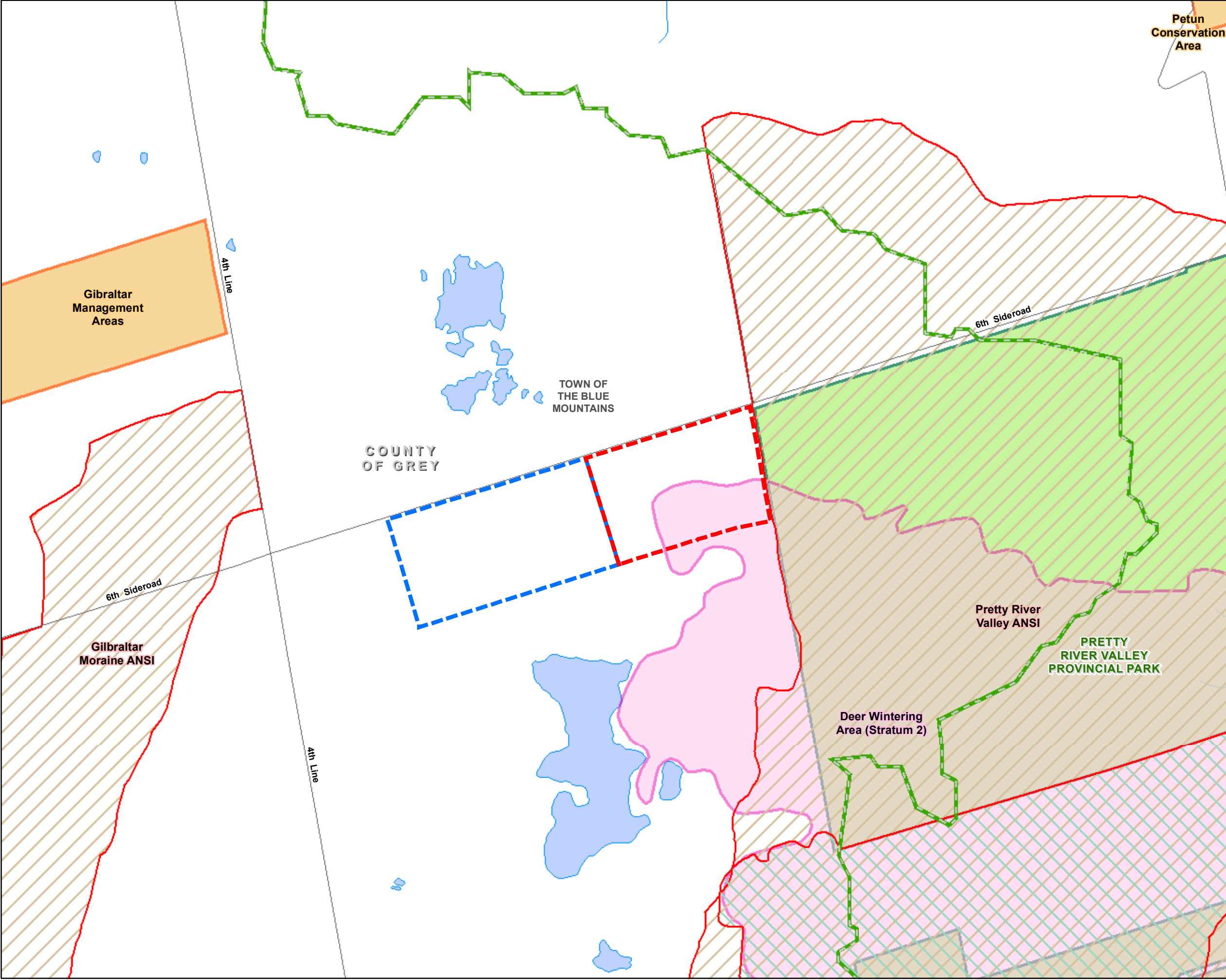
AECOM conducted preliminary reviews of available literature, data sources and investigations of the study area (i.e., Natural Environment Level 1), and determined that there was potential for natural heritage features to be associated with the proposed expansion. As part of the ARA license application process, a Natural Environment Level 2 impact assessment is required when natural heritage features have been identified on, or within, 120 metres of a proposed extraction site during preliminary investigations.

1.2 Site Description and Surrounding Land Uses

The proposed license expansion area is located at Part N ½ Lot 6, Concession 4 in the Township of Blue Mountains in the County of Grey. It is located on the south side of 6th Sideroad Between 3rd and 4th Lines. The study area for this Natural Environment Level 1 & 2 Technical Report is defined as the proposed licensed area plus an area extending 120 metres from it, as per the requirements of the ARA.

An existing operating gravel pit operated by 2223117 Ontario Inc. occurs on the subject property immediately west of the proposed expansion area. Surrounding land uses include agricultural lands to the south, another operating gravel pit to the north and the Pretty River Valley Provincial Park lies on the immediately adjacent property to the east. Photographs of the study area are provided in **Appendix A**.

The study area occurs within Ecoregion 6E (Lake Simcoe – Rideau Ecoregion). Currently, 57% of the ecoregion exists as agricultural land, with deciduous and mixed forests covering a majority of the remaining natural landscape. Wetlands and water bodies comprise 5% and 4% of the area, respectively (Ecological Land Classification Primer, 2007).



Base Features

- Boundary of Area to be Licenced
- Existing Licenced Boundary
- Waterbody

Roads

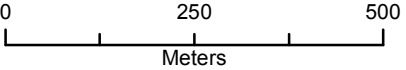
- Local

Natural Environment Features

- Conservation Authority Boundary
- Wintering Area
- Provincial Park
- Conservation Area

ANSI by Significance

- Provincial - Earth Science
- Provincial - Life Science



Conn Pit Expansion
Natural Environment Assessment

Natural Features and
Study Area

December, 2015	1:10,000	Datum: NAD 1983 UTM Zone 17N Source: OMNR, OBM, MMAH, NRCAN, NVCA, GSCA
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P#: 60431371	V#: 001
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AECOM

Figure: 1

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2. Environmental Policy Context

2.1 Ontario Aggregate Resources Act

2223117 Ontario Inc. will be applying to the Ministry of Natural Resources and Forestry (MNRF) for a Category 2 - Class Pit (Below Water) license, under the *Aggregate Resources Act* (ARA). To facilitate these license applications, the MNR has developed a series of provincial application standards to support the Ontario Aggregate Resources Act as amended by Bill 52, the Aggregate and Petroleum Resources Statute Law Amendment Act, 1996. Under these standards, Sections 2.2.1 and 2.2.2 state that technical reports assessing the impact on natural features or ecological functions must accompany an application for such a license.

According to Section 2.2.1, a Natural Environment Level 1 technical report determines whether any of the following features exist on and within 120 metres of the site:

- significant wetlands;
- significant portions of the habitat of endangered or threatened species;
- fish habitat;
- significant woodlands;
- significant valley lands;
- significant wildlife habitat; and
- significant areas of natural and scientific interest.

A Natural Environment Level 2 technical report is required under Section 2.2.2 of the ARA if the Natural Environment Level 1 screening assessment identifies any of the features on or within 120 metres of the proposed license area. The Level 2 report assesses any negative impacts on the form or ecological functions of the natural features, with proposed preventative, mitigative or remedial measures.

2.2 Ontario Provincial Policy Statement

The Ontario Provincial Policy Statement (PPS) is issued under Section 3 of the *Ontario Planning Act*, R.S.O. 1990. Section 3 of the Act requires that decisions affecting planning matters “shall be consistent with” policy statements issued under the Act. The new PPS came into effect on April 30, 2014, and applies to all applications submitted on or after this date.

The PPS provides policy direction on land use planning and development matters that are of provincial interest which protect the natural environment as well as public health and safety.

Section 2.0 Wise Use and Management of Resources, provides policies on protecting the Province’s natural heritage, water, agricultural, mineral, cultural heritage and archaeological resources. Section 2.1 Natural Heritage, identifies the same seven types of natural heritage features as under the ARA above, and is consistent with it.

Development and site alteration is not permitted in provincially significant wetlands in Ecoregions 5E, 6E and 7E, or in significant coastal wetlands. Development and site alteration may be permitted in the remaining natural features or on adjacent lands if it has been demonstrated that there will be no negative impacts on the feature or its ecological function. Development and site alteration within fish habitat or the habitat of endangered or threatened species must be in accordance to provincial and federal requirements.

The natural heritage policies of the PPS must be read in conjunction with other policies in the PPS so all applicable policies are applied to each situation as applicable.

2.3 Grey County Official Plan

Schedule A of the Grey County Official Plan shows that the entire subject property is designated as Rural. Appendix B Map 2 of the OP shows that the woodlot within the proposed expansion area is designated as Significant Woodland. A County of Grey Official Plan Amendment is required.

2.4 Town of Blue Mountain Official Plan

Schedule A of the Town of Blue Mountains Official Plan (2013) identifies the 2223117 Ontario Inc. Proposed Extraction Limits as being in a 'Rural' designation. Additionally, Appendix Map "C" of the OP identifies a portion of the Proposed Extraction Limits as a Secondary Significant Sand and Gravel Resource Area. A Town of Blue Mountains zoning by-law amendment will be required.

2.5 Conservation Authorities Act

The purpose of the Conservation Authorities Act is to establish a program to conserve, restore, develop and manage watersheds. Under the Act, Ontario Regulation 150/6 - The Development, Interference with Wetlands and Alterations to Shorelines and Watercourses Regulation affects what and where a Conservation Authority can regulate. Specifically, this regulation allows Conservation Authorities to:

- a) Prohibit, regulate or provide permission for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering with a wetland.
- b) Prohibit, regulate or provide permission for development if the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development.

Watercourses and those areas 15 meters from their edge are designated as regulated under the regulation.

The Study Area is located within the jurisdiction of the Grey Sauble Conservation Authority. Through information obtained from the Grey Sauble Conservation Authority, it was determined that no wetlands, watercourses or regulated lands are located on or within 120 m of the site. Furthermore the Conservation Authorities Act exempts activities under the ARA from needing a permit.

3. Background Review

3.1 Literature Review

A review of background documents included the examination of existing reports and literature regarding known natural heritage features relevant to the subject lands or vicinity. NRVIS mapping was searched to identify designated natural features in the vicinity including the presence of Species at Risk and provincially rare species. A search of the following information sources was also conducted to identify species potentially presence within the study area or vicinity. These include:

- Ontario Breeding Bird Atlas (Bird Studies Canada et al. 2006)
- Reptiles and Amphibians of Ontario range maps (Ontario Nature 2015)
- Atlas of Mammals of Ontario (Dobbyn 1994)
- Natural Heritage Information Centre (NHIC) database-biodiversity tool
- Make-a-Map: Natural Heritage Areas Application (MNRF, 2014a)

3.2 Designated Natural Areas

The *MNRF Make-a-Map: Natural Heritage Areas Application* (MNRF, 2014a), was used to identify designated natural areas located within or in the immediate vicinity of the Study Area. These include provincially significant wetlands (PSWs), Areas of Natural and Scientific Interest (ANSIs), and an Environmentally Significant Area (ESA). The subject property is located immediately west of Pretty River Valley Provincial Park. The Nottawasaga Lookout Provincial Nature Reserve is about 5 km from the study area.

3.2.1 Areas of Natural and Scientific Interest (ANSI)

An Area of Natural and Scientific Interest (ANSI) is defined as an area of land and/or water containing natural landscapes or features that have been scientifically identified (by the OMNR) as having life science or earth science values related to protection, scientific study or education (MNRF, 2014b). ANSIs are designated as earth science (geological) or life science (biological) depending on the features present (MNRF, 2014b). There is one Earth Science ANSI within the study area that is designated as Provincially Significant. There are also six Life Science ANSIs and four other Earth Science ANSIs located outside but in the vicinity of the Study Area. **Table 1** below provides a summary of these ANSIs and descriptions of their significance. They are mapped on Figure 1.

Table 1. ANSIs in the Vicinity of the Study Area

Area Type	ANSI Name	Significance	Distance from Site
ANSI, Earth Science	Pretty River Valley	Provincial	0 m to east
ANSI, Earth Science	Gilbraltar Moraine	Provincial	740 m to west
ANSI, Life Science	Pretty River Valley	Provincial	1 km to south
ANSI, Life Science	Pretty River Valley Moraine	Regional	1 km to southeast
ANSI, Life Science	Kolapore Swamp	Provincial	2.2 km to west
ANSI, Earth Science	Banks Moraine	Provincial	4 km to north
ANSI, Life Science	Pretty River Valley South	Regional	2 km to south
ANSI, Life Science	Nottawasaga Lookout	Provincial	5 km to southeast
ANSI, Earth Science	Nottawasaga Lookout ES	Provincial	5.5 km to southeast
ANSI, Earth Science	Kolapore Uplands	Provincial	6 km to southwest
ANSI, Life Science	Kolapore Escarpment	Provincial	6 km to southwest

3.2.2 Wetlands

Wetlands are described as lands that are seasonally or permanently flooded by shallow water, as well as lands where the water table is close to the surface and present an abundance of water that has caused the formation of hydric soil, which supports primarily hydrophytic or water tolerant plants (MNRF, 2013). The MNRF evaluates the significance of wetlands through the Ontario Wetland Evaluation System (OWES). This evaluation system uses a scoring system to assign values to four principal components of the wetland, which are the biological, social, hydrological, and special features. Based on the resulting score of an evaluation, an evaluated wetland can fall into one of two classes: Provincially Significant or Locally Significant (MNRF, 2013).

There are no provincially significant wetlands (PSW) located within or in the immediate vicinity of the Study Area. The nearest PSW is the Kolapore Headwaters Wetland Complex that is located more than 2 km to the west of the subject property.

Natural Resources and Values Information System (NRVIS) mapping shows that a cartographic wetland is present in the woodlot at the southeast corner of the subject property, and in the woodlot at the northeast corner of 3rd Line and 6th Sideroad. Both of those “wetlands” are not present as the sites are well drained and dry.

3.2.3 Significant Woodland

The Natural Heritage Reference Manual (NHRM) provides guidance with respect to the following woodland characteristics that indicate provincial significance:

- Woodland size;
- Ecological functions including interior habitat, proximity, linkages, water protection and diversity;
- Woodlands that provide uncommon features; and,
- Woodland economic and social values.

Based on the above criteria the County of Grey Official Plan (2013) has mapped (Map 2 of Appendix B) the woodlot on the southeast portion of the proposed expansion area as Significant Woodland. This woodland extends to a large area of contiguous woodland that includes Pretty River Valley Provincial Park. The woodlot qualifies as Significant Woodland based on its large size (in total about 1000 ha) as well as providing ecological functions. The functions include such as providing wildlife habitat, protection of a headwater source area, linkage to adjacent woodland units, habitat diversity, providing interior habitat and soil stabilization. Since most of the forest is part of a provincial park that is visited by the public, it also has high social values.

3.3 Species at Risk and other Significant Species

Background information review has identified documented records of 12 Species at Risk or provincially rare plant and animal species in the 10 x 10 km UTM atlas square 17NK52 (**Table 2**). The study area lies within this square and consequently this list identifies species that should be considered, especially if their appropriate habitat is present.

Bats were not specifically identified from existing information. However Little Brown Myotis (*Myotis lucifugus*), Northern Long-eared Myotis (*Myotis septentrionalis*), and Small-footed Myotis (*Myotis leibii*) have been designation as Endangered due to rapid population declines from the spread of the White Nose Syndrome disease. These are all widespread in Southern Ontario and until recently, Little Brown Myotis was the most abundant bat in the province. As a result, at least one of the Myotis species has a high probability of occurring in the site vicinity.

Table 2. Significant Species in Square 17NK52 (Site Vicinity)

Common Name	Scientific Name	S_RANK	COSEWIC	MNRF	Recent Date	Source*
A Lichen	<i>Melanelia subargentifera</i>	S1S3			1976	NHIC 2015
Butternut	<i>Juglans cinerea</i>	S3?	END	END	1983	NHIC 2015
Hart's-tongue Fern	<i>Asplenium scolopendrium</i>	S3	SC	SC	2006	NHIC 2015
Shining-branch Hawthorn	<i>Crataegus magniflora</i>	S3			1958	NHIC 2015
Stiff Yellow Flax	<i>Linum medium v. medium</i>	S3?				NHIC 2015
Eastern Milksnake	<i>Lampropeltis triangulum</i>	S3	SC	SC		ORAA
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	S3	SC	SC		ORAA
Massasauga Rattlesnake	<i>Sistrurus catenatus</i>	S3	THR	THR	1994	NHIC 2015
Chimney Swift	<i>Chaetura pelagica</i>	S4	THR	THR	1985	OBBA
Eastern Wood Pewee	<i>Contopus virens</i>	S4	SC	SC	2005	OBBA
Barn Swallow	<i>Hirundo rustica</i>	S4	THR	THR	2005	OBBA
Bank Swallow	<i>Riparia riparia</i>	S4	THR	THR	2005	OBBA
Wood Thrush	<i>Hylocichla mustelina</i>	S4	THR	SC	2005	OBBA
Golden-winged Warbler	<i>Vermivora chloroptera</i>	S4	THR	SC	2005	OBBA
Louisiana Waterthrush	<i>Seiurus motacilla</i>	S3	SC	SC	2005	OBBA

Sources: OBBA - Ontario Breeding Bird Atlas (Cadman et al. 2007)
ORAA – Ontario Reptile and Amphibian Atlas (Ontario Nature 2015)

4. Existing Terrestrial Conditions

4.1 Field Study Methodology

Ecological field assessments were conducted to identify any potential significant natural heritage features on and within 120 m of the proposed license area (i.e., the “study area”). These included vegetation and wildlife inventories. Survey dates were selected based on optimum periods for breeding birds and to inventory plant species.

The following sections describe survey methodology for:

- Vegetation and Vegetation Communities;
- Breeding Birds;
- Other wildlife (e.g., amphibians and reptiles)

4.1.1 Vegetation

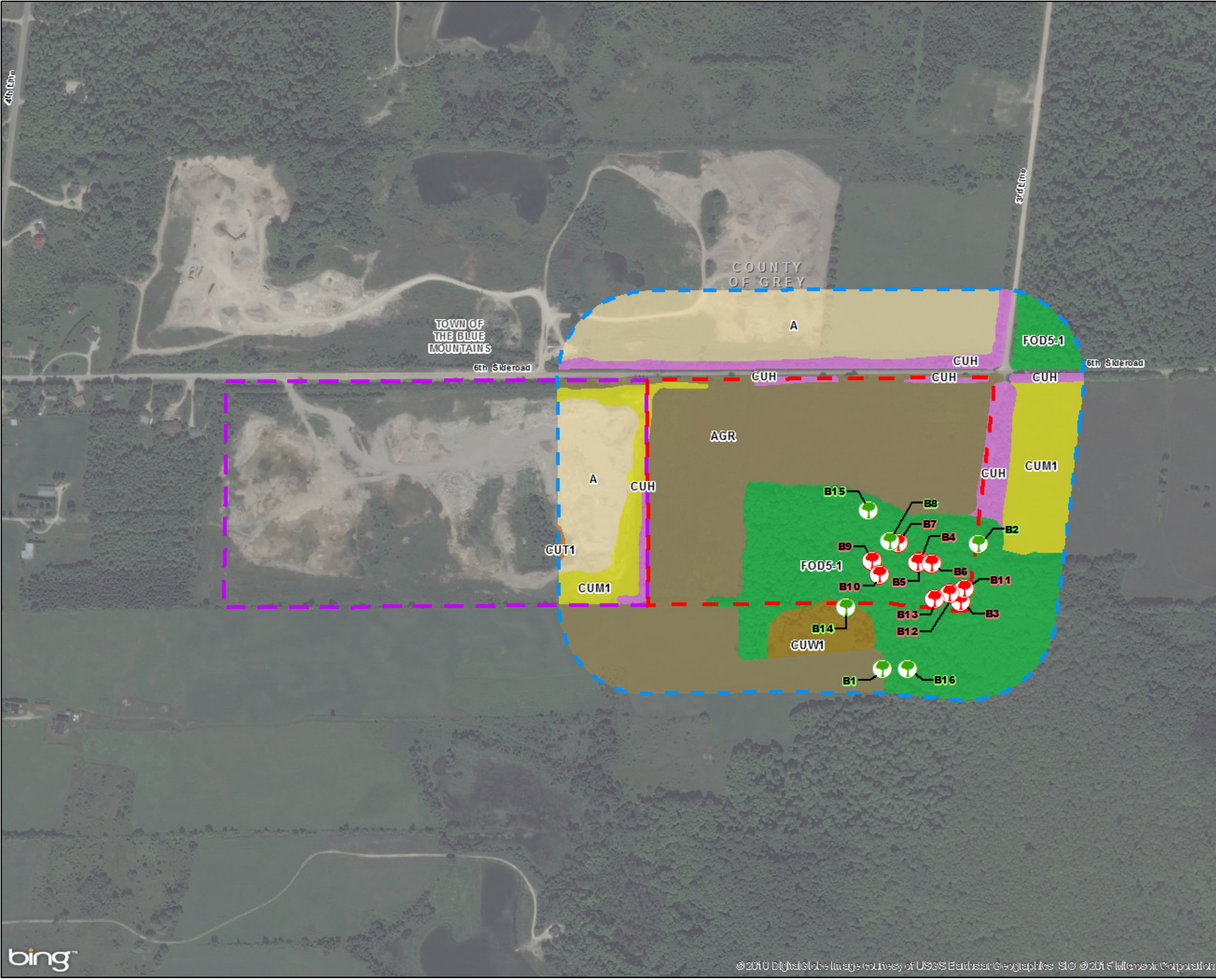
Vegetation community field investigations were conducted on June 17th and July 2nd, 2015 by an AECOM Ecologist. Prior to field investigations aerial photography of the study area was analyzed and vegetation communities were mapped (Figure 2). These communities were then ground-truthed to confirm the mapped boundaries and described following the Ecological Land Classification (ELC) protocols (Lee et al., 1998). Data collected for each vegetation community included dominant species cover, community structure, as well as level of disturbance, presence of indicator species, and other notable features. A comprehensive plant species list was compiled and each species was cross-referenced with Natural Heritage Information Centre (NHIC) rankings for provincial significance, and is included as **Appendix B**.

4.1.2 Breeding Birds



Breeding bird surveys were conducted on June 17th and July 2nd, 2015 by an AECOM Ecologist according to the protocols set out in the Ontario Breeding Bird Atlas Guide for Participants (Environment Canada, 2001). Surveys were conducted between a half hour after sunrise and before 10:00 am during suitable weather conditions (low wind and no rain). Birds observed exhibiting various breeding-related behaviours (observed as part of a pair in suitable breeding habitat, calling, nest building, feeding young, etc.) in suitable breeding habitat on or adjacent to the study area were recorded. Two point counts were established in the woodlot where all birds seen and heard within a 100 m radius birds were documented to provide a standard quantified measure. In addition, a roaming survey was conducted over the entire study area where all birds were marked on field maps. A list of species recorded from the study area is included in **Appendix C**.

4.1.3 Other Wildlife








Incidental of other wildlife species, such as mammals, amphibians and reptiles were recorded when encountered during all field investigations. The two site visits conducted in June and July correspond to the period of maximum biological activity. Amphibian calling count surveys were not conducted because aerial photo interpretation revealed no areas holding standing water where amphibians could breed were present within the proposed expansion area or within 120 m. The lack of potential amphibian breeding habitat was confirmed during site visits. Some small ponds are present in the existing pit resulting from excavation but these are more than 120 m from the proposed expansion area. Logs and other debris found in the forest were turned to detect the possible presence of salamanders, snakes or small mammals. These items were returned to their original position after lifting to minimize any disturbance. All species of butterflies observed in the study area were recorded.






Butternut Tree Locations
Retainable?

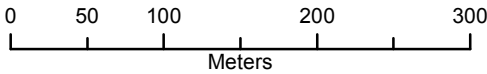
-  No
-  Yes

Vegetation Communities

-  CUH
-  CUM
-  CUT
-  CUW
-  FOD
-  Agricultural
-  Anthropogenic

Base Features

-  Existing Licence Boundary
-  Boundary of Area to be Licenced
-  120m Study Area Boundary



Conn Pit Expansion
Natural Environment Assessment

Ecological Land Classification
Vegetation Communities Map

December, 2015	1:4,936	Datum:NAD 1983 UTM Zone 17N Source:OMNR, OBM, MMAH, NRCAN, NVCA, GSCA
P#: 60431371	V#: 001	<div>Figure: 2</div>
<div>AECOM</div>		

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4.2 Geology, Physiography and Soils

The study area is located within the Horseshoe Moraine physiographic region which is a till moraine on a gently rolling upland area above the Niagara Escarpment (Chapman and Putnam 1984). The Niagara Escarpment lies approximately 2 km to the southeast, and 1.2 km to the northeast of the proposed expansion area.

Topography of the area including the study area is derived from base mapping available from the MNRF digital elevation model, and indicates that the ground surface slopes generally from north to south. Surface elevation ranges from a high of 511 mASL in the northeast to a low of 504 mASL in the southwest. The topography in the study area can be described as gently undulating, with surface slopes usually between 1% to 3%. Bedrock consisting of Anabel formation limestone occurs at approximately 495 mASL (MTE Consultants 2015) which is 10 to 15 m below grade. Soil consists of well drained sandy silt over ice-contact sand and gravel (MTE Consultants 2015).

