GUIDING SOLUTIONS IN THE
NATURAL ENVIRONMENT

Natural Heritage Evaluation 154 and164 Cemetery Road Township of Uxbridge

Prepared For:

Moorefield Properties Ltd.

Prepared By:

Beacon Environmental Limited

Date: *Project:*

November 2016 **216320**

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1. Introduction

Beacon Environmental Limited (Beacon) has been retained by Moorefield Properties Ltd. to prepare a Natural Heritage Evaluation (NHE) for the proposed condominium development of 154 and 164 Cemetery Road in the Town of Uxbridge, Regional Municipality of Durham (**Figure 1**). The property is located on the Oak Ridges Moraine; the western two-thirds of the subject property are within the Natural Linkage Area and Countryside land use designations while the eastern one-third is located in Settlement Area. There are two separate parcels forming this development; the larger parcel on the west side of Cemetery Road and a smaller parcel south of the wetland, at the corner of Cemetery Road and Toronto Street.

The purpose of this report is to identify natural heritage features that pose development constraints consistent with the Oak Ridges Moraine Conservation Plan (ORMCP) (MMAH 2005) and the Town of Uxbridge Official Plan. This report also addresses appropriate mitigation requirements in support of an official plan amendment for the development of a plan of condominium in accordance with the requirements of the ORMCP. This report also addresses the requirements of the provincial *Endangered Species Act*.

The natural heritage evaluation of the subject property was initially completed by a review of background documents and seasonally appropriate field investigations undertaken in 2008. The field investigations included the determination of the boundaries of natural heritage features as staked in 2008 by the Ministry of Natural Resources and Forestry (MNRF) and the Lake Simcoe Region Conservation Authority (LSRCA). Investigations into the potential presence of species at risk on the subject property were conducted initially in 2008 and updated in 2016. In agreement with the LSRCA, these data have been used in the analysis of natural heritage functions and features and confirmed against the current policy framework.

2. Policy Context

2.1 Provincial Policy Statement

The Province released an updated Provincial Policy Statement, or PPS (MMAH, 2014) under section 3 of the *Planning Act*, which came into effect on April 30, 2014. The PPS is intended to provide policy direction on matters of provincial interest related to land use planning.

Policy 2.1 of the PPS provides direction to the regional and local municipalities regarding planning policies for the protection and management of natural heritage features and resources. The PPS defines eight natural heritage features and provides planning policies for each (although not all apply to the Canadian Shield). The Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement (MNR 2010) is a technical guidance document used to help identify and assess natural heritage features.

Section 2.1 of the PPS relates to Natural Heritage. The following subsections are provided.

2.1.3 Natural heritage systems shall be identified in Ecoregions 6E & 7E, recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas.

2.1.4 Development and site alteration shall not be permitted in;
- *a) significant wetlands in Ecoregions 5E, 6E and 7E; and*
- *b) significant coastal wetlands.*

2.1.5 Development and site alteration shall not be permitted in:
- *a) Significant wetlands north of the Canadian Shield north of Ecoregions 5E, 6E and 7E;*
- *b) Significant woodlands in Ecoregions 6E and 7E;*
- *c) Significant valleylands in Ecoregions 6E and 7E;*
- *d) Significant wildlife habitat*
- *e) Significant Areas of Natural and Scientific Interest (ANSI's); and*
- *f) Significant coastal wetlands in Ecoregions 5E, 6E and 7E not covered above*

unless it has been demonstrated (typically through an EIS or a comparable technical study) that there will be no negative impacts on the natural features or their ecological functions.