4.3 Hydrology

The study area is located in a watershed headwater area. It lies only 0.5 km west of the watershed divide between the Grey – Sauble and Nottawasaga Conservation Authorities. There are no watercourses in the study area. The site drainage is mostly by overland sheet flow in a southwesterly direction. Most of the overland flow is infiltrated into the porous soils with little runoff leaving the site (MTE Consultants 2015). A drainage swale is present at the southwest corner of the proposed expansion area. The only water features are two small ponds located in the active gravel pit on the west part of the subject property within the existing license area. The ponds were created as a result of extracting sand and gravel and do not reflect evidence of pre-existing wetlands.

The nearest watercourse shown on Natural Resources and Values Information System (NRVIS) mapping is a small stream that begins approximately 1 km north of the study area, and flows northward. NRVIS mapping shows that a cartographic wetland is present in the woodlot at the southeast corner of the subject property, and in the woodlot at the northeast corner of 3rd Line and 6th Sideroad. Both of these are not correct as the sites are well drained and dry.

MTE Consultants (2015) installed three boreholes at the southwest, northwest and northeast corners of the proposed extraction area. The ground water table was measured at approximately 496 mASL (approximately 10 m below the surface) in July and dropped by more than 1 m by November. It was only monitored for a four month period and therefore may be higher for part of the year. MTE Consultants (2015) completed a water resources assessment for the proposed pit. Since there is proposed to be no dewatering in from the pit, the area of influence is confined to the site and the proposed pit will not impact off-site surface water features.

4.4 Vegetation Communities

Natural vegetation communities located in the study area were delineated into ELC units (Figure 2). One woodlot occurs within the proposed extension area, which is contiguous with a much larger forest area that extends to the east and southeast. Seven ELC units were described into meadow, thicket, woodland and forest community types, and are presented in **Table 3**.

Table 3. Summary of Vegetation Communities

Ecosite / Vegetation Type	Community Class	Code
Dry-Fresh Sugar Maple Deciduous Forest Type	Forest	FOD5-1
Sugar Maple Cultural Savannah	Cultural	CUS1
Cultural Deciduous Hedgerow	Cultural	CUH
Cultural Thicket	Cultural	CUT1
Dry-Fresh-Moist Cultural Meadow	Cultural	CUM1

Terrestrial Communities

• FOD5-1: Dry-Fresh Sugar Maple Deciduous Forest

The canopy of this community is overwhelmingly dominated by Sugar Maple (*Acer saccharum*), with only occasional other trees present such as Ironwood (*Ostrya virginiana*), White Ash (*Fraxinus americana*), American Beech (*Fagus grandifolia*) and Black Cherry (*Prunus serotina*). Trees observed within this community were approximately 20 to 25 m tall with an average diameter at breast height (dbh) of approximately 30 to 40 cm. Very few larger diameter trees are present. The subcanopy was also largely comprised of smaller Sugar Maple with some Alternate-leaved Dogwood (*Cornus alternifolia*). The ground cover layer is quite dense and diverse, especially at the east end where it is a little more moist. Canada Violet (*Viola canadensis*), Blue Cohosh (*Caulophyllum thalictroides*), Wild Leek (*Allium tricoccum*), White Trillium (*Trillium grandiflorum*), Canada Waterleaf (*Hydrophyllum canadense*), Enchanter's Nightshade (*Circaea lutetiana*) and Herb Robert (*Geranium robertianum*) are all abundant but variably distributed in the woodlot. There are also a variety of ferns which are patchily distributed through the woodlot.

The woodlot within the proposed pit extraction limits is entirely this community. The woodlot appears to have been managed as a sugar bush which would account for the dominance of Sugar Maple if other species were removed. Numerous old decomposing stumps are apparent on the forest floor indicating past selective cutting. These stumps appear to be about 20 years old and there was no evidence of recent cutting.

The portion of the contiguous woodlot that extends within 120 m to the east and southeast of the subject property has a similar structure and species composition, as does the forest block which occurs to the northeast of the corner of 3rd Line and 6th Sideroad.

• CUS1: Sugar Maple Cultural Savannah

A single unit of savannah occurs on the south side of the woodlot on the adjacent property. Cultural savannah is distinguished from forest because the tree canopy ranges from 25 to 35% cover while a forest has greater than 60% canopy. Open conditions are a result of past human activities. In this case it appears that it was grazed by livestock, but that land is no longer used as pasture and is regenerating. The remains of a fence is still present that would have kept cattle out of most of the woodlot. The tree canopy is primarily Sugar Maple but scattered smaller individuals of American Elm (*Ulmus americana*) and Black Cherry (*Prunus serotina*) are present. Occasional dense patches of Wild Red Raspberry (*Rubus idaeus*) occur. Ground cover consists largely of Orchard Grass (*Dactylus glomerata*), Wild Basil and Tall Goldenrod (*Solidago altissima*).

• CUH: Cultural Deciduous Hedgerow

Deciduous hedgerows occur along some of the fringes of the proposed license area such as along the roadside or between agricultural fields. Hedgerows are comprised of several deciduous tree species such as Sugar Maple, White Ash, American Elm and Black Cherry. Shrubs may form a dense lower layer that includes Choke Cherry (*Prunus virginiana*), Common Apple (*Malus pumila*) and saplings along with a diversity of other species.

- **CUT1: Cultural Thicket**

Some cultural thicket has developed within the operating gravel pit that lies within the 120 m adjacent lands. It consists of a dense patch of shrubs and saplings that include mix of Eastern Cottonwood (*Populus deltoides*), Balsam Poplar (*Populus balsamifera*), Staghorn Sumac (*Rhus hirta*) Sandbar Willow (*Salix exigua*) and Red-osier Dogwood (*Cornus sericeus*).

- **CUM1-1: Dry-Fresh-Moist Cultural Meadow**

Meadow is an early successional stage that develops after land has been abandoned or can be maintained by periodic mowing or other management that prevents establishment by woody species. It is co-dominated by a variety of grasses, such as Smooth Brome (*Bromus inermis*), Orchard Grass and Kentucky Bluegrass (*Poa pratense*) with forbs such as Tall Goldenrod, Wild Basil (*Clinopodium vulgare*), Birdsfoot Trefoil (*Lotus corniculatus*) and Wild Strawberry (*Fragaria virginiana*).

4.4.1 Vascular Plant Species

Field surveys recorded a total of 132 species of vascular plants in the study area. Of these, 86 (65%) are native species and 46 (35%) are exotic. The average Coefficient of Conservatism (CC) value for the study area is 4.27 which indicate a moderately high occurrence of species tolerant of disturbance. However, the majority of the non-native species occur in the cultural meadow and hedgerows, with relatively few in the forest (FOD5-1). Several specimens of the Endangered tree species, Butternut, were found in the woodlot which will be discussed further in Section 5.1. No species recognized as regionally rare in Grey County were encountered in the study area. Regionally rare plants have been determined by the Bruce-Grey Plant Committee (1995). A complete list of plant species recorded from the study area is provided in **Appendix B**.

4.5 Wildlife

4.5.1 Breeding Birds

A total of 51 bird species was recorded during the breeding bird surveys on June 17 and July 2, 2015. Most birds were observed within the woodlot, hedge rows, and surrounding fields. Few birds were present in the cultivated field planted with winter wheat that covered most of the proposed expansion area. All species are ranked S4 (Apparently Secure) or S5 (Secure), with the exception of Great Egret (*Ardea alba*), which is ranked S2B or provincially rare. A single bird was observed flying over the subject property in a northerly direction on July 2. The nearest known breeding location is on an island off Collingwood in Georgian Bay about 12 km to the northeast (Cadman *et al.* 2007) and the individual observed may have been from that colony. It was flying over the study area and there is no nesting or foraging habitat for this species in the study area.

Three provincially and nationally Threatened species were encountered within the 120 m adjacent lands but not actually within the proposed License area: Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*). These will be discussed in the species at risk Section 4.6. In addition two other Special Concern species were identified in the woodlot: Eastern Wood Pewee (*Contopus virens*) and Wood Thrush (*Hylocichla mustelina*).

The woodlot contained a high diversity of forest breeding birds, including five species which are identified as area sensitive species: Yellow-bellied Sapsucker (*Sphyrapicus varius*), Veery (*Catharus fuscescens*), Black-throated Blue Warbler (*Setophaga caerulescens*), Ovenbird (*Seiurus auricapillaris*) and Scarlet Tanager (*Piranga olivacea*). These are birds that occur in large blocks of forest and usually in the interior (defined as at least 200 m from a forest

edge). The woodlot portion within the subject property is only 4.4 ha but it is contiguous to, and therefore part of, a large block of forest approximately 1000 ha in area. Although none of the woodlot in the study area is more than 200 m from an edge, the overall woodlot is so large with an extensive area of interior habitat. Consequently several of the interior bird species were found to be present.

4.5.2 Amphibians

No aquatic features occur within the immediate study area and therefore no suitable amphibian breeding habitat is present. Consequently amphibian breeding surveys were not conducted. Amphibians will move some distance to breeding sites. An adult American Toad (*Anaxyrus americanus*) was observed in the central area of the woodlot on June 17, and a Gray Tree Frog (*Hyla versicolor*) was heard calling there on the same date, despite the lack of water. The nearest wetland that has potential to support breeding amphibians is situated 280 m to the southwest of the property boundary or at least 350 m from the woodlot. No reptiles were observed but Eastern Garter Snake (*Thamnophis sirtalis*) probably occurs.

4.5.3 Mammals

Mammals were noted through incidental observations while conducting site visits. Visual observations, including tracks, scat, or other signs documented the presence of five mammals species: White-tailed Deer (*Odocoileus virginianus*), Porcupine (*Erethizon dorsatum*), Red Squirrel (*Tamiasciurus hudsonicus*), Eastern Chipmunk (*Tamias striatus*) and European Hare (*Lepus europaeus*). These are all common in this part of Ontario. Likely several other small and medium sized mammals are present as well.

4.5.4 Insects

Formal butterfly counts were not conducted, though all species observed on field visits were recorded. Butterflies observed within and adjacent to the study area consisted of 17 species which are all common to this area of Ontario. A Monarch butterfly was observed along the fenceline between the existing pit and proposed expansion area. Common Milkweed, which is the larval food plant of this species, was abundant in the cultural meadow. The Monarch butterfly is nationally and provincially ranked as Special Concern.

Of note, a heavy infestation of Forest Tent Caterpillars (*Malacosoma disstria*) occurred in the woodlot (see **Appendix A**). The species is cyclic going through boom and bust cycles. During the June 17, 2015 site investigation the foliage in the woodlot was about half of the density that would be expected at this time of year due to the caterpillars.

4.5.5 Fish

No aquatic features, fish or fish habitat are present in the study area.

5. Significant Natural Heritage Features

5.1 Significant Habitat of Endangered or Threatened Species

Field surveys were conducted in part to determine the possible presence of Species at Risk in Ontario. Of the 12 species with previous records in 10 x 10 km UTM atlas square 17NK52 (**Table 2**), four Endangered or Threatened species were found to be present in the study area and are discussed below.

Three other provincially Threatened species are listed in Table 2 with records in the same atlas square that were not encountered in the study area. These are Massasauga Rattlesnake, Chimney Swift and Bank Swallow. Although the Massasauga record appeared from the NHIC (2015) database, it was not recorded from atlas square 17NK52 in the Ontario Reptile and Amphibian Atlas (Ontario Nature 2015). The atlas did show historic records in adjacent atlas squares to the east and west however. Massasaugas are now extremely rare if they still occur in the southern part of Grey County; they are more typical of the Bruce Peninsula where there are open rocky outcrops and alvars present in a mosaic with forest and open wetlands. It is highly unlikely that they would be present in the study area and potentially suitable wetland habitat does not occur.

Chimney Swift was reported from atlas square 17NK52 from the 1981-5 period but not the 2001-5 period (Cadman *et al.* 2007). It primarily nests in chimneys or similar man-made structures, none of which are present in the study area. Bank Swallow nests on steep eroding earthen banks along rivers, streams and often gravel pits. Although the adjacent gravel pit has steep banks, no swallows nest there and none were seen in the study area.

5.1.1 Butternut

A total of 16 Butternuts were encountered within the woodlot on the subject property or within 120 m. The trees are listed on **Table 4** and locations are shown on **Figure 2**. There were no large trees found and most were saplings. Presumably there are large trees present in the more extensive nearby forest that are the parents of these trees. Butternut is an early successional tree that is not highly shade tolerant; many of the trees occur immediately along an old logging track where there is increased light. The trees are not long lived and may die out if they are over shaded.

The health of the Butternuts were assessed for the presence of Butternut Canker (*Sirococcus clavigignenti-juglandacearum*) following MNR (2013) protocols to determine if the trees are “retainable”. Butternut Canker is an introduced fungus that is killing trees throughout their range and is the primary cause of their Endangered status. The field data forms, Butternut Health Assessment (BHA) Report and BHA Tree Analysis are all included in **Appendix D**. Six of the trees qualified as “retainable”, meaning that they may have the canker but are still healthy enough that they may live for some time and must be compensated for if they are cut down. The other ten had a more advanced stage of the disease and therefore were assessed as being “unretainable.” Unretainable trees do not need to be compensated if removed.

Table 4. Butternuts Encountered in Study Area

Number	Easting	Northing	DBH(cm)	Height(m)	Retainable	In Extract Limit
B1	553810	4920310	2.5		Yes	No
B2	553875	4920485	0	0.8	Yes	No
B3	553885	4920427	7		No	No
B4	553817	4920462	1.5	2.5	No	Yes
B5	553815	4920460	0	1.5	No	Yes

Number	Easting	Northing	DBH(cm)	Height(m)	Retainable	In Extract Limit
B6	553832	4920465	6.5	6	No	Yes
B7	553782	4920478	1	3	No	Yes
B8	553770	4920477	2	3.5	Yes	Yes
B9	553755	4920445	8	8	No	Yes
B10	553770	4920430	4	4.5	No	Yes
B11	553885	4920445	12	9	No	No
B12	553865	4920428	7	8	No	No
B13	553850	4920420	5	6	No	No
B14	553740	4920375	8	6	Yes	No
B15	553730	4920508	0	0.5	Yes	Yes
B16	553843	4920320	10	6	Yes	No

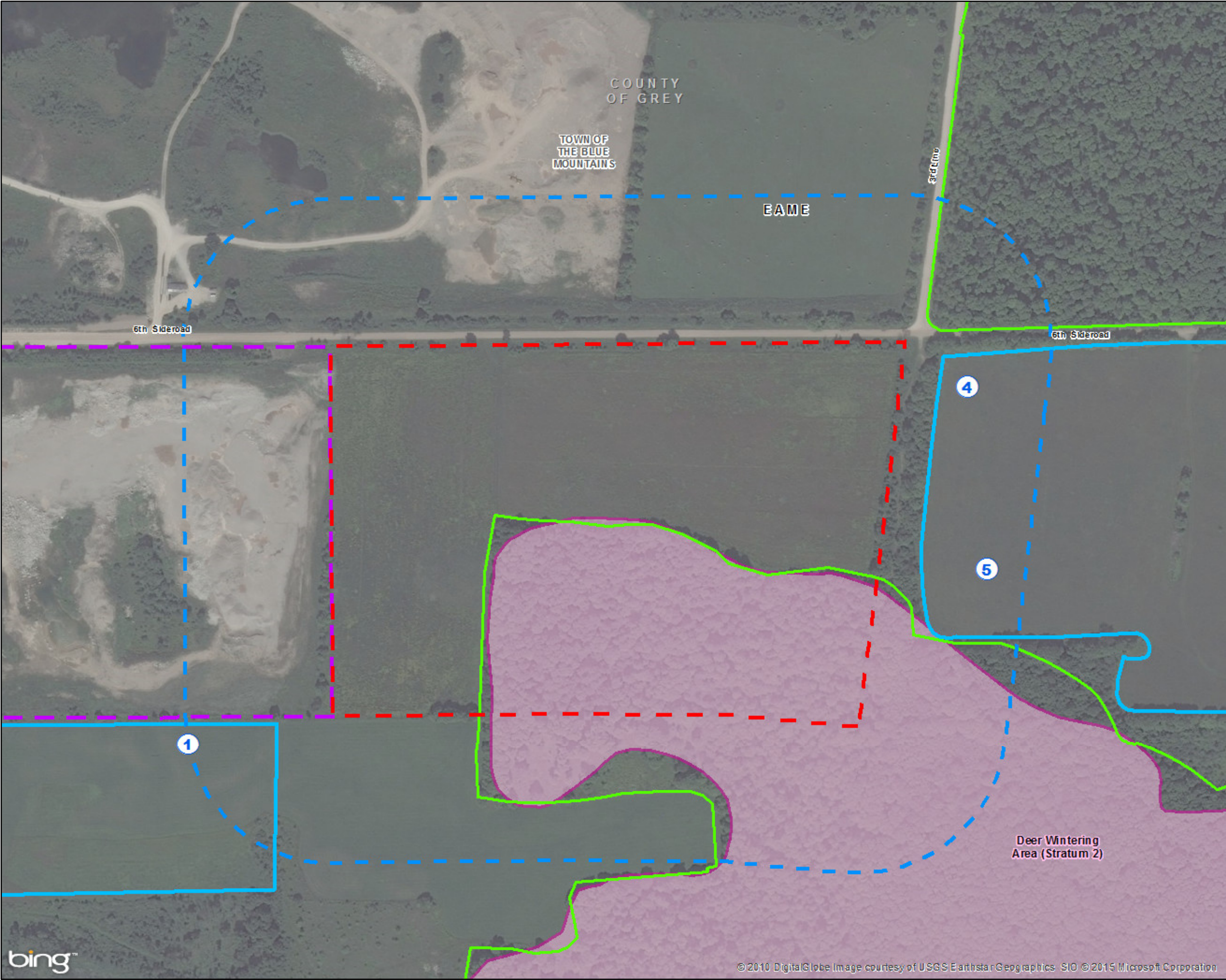
5.1.2 *Barn Swallow*

Barn Swallow is designated as Threatened in Ontario because of long term population declines. Several individuals were observed foraging over the cultivated hayfield immediately south of the existing pit property, and occasionally over the pit itself. A large barn occurs approximately 800 m southwest of the study area that provides the closest potentially suitable nesting habitat. These birds nest almost entirely on human made structures where their mud nests are sheltered from precipitation such as in barns and under bridges. No structures suitable for nesting Barn Swallows are present in the study area and therefore the proposed pit expansion area is not habitat for this species.

5.1.3 *Bobolink and Eastern Meadowlark*

Bobolink is threatened by incidental mortality from agricultural operations, pesticide exposure and bird control at wintering roosts, as well as habitat loss and fragmentation (COSEWIC, 2010a). The preferred habitat of the Bobolink consists of old fields, lightly grazed pasture and hayfields which are widespread in southern Ontario. OMNR (2000) indicates that Bobolink is an area sensitive species that requires large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields typically in excess of 50 ha. The proposed license area consists of active agricultural lands that were cropped for winter wheat in 2015, and therefore do not represent suitable habitat for Bobolink. Bobolinks were recorded in the managed hayfield on the adjacent property to the south of the existing pit which just extends into the southwest corner within 120 m of the proposed licence. Bobolinks were also present in the field to the east that lies within the Pretty River Valley Provincial Park.

Three point counts were established to document the presence of Bobolinks following the MNRF protocols (MNR 2011) but modified to two visits. One point was within the field on the southwest and the other two were in the east side of the study area (**Figure 3**). All Bobolinks seen and heard were recorded during a 10 minute period. Observations of the point counts are shown in **Table 5**. Both fields extend further out from the 120 m adjacent lands and most of the Bobolinks observed were beyond the 120 adjacent lands and therefore were outside of the study area. Some birds were within however, including a female giving alarm calls in the field to the east of the property boundary. Consequently some Bobolink habitat is present both on the east and extreme southwest sides of the study area. Despite the presence of at least five Bobolinks in the east field on June 17, no Bobolinks were present there on the July 2 survey. The field had not been cut and it was still well within the breeding season, therefore there was no apparent reason that the birds were not there. Bobolinks were present in the field to the southwest on both visits.

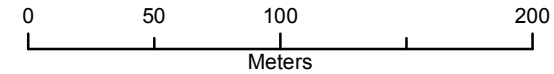


Wildlife Community Features

- EAME** Eastern Meadowlark Observation
- Bobolink Survey Location
 - Bobolink Breeding Habitat
 - Significant Woodland

Base Features

- Existing Licence Boundary
- Boundary of Area to be Licenced
- 120m Study Area Boundary



Conn Pit Expansion
Natural Environment Assessment

Wildlife Communities Map

December, 2015	1:3,000	Datum: NAD 1983 UTM Zone 17N Source: OMNR, OBM, MMAH, NRCAN, NVCA, GSCA
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P#: 60431371 V#: 001

AECOM

Figure: 3

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Table 5. Bobolink Surveys in Study Area

Survey	Date, Start and End Time	Weather Conditions	Point Number	Number of Bobolinks Observed	Comments on Vegetation
1	June 17, 2015 <u>Point Count 1:</u> 8:30 to 8:40 am <u>Point Count 4:</u> 7:40 to 7:50 am <u>Point Count 5:</u> 7:50 to 8:00 am	Wind Speed (Beaufort Wind Scale): 1 Cloud Cover (%): 30 Temperature (°C): 18 Precipitation: None	Point 1:	<ul style="list-style-type: none"> 1 male Bobolink at fenceline to NW, 1 male flying W to E across field to S 2 males flying and chasing 1 female to SW 	Vegetation cover 1:1 ratio grass to forbs. Smooth Brome, Timothy, Black Medick, Goldenrod
			Point 4:	<ul style="list-style-type: none"> 1 male 200 m to SE flying and landing, 1 male 75 m to SE perched 	Vegetation cover 1:1 ratio grass to forbs. Orchard Grass, Timothy, Birds foot Trefoil, Goldenrod
			Point 5:	<ul style="list-style-type: none"> 2 male and 2 females 50 m to ENE, 2 male 100 m to ENE, 1 female giving alarm call 25 m to ENE 	Vegetation cover 1:1 ratio grass to forbs. Orchard Grass, Timothy, Birds foot Trefoil, Goldenrod
2	July 2, 2015 <u>Point Count 1:</u> 8:15 to 8:25 am <u>Point Count 4:</u> 7:30 to 7:40 am <u>Point Count 5:</u> 7:45 to 7:55 am	Wind Speed (Beaufort Wind Scale): 1 Cloud Cover (%): 0 Temperature (°C): 18 Precipitation: None	Point 1:	<ul style="list-style-type: none"> 2 males in field 50 m to S, 1 of the males flew away to W 1 female with original male seen in field 	Similar to June 17 but taller
			Point 4:	0 Bobolinks recorded	Similar to June 17 but taller
			Point 5:	0 Bobolinks recorded	Similar to June 17 but taller

Eastern Meadowlark, another grassland species that is also designated as Threatened, occurs in similar habitat and frequently is found in the same fields as the Bobolink. No Eastern Meadowlarks were encountered in either of the fields where Bobolinks were present, however one was heard singing in the field on the north side of 6th Sideroad on the July 2, 2015 survey only. It was not detected during the June 17 survey. That property is a licenced gravel pit that still retains some field habitat. The bird was approximately 100 m north of 6th Line and therefore very close to the edge of the 120 m adjacent lands and was on opposite side of road from the proposed expansion area.

As such, there is no habitat of endangered or threatened species on site but Bobolink nesting habitat occurs within 120 m of the proposed license area. Since none of the habitat being used by these two species will be removed, a permit under the *Endangered Species Act* (2007) is not required.

5.1.4 Bats

The woodlot provides some potentially suitable roosting habitat for the three Endangered bat species which have potential to occur on site. Little Brown Myotis, Northern Long-eared Myotis and Small-footed Myotis all roost in cavity trees in forests. Confirming their presence is difficult without conducting surveys using specific acoustic monitoring equipment which was not conducted as part of this survey. A cavity tree was conducted in the woodlot on November 30, 2015 to determine if it qualified as Significant Wildlife Habitat for bats. Two cavity trees were identified, therefore some potential suitable roosting habitat is present. It is recommended that acoustic monitoring occur in the woodlot at least a year prior to any tree removal there. If any of the Endangered bat species are present, then a habitat compensation plan will need to be prepared.

5.2 Significant Wetlands

There is no Provincially Significant Wetland (PSW) located on, or within 120 m of the proposed license area.

5.3 Fish Habitat

No direct or indirect fish habitat is present in the study area.

5.4 Significant Woodlands

As discussed in Section 3.2.4 the woodlot in the southeast portion of the proposed pit expansion has been mapped as Significant Woodland in the Grey County Official Plan. It is contiguous with an extensive area of Significant Woodland that extends to the east and southeast of the study area. The woodlot consists of a Sugar Maple deciduous forest. The canopy is almost entirely composed of Sugar Maple and the trees are medium aged with trees averaging 30 to 40 cm DBH, with very few larger trees. Based on this, Significant Woodland is present in the study area.

5.5 Significant Valley Lands

No valley features are present and therefore no significant valley lands occur on or within the 120 m boundary of the proposed license area.

5.6 Significant Wildlife Habitat

A comprehensive approach to identifying and evaluating Significant Wildlife Habitat (SWH) has been developed and recently updated by MNRF (2015b) with criteria schedules for the Ecoregion 6E. These schedules identify many specific type of SWH but divides them into the following four broad categories:

- Seasonal concentration areas;
- Rare vegetation communities or specialised habitats for wildlife;
- Habitats of species of conservation concern, excluding the habitats of endangered and threatened species; and,
- Animal movement corridors.

The various types of SWH from the schedules (MNRF 2015b) are identified and assessed as to whether they are present in study area (**Appendix E**) and therefore qualify. Most of the SWH types are not present in the study area. Only those types of SWH that are, or have potential to occur, are discussed further in the following section.

5.6.1 Habitats of Seasonal Concentrations of Animals

5.6.1.1 Bat Maternity Colonies

The relatively mature deciduous woodlot within the proposed expansion area was deemed to have some potential to be SWH under this criterion. To qualify, a woodlot must contain at least 10 suitable cavity trees >25 cm diameter at breast height (DBH) per hectare (ha). The survey needs to be conducted after the leaves have fallen so that cavities can be seen and are not hidden by foliage. A bat cavity tree assessment was conducted in the woodlot by an AECOM ecologist on November 30, 2015. During the surveys, features that had the potential to support bat roosts were recorded, such as mature trees with cavities or snag trees with cavities. These include hollows, split or broken branches/stems, deep open knotholes and woodpecker holes. The species of each tree was recorded as well as the DBH and an estimation of the height of the tree. The assessment was undertaken from ground level using short range binoculars to identify features at height.

The entire 4.4 ha woodlot was surveyed by criss-crossing it with transects. Only two potential bat habitat trees were identified. Both were Sugar Maples approximately 22 m tall. The details of the two cavity trees are shown on **Table 6**. Generally the woodlot is almost entirely dominated by Sugar Maple and the trees were not that large. In addition it appears that the woodlot has been managed as a sugar bush (a sugar shack is present) and therefore dead, dying and misshapen trees have likely been removed which may account for the small number of cavity trees. There were far less than 10 cavity trees per ha and therefore it does not qualify as SWH under this criterion

Table 6. Bat Cavity Trees Present in Woodlot

Tree ID	UTM	Tree Species	DBH (cm)	Height (m)	Decay Class (1-6)	# of Cavities	Cavity Height (m)	Canopy Cover (%)
1	17T 553824 / 4920462	Sugar Maple	42.1	22.0	1	1	5.0	60
2	17T 553768 / 4920426	Sugar Maple	33.5	23.0	1	1	8.0	40

5.6.1.2 Deer Wintering Congregation Area

The woodlot in the expansion area as well as the extensive adjacent forest to the east and southeast has been identified as a deer wintering area by MNRF. Two types of deer wintering habitat are recognized. The more important Stratum 1 contains a significant coniferous component where deer concentrate during deep snow conditions. Stratum 2 forms a larger area around the Stratum 1, where deer will frequent during moderate snow depths. The woodlot contains no coniferous trees whatsoever and therefore would not qualify as Stratum 1. Jody Scheiffly, biologist with MNRF Owen Sound (pers. comm.) stated that this large deer yard was well known and documented, and is important for sustaining the local deer population. He agreed that the woodlot portion in the study area would qualify as Stratum 2.

As Stratum 2, the 4.4 ha woodlot is the fringe of a relatively large area that may be moderately important for deer wintering. Stratum 2 provides browse that is used by deer when the snow is moderately deep. During times of deep snow deer will concentrate in the Stratum 1 area. There is a high percentage of forest cover in the lands to the east and southeast of the study area, consequently the contribution of the woodlot to the overwintering function is likely to be minor and on the fringe of the core portion of the deer yard.

5.6.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

The study area consists of agricultural land with one woodlot consisting of one natural community type that is dry-fresh Sugar Maple deciduous forest (FOD5-1), a very common forest type in southern Ontario. No rare vegetation communities or specialized habitats for wildlife are present.

5.6.3 Habitats of Species of Conservation Concern

5.6.3.1 Woodland Area-Sensitive Bird Breeding Habitat

To qualify under this criterion, a forest must be at least 30 ha in area, contain interior habitat more than 200 m from an edge and support at least three of the listed area sensitive breeding bird species (MNRF 2015b). The woodlot portion on site is 4.4 ha and contains no interior habitat greater than 200 m from an edge. However it is part of a contiguous forest area of 1,000 ha that does contain a large area of interior forest. Five species of listed area sensitive forest birds were documented during breeding bird surveys which are listed on **Table 7**.

Table 7. Area Sensitive Species Observed within the Woodlot

Common Name	Scientific Name
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>
Black-throated Blue Warbler	<i>Setophaga caerulescens</i>
Ovenbird	<i>Seiurus auricapillaris</i>
Veery	<i>Catharus fuscescens</i>
Scarlet Tanager	<i>Piranga olivacea</i>

Although the woodlot in the study area qualifies as SWH it is only 0.4% of the contiguous forest block and as such only makes a minor contribution to the area sensitive function of the entire forest. Although area sensitive, the five species are widespread and common in southern Ontario and likely represented by many pairs within the forest block. Consequently the woodlot makes a minor contribution to the overall forest block.

5.6.3.2 Special Concern and Rare Wildlife Species

The Special Concern and provincially rare species that have been recorded in the 17NK52 UTM atlas square through background review (see Table 2) were assessed according to their habitat requirements and likelihood of being present within the study area. These are summarized in **Table 8**.

Table 8. Special Concern and Provincially Rare Species

Common Name	Scientific Name	S_RANK	MNRF	Habitat	Present On-site
A Lichen	<i>Melanelia subargentifera</i>	S1S3		On tree trunks or mossy rocks in open woods and swamps (Flenniken, 1999; Brodo, <i>et al.</i>)	No
Hart's-tongue Fern	<i>Asplenium scolopendrium</i>	S3	SC	Mossy limestone outcrops especially along the Niagara Escarpment, these are not present on site	No
Shining-branch Hawthorn	<i>Crataegus magniflora</i>	S3		Second growth thickets. Two other hawthorn species were present.	No
Stiff Yellow Flax	<i>Linum medium v. medium</i>	S3?		Natural sandy fields including inter-dunal flats, shore meadows and oak openings (Voss & Reznicek 2012)	No
Eastern Milksnake	<i>Lampropeltis triangulum</i>	S3	SC	Meadow, thickets, forests	Possibly
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	S3	SC	Marsh, swamp, edge of ponds	No
Eastern Wood Pewee	<i>Contopus virens</i>	SC	SC	Deciduous or mixed forest	Yes
Wood Thrush	<i>Hylocichla mustelina</i>	THR	SC	Deciduous or mixed forest	Yes
Golden-winged Warbler	<i>Vermivora chloroptera</i>	THR	SC	Deciduous shrub thickets	No
Louisiana Waterthrush	<i>Seiurus motacilla</i>	SC	SC		No
Monarch Butterfly	<i>Danaus plexipus</i>	SC	SC	Fields where Common Milkweed is present	Yes

During field investigations three Special Concern species were recorded. Two were forest birds, Eastern Wood Pewee and Wood Thrush which were documented as probable breeders within the woodlot, as they were observed on both breeding bird surveys. Both species are still widespread as they were recorded in nearly every atlas square of southern Ontario during the OBBA (Cadman *et al.* 2007), but have been designated as Special Concern due to continued long term population declines (COSEWIC, 2012a; COSEWIC, 2012b). There are likely many pairs of both species present throughout the large forest block that is adjacent to the study area.

The other species was Monarch Butterfly of which a single individual was observed along the northeastern edge of the study area. Monarch is a wide ranging migratory species that can be expected to occur in any field habitat in southern Ontario, especially during the autumn migration period in August and September. As such the presence of a single Monarch is not particularly significant. In addition potentially suitable habitat for the Eastern Milksnake is present in the study area but it was not observed during field investigations. It is an elusive species that may occur in meadows, hedgerows and forests, particularly along the edge.

5.6.4 Animal Movement Corridors

Landscape connectivity (often referred to as “wildlife corridors”) has become recognized as an important part of natural heritage planning and a wide range of benefits have been attributed to the maintenance or re-connection of the natural landscape. The on-site woodlot is an extension of the large forest block to the southeast but it is not part of a link between core natural features and therefore would not qualify as an animal movement corridor.

5.6.5 Determination of Significance

Based on this evaluation, the woodlot qualifies as significant wildlife habitat for:

- Designated Stratum 2 Deer Wintering Habitat by MNRF
- Presence of Woodland Area Sensitive breeding bird habitat
- Presence of probable breeding habitat for three Special Concern species

5.7 Areas of Natural & Scientific Interest

The Pretty River Valley Provincial Earth Science ANSI lies immediately to the east of the subject property and is within the 120 m adjacent lands. This ANSI is located on the Niagara Escarpment and contains geological features including meltwater channels, crevice caves, ice-contact terrain and talus slopes that are the result of glacial and post-glacial processes (MNR, 1995). Furthermore it contains a seepage zone that occurs on a moraine-ridge complex that mantles the Niagara Escarpment slopes and is important for the protection of groundwater recharge (Gartner Lee Limited, 2006). The portion of the ANSI within the 120 m adjacent lands however, is 2 km from the Niagara Escarpment slope and does not contain good representation of the mentioned features. The Pretty River Valley Earth Science ANSI is within, and makes up a large part of Pretty River Valley Provincial Park.

No Life Science ANSIs are present within the study area.

5.8 Level 1 Assessment: Summary of Natural Heritage Features

Table 9 summarizes natural heritage features associated with the proposed Conn Pit expansion site.

Table 9. Summary of Natural Heritage Features Associated with the Study Area

Natural Environment Feature	Present in Proposed License Area	Present in Adjacent Lands (120 m of proposed license boundary)
Habitat of Endangered or Threatened Species		
• <i>Butternut</i>	Yes	Yes
• <i>Bobolink</i>	No	Yes
• <i>Eastern Meadowlark</i>	No	Yes
Significant Wetlands	No	No
Fish Habitat	No	No
Significant Woodlands	Yes	Yes
Significant Valleylands	No	No
Significant Wildlife Habitat		
• <i>Deer Wintering Habitat</i>	Yes	Yes
• <i>Woodland Area Sensitive Breeding Birds</i>	Yes	Yes
• <i>Species of Conservation Concern</i>	Yes	Yes
Significant Areas of Natural and Scientific Interest (ANSI)	No	Yes

Three natural environment features occur within the proposed license area and the adjacent lands, therefore the application is advanced to a Level 2 which requires an assessment of impacts and mitigation. All of the significant features are present within the woodlot. None occur in the other portions of the proposed licence area. The forest community FOD5-1 qualifies as Habitat for Endangered Butternut, Significant Woodland and Significant Wildlife Habitat.

6. Level 2 Assessment: Potential Impacts of Proposed Gravel Pit Expansion

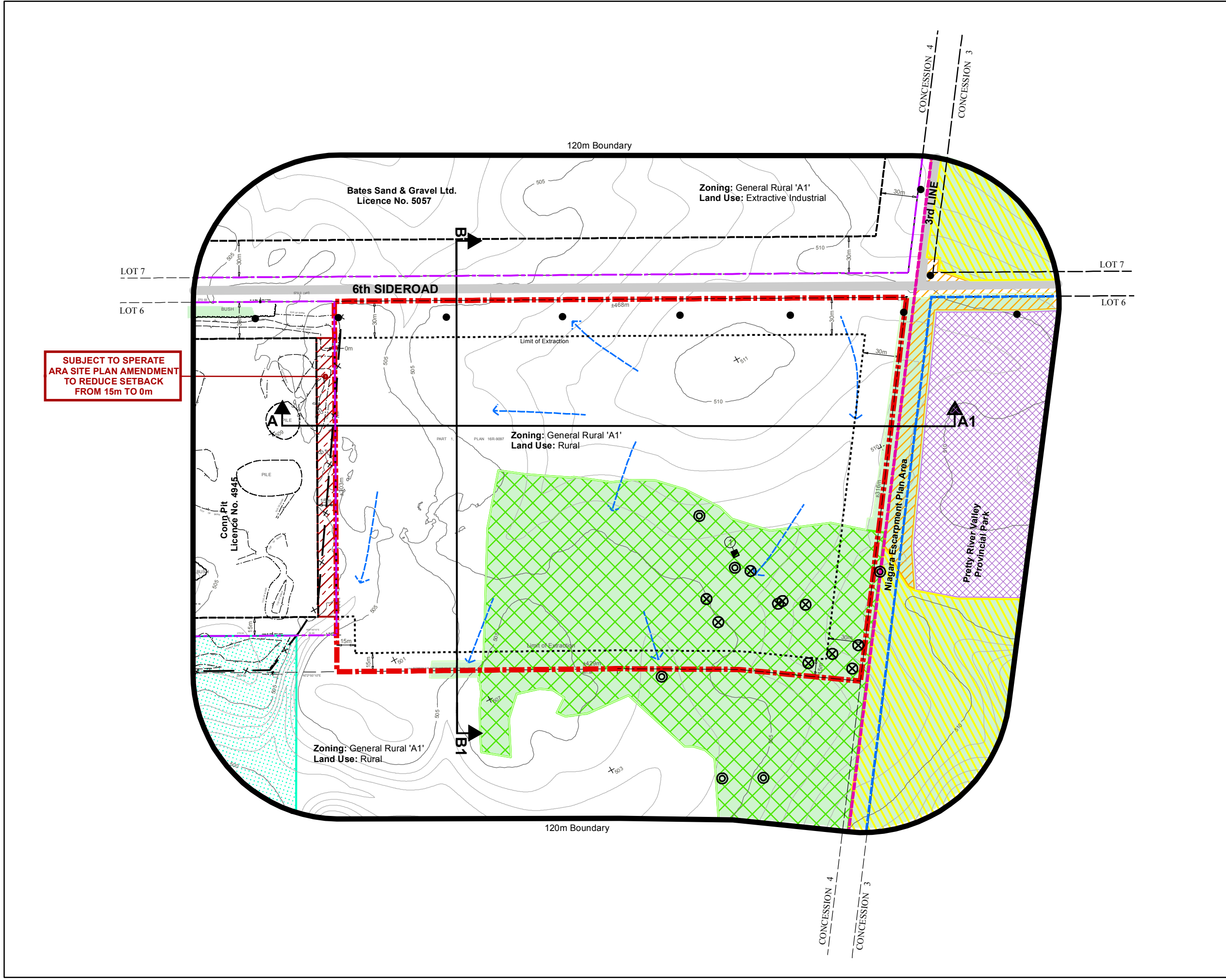
6.1 Description of the Proposed Gravel Pit Expansion Development

A gravel pit has operated in the western portion of their parcel in Part Lot 6, Concession 4, Township of Blue Mountains since the early 1990s. The extracted portion of that pit is approximately 10 ha. The proposed extraction limit in the expansion application will be a 10.7 ha area. This is proposed to be a below water pit meaning that extraction will occur below the water table. Below water extraction will be accomplished using a high hoe excavator which is able reach into the water and pull out the aggregate material. No dewatering is required and there will be no discharge of water from the pit off site. A pond will form in the pit at the approximate level of the groundwater table which is approximately at 296 mASL. When the excavation first hits the groundwater table to create a pond there is an expected initial drawdown of the water table of approximately 1.7 m (MTE Consulting 2015). This will only be temporary however for once it stabilizes and the pond is enlarged, the drawdown of the water table will only be about 0.07 m. It is expected that the zone of influence to the groundwater table will extend up to 15 m from the limit of extraction (MTE Consulting 2015).

Figure 4 shows the outline of the limits of extraction. The current plan is to extract the aggregate in three phases beginning in the west through the existing gravel pit and working eastward. The first phase would not remove the woodlot; the second phase would remove half of the woodlot and the third phase would remove the remaining portion of the woodlot. The woodlot portion within the subject property is 4.4 ha. The proposed pit expansion would remove 3.6 ha of woodlot and 0.8 ha would remain in the proposed license area.

The proposed extraction plans for the gravel pit expansion are provided in the Site Plans (MHBC, 2015). The key assumptions regarding site design and operation, as they relate to natural heritage features, were drawn from the Site Plans, and summarized as follows:

- a) The limits of extraction are illustrated on **Figure 4**. A setback of 15 m, including appropriate fencing, will be established from the south property boundary. This setback will be expanded to 30 m along the 6th Sideroad and along the east property boundary to provide a wider buffer from the 3rd Line road allowance and the park boundary of Pretty River Valley Provincial Park. These setbacks are consistent with requirements under the ARA. No setback or fencing will be established along the western property boundary, immediately adjacent to the existing pit.
- b) Topsoil and overburden deposits will be stripped and re-used on-site for perimeter berm construction on the north side of the extraction limits. Excess topsoil and overburden may be used for progressive rehabilitation in the existing pit. Overburden and topsoil not required for immediate use in berm construction or progressive rehabilitation of the site or the adjacent licence may be stockpiled on site or the adjacent licence.
- c) Prior to any forest removal, the 30 m buffer along the east side will be planted to recreate an area of natural forest with appropriate native tree species.
- d) Excavation will commence in the west quadrant of the site and proceed in an eastward direction.
- e) The surface area of the pit, including existing and proposed extraction, will cover approximately 20 ha.
- f) The pit floor will have a maximum final elevation of 495 mASL, subject to further assessment with pit development.



Legend

Boundary of Area to be Licenced

Proposed Limit of Extraction

Existing Licence Boundary

Existing Extraction Limit

Existing Vegetation

Bobolink Habitat

Significant Woodland & Significant Wildlife Habitat

ANSI (Earth Science)

Significant Woodland, Significant Wildlife Habitat & ANSI (Earth Science)

Bobolink Habitat & ANSI (Earth Science)

Niagara Escarpment Plan Area

Pretty River Valley Provincial Park

Property Line

Existing Fence

Paved Road

Hydro Pole

Shed Structure

Elevation Contour

Spot Elevation

Surface Water Drainage

Butternut Tree Retainable

Butternut Tree Non-Retainable

Cross-Sections

0 50 100 200

Meters

N

Conn Pit Expansion

Natural Environment Assessment

Extraction Limits and Significant Environmental Features

December, 2015

1:3,000

Datum: NAD 1983 UTM Zone 17N

P#: 60431371

V#: 001

Source: OMNR, OBM, MMAH, NRCAN, MHBC

AECOM

PLANNING
URBAN DESIGN
& LANDSCAPE
ARCHITECTURE

MHBC

ARCHITECTURE

Figure: 4

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- g) Main equipment on site may include but is not limited to portable processing plant (crushers, generators, screens, conveyors), loaders, highway trucks, and service vehicles for general operations and maintenance.
- h) No fuel will be stored onsite. Fuel trucks may be used to transfer fuel to non-mobile equipment within the active quarry area.
- i) Dewatering of the existing pit and expansion area will not be necessary.
- j) After the aggregate resource has been extracted from within the proposed extraction limit, the site will be rehabilitated. Rehabilitation will result in a large pond, surrounded by naturalized vegetation areas. A Rehabilitation Plan has been prepared with input from AECOM and will be part of the site plan.

6.2 Potential Environmental Effects

This section provides a discussion of the potential impacts, and recommended mitigations, on natural heritage features associated with the proposed Conn Pit expansion. This section should be read in conjunction with the Site Plans prepared by MHBC Planning as part of the ARA license application. The site plans provide specific details regarding the existing conditions, operational plan, rehabilitation plan and cross-sections (e.g., pre- and post-construction contours, soil conditions, drainage, etc.).

6.2.1 *Endangered and Threatened Species*

6.2.1.1 *Butternut*

During field investigations 16 Endangered Butternuts were encountered, mapped and assessed by a qualified Butternut Health Assessor (see Figure 2). Two of the Butternuts within the proposed extraction limits were assessed as retainable and another six were assessed as unretainable. All of those trees will need to be removed with the proposed pit expansion but compensation plantings will only be required for the retainable trees. The remaining trees will not need to be removed as they are in the 120 m adjacent lands and other retainable trees will be more than 25 m from the edge of the proposed extraction limits. Currently the retainable trees (B8 and B15 on Table 4) are all seedlings or saplings ranging in height from 0.5 to 3.5 m tall and a DBH maximum of 2 cm. Removing these trees will require compensation plantings of two seedlings each. In addition tree B14 with a DBH of 8 cm is situated just within 25 m of the proposed limit of extraction which is considered within the range of harm and therefore will require compensation plantings of three seedlings. Required compensation is in accordance with regulation 242/08 of the Endangered Species Act. Planting a minimum of seven Butternut seedlings will be required. The Butternut Health Assessment Report is attached in **Appendix D**. The assessment report and notice of activity will be submitted following MNRF review of the assessment report.

Forest compensation planting is proposed within the 30 m buffer along the east side of the subject property. This is an ideal location for compensation plantings since Butternut is an early successional species that requires light. Also this site is partially sheltered by the wide hedgerow on the east side. It will be a young developing forest for many years. Butternut compensation planting therefore should be incorporated into the forest compensation planting plan. Requirements for care and monitoring of butternut seedlings are provided in MNRF (2015c). The health and survival of the Butternuts will need to be monitored over a two year period after planting.

6.2.1.2 *Bobolink*

As discussed in Section 5.1.3, Bobolink breeding habitat was confirmed within the 120 m adjacent lands to the southwest and east and of the proposed extraction limits. No Bobolink habitat is present on the subject property and

therefore no habitat would be removed with the proposed expansion. The edge of the habitat is located 75 m southwest and 60 m east of the limits respectively. Currently the Bobolink habitat to the southwest lies within 50 m from the active pit within the west portion of the subject property. The Bobolink habitat to the east is separated by a 30 m wide mature deciduous hedgerow which would form a visual barrier from the future pit operations. For these reasons, it is believed that the proposed pit expansion will have a minimal impact on the Bobolink breeding habitats which currently exist to the southeast and east. As a result an ESA Authorization Permit will not be required for Bobolink.

6.2.1.3 *Eastern Meadowlark*

An Eastern Meadowlark was recorded in a field on the adjacent property to the north of the proposed license area late in the breeding season, and although probable breeding was not confirmed it is assumed that this provides suitable breeding habitat. That field is located on the opposite side of Sixth Sideroad from the subject property. The road right-of-way is 30 m wide and a 30 m buffer with a raised berm will be applied between the right-of-way and the proposed extraction limit. Consequently the edge of potential Eastern Meadowlark is at least 60 m away, and likely much further back from the roadside. It is believed that the proposed pit expansion will have a minimal impact on the breeding habitat. As a result an ESA Authorization Permit will not be required for Eastern Meadowlark.

6.2.2 *Significant Woodland*

The woodlot on site has been designated as Significant Woodland in the Grey County OP on the basis of size of the woodlot and functions described in Section 5.4. The proposed expansion will remove 3.6 ha of forest in phases 2 and 3. None will be removed in phase 1. The contiguous block of forest that makes up this unit of Significant Woodland is approximately 1000 ha, therefore only about 0.4% of it would be removed. All of the functions of the overall block of significant forest will be maintained outside of the extraction limit such as Pretty River Valley PP and on the adjacent property to the south. The Township of Blue Mountains has a high forest cover and approximately 30% of the township is mapped as Significant Woodland (Appendix B of Grey County OP).

A 30 m buffer on the east side of the proposed extraction limit will be planted to a natural forest that should contain a more diverse complement of native tree species than currently exists in the woodlot (primarily Sugar Maple). This will replace approximately 0.39 ha of forest resulting in a net loss of 3.21 ha. By adding to an existing 30 m wide hedgerow, the proposed planting will enhance habitat linkage between Pretty River Valley PP and another forest block on the north side of 6th Sideroad.

In addition, the side slopes and buffers on the north, south and east side of the pit will eventually be planted with appropriate native tree and shrub cover that will in total amount to 4.1 ha which will result in a net gain of area covered by vegetation. In the long term, therefore, there will be no loss in the area of Significant Woodland. In the interim, regenerating vegetation that is on the way to becoming forest will provide habitat to wildlife adapted to early successional stages such as butterflies and shrub-land birds. The plan will be described in Section 6.3.

6.2.3 *Significant Wildlife Habitat*

6.2.3.1 *Deer Wintering Congregation Area*

The on-site woodlot has been identified as Stratum 2 deer wintering habitat but it lacks any coniferous cover and is at the fringe of a very large forested area that provides this function. The deciduous forest provides winter browse but there is extensive areas of browse in the vicinity so it is not limiting for the local deer population. The 3.6 ha of winter browse that is proposed for removal is a very small part of the overall Stratum 2 area. As such the woodlot's

function as deer wintering habitat is likely minor and its removal would not have a significant impact on the local deer population. Proposed tree plantings in the setback along the east side of the proposed extraction area will improve the wildlife corridor function for White-tailed Deer between the extensive forested area to the southeast with the forest northeast of 6th Sideroad and 3rd Line. In addition the forest is to be removed in stages with no loss until stage 2. Therefore impacts on the overwintering deer will not happen for some time. Furthermore, 4.1 ha of forest will be planted within the setbacks and sideslopes that surround the pit. Although this will not immediately be functioning forest, it will eventually be able to provide browse habitat in a slightly greater area so there will be no loss of area of this function in the long term.

6.2.3.2 Woodland Area-Sensitive Bird Breeding Habitat

The on-site woodlot was found to support five of the listed species of forest interior breeding birds. Since there is no actual interior forest habitat on-site, the presence of these species is only possible because of the extensive block of adjacent contiguous forest. All of these are widespread species ranked as S5 in Ontario and present in most atlas squares in this part of Grey County. There are likely to be many territories of all of these species in the large adjacent forest block, as well as elsewhere in the county. Consequently there is not expected to be a loss of any species, just a small reduction in the number of territories.

Because of the configuration of the woodlot, the removal of the on-site woodlot will not result in any loss of any interior forest habitat (i.e., more than 200 m from an edge) from the adjacent forest. The woodlot portion on site is only 4.4 ha and contains no interior habitat greater than 200 m from an edge. However it is part of a contiguous forest area of 1000 ha that contains a substantial area of interior forest. Forest loss will not be immediate but will occur in phases 2 and 3. There will be no loss of interior forest (greater than 200 m from an edge) on the adjacent lands as a result of forest removed on site.

There will be no loss of function of Area-Sensitive Bird Breeding Habitat taking into account the remaining large forested area immediately adjacent to the study area. Compensation plantings will eventually re-establish 4.1 ha of forest that will potentially provide habitat for some of the area-sensitive species, since it will be connected to what remains of the on-site woodlot.

6.2.3.3 Special Concern and Rare Wildlife Species

Two Special Concern bird species: Eastern Wood Pewee and Wood Thrush, were present in the on-site woodlot. Despite their status both species are still widespread and common, being recorded in every 10 x 10 km atlas square in Grey County during the OBBA (Cadman *et al.* 2007). The large adjacent forest block as well as nearly every sizeable block of deciduous forest is likely to support a number of pairs of both species. The removal of the woodlot may result in the loss of a couple territories but these species will be able to continue breeding throughout most of the adjacent forest block. The overall impact to the local populations of these species is expected to be minimal as there will extensive areas of suitable habitat remaining in Grey County. Furthermore the compensation plantings will eventually re-establish 4.1 ha of forest that will be suitable for Eastern Wood Pewee and Wood Thrush

The Monarch was observed in the field east of the subject property within the 120 m adjacent lands, and it likely occurs on occasion in the hedgerows along the fringes of the proposed license area as there is some milkweed and nectaring plants present. Monarchs generally do not occur in active cropland or forests except for moving through in migration or when wandering. As a result the removal of vegetation in the proposed extraction area is not expected to have a significant effect on Monarchs.

The presence of Eastern Milksnake, a Special Concern species, was not confirmed but there is potentially suitable habitat in the study area such. The species would avoid the open cultivated area but may occur in hedgerows,

adjacent fields and the on-site woodlot. It is most prevalent in meadows particularly where there is cover in the form of rock piles or other debris. A stone fencerow is present on the property boundary on the south side of the existing pit that offers potential cover. It is outside of the expansion area or extraction limit.

6.2.3.4 Conclusion on Significant Wildlife Habitat

Based on the above discussion three types of Significant Wildlife Habitat are being affected but the impact is minor in the context of the adjacent woodlot, and only temporary when final pit rehabilitation is taken into consideration.

The deer overwintering habitat will be reduced in the second and third phases of pit development but this is a very small portion of the deer yard that it is a part of. This function will continue in the extensive area of remaining adjacent habitat and the area of forest will eventually return with forest compensation. The Woodland Area Sensitive breeding birds will lose a small area of forest that will be partially returned when the compensation plantings mature into forest. The two special concern bird species, Eastern Wood Pewee and Wood Thrush are not area sensitive and are capable of colonizing the forest compensation areas as they mature. The third Monarch Butterfly will likely find some habitat in the fringes of the pit when active since its larval foodplant Common Milkweed is likely to colonize the berm and setback areas while they are open. As a result the impacts of the proposed gravel pit expansion are not considered significant to the Significant Wildlife Habitat.

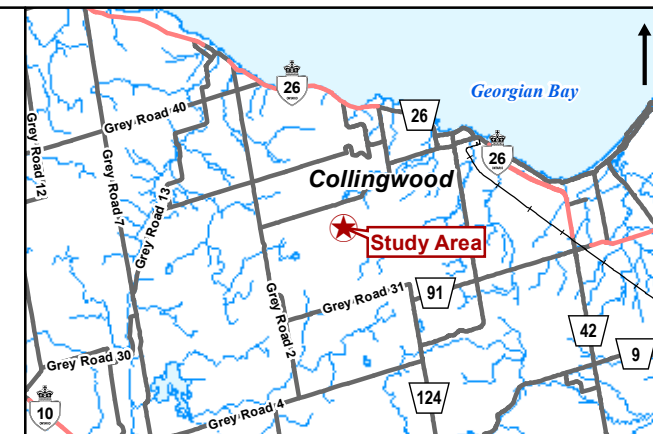
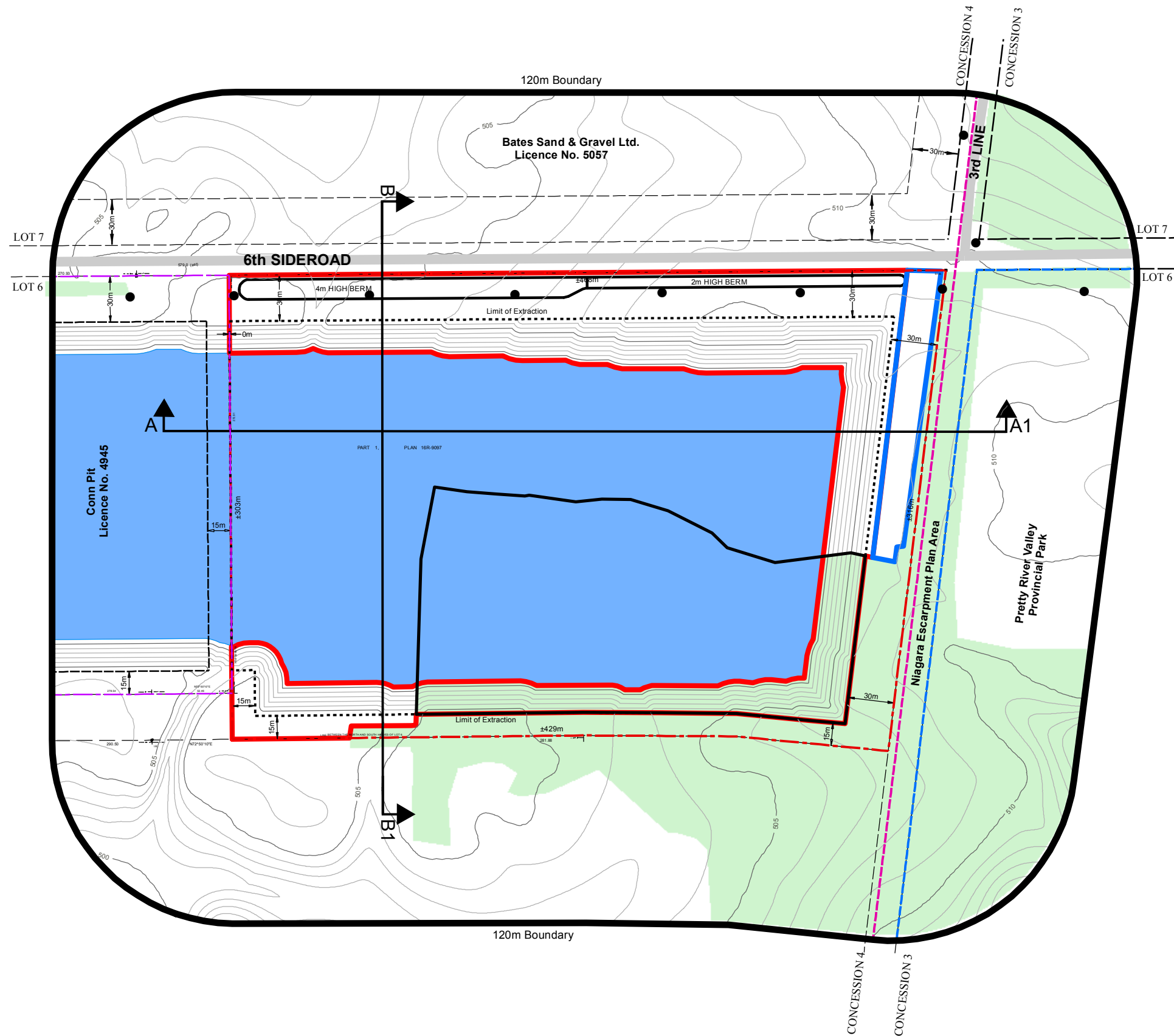
6.3 Compensation Planting Plan

The biggest impact will be removing of 3.6 ha of on-site deciduous woodlot. Negating the effect of the forest loss is possible by the preparation of a planting plan that uses locally indigenous native tree and shrub species that are appropriate to the site conditions. The plan will need to be implemented in two stages. First the buffer area along the east property boundary should be planted prior to any forest removal to start the process of forest regeneration. The other setback areas on the north and south sides of the proposed pit could be planted at any time, but the side slopes cannot be planted until near the end of the working life of the pit since these areas will not be available until most of the aggregate has been extracted. Planting areas are shown on **Figure 5**. The compensation planting plan should be incorporated into the site plan for the gravel pit expansion.

6.3.1 Area to be Planted Prior to Phase 2

The first area to be planted will be a portion of the 30 m wide buffer area on east boundary which is 0.39 ha. It will be planted prior to any forest removal that is scheduled to occur in Phase 2 of pit development. Suitable trees and shrubs in recommended proportions are listed on **Table 10**. Recommendations for planting are as follows:

1. Trees should be spaced at approximately 4 m off centre line, staggered. This works out to approximately 250 trees. The tree arrangement should be variable and not in rows, to mimic a natural forest.
2. Tree species should be randomly mixed but often arranged into single species groupings.
3. Shrub plantings should be arranged in random clumps. Planted as close as 1 m off centre line in patches but not uniformly spread through tree planting area. The number of shrubs should be approximately the same as number of trees (250).
4. Species and percentages can be adjusted depending on availability.
5. Butternut seedlings should be planted among the other trees. A minimum of seven are required but additional seedlings are recommended for a total of 20.



Plantings

- Planted Prior to Phase 2 (0.39 ha)
- Planted During Rehabilitation (4.15 ha)
- Treed Area to be Removed (3.60 ha)

Base Features

- Boundary of Area to be Licenced
- Proposed Limit of Extraction
- Existing Licence Boundary
- Existing Extraction Limit
- Existing Vegetation
- Pond
- Niagara Escarpment Plan Area
- Pretty River Valley Provincial Park
- Property Line
- Paved Road
- Hydro Pole
- Shed Structure
- Elevation Contour
- Spot Elevation

Cross-Sections

0 50 100 200 Meters

N

Conn Pit Expansion
Natural Environment Assessment

Forest Compensation Plan

December, 2015	1:3,000	Datum: NAD 1983 UTM Zone 17N Source: OMNR, OBM, MMAH, NRCAN, MHBC
P#: 60431371	V#: 001	Figure: 5
AECOM PLANNING URBAN DESIGN & LANDSCAPE ARCHITECTURE MHBC		

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6. Seedlings or saplings are best planted in spring or autumn.
7. Plant material can be bare root if planted before leaf out (April to mid-May, or October to November) but should be potted or B&B if planted when leafed out (mid-May to late September).
8. Plant material should be watered immediately after planting and monthly during the first growing season. Butternut seedlings should be watered weekly over the first growing season .
9. Tree guards should be placed on stems of plants to reduce mammal browsing.
10. Tree stakes should not be used.
11. Prior to removal of the woodlot, ground flora and soil from the forest floor (containing seedbank) should be salvaged and moved into the forest compensation area.
12. Plant material should be inspected annually for survival for two years following planting. Plants should be replaced if there is less than 70% survival. Butternut seedling health and survival will also be monitored

Table 10. Trees and Shrubs Recommended for Planting in Setback Areas

	Common Name	Scientific Name	Planting Proportions
TREES	White Pine	<i>Pinus strobus</i>	20%
	Red Pine	<i>Pinus resinosa</i>	5%
	Sugar Maple	<i>Acer saccharum</i>	20%
	Red Oak	<i>Quercus rubra</i>	10%
	Bur Oak	<i>Quercus macrocarpa</i>	5%
	Big-toothed Aspen	<i>Populus grandidentata</i>	10%
	American Basswood	<i>Tilia americana</i>	10%
	American Beech	<i>Fagus grandifolia</i>	5%
	Black Cherry	<i>Prunus serotina</i>	5%
	Ironwood	<i>Ostrya virginiana</i>	5%
	Butternut	<i>Juglans cinerea</i>	20 seedlings
SHRUBS	Choke Cherry	<i>Prunus virginianus</i>	20%
	Bush Honeysuckle	<i>Diervilla lonicera</i>	20%
	Alternate-leaved Dogwood	<i>Cornus alternifolia</i>	20%
	Round-leaved Dogwood	<i>Cornus rugosa</i>	10%
	Beaked Hazel	<i>Corylus cornuta</i>	10%
	Red-berried Elder	<i>Sambucus racemosa</i>	10%
	Downy Arrowwood	<i>Viburnum rafinesquianum</i>	10%

6.3.2 Area to be Planted during Pit Rehabilitation

These areas will not be planted for a number of years until the gravel pit is at or near the end of the aggregate excavation period. The level tableland areas in the 15 m buffer on the north and south sides of the pit should be planted with the same complement of tree and shrub species listed in **Table 10**. If these areas are planted later, monitoring the survival of the first plantings will have been completed before the pit is nearing the end of its extraction period. If that monitoring determines that some of the species had a poor survival rate, the species list can be adjusted to improve the rate of plant survival.

The side slopes, especially on the south and west faces will be drier and more subject to drought conditions than on the tableland, because of slope and lack of topsoil. Therefore the following complement of tree and shrub species listed on **Table 11** are recommended for planting on the slopes which are more tolerant of dry conditions. The general techniques are the same as recommended in 6.3.1 except that some additional recommendations are provided below:

Recommendations for planting are as follows:

1. Topsoil layer of at least 20 cm deep will need to be placed on the slopes prior to planting.
2. Additional topsoil should be placed around the roots of all planted trees and shrubs
3. Plant material should be watered immediately after planting and bi-weekly for first two months, then monthly for the rest of the first growing season.
4. Plant material should be inspected annually for survival for the first three years. Plants should be replaced if there is less than 70% survival.

Table 11. Trees and Shrubs Recommended for Planting on Dry Side-slopes of Pit

	Common Name	Scientific Name	Planting Proportions
TREES	White Pine	<i>Pinus strobus</i>	20%
	Red Pine	<i>Pinus resinosa</i>	5%
	White Spruce	<i>Picea glauca</i>	5%
	Eastern Red Cedar	<i>Juniperus virginianus</i>	5%
	Red Maple	<i>Acer rubrum</i>	20%
	Red Oak	<i>Quercus rubra</i>	20%
	Big-toothed Aspen	<i>Populus grandidentata</i>	10%
	Trembling Aspen	<i>Populus tremuloides</i>	10%
	Pin Cherry	<i>Prunus pennsylvanica</i>	5%
SHRUBS	Bush Honeysuckle	<i>Diervilla lonicera</i>	20%
	Round-leaved Dogwood	<i>Cornus rugosa</i>	20%
	Staghorn Sumac	<i>Rhus hirta</i>	20%
	Buffalo-berry	<i>Shepherdia canadensis</i>	10%
	Downy Arrowwood	<i>Viburnum rafinesquianum</i>	20 %
	Common Juniper	<i>Juniperus communis</i>	10%

6.3.3 Other Mitigations

It will be important to minimize impacts to the immediately adjacent forested area that will remain. An edge management plan will need to be prepared that may involve installing temporary construction fencing prior to cutting to prevent accidental intrusion further into the forest. Identification and protection of specimen trees along the edge, pruning of exposed roots and broken branches. Pre-stressing the edge at the second clearing phase can be implemented so that vegetation can pre-adapt to the ultimate new edge prior to the third stage.

Birds, their eggs, and nests are protected under the Migratory Birds Convention Act (MBCA). Though the MBCA does not specify vegetation clearing specifically, eradicating large swaths of habitat during the nesting season inevitably results in nest destruction. In order to limit the effect of the proposed expansion on nesting birds, it is recommended that the land clearing and expansion activities be conducted outside of the time period that encompasses a majority of the nesting season in southern Ontario for the forest, hedge row and open habitat types on site; this is generally between April 15 to August 15 of any given year.

Natural areas are most susceptible to impacts during the site preparation phase because this is the time during which site conditions are most significantly altered. Activities associated with site preparation require mitigation and control to avoid or minimize impacts.

Recommended mitigation measures for the proposed Conn Pit expansion are summarized in Section 7.

7. Conclusions and Recommendations

If the recommended mitigation measures are implemented and properly maintained, it is our opinion that the proposed Conn Pit expansion will result in no net negative impact to the natural heritage features associated with the study area. With the appropriate mitigation measures described in this Natural Environment Level 1 & 2 Technical Report, it is our opinion that the development proposal meets the provincial and municipal policy requirements for natural heritage. In summary, these recommendations include:

- a) Postpone removal of the on-site deciduous forest woodlot through a three phased approach, allowing it to continue functioning as woodlot for as long as possible. No forest removal will occur until phase 2 when half of the forested area will be cut. The remaining forest will be removed in the third phase.
- b) When woodlot needs to be removed, vegetation clearing shall occur between September 2nd and April 14th to avoid the bird nesting period (April 15 to August 15) and the bat maternity / roosting season (April 30th to September 1st).
- c) In the spring/summer prior to removal of the on-site woodlot, bat acoustic monitoring shall take place in the night to determine if any bat Species at Risk are present. If they are found to be present, some additional mitigation may be required to comply with the provisions of the Endangered Species Act.
- d) A forest compensation plan shall be prepared for the 30 m setback along the east boundary. This should consist of a mix of native tree and shrub species appropriate to the site conditions (described in Section 6.3).
- e) Butternut compensation planting should occur within the 30 m setback on the east boundary. A minimum of seven seedlings will be required according to MNRF protocols but additional Butternuts should be planted as they can be accommodated in forest compensation areas. Butternuts need to be watered regularly over the first growing season and should be monitored for two years after planting.
- f) The setbacks on the north and south sides of the pit shall be reforested with appropriate native tree and shrub species (described in Section 6.3).
- g) Ultimately when the pit approaches its full dimensions, the side slopes extending from the setback down to the pond should be planted with appropriate native tree and shrub species adapted to the site conditions.
- h) Maintain existing vegetation within the prescribed setbacks between the proposed extraction limit and the license boundary along the entire north, south and east peripheries of the proposed extension. This will facilitate wildlife movement around the active quarry.
- i) In areas immediately adjacent to the woodlot that will be removed, an appropriate edge management plan will be prepared.
- j) Prior to removal of the woodlot, native non-invasive ground flora and soil from the forest floor should be salvaged and moved into the forest compensation areas.
- k) Surface drainage from any disturbed areas shall be directed into the pit. There shall be no surface runoff directed off-site.

- I) All berms shall be graded to a maximum of 2:1 slopes. Berms and all areas progressively rehabilitated shall be vegetated with a perennial native grass mixture (that should include sand barren and tall grass prairie plant species) planted in the fall or spring season and shall be maintained and reseeded until self-sustaining cover is established.

The site occurs immediately adjacent to and includes a small portion of a large forest block that contains important environmental functions and features. If the recommended mitigations and compensation planting plan are followed as described in Section 6.3, we feel that the long term environmental impacts of the proposed Conn Pit expansion will be negligible.

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Appendix A

Photo Log

Appendix A. Conn Pit Photographic Log



Photograph 1. ↑
On-site woodlot: sparse foliage on June 17, 2015 from infestation of Forest Tent Caterpillars (facing north).



Photograph 2. ↑
Berm on south side of existing gravel pit (facing east).



Photograph 3. ↑
West side of on-site woodlot (facing east).



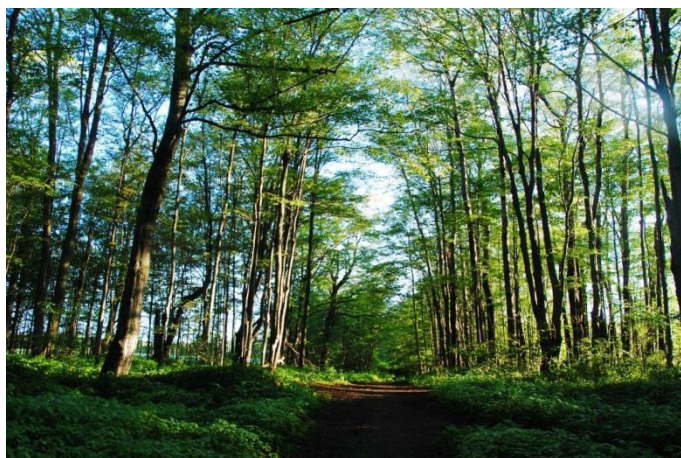
Photograph 4. ↑
West side of proposed expansion area with hedgerow on left (facing north).



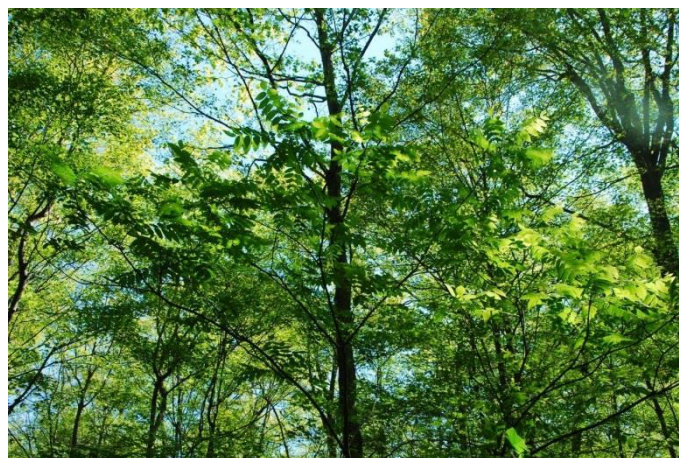
Photograph 5. ↑
Field east of proposed expansion area where Bobolinks were present (facing east).



Photograph 6. ↑
Interior of on-site woodlot (facing west).



Photograph 6. ↑
Road allowance of 3rd Line on east side of proposed expansion area (facing north).



Photograph 8. ↑
Small Butternut in on-site woodlot.

Appendix B

Plant Species List

Appendix B. Conn Pit Plant Species List

BOTANICAL NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	FOD5-1	CUH+CUM
Aceraceae	Maple Family								
<i>Acer</i>	<i>saccharum</i>	4	3		S5			X	X
Anacardiaceae	Cashew Family								
<i>Rhus</i>	<i>hirta</i>	1	5		S5				X
Apiaceae	Parsley Family								
<i>Daucus</i>	<i>carota</i>		5	-2	SE5				X
Apocynaceae	Dogbane Family								
<i>Apocynum</i>	<i>androsaemifolium</i>	3	5		S5			X	
<i>Apocynum</i>	<i>cannabinum</i>		1		S5			X	
Araceae	Arum Family								
<i>Arisaema</i>	<i>triphyllum</i>	5	-2		S5			X	
Araliaceae	Ginseng Family								
<i>Aralia</i>	<i>nudicaulis</i>	4	3		S5			X	
Aristolochiaceae	Duchman's-pipe Family								
<i>Asarum</i>	<i>canadense</i>	6	5		S5			X	
Asclepiadaceae	Milkweed Family								
<i>Asclepias</i>	<i>syriaca</i>	0	5		S5			X	X
Asteraceae	Composite Family								
<i>Achillea</i>	<i>millefolium</i>		3	-1	SE?				X
<i>Arctium</i>	<i>minus</i>		5	-2	SE5			X	
<i>Artemisia</i>	<i>vulgaris</i>		5	-1	SE5			X	
<i>Symphyotrichum</i>	<i>lanceolatum</i>	3	-3		S5			X	X
<i>Symphyotrichum</i>	<i>lateriflorum</i>	3	-2		S5				X
<i>Bidens</i>	<i>frondosa</i>	3	-3		S5			X	
<i>Calendula</i>	<i>officinalis</i>		5	-1	SE1				X
<i>Centaurea</i>	<i>jacea</i>		5	-1	SE5				X
<i>Leucanthemum</i>	<i>vulgare</i>		5	-1	SE5				X
<i>Cichorium</i>	<i>intybus</i>		5	-1	SE5				X
<i>Erigeron</i>	<i>philadelphicus</i>	1	-3		S5			X	X
<i>Fragaria</i>	<i>vesca</i> ssp. <i>americana</i>	4	4		S5				X
<i>Fragaria</i>	<i>virginiana</i>	2	1		SU			X	
<i>Hieracium</i>	<i>aurantiacum</i>		5	-2	SE5				X
<i>Hieracium</i>	<i>caespitosum</i>		5	-2	SE5				X
<i>Hieracium</i>	<i>pilosella</i>		5	-1	SE5				X
<i>Prenanthes</i>	<i>altissima</i>	5	3		S5				X
<i>Solidago</i>	<i>altissima</i>	1	3		S5				X
<i>Tragopogon</i>	<i>pratensis</i> ssp. <i>pratensis</i>		5	-1	SE5				X
<i>Tussilago</i>	<i>farfara</i>		3	-2	SE5			X	X
Balsaminaceae	Touch-me-not Family								
<i>Impatiens</i>	<i>capensis</i>	4	-3		S5			X	
Betulaceae	Birch Family								
<i>Betula</i>	<i>alleghaniensis</i>	6	0		S5			X	
<i>Ostrya</i>	<i>virginiana</i>	4	4		S5			X	X

Appendix B. Conn Pit Plant Species List

BOTANICAL NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	FOD5-1	CUH+CUM
Boraginaceae	Borage Family								
<i>Echium</i>	<i>vulgare</i>		5	-2	SE5				X
<i>Myosotis</i>	<i>scorpioides</i>		-5		SE5			X	
Brassicaceae	Mustard Family								
<i>Alliaria</i>	<i>petiolata</i>		0	-3	SE5			X	
<i>Hesperis</i>	<i>matronalis</i>		5	-3	SE5			X	
Caprifoliaceae	Honeysuckle Family								
<i>Diervilla</i>	<i>lonicera</i>	5	5		S5			X	
<i>Sambucus</i>	<i>racemosa</i>	5	2		S5			X	
<i>Viburnum</i>	<i>lentago</i>	4	-1		S5				X
<i>Viburnum</i>	<i>opulus</i>		0	-1	SE4			X	
Caryophyllaceae	Pink Family								
<i>Silene</i>	<i>vulgaris</i>		5	-1	SE5				X
Cornaceae	Dogwood Family								
<i>Cornus</i>	<i>alternifolia</i>	6	5		S5			X	X
<i>Cornus</i>	<i>sericea</i>	2	-3		S5			X	X
Cyperaceae	Sedge Family								
<i>Carex</i>	<i>blanda</i>	3	0		S5			X	
<i>Carex</i>	<i>cephalophora</i>	5	3		S5			X	
<i>Carex</i>	<i>intumescens</i>	6	-4		S5			X	
<i>Carex</i>	<i>pauciflora</i>	10	-5		S5			X	
<i>Carex</i>	<i>pensylvanica</i>	5	5		S5			X	
<i>Carex</i>	<i>plantaginea</i>	7	5		S5			X	
<i>Carex</i>	<i>radiata</i>	4	5		S5			X	
<i>Carex</i>	<i>sparganioides</i>	5	0		S5			X	
<i>Carex</i>	<i>spicata</i>		5	-1	SE5			X	
Dryopteridaceae	Wood Fern Family								
<i>Athyrium</i>	<i>filix-femina</i> var. <i>angustum</i>	4	0		S5			X	
<i>Cystopteris</i>	<i>bulbifera</i>	5	-2		S5			X	
<i>Dryopteris</i>	<i>carthusiana</i>	5	-2		S5			X	
<i>Dryopteris</i>	<i>goldiana</i>	10	0		S4			X	
<i>Dryopteris</i>	<i>intermedia</i>	5	0		S5			X	
<i>Onoclea</i>	<i>sensibilis</i>	4	-3		S5			X	
Fabaceae	Pea Family								
<i>Lotus</i>	<i>corniculatus</i>		1	-2	SE5				X
<i>Melilotus</i>	<i>alba</i>		3	-3	SE5				X
<i>Trifolium</i>	<i>pratense</i>		2	-2	SE5				X
<i>Vicia</i>	<i>cracca</i>		5	-1	SE5				X
Fagaceae	Beech Family								
<i>Fagus</i>	<i>grandifolia</i>	6	3		S5			X	
Geraniaceae	Geranium Family								
<i>Geranium</i>	<i>robertianum</i>		5	-2	SE5			X	X
Grossulariaceae	Currant Family								

Appendix B. Conn Pit Plant Species List

BOTANICAL NAME	COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	FOD5-1	CUH+CUM
<i>Ribes cynosbati</i>	Prickly Gooseberry	4	5		S5			X	X
<i>Ribes rubrum</i>	Red Currant		5	-2	SE5			X	
Guttiferae	St. John's-wort Family								
<i>Hypericum perforatum</i>	Common St. John's-wort		5	-3	SE5				X
Hydrophyllaceae	Water-leaf Family								
<i>Hydrophyllum virginianum</i>	Virginia Water-leaf	6	-2		S5			X	X
<i>Hydrophyllum canadense</i>	Canada Water-leaf	8	-2		S4			X	
Juglandaceae	Walnut Family								
<i>Juglans cinerea</i>	Butternut	6	2		S3?	END	END	X	
Lamiaceae	Mint Family								
<i>Glechoma tetrahit</i>	Common Hemp-nettle		5	-1	SE5			X	
<i>Leonurus cardiaca ssp. cardiaca</i>	Common Motherwort		5	-2	SE5			X	
<i>Nepeta cataria</i>	Catnip		1	-2	SE5				X
<i>Prunella vulgaris ssp. lanceolata</i>	Heal-all	5	5		S5			X	
<i>Clinopodium vulgare</i>	Wild Basil	4	5		S5				X
Liliaceae	Lily Family								
<i>Allium tricoccum</i>	Wild Leek	7	2		S5			X	
<i>Maianthemum racemosum</i>	False Solomon's Seal	4	3		S5			X	
<i>Trillium erectum</i>	Purple Trillium	6	1		S5			X	
<i>Trillium grandiflorum</i>	White Trillium	5	5		S5			X	
Malvaceae	Mallow Family								
<i>Malva neglecta</i>	Cheeses		5	-1	SE5			X	X
Oleaceae	Olive Family								
<i>Fraxinus americana</i>	White Ash	4	3		S5				X
Onagraceae	Evening-primrose Family								
<i>Circaea lutetiana ssp. canadensis</i>	Enchanter's Nightshade	3	3		S5				X
<i>Epilobium ciliatum ssp. glandulosum</i>	Northern Willow-herb	6	3		SU			X	
<i>Oenothera biennis</i>	Common Evening-primrose	0	3		S5				X
Orchidaceae	Orchid Family								
<i>Epipactis helleborine</i>	Common Helleborine		5	-2	SE5			X	
Oxalidaceae	Wood Sorrel Family								
<i>Oxalis stricta</i>	Upright Yellow Wood-sorrel	0	3		S5			X	
Papaveraceae	Poppy Family								
<i>Sanguinaria canadensis</i>	Bloodroot	5	4		S5			X	
Plantaginaceae	Plantain Family								
<i>Plantago lanceolata</i>	Ribgrass		0	-1	SE5				X
<i>Plantago rugelii</i>	Rugel's Plantain	1	0		S5			X	
Poaceae	Grass Family								
<i>Bromus inermis ssp. inermis</i>	Awnless Brome		5	-3	SE5				X

Appendix B. Conn Pit Plant Species List

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	FOD5-1	CUH+CUM
<i>Dactylis</i>	<i>glomerata</i>	Orchard Grass		3	-1	SE5			X	X
<i>Lolium</i>	<i>arundinaceum</i>	Tall Fescue		2	-1	SE5				X
<i>Glyceria</i>	<i>striata</i>	Fowl Meadow Grass	3	-5		S5			X	
<i>Melica</i>	<i>effusum</i>	Wood Millet	8	4		S4S5			X	
<i>Phleum</i>	<i>pratense</i>	Timothy		3	-1	SE5				X
<i>Poa</i>	<i>compressa</i>	Canada Blue Grass	0	2		S5			X	X
<i>Poa</i>	<i>pratensis</i>	Kentucky Bluegrass	0	1		S5				X
<i>Schizachne</i>	<i>purpurascens</i>	False Melic Grass	6	2		S5			X	
Polygonaceae		Smartweed Family								
<i>Rumex</i>	<i>obtusifolius</i>	Bitter Dock		-3	-1	SE5			X	
Pteridaceae		Maidenhair Fern Family								
<i>Adiantum</i>	<i>pedatum</i>	Northern Maidenhair Fern	7	1		S5			X	
Ranunculaceae		Buttercup Family								
<i>Actaea</i>	<i>pachypoda</i>	White Baneberry	6	5		S5			X	
<i>Actaea</i>	<i>rubra</i>	Red Baneberry	5	5		S5			X	
<i>Anemone</i>	<i>acutiloba</i>	Sharp-lobed Hepatica	6	5		S5			X	
<i>Ranunculus</i>	<i>acris</i>	Tall Buttercup			-2	SE5				X
<i>Thalictrum</i>	<i>dioicum</i>	Early Meadow-rue	5	2		S5			X	
Rosaceae		Rose Family								
<i>Agrimonia</i>	<i>gryposepala</i>	Tall Hairy Agrimony	2	2		S5			X	
<i>Amelanchier</i>	<i>arborea</i>	Downy Juneberry		3		S5				X
<i>Crataegus</i>	<i>macracantha</i>	Large-thorned Hawthorn	4	5		S5				X
<i>Crataegus</i>	<i>monogyna</i>	English Hawthorn		5	-1	SE5				X
<i>Geum</i>	<i>urbanum</i>	Wood Avens		5	-1	SE2			X	
<i>Geum</i>	<i>canadense</i>	White Avens	3	0		S5			X	
<i>Malus</i>	<i>pumila</i>	Common Crabapple		5	-1	SE5				X
<i>Potentilla</i>	<i>recta</i>	Rough-fruited Cinquefoil		5	-2	SE5				X
<i>Prunus</i>	<i>serotina</i>	Black Cherry	3	3		S5			X	X
<i>Prunus</i>	<i>virginiana</i>	Choke Cherry	2	1		S5			X	X
<i>Rubus</i>	<i>idaeus</i>	Red Raspberry				SE1			X	X
<i>Rubus</i>	<i>occidentalis</i>	Thimble-berry	2	5		S5				X
<i>Sorbus</i>	<i>aucuparia</i>	European Mountain-ash		5	-2	SE4				X
Rubiaceae		Madder Family								
<i>Galium</i>	<i>mollugo</i>	White Bedstraw		5	-2	SE5				X
<i>Galium</i>	<i>triflorum</i>	Sweet-scented Bedstraw	4	2		S5			X	
Salicaceae		Willow Family								
<i>Populus</i>	<i>tremuloides</i>	Trembling Aspen	2	0		S5			X	
<i>Populus X</i>	<i>canadensis</i>	Carolina Poplar				SE1				X
Saxifragaceae		Saxifrage Family								
<i>Tiarella</i>	<i>cordifolia</i>	Foamflower	6	1		S5			X	
Scrophulariaceae		Figwort Family								
<i>Verbascum</i>	<i>thapsus</i>	Common Mullein		5	-2	SE5				X

Appendix B. Conn Pit Plant Species List

BOTANICAL NAME		COMMON NAME	COEFFICIENT OF CONSERVATISM	WETNESS INDEX	WEEDINESS INDEX	PROVINCIAL STATUS	OMNR STATUS	COSEWIC STATUS	FOD5-1	CUH+CUM
<i>Scrophularia</i>	<i>marilandica</i>	Carpenter's-square Figwort	7	4		S4			X	
Solanaceae		Nightshade Family								
<i>Solanum</i>	<i>dulcamara</i>	Bitter Nightshade		0	-2	SE5			X	X
Tiliaceae		Linden Family								
<i>Tilia</i>	<i>americana</i>	American Basswood	4	3		S5			X	X
Ulmaceae		Elm Family								
<i>Ulmus</i>	<i>americana</i>	American Elm	3	-2		S5			X	X
<i>Ulmus</i>	<i>rubra</i>	Slippery Elm	6	0		S5				X
<i>Ulmus</i>	<i>thomasii</i>	Rock Elm	6	-1		S4?			X	
Urticaceae		Nettle Family								
<i>Laportea</i>	<i>canadensis</i>	Wood Nettle	6	-3		S5			X	
Violaceae		Violet Family								
<i>Viola</i>	<i>canadensis</i>	Canada Violet	6	5		S5			X	X
<i>Viola</i>	<i>conspersa</i>	American Dog Violet	4	-2		S5			X	
<i>Viola</i>	<i>pubescens</i>	Downy Yellow Violet	5	4		S5			X	
<i>Viola</i>	<i>sororia</i>	Woolly Blue Violet	4	1		S5			X	
Vitaceae		Grape Family								
<i>Parthenocissus</i>	<i>inserta</i>	Thicket-creeper	3	3		S5			X	
<i>Vitis</i>	<i>riparia</i>	Riverbank Grape	0	-2		S5			X	X

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity

		Percent
Total Species:	132	
Native Species:	86	65.15%
Exotic Species	46	34.85%
Regionally Significant Species	0	
S1-S3 Species	0	
S4 Species	3	
S5 Species	80	

Co-efficient of Conservatism and Floral Quality Index

Co-efficient of Conservatism (CC) (average)	4.27	
CC 0 to 3	lowest sensitivity	27
CC 4 to 6	moderate sensitivity	51
CC 7 to 8	high sensitivity	6
CC 9 to 10	highest sensitivity	2
Floral Quality Index (FQI)	39.57	

Appendix C

Breeding Birds

Appendix C - Conn Pit Bird List

Common Name	Scientific Name	ESA Status	COSEWIC Status	NHIC Prov Rank Status	Breeding Bird Surveys		Existing Pit	Proposed Expansion Area	Within 120 m adjacent	Total Individuals
					17-Jun-15	2-Jul-15				
American Crow	<i>Corvus brachyrhynchos</i>			S5B					3	3
American Goldfinch	<i>Carduelis tristis</i>			S5B	✓	✓	2	2	2	6
American Redstart	<i>Setophaga ruticilla</i>			S5B	✓	✓		4	1	5
American Robin	<i>Turdus migratorius</i>			S5	✓	✓	1	8	5	14
Baltimore Oriole	<i>Icterus galbula</i>			S4	✓	✓	1	2	2	5
Barn Swallow	<i>Dolichonyx oryzivorus</i>	THR	THR	S4B	✓				5	5
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>			S5	✓		1			1
Black-capped Chickadee	<i>Poecile atricapillus</i>			S5	✓	✓		1	4	5
Black-throated Blue Warbler	<i>Setophaga caerulescens</i>			S5B	✓	✓		2	1	3
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR	S4B	✓	✓			2	2
Brown-headed Cowbird	<i>Molothrus ater</i>			S4	✓			1	1	2
Brown Thrasher	<i>Toxostoma rufum</i>			S4	✓		1			1
Blue Jay	<i>Cyanocitta cristata</i>			S5	✓			3	2	5
Cedar Waxwing	<i>Bombycilla cedrorum</i>			S5		✓	1			1
Chipping Sparrow	<i>Spizella passerina</i>			S5B		✓		3	1	4
Eastern Kingbird	<i>Tyrannus tyrannus</i>			S4	✓	✓	1	2		3
Eastern Meadowlark	<i>Sturnella magna</i>	THR	THR	S4B		✓			1	1
Eastern Phoebe	<i>Sayornis phoebe</i>			S5	✓	✓	1			1
Eastern Towhee	<i>Pipilo erythrophthalmus</i>			S4B	✓		1	1		2
Eastern Wood-Pewee	<i>Contopus virens</i>	SC	SC	S4	✓	✓		1	3	4
European Starling	<i>Sturnus vulgaris</i>			SNA	✓	✓	1		2	3
Field Sparrow	<i>Spizella pusilla</i>			S4B	✓	✓			2	2
Gray Catbird	<i>Dumetella carolinensis</i>			S4	✓		1			1
Great Egret	<i>Ardea alba</i>			S2B		✓			1	1
Great Crested Flycatcher	<i>Myiarchus crinitus</i>			S4	✓				2	2
Hairy Woodpecker	<i>Picoides villosus</i>			S5		✓			2	2
House Wren	<i>Troglodytes aedon</i>			SNA	✓	✓		2	2	4
Indigo Bunting	<i>Passerina cyanea</i>			S4	✓	✓	1	4	3	8
Killdeer	<i>Charadrius vociferus</i>			S5B		✓			1	1

Appendix C - Conn Pit Bird List

Common Name	Scientific Name	ESA Status	COSEWIC Status	NHIC Prov Rank Status	Breeding Bird Surveys		Existing Pit	Proposed Expansion Area	Within 120 m adjacent	Total Individuals
					17-Jun-15	2-Jul-15				
Least Flycatcher	<i>Empidonax minimus</i>			S4B	✓			1	2	3
Mallard	<i>Anas platyrhynchos</i>			S5	✓		1			1
Mourning Dove	<i>Zenaidura macroura</i>			S5	✓	✓	1		4	5
Mourning Warbler	<i>Geothlypis philadelphia</i>			S4B	✓				2	2
Northern Flicker	<i>Colaptes auratus</i>			S4	✓	✓	1	1	5	7
Ovenbird	<i>Seiurus aurocapilla</i>			S4B	✓			3	3	6
Red-tailed Hawk	<i>Buteo jamaicensis</i>			S4		✓	1			1
Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>			S4B	✓	✓	2	5	4	11
Red-breasted Nuthatch	<i>Sitta canadensis</i>			S5	✓				1	1
Red-eyed Vireo	<i>Vireo olivaceus</i>			S5	✓	✓		5	6	11
Red-winged Blackbird	<i>Agelaius phoeniceus</i>			S4	✓	✓	6	3	6	15
Scarlet Tanager	<i>Piranga olivacea</i>			S4B	✓	✓		1	1	2
Song Sparrow	<i>Melospiza melodia</i>			S5	✓	✓	10	5	7	22
Spotted Sandpiper	<i>Actitis macularia</i>			S5	✓		2			2
Veery	<i>Catharus fuscescens</i>			S4B	✓			3		3
Warbling Vireo	<i>Vireo gilvus</i>			S5	✓				1	1
Wood Thrush	<i>Hylocichla mustelina</i>	SC	SC	S4B	✓	✓		2	2	4
White-breasted Nuthatch	<i>Sitta carolinensis</i>			S5	✓				1	1
Wild Turkey	<i>Meleagris gallopavo</i>			S5		✓		3		3
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>			S4B	✓				1	1
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>			S5B	✓	✓		2	3	5
Yellow Warbler	<i>Setophaga petechia</i>			S5	✓		2			2
TOTAL INDIVIDUALS							39	70	97	206
TOTAL SPECIES							21	26	38	51

Appendix D

Butternut Health Assessment

December 17, 2015

Romas Kartavicius,
2223117 Ontario Inc.
1443 Hurontario Street
Mississauga, Ontario
L5G 3H5

Dear Mr. Kartavicius:

Project No: 60431371

Regarding: Butternut Health Assessor's Report

We are pleased to provide you with the attached report which contains the results of the Butternut health assessment that took place within the proposed Conn Pit expansion area (Part N ½ Lot 6, Concession 4 in the Township of Blue Mountains in the County of Grey) by a designated Butternut Health Assessor (BHA). Butternut is listed as an endangered species on the Species at Risk in Ontario List, and as such, it is protected under the *Endangered Species Act, 2007* (ESA) from being killed, harmed, or removed unless eligible, in accordance with Ontario Regulation 242/08 under the ESA.

If you have questions about this report please do not hesitate to contact me at 905-747-7566.

Sincerely,
AECOM Canada Ltd.

James Kamstra, B.Sc., M.E.S
Senior Ecologist
James.Kamstra@aecom.com

Encl.

1. Information from the Ministry of Natural Resources and Forestry about Butternut and the *Endangered Species Act, 2007*
2. Butternut Health Assessor's Report
3. Original data forms
4. Electronic and printed copies of the Excel data spreadsheet (BHA Tree Analysis)

**Ministry of Natural
Resources and Forestry****Species At Risk**
P.O. Box 7000, 300 Water
Street
Peterborough ON K9J 8M5**Ministère des Richesses
naturelles et des Forêts****Espèces en péril**
C.P. 7000, 300, rue Water
Peterborough ON K9J 8M5

The enclosed Butternut Health Assessor's Report documents the results of the Butternut health assessment that was conducted by the designated Butternut Health Assessor (BHA) identified in the top section of the report. If there are other Butternut trees (of any size or age) at the site that may be affected by the activity and they are not identified in the enclosed BHA Report, they too must be assessed by a designated BHA.

Butternut is listed as an endangered species on the Species at Risk in Ontario List, and as such, it is protected under the *Endangered Species Act, 2007* (ESA) from being killed, harmed, or removed. If you are planning to undertake an activity that may affect Butternut, you may be eligible to follow the requirements set out in section 23.7 of Ontario Regulation 242/08 under the ESA, or you may need to seek an authorization under the ESA (e.g., a permit).

Please visit e-laws at the link provided below for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled. Information about Butternut is also available at: <http://www.ontario.ca/environment-and-energy/butternut-trees-your-property>.

If you are eligible to kill, harm or take Butternut under section 23.7 of the regulation, your first step is to submit the BHA Report and the original data forms enclosed in this package to the local Ministry of Natural Resources and Forestry (MNRF) District Manager. Note that MNRF cannot accept photocopies or scanned electronic copies of the data forms.

Note regarding changes:

If the enclosed BHA Report does not identify which Butternut tree(s) are proposed to be killed, harmed, or taken in Table 1 (i.e., if "unknown" is indicated in the second last column of Table 1), or, if the information in the last two columns of Table 1 has changed since the date this BHA Report was produced, **do not make any edits to the BHA Report**. Instead, please attach a cover letter that identifies which Butternut tree(s) are proposed to be killed, harmed, or taken (by referencing the tree identification numbers) when you submit the enclosed BHA Report to the local MNRF District Manager.

The BHA Report must be submitted at least 30 days prior to registering an eligible activity to kill, harm, or remove a Butternut tree. During this 30 day period, no Butternut trees (of any category) may be killed, harmed, or removed, and MNRF may contact you for an opportunity

to examine the trees. If MNRF chooses to examine the trees, a representative of MNRF will contact you using the information you supplied when you submitted the BHA Report.

If you are eligible to follow the rules in regulation under section 23.7, you may register your activity using the “Notice of Butternut Impact” form on the [MNRF Registry](#) **after the 30 day period has elapsed**.

If you are **not** eligible to follow the rules in regulation under section 23.7, please contact the local MNRF district office to determine whether you will need to seek an authorization (e.g., a permit). A link to the directory of MNRF offices is provided below.

Note that municipal by-laws and legislation other than the ESA may also be applicable to the removal or harming of trees.

Please retain this information and a copy of the BHA Report (including copies of all data forms) for your records, along with any other documentation you may receive from MNRF should an examination of the trees occur. If you have any questions, please contact your local MNRF district office.

Links:

Endangered Species Act, 2007:

http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Ontario Regulation 242/08 (refer to section 23.7):

http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm

MNRF Office Locations:

<https://www.ontario.ca/government/ministry-natural-resources-and-forestry-regional-and-district-offices>

Butternut Health Assessor's Report Number: 039-001

James Kamstra BHA Identification # 039
105 Commerce Valley Drive West,
Markham, Ontario
L3T 7W3
905-747-7566
James.Kamstra@aecom.com

Romas Kartavicius,
2223117 Ontario Inc.
1443 Hurontario Street
Mississauga, Ontario
L5G 3H5
romas@edenoak.com

Site location: Part N ½ Lot 6, Concession 4, Township of Blue Mountains

Date(s) of Butternut health assessment: June 17 & July 2, 2015

Date BHA Report prepared: December 16, 2015

Map datum used: ☒ NAD83 ☐ WGS84

Total number of trees assessed in this BHA Report: 16

The assessed trees were numbered on site using orange flagging tape. The numbers at the site correspond to the tree numbers referenced in this report.

This BHA Report includes the following tables:

- Table 1: Butternut Trees Assessed
- Table 2: Trees Determined by BHA to be Butternut Hybrids
- Table 3: Summary of Assessment Results

Table 1: Butternut Trees Assessed

Tree #	UTM coordinates	Category ¹ (1, 2, or 3 ²)	dbh ³ (cm)	Cultivated? (Y/N)	Proposed to be: (enter one: unknown ⁴ , killed, harmed or taken)	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:
--------	-----------------	---	-----------------------	----------------------	--	---

¹ The extent to which the tree is affected by Butternut Canker is presented in the Excel document titled, "BHA Tree Analysis" that accompanies this BHA Report.

² Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08.

³ dbh: diameter at breast height, rounded to nearest cm (if tree is shorter than breast height, enter zero)

⁴ In this column, "unknown" indicates that at the time of assessment, there are no proposals to kill, harm or take this tree that are known to the BHA.

Tree #	UTM coordinates	Category ¹ (1, 2, or 3 ²)	dbh ³ (cm)	Cultivated? (Y/N)	Proposed to be: (enter one: unknown ⁴ , killed, harmed or taken)	If tree is proposed to be killed, harmed, or taken, indicate reason tree is proposed to be killed, harmed or taken:
1	17T 553810 4920310	2	3	N	N/A	Existing quarry expansion
2	17T 553875 4920485	2	0	N	N/A	Existing quarry expansion
3	17T 553885 4920427	1	7	N	unknown	Existing quarry expansion
4	17T 553817 4920426	1	3	N	unknown	Existing quarry expansion
5	17T 553815 4920460	1	0	N	unknown	Existing quarry expansion
6	17T 553832 4920465	1	7	N	unknown	Existing quarry expansion
7	17T 553782 4920478	1	1	N	unknown	Existing quarry expansion
8	17T 553770 4920477	2	2	N	Killed	Existing quarry expansion
9	17T 553755 4920445	2	8	N	unknown	Existing quarry expansion
10	17T 553770 4920430	1	4	N	unknown	Existing quarry expansion
11	17T 553885 4920445	1	12	N	unknown	Existing quarry expansion
12	17T 553865 4920428	1	7	N	unknown	Existing quarry expansion
13	17T 553850 4920420	1	5	N	unknown	Existing quarry expansion
14	17T 553740 4920375	2	8	N	Harmed	Existing quarry expansion
15	17T 553730 4920508	2	0	N	Killed	Existing quarry expansion
16	17T 553843 4920320	2	10	N	N/A	Existing quarry expansion

Table 2: Summary of Assessment Results

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
Category 1	9	<ul style="list-style-type: none"> A Category 1 tree is one that is affected by butternut canker to such an advanced degree that retaining the tree would not support the protection or recovery of butternut in the area in which the tree is located; and is considered “non-retainable”. During the 30 day period that follows your submission of this BHA Report to the MNRF

Result:	Total #:	Important information for persons planning activities that may affect Butternut:
		<p>District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNRF may contact you for an opportunity to examine the trees.</p> <ul style="list-style-type: none"> Category 1 trees may be killed, harmed or taken after the 30 day period that follows submission of this BHA Report to the MNRF District Manager, unless the results of an MNRF examination indicate that the assessment has not been conducted in accordance with the document entitled "Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the <i>Endangered Species Act, 2007</i>".
Category 2	7	<ul style="list-style-type: none"> A Category 2 tree is one that is not affected by Butternut Canker, or is affected by Butternut Canker but the degree to which it is affected is not too advanced and retaining the tree could support the protection or recovery of butternut in the area in which the tree is located, and is considered "retainable". During the 30 day period that follows your submission of this BHA Report to the MNRF District Manager, no Butternut trees (of Category 1, 2, or 3) may be killed, harmed, or taken, and MNRF may contact you for an opportunity to examine the trees. Activities that may kill, harm or take up to a maximum of ten (10) Category 2 trees may be eligible to follow the rules in section 23.7 of Ontario Regulation 242/08, in accordance with the conditions and requirements set out in the regulation. Refer to e-Laws for the legal requirements of eligible activities under section 23.7 of Ontario Regulation 242/08 and conditions that must be fulfilled: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080242_e.htm Activities that may kill, harm or take more than ten (10) Category 2 trees are not eligible to follow the rules in section 23.7 of Ontario Regulation 242/08. Contact the local MNRF district office for information on how to seek an ESA authorization (e.g., a permit) or consider an alternative that would be eligible for the regulation.
Category 3	0	<ul style="list-style-type: none"> A Category 3 tree is one that may be useful in determining sources of resistance to Butternut Canker, and is considered "archivable". Category 3 trees are not eligible to be killed, harmed or taken under section 23.7 of Ontario Regulation 242/08. Contact the local MNRF district office for information on how to seek an ESA authorization, or consider an alternative that will avoid killing, harming or taking any Category 3 trees.
Cultivated	0	<ul style="list-style-type: none"> An activity that involves killing, harming, or taking a cultivated Butternut tree that was not required to be planted to fulfill a condition of an ESA permit or a condition of a regulation, may be eligible for the exemption provided by subsection 23.7 (11) of O. Reg. 242/08. Prior to undertaking the activity, the owner or occupier of the land on which the Butternut is located (or person acting on their behalf) will need to determine whether the exemption for cultivated trees is applicable by determining whether or not the tree was cultivated as a result of the requirements for an exemption under O. Reg. 242/08 or a condition of a permit issued under the ESA. This information can be accessed by contacting the local MNRF district office. The owner or occupier of the land on which the Butternut is located (or person acting on their behalf) is encouraged to append the details regarding whether the tree was planted to satisfy a requirement (e.g., the permit number or registration number) to this BHA Report for their records.
Hybrid	0	<ul style="list-style-type: none"> Hybrid Butternut trees are not protected under the ESA, but their removal may be subject to municipal by-laws and other legislation.

Butternut Health Assessor's Comments:

16 Butternuts, all were quite small and most were seedlings or saplings in one deciduous woodlot. Only two retainables are within the portion of woodlot that is proposed for removal and one other is within 25 m.

This concludes the summary of the BHA Report. A complete BHA Report must also include:

1. All original (hard copy) data forms (i.e., all completed sets of Form 1 and Form 2),
and
2. Electronic and printed copies of the Excel data analysis spreadsheet.

Butternut Data Collection Form 1 - 2010 Edition

Surveyor ID
or BHA # **39**

(PLEASE USE BLOCK LETTERS)

Date (dd/mm/yyyy)

02-07-2015

Shaded fields are mandatory for Butternut Health Assessments

Surveyor Contact
First **JAMES** Last **KAMSTRA**
Email _____
Telephone (**905**) **747-7566** Telephone Other () - - X

Property Owner
(check if same as surveyor) ☐
First **ROMAS** Last **KARTAVICIUS**
or Company **2223117 ONTARIO INC.**
Email **ROMAS@EDENOAK.COM**
Telephone () - - Telephone Other () - - X

Property Owner's Mailing address
Address **1443 HURONTARIO STREET** Postal Code **L5G3H5** Prov. **ON**
City **MISSISSAUGA**

Tree Location (if different from mailing address)
Address/(911#) _____
Township **BLUE MOUNTAINS** Lot **N6** Con. **4**
City **BLUE MOUNTAINS**

Directions
Woodlot is South of 6th Sideroad, West of 3rd Line

☒ Yes ☐ No Can Share Location Information with other Butternut Recovery Organizations?
☒ Yes ☐ No Site visits OK? (prior arrangements will always be made for a site visit)

> (Greater than)
< (Less than)

Butternut Trees Tally by Diameter Class
(Do a dot tally in blank space; write total# in box for each)

Tree Condition	< 3 cm	3-15 cm	16-30cm	>30 cm
Vigorous: > 50% Live Crown Minor or no cankers	:: 4	: 2		
Poor Vigor: <50% Live Crown or >50% Live Crown + heavily cankered stem	:: 3	: 7		
Dead				

Overall Property Description
(area(s) containing Butternut)

☒ Rolling Upland ☐ Bottomland
☐ Valley Slope ☐ Variable
☐ Tableland ☐ Unknown

Vegetation Community/ies

☐ Open ☐ Fencerow
☐ Shrubland ☐ Roadside
☒ Deciduous Forest ☐ Quarry
☐ Conifer Forest ☐ Urban Yard
☐ Mixed Forest ☐ Urban Park

Other

Historically, do some trees produce seeds? ☐ Y ☐ N ☒ Unknown

Estimated area containing butternut
for properties > 1 acre (0.4 hectares): **5** Acres ☒ Hectares

Soil Drainage
☒ Well Drained
☐ Moderately Drained
☐ Poorly Drained
☐ Unknown

Soil Depth
☒ > 1metre
☐ 30 - 99cm
☐ < 30cm
☐ Variable
☐ Unknown

Soil Texture
☐ Clay ☐ Sand
☐ Clay Loam ☐ Variable
☐ Loam ☐ Unknown
☒ Loamy Sand

Please enter matching numerical page link code on forms 1 and 2

Page Link **39-1**

(Contact Information follows all applicable privacy policies and guidelines)

Please return forms to:
Forest Gene Conservation Association
Suite 233, 266 Charlotte St.
Peterborough, ON, K9J 2V4
www.fgca.net

49731

W/15

8

↳ removed

1, 2, 16

↳ no

14 named

Butternut Data Collection FORM 2 (2010 Edition)

(PLEASE USE
BLOCK LETTERS)Fill when Form 1 indicates canker is well
established. The information on Form 2
must be filled out for all trees when doing a
Butternut Health Assessment.**Shaded fields are mandatory for Butternut Health Assessments**

Site Code(A,B,...Z, AA,...)

Surveyor ID
or BHA #

39

Date (dd/mm/yyyy)

17-06-2015

Surveyor Last Name

KAMSTRA

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree #	Zone	Easting	Northing
1	1	7553810	4920320

4	Crown Class	100	Live Crown %	2	Main Stem Length(m)	Below crown	Seed Signs
<input type="checkbox"/>	Twig Dieback	1	#Stems	<input type="checkbox"/>	Butternut Origin	<input type="checkbox"/>	Male Flowers
<input type="checkbox"/>	Branch Dieback			<input checked="" type="checkbox"/>	Natural	<input type="checkbox"/>	Female Flowers
<input type="checkbox"/>	Defoliation			<input type="checkbox"/>	Planted	<input type="checkbox"/>	Seed Set
<input type="checkbox"/>	Discolouration		3	DBH(cm)	<input type="checkbox"/>	Unknown	None

Assess below live crown

<input type="checkbox"/>	#Epic-Live	#Open	#Sooty
<input type="checkbox"/>	#Epic-Dead	Root	
5	Bark Type	=<2m	1
<input type="checkbox"/>	# Callused Wounds	>2m	

Metres from badly cankered tree

☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C	C

Tree #	Zone	Easting	Northing
2	1	7553875	4920485

4	Crown Class	100	Live Crown %		Main Stem Length(m)	Below crown	Seed Signs
<input type="checkbox"/>	Twig Dieback	1	#Stems	<input type="checkbox"/>	Butternut Origin	<input type="checkbox"/>	Male Flowers
<input type="checkbox"/>	Branch Dieback			<input checked="" type="checkbox"/>	Natural	<input type="checkbox"/>	Female Flowers
<input type="checkbox"/>	Defoliation			<input type="checkbox"/>	Planted	<input type="checkbox"/>	Seed Set
<input type="checkbox"/>	Discolouration		0	DBH(cm)	<input type="checkbox"/>	Unknown	None

Assess below live crown

<input type="checkbox"/>	#Epic-Live	#Open	#Sooty
<input type="checkbox"/>	#Epic-Dead	Root	
S	Bark Type	=<2m	
<input type="checkbox"/>	# Callused Wounds	>2m	

Metres from badly cankered tree

☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C	C

Tree #	Zone	Easting	Northing
3	1	7553885	4920427

4	Crown Class	60	Live Crown %	3	Main Stem Length(m)	Below crown	Seed Signs
<input type="checkbox"/>	Twig Dieback	1	#Stems	<input type="checkbox"/>	Butternut Origin	<input type="checkbox"/>	Male Flowers
<input checked="" type="checkbox"/>	Branch Dieback			<input checked="" type="checkbox"/>	Natural	<input type="checkbox"/>	Female Flowers
<input type="checkbox"/>	Defoliation			<input type="checkbox"/>	Planted	<input type="checkbox"/>	Seed Set
<input type="checkbox"/>	Discolouration		7	DBH(cm)	<input type="checkbox"/>	Unknown	None

Assess below live crown

<input type="checkbox"/>	#Epic-Live	#Open	#Sooty
<input type="checkbox"/>	#Epic-Dead	Root	
D	Bark Type	=<2m	2 1 2
<input type="checkbox"/>	# Callused Wounds	>2m	

Metres from badly cankered tree

☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C	C

Tree #	Zone	Easting	Northing
4	1	7553817	4920463

4	Crown Class	85	Live Crown %	2	Main Stem Length(m)	Below crown	Seed Signs
<input checked="" type="checkbox"/>	Twig Dieback	1	#Stems	<input type="checkbox"/>	Butternut Origin	<input type="checkbox"/>	Male Flowers
<input type="checkbox"/>	Branch Dieback			<input checked="" type="checkbox"/>	Natural	<input type="checkbox"/>	Female Flowers
<input type="checkbox"/>	Defoliation			<input type="checkbox"/>	Planted	<input type="checkbox"/>	Seed Set
<input type="checkbox"/>	Discolouration		3	DBH(cm)	<input type="checkbox"/>	Unknown	None

Assess below live crown

<input type="checkbox"/>	#Epic-Live	#Open	#Sooty
<input type="checkbox"/>	#Epic-Dead	Root	
S	Bark Type	=<2m	1 2
<input type="checkbox"/>	# Callused Wounds	>2m	

Metres from badly cankered tree

☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C	C

Tree #	Zone	Easting	Northing
5	1	7553815	4920460

4	Crown Class	100	Live Crown %	1	Main Stem Length(m)	Below crown	Seed Signs
<input type="checkbox"/>	Twig Dieback	2	#Stems	<input type="checkbox"/>	Butternut Origin	<input type="checkbox"/>	Male Flowers
<input type="checkbox"/>	Branch Dieback			<input checked="" type="checkbox"/>	Natural	<input type="checkbox"/>	Female Flowers
<input type="checkbox"/>	Defoliation			<input type="checkbox"/>	Planted	<input type="checkbox"/>	Seed Set
<input type="checkbox"/>	Discolouration		0	DBH(cm)	<input type="checkbox"/>	Unknown	None

Assess below live crown

<input type="checkbox"/>	#Epic-Live	#Open	#Sooty
<input type="checkbox"/>	#Epic-Dead	Root	
S	Bark Type	=<2m	2
<input type="checkbox"/>	# Callused Wounds	>2m	

Metres from badly cankered tree

☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C	C

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Fill when Form 1 indicates canker is well
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must be filled out for all trees when doing a
Butternut Health Assessment.

Shaded fields are mandatory for Butternut Health Assessments

Site Code(A,B,...Z, AA,...)

Surveyor ID
or BHA #

39

Date (dd/mm/yyyy)

17-06-2015

Surveyor Last Name

KAMSTRA

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree #	Zone	Easting	Northing
6	1	7553832	4920465

4 Crown Class 100 Live Crown % 3 Main Stem Length(m)
Below crown Seed Signs
Butternut Origin Male Flowers
Natural Female Flowers
Planted Seed Set
Unknown None

Twig Dieback 1 #Stems
Branch Dieback
Defoliation 7 DBH(cm)
Discolouration

Assess below live crown

#Epic-Live	#Open	#Sooty
	1	
		2

Bark Type =<2m
Callused Wounds >2m

Metres from badly cankered tree
☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C	C
---	---	---	---	---	---	---

Tree #	Zone	Easting	Northing
7	1	7553782	4920478

4 Crown Class 65 Live Crown % 1 Main Stem Length(m)
Below crown Seed Signs
Butternut Origin Male Flowers
Natural Female Flowers
Planted Seed Set
Unknown None

Twig Dieback 2 #Stems
Branch Dieback
Defoliation 1 DBH(cm)
Discolouration

Assess below live crown

#Epic-Live	#Open	#Sooty
	1	1

Bark Type =<2m
Callused Wounds >2m

Metres from badly cankered tree
☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C	C
---	---	---	---	---	---	---

Tree #	Zone	Easting	Northing
8	1	7553770	4920477

4 Crown Class 100 Live Crown % 2 Main Stem Length(m)
Below crown Seed Signs
Butternut Origin Male Flowers
Natural Female Flowers
Planted Seed Set
Unknown None

Twig Dieback 1 #Stems
Branch Dieback
Defoliation 2 DBH(cm)
Discolouration

Assess below live crown

#Epic-Live	#Open	#Sooty

Bark Type =<2m
Callused Wounds >2m

Metres from badly cankered tree
☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C	C
---	---	---	---	---	---	---

Tree #	Zone	Easting	Northing
9	1	7553755	4920445

4 Crown Class 95 Live Crown % 3 Main Stem Length(m)
Below crown Seed Signs
Butternut Origin Male Flowers
Natural Female Flowers
Planted Seed Set
Unknown None

Twig Dieback #Stems
Branch Dieback
Defoliation 8 DBH(cm)
Discolouration

Assess below live crown

#Epic-Live	#Open	#Sooty
	2	4

Bark Type =<2m
Callused Wounds >2m

Metres from badly cankered tree
☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C	C
---	---	---	---	---	---	---

Tree #	Zone	Easting	Northing
10	1	7553770	4920430

4 Crown Class 95 Live Crown % 2 Main Stem Length(m)
Below crown Seed Signs
Butternut Origin Male Flowers
Natural Female Flowers
Planted Seed Set
Unknown None

Twig Dieback #Stems
Branch Dieback
Defoliation 4 DBH(cm)
Discolouration

Assess below live crown

#Epic-Live	#Open	#Sooty
	3	
	2	

Bark Type =<2m
Callused Wounds >2m

Metres from badly cankered tree
☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C	C
---	---	---	---	---	---	---

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Shaded fields are mandatory for Butternut Health Assessments

Site Code(A,B,...Z, AA...)

Surveyor ID
or BHA#

39

Date (dd/mm/yyyy)

02-07-2015

Surveyor Last Name

KAMSTRA

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree # Zone Easting Northing
11 17 553885 4920445

Crown Class 4 Live Crown % 95 Main Stem Length(m) 4 Below crown 4
Butternut Signs
Origin Natural Male Flowers
Planted Female Flowers
Unknown None Seed Set

Twig Dieback
Branch Dieback 1 #Stems
Defoliation
Discolouration 12 DBH(cm)

Assess below live crown

#Epic-Live
#Epic-Dead
Bark Type
Callused Wounds
Root #Open #Sooty
=<2m 10 8
>2m

Metres from badly cankered tree

< 40 > 40 None Found

Competing Species

ACESACC

Tree # Zone Easting Northing
12 17 553865 4920428

Crown Class 4 Live Crown % 95 Main Stem Length(m) 3 Below crown 3
Butternut Signs
Origin Natural Male Flowers
Planted Female Flowers
Unknown None Seed Set

Twig Dieback
Branch Dieback 1 #Stems
Defoliation
Discolouration 7 DBH(cm)

Assess below live crown

#Epic-Live
#Epic-Dead
Bark Type
Callused Wounds
Root #Open #Sooty
=<2m 2 10
>2m

Metres from badly cankered tree

< 40 > 40 None Found

Competing Species

ACESACC

Tree # Zone Easting Northing
13 17 553850 4920420

Crown Class 4 Live Crown % 95 Main Stem Length(m) 2 Below crown 2
Butternut Signs
Origin Natural Male Flowers
Planted Female Flowers
Unknown None Seed Set

Twig Dieback
Branch Dieback 1 #Stems
Defoliation
Discolouration 5 DBH(cm)

Assess below live crown

#Epic-Live
#Epic-Dead
Bark Type
Callused Wounds
Root #Open #Sooty
=<2m 1 5
>2m

Metres from badly cankered tree

< 40 > 40 None Found

Competing Species

ACESACC

Tree # Zone Easting Northing
14 17 553740 4920375

Crown Class 4 Live Crown % 100 Main Stem Length(m) 2 Below crown 2
Butternut Signs
Origin Natural Male Flowers
Planted Female Flowers
Unknown None Seed Set

Twig Dieback
Branch Dieback 1 #Stems
Defoliation
Discolouration 8 DBH(cm)

Assess below live crown

#Epic-Live
#Epic-Dead
Bark Type
Callused Wounds
Root #Open #Sooty
=<2m
>2m

Metres from badly cankered tree

< 40 > 40 None Found

Competing Species

ACESACC

Tree # Zone Easting Northing
15 17 553730 4920508

Crown Class 4 Live Crown % 100 Main Stem Length(m) Below crown
Butternut Signs
Origin Natural Male Flowers
Planted Female Flowers
Unknown None Seed Set

Twig Dieback
Branch Dieback 1 #Stems
Defoliation
Discolouration 0 DBH(cm)

Assess below live crown

#Epic-Live
#Epic-Dead
Bark Type
Callused Wounds
Root #Open #Sooty
=<2m
>2m

Metres from badly cankered tree

< 40 > 40 None Found

Competing Species

ACESACC

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Butternut Data Collection FORM 2 (2010 Edition)

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Fill when Form 1 Indicates canker is well established. The information on Form 2 must be filled out for all trees when doing a Butternut Health Assessment.

Site Code(A,B,...Z, AA...)

Surveyor ID
or BHA #

39

Date (dd/mm/yyyy)

17-06-2015

Surveyor Last Name

KAMSTRA

Tree ID Numbering: 1,2,3,...Starting from 1 for each site

Tree #	Zone	Easting	Northing
1	6	17553843	4920320

4 Crown Class 100 Live Crown % 3 Main Stem Length(m)
Below crown Seed Signs
Butternut Origin Male Flowers
Natural Female Flowers
Planted Seed Set
Unknown None

☐ Twig Dieback ☐ #Stems
☐ Branch Dieback ☐
☐ Defoliation ☐
☐ Discolouration ☐ DBH(cm)

Assess below live crown

#Epic-Live	#Open	#Sooty
#Epic-Dead	Root	
Bark Type	=<2m	3
# Callused Wounds	>2m	

Metres from badly cankered tree
☐ < 40 ☐ > 40 ☐ None Found

Competing Species

A	C	E	S	A	C

Tree #	Zone	Easting	Northing
	1		

Crown Class Live Crown % Main Stem Length(m)
Below crown Seed Signs
Butternut Origin Male Flowers
Natural Female Flowers
Planted Seed Set
Unknown None

☐ Twig Dieback ☐ #Stems
☐ Branch Dieback ☐
☐ Defoliation ☐
☐ Discolouration ☐ DBH(cm)

Assess below live crown

#Epic-Live	#Open	#Sooty
#Epic-Dead	Root	
Bark Type	=<2m	
# Callused Wounds	>2m	

Metres from badly cankered tree
☐ < 40 ☐ > 40 ☐ None Found

Competing Species

Tree #	Zone	Easting	Northing
	1		

Crown Class Live Crown % Main Stem Length(m)
Below crown Seed Signs
Butternut Origin Male Flowers
Natural Female Flowers
Planted Seed Set
Unknown None

☐ Twig Dieback ☐ #Stems
☐ Branch Dieback ☐
☐ Defoliation ☐
☐ Discolouration ☐ DBH(cm)

Assess below live crown

#Epic-Live	#Open	#Sooty
#Epic-Dead	Root	
Bark Type	=<2m	
# Callused Wounds	>2m	

Metres from badly cankered tree
☐ < 40 ☐ > 40 ☐ None Found

Competing Species

Tree #	Zone	Easting	Northing
	1		

Crown Class Live Crown % Main Stem Length(m)
Below crown Seed Signs
Butternut Origin Male Flowers
Natural Female Flowers
Planted Seed Set
Unknown None

☐ Twig Dieback ☐ #Stems
☐ Branch Dieback ☐
☐ Defoliation ☐
☐ Discolouration ☐ DBH(cm)

Assess below live crown

#Epic-Live	#Open	#Sooty
#Epic-Dead	Root	
Bark Type	=<2m	
# Callused Wounds	>2m	

Metres from badly cankered tree
☐ < 40 ☐ > 40 ☐ None Found

Competing Species

Tree #	Zone	Easting	Northing
	1		

Crown Class Live Crown % Main Stem Length(m)
Below crown Seed Signs
Butternut Origin Male Flowers
Natural Female Flowers
Planted Seed Set
Unknown None

☐ Twig Dieback ☐ #Stems
☐ Branch Dieback ☐
☐ Defoliation ☐
☐ Discolouration ☐ DBH(cm)

Assess below live crown

#Epic-Live	#Open	#Sooty
#Epic-Dead	Root	
Bark Type	=<2m	
# Callused Wounds	>2m	

Metres from badly cankered tree
☐ < 40 ☐ > 40 ☐ None Found

Competing Species

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BHA Tree Analysis (version: December 2013)

This table is to be completed by a designated Butternut Health Assessor (BHA).

BHA Report #	2015-1	Assessment Date(s)	June 17 & July 2, 2015				Total # Butternut Trees in BHA Report				16									
BHA ID #	39	BHA Name	James Kamstra																	
Landowner / Client Name			Eden Oak Gravel Pit																	
Property Location			17T 553800 4920400																	
input field data									automatic calculations from field data						Categories:					
Tree #	Live Crown %	Tree dbh (cm)	# bole cankers				# root flare (RF) cankers		<40 m from cankered tree? (Y or N)	Circ. (cm) = Pi x dbh	total bole canker width (sooty x 2.5 + open x 5)	total RF canker width (sooty x 2.5 + open x 5)	bole canker % of circ.	RF canker % of circ.	total bole & root canker % of 2xCirc	1: non-retainable, 2: retainable, 3: archivable				FINAL TREE CALL a Cat 2, dbh>20cm <40m from a Cat 1
			sooty (S) (will be assigned 2.5 cm per canker)		open (O) (will be assigned 5 cm per canker)		RF S	RF O								LC% >= 50 & BC% = 0	LC% >70 & BRC % <20	LC% >70 & BC % <20	Preliminary tree call	
			S <2 m	S >2 m	O <2 m	O >2 m														
1	100	3	1						9.42	2.5	0.0	26.5	0.0	13.3	1	2	1	2	2	
2	100	1							3.14	0.0	0.0	0.0	0.0	0.0	2	2	2	2	2	
3	60	7	12		2				21.98	40.0	0.0	182.0	0.0	91.0	1	1	1	1	1	
4	85	3			2			1	9.42	10.0	5.0	106.2	53.1	79.6	1	1	1	1	1	
5	100	1	2						3.14	5.0	0.0	159.2	0.0	79.6	1	1	1	1	1	
6	100	7	2		1				21.98	10.0	0.0	45.5	0.0	22.7	1	1	1	1	1	
7	65	1	1		1				3.14	7.5	0.0	238.9	0.0	119.4	1	1	1	1	1	
8	100	2							6.28	0.0	0.0	0.0	0.0	0.0	2	2	2	2	2	
9	95	8	4		2		2		25.12	20.0	5.0	79.6	19.9	49.8	1	1	1	1	1	
10	95	4			2			3	12.56	10.0	15.0	79.6	119.4	99.5	1	1	1	1	1	
11	95	12	10					2	37.68	25.0	10.0	66.3	26.5	46.4	1	1	1	1	1	
12	95	7	10		2			1	21.98	35.0	5.0	159.2	22.7	91.0	1	1	1	1	1	
13	95	5	5					1	15.7	12.5	5.0	79.6	31.8	55.7	1	1	1	1	1	
14	100	8						2	25.12	0.0	10.0	0.0	39.8	19.9	2	2	2	2	2	
15	100	1							3.14	0.0	0.0	0.0	0.0	0.0	2	2	2	2	2	
16	100	10	3					1	31.4	7.5	5.0	23.9	15.9	19.9	1	2	1	2	2	

Appendix E

Significant Wildlife Habitat Assessment

Appendix E. Significant Wildlife Habitat Assessment following Ecoregion 6E Criterion Schedule*



Table 1.1: Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate or Confirmed Habitat Present Within the Study Area	Conclusions/Recommendations
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
Waterfowl Stopover and Staging Areas (Terrestrial)	American Black Duck Northern Pintail Gadwall Blue-winged Teal Green-winged Teal American Wigeon Northern Shoveler Tundra Swan	CUM1, CUT1, and agriculture fields where evidence of annual spring flooding from melt water or run-off	<ul style="list-style-type: none">Fields with temporary sheet water utilized by staging waterfowl during Spring (mid March to May).	Studies verified presence of an annual concentration of any listed and follow conditions: <ul style="list-style-type: none">Any mixed species aggregations of 100 or more individuals.The area of the flooded field ecosite habitat plus a 100-300m radius.Annual use of habitat is documented from information sources or field studies	No fields present in study area where evidence of spring flooding	This type of SWH is not present
Waterfowl Stopover and Staging Areas (Aquatic)	All waterfowl species except Mallard and Mute Swan	MAS, SAS, SAM, SAF, SWD	<ul style="list-style-type: none">Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration.These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water);	Studies verified presence of: <ul style="list-style-type: none">Aggregations of 100 or more of listed species for 7 days, results in > 700 waterfowl use days.Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWHThe combined area of the ELC ecosites and a 100m radius area is the SWH	No large marshes, or ponds suitable for waterfowl staging present in study area	This type of SWH is not present
Shorebird Migratory Stopover Area	All migratory shorebirds	BBO, BBS, BBT, SDO, SDS, SDT, MAM	<ul style="list-style-type: none">Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats.Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores	Studies confirming: <ul style="list-style-type: none">Presence of 3 or more of listed species and > 1000 shorebird use days during spring or fall migration period.Any site with >100 Whimbrel used for 3 years or more.The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area	No shoreline of lakes or wetlands suitable for shorebird staging present in study area	This type of SWH is not present
Raptor Wintering Area	Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl <u>Special Concern:</u> Short-eared Owl Bald Eagle	<u>Hawks/Owls</u> FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. <u>Bald Eagle:</u> FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or lakes with open water	<ul style="list-style-type: none">The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors.Raptor wintering sites need to be > 20 ha with a combination of forest and upland..Fallow or lightly grazed field/meadow (>15ha) with adjacent woodlandsEagle sites have open water and large trees and snags available for roosting.	Studies confirm the use of these habitats by: <ul style="list-style-type: none">One or more Short-eared Owls or;At least 10 individuals and two listed spp.Must be used regularly (3 in 5 years) for a minimum of 20 days by the above number of birds.The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area.	Fields in study area much <15 ha and therefore would not qualify as Raptor Wintering Habitat	This type of SWH is not present
Bat Hibernacula	Big Brown Bat Tri-colored Bat	Bat Hibernacula may be found in these ecosites: CCR, CCA	<ul style="list-style-type: none">Hibernacula may be found in caves, mine shafts, underground foundations and Karsts.Active mine sites should not be considered as SWH.The locations of bat hibernacula are relatively poorly known.	<ul style="list-style-type: none">All sites with confirmed hibernating bats are SWH í.The area includes 200m radius around the entrance of the hibernaculum cxlviii, ccvii, í for most development types and 1000m for wind farms.Studies are to be conducted during the peak swarming period (Aug. – Sept.	No caves or crevices present in study area	This type of SWH is not present
Bat Maternity Colonies	Big Brown Bat Silver-haired Bat	FOD,FOM,SWD, SWM	<ul style="list-style-type: none">Maternity colonies can be found in tree cavities, vegetation and often in buildings (buildings are not considered to be SWH).Maternity colonies located in Mature deciduous or mixed forest stands with >10/ha large diameter (>25cm dbh) wildlife treesccviiFemale Bats prefer wildlife tree (snags) in early stages of decay.Silver-haired Bats prefer older mixed or deciduous forest	<ul style="list-style-type: none">Maternity Colonies with confirmed use by;<ul style="list-style-type: none">>10 Big Brown Bats, or>5 Adult Female Silver-haired BatsíThe area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies.	Tree cavity survey was conducted on November 30, 2015. Only two potentially suitable cavity trees were present in the 4 ha woodlot on site, which is far below threshold of 10/ha.	This type of SWH is not present
Turtle Wintering Areas	Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle	Snapping and Midland Painted turtles; SW, MA, OA and SA. ELC Community Series; FEO and BOO Map Turtle - Open Water areas such as deeper rivers and lakes with current can also be used as over-wintering habitat.	<ul style="list-style-type: none">For most turtles, wintering areas are in the same general area as their core habitat. Water deep enough not to freeze and have soft mud substrates.Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens	<ul style="list-style-type: none">Presence of 5 over-wintering Midland Painted Turtles.One or more Northern Map Turtle or Snapping Turtle over-wintering.The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH.Over wintering areas identified by searching for basking turtles on warm, sunny days during the fall or spring .	No aquatic features present in the study area	This type of SWH is not present



Table 1.1: Seasonal Concentration Areas of Animals

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Candidate or Confirmed Habitat Present Within the Study Area	Conclusions/Recommendations
		ELC Ecosite Codes	Habitat Criteria	Defining Criteria		
Snake Hibernaculum	<u>Snakes:</u> All snakes <u>Special Concern:</u> Milksnake Eastern Ribbonsnake	Habitat may be found in any ecosite other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats.	<ul style="list-style-type: none">For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations: e.g. rock piles, stone fences, and crumbling foundationsWetlands can be important over-wintering habitat in conifer or shrub swamps, poor fens, with sphagnum moss or sedge hummocks.	Studies confirming: <ul style="list-style-type: none">Presence of snake hibernacula used by at least five individuals of one sp. or; individuals of at least two spp.Same numbers near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring or Fall .	No suitable hibernacula sites identified during field surveys and no snakes were observed	This type of SWH is not present
Colonially -Nesting Bird Breeding Habitat (Bank and Cliff)	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies).	Eroding banks, sandy hills, borrow pits, and sand piles, cliff faces, bridge abutments, barns. ,BLO1,BLS1,BLT1,CLO1,CLS1,CLT1	<ul style="list-style-type: none">Any site or areas with exposed soil banks, undisturbed or naturally erodingDoes not include man-made structures (bridges or buildings) or recently disturbed soil areas, such as berms or stockpilesDoes not include a licensed Mineral Aggregate Operation	<ul style="list-style-type: none">Presence of nesting site with 8 or more Cliff Swallow and/or Rough-winged Swallow pairs.A colony identified as SWH will include a 50m radius area from the peripheral nests	Banks present in active gravel pit but these do not qualify. No nesting Cliff or Rough-winged Swallows present	This type of SWH is not present
Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs)	Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM, SWD, FET	<ul style="list-style-type: none">Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas.Most nests in trees are 11 to 15 m from ground, near the top of the tree.	<ul style="list-style-type: none">Presence of 1or more active nests of the list species.The edge of the colony and a minimum 300m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWHConfirmation of active colonies must be achieved through site visits conducted during the nesting season	No heron nests present in the study area	This type of SWH is not present
Colonially -Nesting Bird Breeding Habitat (Ground)	Herring Gull Great Black-backed Gull Little Gull Common Tern Caspian Tern Brewer's Blackbird Ring-billed Gull	Any rocky island or peninsula (natural or artificial) within a lake or large river MAM, MAS, CUM, CUT,CUS	<ul style="list-style-type: none">Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas.Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands.	<ul style="list-style-type: none">> 25 active nests for Herring or Ring-billed Gulls, >5 active nests for Common Tern, or >2 active nests for Caspian Tern.Any active nesting colony of one or more Little Gull, or Great Black-backed GullPresence of 5 or more pairs for Brewer's Blackbird.The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH ^{ccvii}	No gravel bars or other features with colonial ground nesting birds present in the study area	This type of SWH is not present
Migratory Butterfly Stopover Areas	Painted Lady Red Admiral <u>Special Concern</u> Monarch	CUM,CUT,CUS,FOC,FOD,FOM,CUP	<ul style="list-style-type: none">> 10 ha in size with a combination of field and forest, located within 5 km of Lake Ontario and Erie.To provide a stopover location to rest prior to migration southFields/meadows with an abundance of nectar plants and woodland edge providing shelterStopover areas are often spits of land or areas with the shortest distance to cross the Great Lakes	Studies confirm: <ul style="list-style-type: none">The presence of Monarch Use Days (MUD) during fall migration(MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral's is to be considered significant.Í.	Study area is much more than 5 km from Lake Ontario and therefore does not qualify as SWH. One Monarch was observed in study area. They likely migrate through and breed in small numbers.	This type of SWH is not present
Landbird Migratory Stopover Areas	All migratory songbirds	FOC,FOM,FOD,SWC,SWM ,SWD	<ul style="list-style-type: none">Woodlots >5 ha in size and within 5 km of Lake Ontario and Erie.If woodlands are rare, 2-5 ha can be considered.Sites have a variety of habitats; forest, grassland and wetland complexes	Studies confirm: <ul style="list-style-type: none">Use of the woodlot by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 survey dates.Studies should be completed during spring and fall migration using standardized assessment techniques.	Study area is more than 5 km from Lake Ontario and therefore does not qualify as SWH.	This type of SWH is not present
Deer Winter Congregation Areas	White-tailed Deer	FOC,FOM,FOD, SWC,SWM , SWD Conifer plantations (CUP) smaller than 50 ha may also be used.	<ul style="list-style-type: none">Woodlots >100 ha in size or if large woodlots are rare in a planning area woodlots>50ha Í.Deer movement during winter are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands.Large woodlots > 100ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha.	<ul style="list-style-type: none">Deer management is an MNRF responsibility,Use of the woodlot by white-tailed deer will be mapped and determined by MNRF,All woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF.	Woodlot on site was identified as deer wintering habitat by MNRF, however no coniferous component is present and therefore not likely to provide good deer wintering habitat	Woodlot has been identified as Deer Wintering Area (Stratum II) which is less important than Stratum I

Appendix E. Significant Wildlife Habitat Assessment following Ecoregion 6E Criterion Schedule*



Table 1.2.1 Rare Vegetation Communities.

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH Defining Criteria	Candidate or Confirmed Habitat Present Within the Study Area	Conclusions/Recommendations
	ELC Ecosite Code	Habitat Criteria	Detailed Information and Sources			
Cliffs and Talus Slopes	TAO, CLO,TAS CLS ,TAT,CLT	<ul style="list-style-type: none">• A Cliff is vertical to near vertical bedrock >3m in height.• A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris• Most cliff and talus slopes occur along the Niagara Escarpment	.	<ul style="list-style-type: none">• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes	No cliffs or talus slopes present in the study area	This type of SWH is not present
Sand Barren	SBO1,SBS1,SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	<ul style="list-style-type: none">• Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil.• A sand barren must be >0.5ha in size.	<ul style="list-style-type: none">• Sand Barrens support rare species such as provincially Endangered Forked Three-awned Grass. By extension, sand barren sites that could support these rare species (close proximity to other populations), historically or currently should be considered for higher priority conservation.	<ul style="list-style-type: none">• Confirm any ELC Vegetation Type for Sand Barrens• Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics).• Presence of indicator species	No Sand Barrens present in the study area	This type of SWH is not present
Alvar	ALO1,ALS1,ALT1 FOC1,FOC2,CUM2, Five Alvar Indicator Species: 1)Carex crawei 2)Panicum philadelphicum 3)Elocharis compressa 4)Scutellaria parvula 5)Trichostema brachiatum	<ul style="list-style-type: none">• An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil.• Vegetation cover varies from sparse lichen-moss to grasslands and shrublands with a number of characteristic indicator plant species.• Alvar must be > 0.5 ha	<ul style="list-style-type: none">• Alvar is particularly rare in ecoregion 7E	<ul style="list-style-type: none">• Field studies identify at least 4 Alvar indicator species.• Confirm and map ELC Vegetation Type polygons for Alvars• Site must not be dominated by exotic or introduced species (<50% cover).• The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses.	No alvars present in the study area	This type of SWH is not present
Old Growth Forest	FOD,FOC,FOM, SWD,SWC,SWM	<ul style="list-style-type: none">• Old-growth forests tend to be relatively undisturbed, structurally complex, and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species.• No minimum size		Field Studies will determine: <ul style="list-style-type: none">• If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat• no recognizable evidence of forestry activities• Determine ELC Vegetation Type for forest stand.	No old growth forest present in the study area	This type of SWH is not present
Savannah	TPS1,TPS2,TPW1,TPW2,CUS2	<ul style="list-style-type: none">• A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%.• Characteristic indicator species e.g. Black Oak• No minimum size• Remnant sites such as railway ROWs are not SWH.	í Site must be restored or a natural site.	<ul style="list-style-type: none">• Field studies confirm one or more of the Savannah indicator species• Area of the ELC Vegetation type is the SWH• Site must not be dominated by exotic or introduced species (<50% cover).	No savannah vegetation present in the study area	This type of SWH is not present
Tallgrass Prairie	TPO1,TPO2	<ul style="list-style-type: none">• A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover.• Characteristic indicator species e.g. Big Bluestem• No minimum size• Remnant sites such as railway ROWs are not SWH.	No minimum size to site í. Site must be restored or a natural site. Remnant sites such as railway right of way are not considered to be SWH.	<ul style="list-style-type: none">• Field studies confirm one or more of the Prairie indicator species• Area of the ELC Vegetation Type is the SWH lxxviii.• Site must not be dominated by exotic or introduced species (<50% cover).	No Tallgrass Prairie present in the study area	This type of SWH is not present
Other Rare Vegetation Communities	Provincially Rare S1, S2 and S3 vegetation communities Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	<ul style="list-style-type: none">• Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.• ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M• The OMNR/NHIC will have up to date listing for rare vegetation communities	<ul style="list-style-type: none">• .	<ul style="list-style-type: none">• Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTGcxlviii .• Area of the ELC Vegetation Type polygon is the SWH.	No rare vegetation communities present in the study area	This type of SWH is not present

Table 1.2.2 Specialized Habitats of Wildlife considered SWH.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH Defining Criteria	Candidate or Confirmed Habitat within the Study Area	Conclusions/ Recommendations
		ELC Ecosite Codes	Habitat Criteria			
Waterfowl Nesting Area	American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	MAS, SAS1, SAM1, SAF1, MAM, SWT1, SWT2, SWD	<ul style="list-style-type: none">A waterfowl nesting area extends 120 m from a wetland (> 0.5 ha) or a wetland (>0.5 ha) with small wetlands (<0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occurUpland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests.Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites.	Studies confirmed: <ul style="list-style-type: none">Presence of 3 or more nesting pairs for listed species excluding MallardsPresence of 10 or more nesting pairs for listed species including Mallards.Any active nesting site of American Black DuckNesting studies should be completed during the spring breeding season.A field study will determine the boundary of the waterfowl nesting habitat	No marsh / swamp / wetland likely to support large numbers of breeding waterfowl present in the study area	This type of SWH is not present
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Osprey Bald Eagle	FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	<ul style="list-style-type: none">Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water.Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy.Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms).	Studies confirm the use of nests: <ul style="list-style-type: none">One or more active Osprey or Bald Eagle nests in an area.For Osprey, the active nest and a 300 m radius is the SWHFor Bald Eagle the active nest and a 400-800 m radius is the SWH,Nest must be inactive for > 3 years or suspected of not being used for >5 years before being considered not significant	No large stick nests present in the study area	This type of SWH is not present
Woodland Raptor Nesting Habitat	Northern Goshawk Cooper’s Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	SWC, SWM, SWD and CUP3	<ul style="list-style-type: none">All natural or conifer plantation woodland/forest stands combined >30ha or with >4 ha of interior habitat ,determined with a 200m bufferStick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands.In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest.	Studies confirm: <ul style="list-style-type: none">Presence of 1 or more active nests from species list.Red-shouldered Hawk and Northern Goshawk –400m radius around the nest or 28 ha of suitable habitatBarred Owl – 200m radius around the nest is the SWHBroad-winged Hawk and Coopers Hawk,– 100m radius around the nest.Sharp-Shinned Hawk –50m radius around the nest	Woodlot on site is part of forest area >30 ha however no stick nests were present	This type of SWH is not present
Turtle Nesting Areas	Midland Painted Turtle <u>Special Concern Species</u> Northern Map Turtle Snapping Turtle	MAS1,MAS2,MAS3, SAS1,SAM1,SAF1, BOO1,FEO1	<ul style="list-style-type: none">Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals.Site must provide sand and gravel that turtles are able to dig in open, sunny areas.Nesting areas on the sides of road embankments and shoulders are not SWH.Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used.	Studies confirm: <ul style="list-style-type: none">Presence of 5 or more nesting Painted TurtlesOne Map Turtle or Snapping Turtle nesting is SWH.The area of exposed mineral soils where the turtles nest, plus a radius of 30-100m dependant on slope, riparian vegetation and adjacent land use is the SWHTravel routes from wetland to nesting area are to be considered within the SWH.Field investigations should be conducted in prime nesting season.	No aquatic habitat in immediate vicinity that would support turtles. Site is actively cultivated or forest that would not support turtle nesting.	This type of SWH is not present
Seeps and Springs <u>Rationale:</u> Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Wild Turkey Ruffed Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	<ul style="list-style-type: none">Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river systemSeeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species	Field Studies confirm: <ul style="list-style-type: none">Presence of a site with 2 or more seeps/springs should be considered SWH.The area of an ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope and groundwater condition need to be considered in delineation the habitat	No seeps or spring found within the study area	This type of SWH is not present
Amphibian Breeding Habitat (Woodland)	Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	FOC,FOM,FOD,SWC,SWM,SWD	<ul style="list-style-type: none">Presence of a wetland, pond or woodland pool (including vernal pools) >500m2 within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians.Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat	Studies confirm; <ul style="list-style-type: none">Presence of breeding population of 1 or more of the listed salamander species or 2 or more of the listed frog species with at least 20 individualsAn observational study to determine breeding will be required during spring surveysThe habitat is the woodland (ELC polygons) and wetland (ELC polygons) combined. A travel corridor connecting the woodland and wetland polygons is to be included in the habitat.	No aquatic habitat suitable for amphibian breeding present in the study area.	This type of SWH is not present
Amphibian Breeding Habitat (Wetlands)	Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	SW, MA, FE, BO, OA and SA. Wetland areas >120m from woodland habitats.	<ul style="list-style-type: none">Wetlands and pools (including vernal pools) >500m² (supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats clxxiv.Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators.Bullfrogs require permanent water bodies with abundant emergent vegetation.	Studies confirm: <ul style="list-style-type: none">Presence of breeding population of 1 salamander or at least 2 or of the listed frog or toad species and with at least 20 individualsAny wetland with confirmed breeding BullfrogsThe ELC ecosite wetland area and the shoreline are the SWH.Surveys to confirm breeding to be completed during spring when amphibians are migrating, calling and breeding.If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered	No wetland amphibian breeding habitat found to be present in the study area.	This type of SWH is not present

Table 1.3 Habitats of Species of Conservation Concern considered SWH.

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Candidate or Confirmed Habitat within the Study Area	Conclusions/ Recommendations
		ELC Ecosite	Habitat Criteria	Defining Criteria		
Marsh Bird Breeding Habitat	American Bittern, Virginia Rail, Sora Common Moorhen, American Coot Pied-billed Grebe, Marsh Wren, Sedge Wren, Common Loon Green Heron, Trumpeter Swan Special Concern: Black Tern Yellow Rail	MAM, MAS, SAS1, SAM, SAF1, FEO1,BOO1 For Green Heron: All SW, MA and CUM1 sites.	<ul style="list-style-type: none">• Nesting occurs in wetlands.• All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present cxxiv.• For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water.	Studies confirm: <ul style="list-style-type: none">• Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or breeding by any combination of 4 or more of the listed species Í.• Note: any wetland with breeding of 1 or more Trumpeter Swans, Black Terns or Yellow Rail is SWH Í.• Area of the ELC ecosite is the SWH.• Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats.• Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi}	No marshes suitable for marsh breeding birds present in the study area.	This type of SWH is not present
Woodland Area-Sensitive Bird Breeding Habitat	Yellow-bellied Sapsucker, Veery, Red-breasted Nuthatch, Blue-headed Vireo, Northern Parula, Black-throated Green Warbler, Blackburnian Warbler, Black-throated Blue Warbler Ovenbird, Scarlet Tanager Winter Wren, Pileated Woodpecker <u>Special Concern:</u> Canada Warbler	FOC,FOM,FOD,SWC, SWM,SWD	<ul style="list-style-type: none">• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha.• Interior forest habitat is at least 200 m from forest edge habitat.	Studies confirm: <ul style="list-style-type: none">• Presence of nesting or breeding pairs of 3 or more of the listed birds.• Note: any site with breeding Canada Warbler is to be considered SWH.Í• Conduct field investigations in spring and early summer when birds are singing and defending their territories.• Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects	Woodlot on site is part of forests > 30 ha present in study area, but is not at least 200 m from forest edge. Five of the listed species were present: Yellow-bellied Sapsucker, Veery, Ovenbird, Black-throated Blue Warbler, Scarlet Tanager	This type of SWH is not present according to lack of interior habitat on subject portion of forest. However interior is present in nearby portion of same forest block. Meets threshold for species.
Open Country Bird Breeding Habitat	Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow Special Concern Short-eared Owl	CUM1 CUM2	<ul style="list-style-type: none">• Large grassland areas (includes natural and cultural fields and meadows) >30 ha• Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming• Grassland sites considered significant should have a history of longevity, either abandoned, mature hayfields and pasturelands that are at least 5 years or older.	Field Studies confirm: <ul style="list-style-type: none">• Presence of nesting or breeding of 2 or more of the listed species.Í• A field with 1 or more breeding Short-eared Owls.• The area of SWH is the contiguous ELC ecosite field areas.• Conduct field investigations of the most likely areas in breeding season.	No extensive grassland areas > 30 ha present in the study area	This type of SWH is not present
Shrub/Early Successional Bird Breeding Habitat	<u>Indicator Spp:</u> Brown Thrasher Clay-colored Sparrow <u>Common Spp.</u> Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher Special Concern: Golden-winged Warbler	CUT, CUS, CUW	<ul style="list-style-type: none">• Large natural field areas succeeding to shrub and thicket habitats >10ha in size.• Class 1 or 2 agricultural lands not being actively used for farming are not SWH• Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands.	Field Studies confirm: <ul style="list-style-type: none">• Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species.Í• A field with breeding Golden-winged Warbler.• SWH is the contiguous ELC ecosite field/thicket area.• Conduct field investigations in spring and early summer breeding season	No shrub and thicket habitats > 10 ha present in study area	This type of SWH is not present
Terrestrial Crayfish;	Chimney or Digger Crayfish; (<i>Fallicambarus fodiens</i>) Devil Crawfish or Meadow Crayfish; (<i>Cambarus Diogenes</i>)	MAM, MAS, SWD, SWT, SWM	<ul style="list-style-type: none">• Meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish.• Constructs burrows in marshes, mudflats, meadows.• Agricultural fields with crayfish burrows are not considered SWH	Studies Confirm: <ul style="list-style-type: none">• Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites cci• Area of ELC Ecosite polygon is the SWH• Surveys should be done during adult breeding season (April to late June) and in late summer in nearby water bodies for juveniles.• Note the presence of burrows or chimneys are often the only indicator of presence,	No evidence of terrestrial crayfish (e.g. chimneys) was present in study area	This type of SWH is not present
Special Concern and Rare Wildlife Species	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal Species, as tracked by the Natural Heritage Information Centre.	All plant and animal element occurrences (EO) within a 1 or 10km grid. Older element occurrences may lack location accuracy	<ul style="list-style-type: none">• When an element occurrence is identified within a 1 or 10km grid for a Special Concern or Provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites lxxviii	Studies Confirm: <ul style="list-style-type: none">• Survey of the site for the identified species needs to be completed when the species is likely present and identifiable.• The area of the habitat identified to the finest ELC scale that protects the habitat form and function is the SWH, and must be delineated through detailed field studies.	Eastern Wood Pewee and Wood Thrush recorded during Breeding Bird surveys. was present in 1 woodlot Monarch Butterfly likely present in field areas during migration	Presence of Special Concern Species <ul style="list-style-type: none">• Ensure that no intrusion by construction equipment into the Credit River floodplain where turtles may be present• Minimize area of woodlot removal• Minimize area of meadow removal



Table 1.4 Animal Movement Corridors

Habitat	SPECIES	CANDIDATE SWH		CONFIRMED SWH	Candidate or Confirmed Habitat Present Within the Study Area	Conclusions/Recommendations
		ELC Eco-sites	Habitat Criteria	Defining Criteria		
Amphibian Movement Corridors	All amphibian species	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for amphibians in Table 1.2.2	<ul style="list-style-type: none">• Movement corridors between breeding habitat and summer habitat• Movement corridors must be considered when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2.	<ul style="list-style-type: none">• Field Studies must be conducted when species are expected to be moving to and from breeding sites.• Corridors should consist of native vegetation, roadless area, with no gaps such as fields, waterways or bodies,• Corridors should be at least 200m wide with gaps <20m• If following riparian area >15m of vegetation on both sides of waterway.	No amphibian breeding habitat is present in the study area and therefore no movement corridors occur.	This type of SWH is not present
Deer Movement Corridor	White-tailed Deer	Corridors may be found in any forested ecosites in or near Stratum II Deer Wintering Area	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 <ul style="list-style-type: none">• Corridors typically follow riparian areas, woodlots, areas of physical geography such as ravines or ridges	<ul style="list-style-type: none">• Corridors should be at least 200m wide with gaps <20m and if following riparian area with at least 15m of vegetation on both sides of waterway• Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas	Although Stratum II Deer Wintering habit has been mapped in the on-site woodlot, the woodlot is not part of a continuous habitat link between two large forest blocks.	This type of SWH is not present

Note: * This follows: Ontario Ministry of Natural Resources and Forestry. 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E: <http://www.ontario.ca/document/significant-wildlife-habitat-ecoregional-criteria-schedules-ecoregion-6e>

Appendix F

Curricula Vitae of Report Writers



James Kamstra, B.Sc., M.E.S. Senior Terrestrial Ecologist

Education

MES, Environmental
Studies, York University
BSc, Biology and
Environmental Science,
Trent University

Years of Experience

With AECOM: 25
With Other Firms: 3

Professional Affiliations

Committee on the Status of
Species at Risk in Ontario
(COSSARO) 2008-2015

Durham Region
Environmental Advisory
Committee 2001-06

Durham Land Stewardship
Council 1995-2002

Blue Racer Species
Recovery Team 1995-2001

E. Fox Snake and Hog-
Nosed Snake Species
Recovery Team 2003-2006

Citizens Advisory Panel on
Ontario Endangered
Species Act 2006

Society for Ecological
Restoration member

Ontario Regional Editor for
North American Butterfly
Association 2010-2015

Mr. Kamstra has 25 years of experience conducting environmental impact studies, biophysical inventories, and ecological restoration projects. Through his extensive field experience, he has become a recognized expert in identifying flora and fauna, assessing ecological significance, and understanding the functions of ecosystems. Mr. Kamstra has completed numerous studies on the impact of a wide variety of developments on natural heritage features including wind turbines, water servicing, residential housing, industrial sites, landfills, gravel pits, mines, golf courses, highways, pipelines, and hydroelectric dams with experience across Canada, the United Arab Emirates and Belize. He is highly experienced with breeding bird surveys, herpetofaunal surveys, vegetation mapping, quantified vegetation sampling, tree saving plans, wildlife population surveys, and habitat evaluations. Mr. Kamstra is a qualified wetland evaluator and has evaluated several wetlands in southern Ontario. He has particular expertise in the fields of herpetology, ornithology, and botany, and has worked with many of Ontario's species at risk.

Mr. Kamstra has extensive species at risk experience in Ontario. He sat on advisory panel assisting MNR in developing the Endangered Species Act 2007 and currently sits on COSSARO, which determines species on the official list. He sits on two recovery teams and has written status reports and recovery strategies for several species. In addition, Mr. Kamstra has first-hand field experience with many species at risk through environmental impact studies.

Experience and Some Project Examples

Environmental Impact Assessments and Evaluations

Southeast Collector Trunk Sewer, York Region. Conducted vegetation and wildlife data and evaluated impact of route alternatives during original EA. More recently has developed plan to mitigate and monitor potential impacts to nearby Great Blue Heron colony. [2004 - 2015]

Upper York Sanitary Sewer, York Region. Conducted surveys, reviewed data and evaluated impact of route alternatives. Provided mitigations including a wetland restoration plan at Holland River. [2011 - 2014]

Creditview Road Widening EA, Mississauga. Completed Class EA which included assessment of significant natural features in context of proposed road widening. [2013 – 2015]

Casino Mine, Terrain Ecosystem Mapping, Yukon Territory. Conducted vegetation mapping through aerial photo interpretation and a detailed program of quantitative field sampling program as part of existing conditions report for Environmental Assessment of proposed gold and copper mine. [2010]

Taseko Aley Mine, Terrain Ecosystem Mapping, B.C. Conducted vegetation mapping through aerial photo interpretation and a detailed program of quantitative field sampling program for proposed niobium mine in northern Rocky Mountains using BC Terrestrial Ecosystem Mapping. [2011 - 2013]

Next Era, Wind Turbine Farm. Detailed natural environment study of existing conditions and assessment for approval of ~200 proposed wind turbines in Lambton and Huron counties including vegetation, wildlife surveys and evaluation of significant wildlife habitat. [2011-2013]

Various Clients, Proposed Golf Course Environmental Evaluations. Conducted evaluations for many proposed sites including sites in Pickering, Uxbridge, Port Severn, Sutton, and Aurora. [1992 – 2007]

Various Clients, Provincial Highway Upgrades and Extensions. Performed environmental impact assessment on vegetation and wildlife from upgrades and extension for highways including Highway 403 (Hamilton), Highway 401 (Pickering, Cobourg, Mississauga), Highway 69 (Parry Sound), Highway 6 (Manitoulin) (Oakville), Highway 10 (Orangeville), Highway 11 (Sundridge, Bracebridge, Powassan), and Highway 407 (Durham extension). [1995 – 2013]

Various Clients, Gravel Pit and Quarry Expansion Assessments. Provided environmental impact assessments for proposed pits and expansions at many locations including Erin, Grafton, Guelph, Lakefield, Niagara Falls, Pontypool, Port Colborne, Dunnville and Trenton. [2000 – 2013]

Smoky Falls Hydroelectric Generating Facilities Upgrade, Cochrane District. Assess impact of replacing existing dam. [1998]

Ottawa (West Carleton) Landfill Impact Assessment. Conducted environmental impact assessment of landfill expansion including impacts to the Threatened species for Waste Management. [2011 – 2014]

Clean Harbors Landfill Impact Assessment, Petrolia. Conducted environmental impact assessment of high level contaminant landfill expansion. [2011 – 2014]

Species at Risk Projects

Population Study and Translocation of Butler's Garter Snakes, Sarnia. Conducted a year mark-recapture study of population of Endangered snake to determine population size and habitat use on proposed. Prepared Benefit Permit application then translocated snakes from development site to receiver site with habitat enhancements for Cantaleigh Investments Inc. [2007 – 2013].

Overall Benefit Permit for Fowler's Toad, Fort Erie. Prepared 17(2)c Endangered Species Act Permit to provide benefit for a Fowler's Toad population affected by condominium development [2010 – 2011].

COSEWIC Status Report of Queen Snake. Wrote status report update for this species was later designated as endangered. Included confirming presence at former sites. [2009]

Eastern Fox Snake Recovery Plan. Wrote the recovery plan for Eastern Fox Snake through consultation with Foxsnake – Hognose Snake Recovery Team. [2004 – 2006]

Butternut Evaluations. Is a qualified Butternut assessor and has completed numerous Butternut evaluation and compensation plans at variety of development sites.

Inventory of Species at Risk. Conducted inventory of species at risk, with an emphasis on reptiles at Queen Elizabeth II Wildlands Provincial Park [2005] and Massasauga Provincial Park. [2006]

Floral and Faunal Inventories

Severn River Corridor Biophysical Inventory, Muskoka. Conducted biophysical inventory as part of the Muskoka Heritage Areas Program to provide baseline data, to evaluate ecological significance and to aid in conservation management. Inventory involved documenting flora, fauna, and vegetation communities. [1991]

Cambden East Alvar Area of Natural and Scientific Interest. Conducted biophysical inventory to provide baseline data, to evaluate ecological significance and to aid in conservation management. Inventory involved documenting flora, fauna, and vegetation communities. [2001 – 2002]

Breeding Bird Surveys for Proposed Mines - Conducted breeding bird surveys for several proposed mines in remote sites using transects, point counts and area searches. Sites included **High Lake, Nunavut.** [2004], **Tulsequah, British Columbia** [2007], and **Schefferville, Quebec / Labrador** [2011]

Awenda Provincial Park Life Science Inventory.

Conducted complete detailed inventory of vegetation, flora, fauna of park including surveys, mapping, species lists and evaluation of significant features. [2008 – 2009]

Ecological Restoration

Ottawa (West Carleton) Landfill. Developed plan to restore wetland and forest habitat in order to compensate for habitat loss from proposed landfill expansion. [2013 – 2015]

Don River Wetland Restoration, Toronto. Provided input to wetland restoration at mouth of Don River. [2007 – 2008]

Oshawa Second Marsh Monitoring Program and Restoration. Developed monitoring program of breeding birds, amphibians, and vegetation in conjunction with habitat restoration. [1993 – 2003]

Grenadier Pond, High Park, Toronto. Contributed to restoration plan along shoreline of Grenadier Pond including recording baseline, removal of hardened shore and planting plan. [1996]

Wetland Restoration, Vaughan. Performed salvage of wetland vegetation and transplanting to created wetland pond. [1996]

Ecosystem Planning

Protection of Natural Heritage Features in King City Community Plan. [2004 – 2007]

Town of Whitchurch-Stouffville, Peer Review of Environmental Impact Studies. Provided peer review of EISs prepared by other consultants. [2000 – 2013]

Town of Whitby, Peer Review of Environmental Impact Studies. Provided peer review of EISs prepared by other consultants. [2000 – 2012]

International Experience

Environmental Impact Assessment, Abu Dhabi, United Arab Emirates. Assessed impact of proposed city landfill on environment. [2008 – 2009]

Chalillo Hydroelectric Dam Impact Analysis, Belize. Analysed impact of hydroelectric dam on three endangered species: Baird's Tapir, Scarlet Macaw, and Morelet's Crocodile. [2000 – 2001]

Various Tour Companies, Ecotour Guiding, Multiple Locations. Guided naturalist history tours to Belize, Bolivia, Brazil, Costa Rica, Ecuador, Guatemala, Guyana, Panama, Peru, Portugal, and Spain for Tours of Exploration, Quest Nature Tours, and Top Flight. [1987 – 2013]

Previous Employment

Flora and Fauna Survey and Park Planning, Ontario. Conducted a floral and faunal inventory of six environmentally significant areas in the Lake Erie Islands. Also acted as a park planner in the Thunder Bay District, coordinating an areas of natural and scientific interest (ANSI) program. Responsible for addressing land use conflicts, and mapping and layout of brochures. [Ministry of Natural Resources, 1988 – 1989]

Various National and Provincial Parks, Interpretive Naturalist. Worked as an interpretive naturalist with Pukaskwa National Park, St. Lawrence Islands National Park, Algonquin Provincial Park, Ontario, and Shuswap Lake Provincial Park, British Columbia. [1976 – 1987]

Publications

Kamstra, J. 2013. "Butterflies Region 22 Eastern Canada" pp.97-102 in NABA Butterfly Counts 2012 Report. North American Butterfly Assoc.

COSEWIC. 2010. COSEWIC Assessment and Status Report of the Queensnake *Regina septemvittata* in Canada. Committee on the Status of Endangered Wildlife in Canada, Ottawa. 34 pp.

Kamstra, J. and S. Spisani, 2009, A life science inventory and evaluation of Awenda Provincial Park. Ontario Parks, Central Region.

Kamstra, J., 2006, National Recovery Strategy for the Eastern Foxsnake (*Elaphe gloydi*) in Canada. Eastern Foxsnake and Eastern Hog-nosed Snake Recovery Team.

Kamstra, J., 2003, A life science inventory and evaluation of Cambden East Alvar. Ontario Ministry of Natural Resources, Kingston District.

Kamstra, J., M.J. Oldham and P.A. Woodliffe, 1995, A life science inventory and evaluation of six natural areas in the Erie Islands. Ontario Ministry of Natural Resources, Chatham District. 160p.



Jillian deMan, H. BSc. Terrestrial and Wetland Ecologist

Education

Honors Bachelor of
Science, Biological
Sciences and Earth
Sciences
Brock University, 2003

Years of Experience

With AECOM: 19
With Other Firms: 0

Training and Certification

Amphibian and Reptile
Survey Techniques, Nature
Conservancy
Canada/Ministry of Natural
Resources, 2013

Butternut Health Assessor,
Ontario Ministry of Natural
Resources, 2011

Temperate Wetlands
Restoration Training
Course, Ontario Ministry of
Natural Resources, 2005

Class 1 Electrofishing
Certification Course,
Watershed Science Centre,
2004

Wetlands Evaluation
Course, Ontario Ministry of
Natural Resources, 2004

Ecological Land
Classification for Southern
Ontario Training Course,
Ontario Ministry of Natural
Resources, 2003.

Animal Care and Use,
Brock University, 2002

Jillian deMan is a terrestrial ecologist with AECOM's Environmental Division based out of Kitchener, Ontario. With the company for over 15 years, her expertise has a wide range of scope within the environmental, engineering and transportation fields enabling her to be involved with numerous projects across Canada that incorporate natural heritage issues/planning and restoration. She provides senior review and has experience in small to large-scale natural heritage baseline, environmental assessment, impact analysis, peer review, monitoring and restoration work where she co-ordinates multi-disciplinary teams for projects across Canada. She also has considerable experience in facilitation of project approvals with respect to the Endangered Species Act, Species at Risk Act and Conservation Authorities Act. Her technical skills include; wetland and woodland systems assessment, evaluation, delineation and restoration; Species at Risk habitat assessment and species inventories; amphibian and reptile surveys; multi-scale floral inventories; vegetation community delineation; soils analysis and identification; air-photo interpretation and biomass fish sampling through seine net, minnow trap or electrofishing methods.

Experience

Renewable Energy Projects

Henvey Inlet Wind LP, Henvey Inlet Wind Energy Centre (HIWEC), Parry Sound District, Ontario. Co-ordinated and provided senior review with respect to terrestrial site investigations including ELC, vascular plant inventories, bat cavity tree surveys, turtle and snake basking turtles, vernal pool assessments, breeding bird surveys, old growth assessments and rare plant surveys in the project Study Area. Collected data with respect to vegetation delineation and old growth assessments. Reviewed survey data and other sections relating to wildlife/terrestrial habitat for the NHA and EIS report. Assisted in preparation of section in the Volume A: HIWEC EA. Species at Risk associated with project include: Blanding's Turtle, Eastern Musk Turtle, Eastern Whip-poor-will, Canada Warbler, Common Nighthawk, Olive-sided Flycatcher, Kirtland's Warbler, Little Brown Bat, Northern Myotis, Tri-coloured Bat, Massasauga Rattlesnake, Eastern Foxsnake, and Hognose Snake [ongoing].

NextEra Energy Canada, Bluewater and Goshen Wind Energy Centre, Haldimand County, Ontario. Completed detailed tree inventories in road right-of-ways and on private property. Prepared report summarizing and analyzing the results of the tree inventory to be used for a replanting plan. Species at Risk associated with project include: Butternut, Bobolink, Barn Swallow, Little Brown Bat, Northern Myotis, and American Badger.

NextEra Energy Canada, Goshen Wind Energy Centre, Huron County, Ontario. Managed and analyzed ecological data in preparation of the Natural Heritage Assessment (NHA) and Environmental Impact Study (EIS) Report. Prepared a woodland compensation plan with respect to removal/replanting of Butternut specimens. Species at Risk associated with project include: Butternut, Bobolink, Barn Swallow, Little Brown Bat, Northern Myotis, and American Badger.

Natural Heritage Studies and Impact Analysis

Upper Hannon Creek Master Drainage and Servicing Study, City of Hamilton, Ontario. Jillian is currently leading the completion of the aquatic and terrestrial studies in order to finalize reach management recommendations for the headwaters of Upper Hannon Creek. Investigations undertaken included breeding bird, amphibian call, refinement of Ecological Land Classification, aquatic assessment and electrofishing surveys. Species at Risk associated with project include: Barn Swallow.

Hamilton Port Authority, Randle Reef Risk Assessment, Hamilton Harbour, Ontario. Determined the potential associated risks for the confinement of Randle Reef, an underwater coal tar deposit of 630,000 cubic metres. As part of this task, the surrounding fisheries, wetlands, forests and Species at Risk were assessed and described including conditions of Cootes Paradise. Through this assessment, it was determined how these features could be potentially affected through the confinement of Randle Reef. A cumulative impact assessment was also conducted in accordance with the "Cumulative Effects Practitioners Guide." Species at Risk associated with project include: Peregrine Falcon, Map Turtle, Blanding's Turtle, and Eastern Musk Turtle.

Probe Mines, Terrestrial Baseline, Chapleau, Ontario. Lead the completion of the aquatic, wildlife and terrestrial baseline reports to be incorporated into an overall Environmental Impact Study. Field investigations included vegetation community delineation, botanical surveys, basal area calculations, aquatic assessments, fish community determination through electrofishing /netting and wildlife inventories including breeding bird surveys, amphibian surveys and large mammal surveys, soil profile analysis and air-photo interpretation.

Labrador Iron Mines, Terrestrial Baseline for Twelve Properties, Schefferville, Quebec. Lead the completion of the aquatic, wildlife and terrestrial baseline reports to be incorporated into an overall Environmental Impact Study for twelve potential iron mine sites. Field investigations included vegetation community delineation, botanical surveys, basal area calculations, aquatic assessments, fish community determination through electrofishing /netting and wildlife inventories including breeding bird surveys, amphibian surveys and large mammal surveys with a focus on caribou habitat, soil profile analysis and air-photo interpretation. Traditional knowledge was also obtained from members of the local Cree and Inu communities. Species at Risk include: Woodland Caribou.

Labrador Iron Mines, Terrestrial Baseline for Redmond, James and Silveryards Properties, Schefferville, Quebec. Lead the completion of the terrestrial baseline report to be incorporated into an overall Environmental Impact Study for the re-opening of an iron ore open pit mining operation. Field investigations focused on identifying vegetation communities within three proposed sites and included botanical surveys, basal area calculations, soil profile analysis and air-photo interpretation. Traditional knowledge was also obtained from members of the local Cree and Inu communities. Species at Risk include: Woodland Caribou.

Public Works Canada, Bear Island Vegetation Assessment, Nunavut. Completed an assessment of the natural features on Bear Island in James Bay, Nunavut. This was required to determine the impacts of a proposed landfill to be located on the Island. Tasks include: vegetation species inventories, wildlife habitat assessments and vegetation community delineation. Traditional knowledge was obtained from members of the local Cree community. Species at Risk associated with project include: Polar Bear and Arctic Fox.

City of Sudbury, Frobisher Works Yard Wetland Evaluation, City of Sudbury, Ontario. Lead and completed a wetland evaluation of a portion of a wetland surrounding the City of Sudbury Works Yard. Wetland community boundaries were delineated and a vegetation survey was completed using the Ministry of Natural Resources Wetland Evaluation System (Northern Edition). Tasks included: wetland community mapping, vegetation inventories, background review and documentation, completion of wetland evaluation score sheet and consultation with the City of Sudbury, Ministry of Natural Resources and Nickel District Conservation Authority.

Transportation

Valley Inn Wildlife Monitoring, CN Rail, Burlington, Ontario. Jillian has been co-ordinating and undertaking wildlife monitoring for CN's Valley Inn site in Burlington, Ontario where rail improvements are currently underway. This site is immediately adjacent to Carroll's Bay, which contains one of the largest Map Turtle populations in Canada. To isolate the site, a series of turtle barrier fencing was installed and monitored over the nesting period from June to July. Jillian kept in contact with staff from Royal Botanical Gardens as well as the contractor to ensure turtles were kept safe and off the project site during construction. Species at Risk associated with project: Map Turtle, Snapping Turtle, Blanding's Turtle and Eastern Musk Turtle.

Region of Waterloo Rapid Transit System Natural Heritage Approvals. Jillian was responsible and successful in the acquirement of all natural heritage approvals required for the construction of the Region's new Rapid Transit System. This involved consultation with Grand River Conservation Authority, Ministry of Natural Resources, Department of Fisheries and Oceans and Environment Canada; provision of comprehensive Environmental Impact Studies specific to certain areas where natural features were affected along the route; presentation of data to the agencies at various project meetings and co-ordination of construction monitoring related to breeding birds, fisheries and tree preservation.

City of Ottawa Light Rail Transit System. To determine a preferred route and mitigation strategy, Jillian co-ordinated the collection of natural heritage baseline data including vegetation community delineation, fish habitat assessment, floral species inventories and incidental wildlife.

Improvements to Victoria Street, Region of Durham. Jillian is currently negotiating approvals with the Ministry of Natural Resources and Forestry, Central Lake Ontario Conservation Authority and Department of Fisheries and Oceans for the widening of Victoria Street within the Region of Durham. Approvals are required due to the presence of the Eastern Pondmussel and Lynde Creek Marsh Provincially Significant Wetland. Mitigation includes a series of relocation plans for potential plants, fish and mussel specimens and wetland restoration/creation. Overall the project will improve wildlife connectivity across the road thereby resulting in a significant reduction of wildlife road mortality.

Highway 401 Road Widening between Credit River and 403/410 Interchange, Ministry of Transportation, Ontario. Co-ordinated and conducted terrestrial assessments for the widening of Highway 401. Fieldwork included botanical surveys, vegetation community delineation, wetland assessment, bird surveys and amphibian habitat assessments. Determined overall constraints and provided recommendations for mitigation. Currently negotiating approvals with MNRF due to the presence of Jefferson Salamander and Redside Dace.

Bracebridge Transportation EA. Jillian led and co-ordinated the collection of baseline data along alternative routes for a new inner-city highway system for the Town of Bracebridge. Fieldwork comprised of woodland and wetland assessment, vegetation community delineation, refinement of deer wintering yards through fieldwork and consultation with MNRF and fish habitat assessment.

Windsor Essex Parkway Wetlands Review, Ministry of Transportation, Windsor, Ontario. As one of AECOM's wetlands specialists, Jillian is responsible for reviewing wetlands related documentation for the Windsor Essex Parkway extension on behalf of the Ministry of Transportation. This includes documents pertaining to wetlands delineation, evaluation and compensation.

Ottawa 174/ Prescott-Russell County Road 17 Environmental Assessment Natural Environment Report. Jillian led the completion of the natural environment report which documented existing aquatic, terrestrial and wildlife conditions along alternative routes. Fieldwork encompassed aquatic habitat assessments, vegetation community delineation, identification of wetland areas, turtle basking surveys and auditory amphibian surveys. Effects to aquatic habitat, wetland, woodland, Species at Risk habitat, Significant Wildlife Habitat and natural corridors were determined for each alternative. Species at Risk associated with project: Blanding's Turtle.

Rehabilitation of Muskoka Road 169 Underpass (42-139), Hawk Rock Creek Culvert (42-203/C) and two Kahshe River Culverts (42-105/C, 42-197/C) in Huntsville Area, Ministry of Transportation, Ontario. Provided senior review for the completion of the Terrestrial Ecosystems Existing Conditions and Impact Assessment Report. Tasks included guidance and oversight of fieldwork, review of the report and determination of appropriate mitigation measures with respect to Species at Risk.

Peer Reviews

Métis Nation of Ontario, Peer Review of "Hydro One's Draft Environmental Assessment Report of a Transmission Reinforcement Project from Bruce to Milton", Ontario. Reviewed the terrestrial component of the Draft Environmental Assessment Report for a Transmission Reinforcement Project from Bruce to Milton. The review focused on how the MNO's harvesting rights and species of concern would be affected by the proposed transmission reinforcement.

Kettle Creek Conservation Authority, Peer Review of "Dalewood Meadows Environmental Impact Study", St. Thomas, Ontario. Lead the completion of a peer review of an Environmental Impact Study completed for lands adjacent to a significant valleyland and Kettle Creek Woods Provincially Significant Wetland owned by Kettle Creek Conservation Authority. Peer review methods were based on Environmental Impact Study guidelines developed by the KCCA, City of St. Thomas and the Provincial Policy Statement. To keep an unbiased opinion, reconnaissance terrestrial and aquatic investigations were completed prior to reviewing the EIS document. Proponents from the City, conservation authority, Ministry of Natural Resources, developer and the consultant who prepared the original EIS were also contacted.

Sydney Tar Ponds Agency, Peer Review of "Remediation of Sydney Tar Ponds and Coke Ovens Sites Environmental Impact Study", Sydney, Nova Scotia. Reviewed the terrestrial component of a 642 page Environmental Impact Study document for the clean-up of coal-based contaminants/sludge from a tidal estuary at the mouth of Muggah Creek. A comprehensive team was organized for the review including the completion of status reports and a presentation to the client.

Wetland Evaluation System Review, New Brunswick. Provided technical review for New Brunswick's provincial wetland evaluation system. Jillian provided recommendations for overall improvement of the system.

Publications

Digital analysis of lichen abundance testing EMAN's Lichen Monitoring Protocol
Leading Edge: The Working Biosphere, 2004.

Professional Development

- First Aid Certification, St. John's Ambulance, 2015
- Safety Orientation (11/2015)
- Hazard Communication/WHMIS (2015)
- Basics of Fall Protection (01/2010)
- Defensive Driving Awareness Training (2015)
- Field Safety 4 Hour (2015)
- Office Ergonomics Training (2015)
- Hearing Protection (03/2010)
- General Excavation Safety Training (04/2009)