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

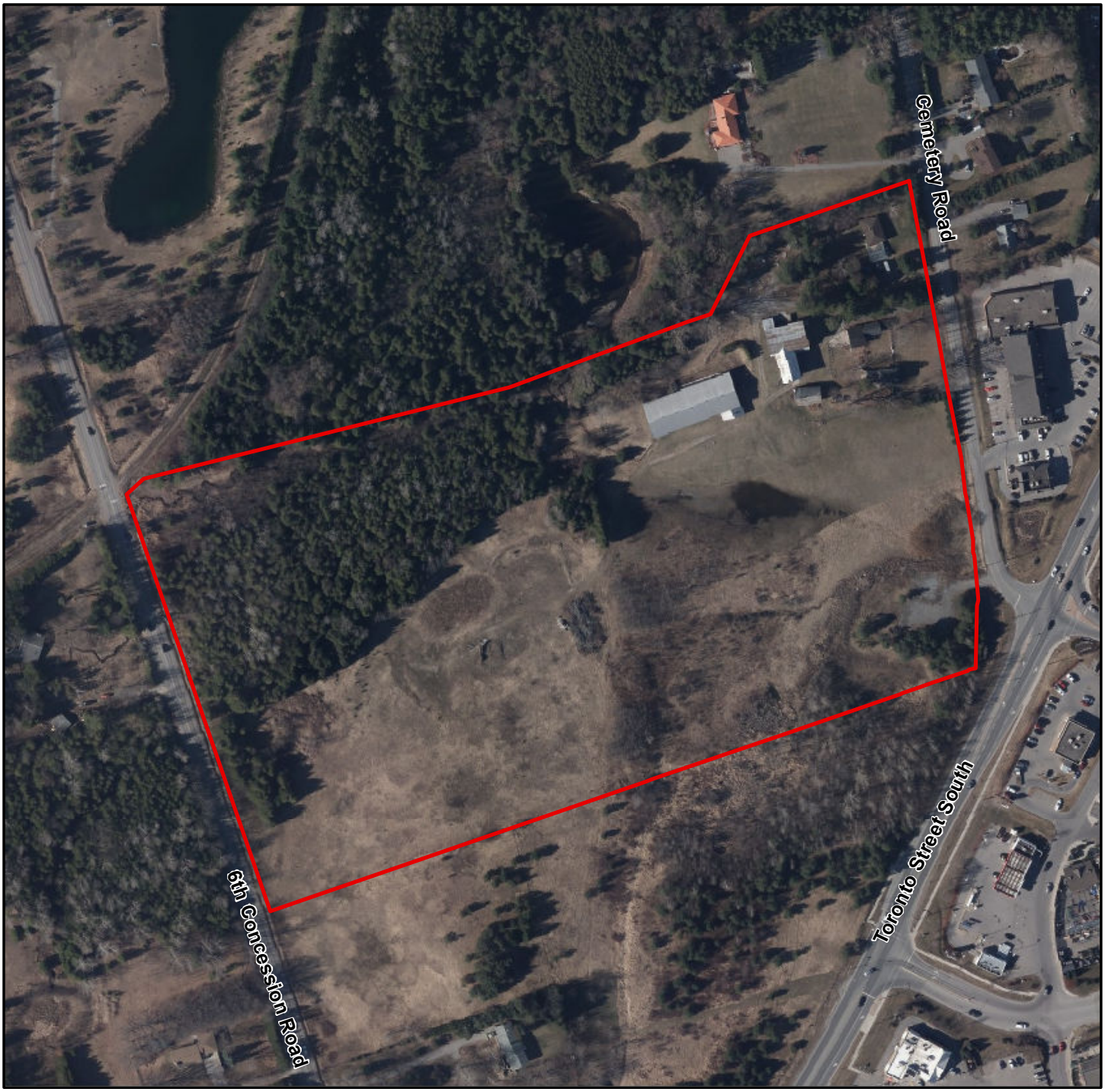
2.1.7 Development and site alternation shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.

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

Each of these features is afforded varying levels of protection subject to guidelines, and in some cases, regulations.

Since the property is located inside Ecoregions 6E and7E, subsections 2.1.3 and 2.1.5 b) and c) do apply.

Some of these features (e.g., provincially significant wetlands and ANSIs, criteria for significant woodlands) are identified by the MNRF, while others are to be identified by the local area municipalities or planning authorities (i.e., significant valleylands and significant wildlife habitat). Threatened and Endangered species are designated at the provincial level, but their habitat is typically identified or verified at the site-specific level. It is expected that even where features have been identified at the provincial, regional or local levels that verification and some level of refinement is required at the site-specific basis. The application is also required to be compliant with the requirements of the *Endangered Species Act* (ESA).



Site Location	Figure 1
154 and 164 Cemetery Road, Moorefield Properties Ltd.	
First Base Solutions Web Mapping Service 2016	N W E S
UTM Zone 17 N, NAD 83	
0 20 40 80 Meters	1:3,000
BEACON ENVIRONMENTAL	Project 216320 November 2016

As the subject property is also within the Oak Ridges Moraine, the policies of the Oak Ridges Moraine Conservation Plan (ORMCP) (see section 2.2) generally prevail as it is the more restrictive. Therefore, the test for policy compliance is against the ORMCP rather than the PPS.

2.2 Oak Ridges Moraine Conservation Plan

The subject property is located on the Oak Ridges Moraine (Map 5: Oak Ridges Conservation Plan Land Use Designation Map of the ORMCP 2002). The western two-thirds of the property are within the Natural Linkage Area and Countryside land use designations while the eastern one-third is located in Settlement Area.

Existing uses and restricted new uses are allowed in the Natural Linkage Areas, which include: resource management, agricultural, low intensity recreational, home businesses, transportation and utility uses. Countryside Areas act as a buffer between Natural Core, Natural Linkage and the urbanized Settlement Areas. Uses within Countryside Areas are the same as those allowed in the Natural Core and Linkage Areas. Settlement Areas are designated for urban development and permit a range of residential, commercial, industrial and institutional uses, in accordance with official plans.

Section 22 (1) of the Oak Ridges Moraine Conservation Plan (ORMCP) identifies seven Key Natural Heritage Features (KHNF). These include:

1. *Wetlands;*
2. *Significant portions of the habitat of endangered, rare and threatened species;*
3. *Fish habitat;*
4. *Areas of Natural and Scientific Interest (life science);*
5. *Significant valleylands;*
6. *Significant woodlands;*
7. *Significant wildlife habitat; and*
8. *Sand barrens, savannahs and tallgrass prairies.*

Section 26 (1) of the ORMCP also identifies Hydrologically Sensitive Features (HSF). These include:

1. *Permanent and intermittent streams;*
2. *Wetlands;*
3. *Kettles lakes; and*
4. *Seepage areas and springs.*

Policy 23 (1) of the ORMCP requires that Minimum Vegetation Protection Zones (MVPZs) be applied to the limits of KNHFs and HSFs and that the width of these can either be a 30 m minimum or be determined through a natural heritage study, provided that a public process (e.g., an Official Plan Amendment) is undertaken.

Permitted uses are limited within the MVZPs. The ORMCP states that:

> *"All development and site alteration with respect to land within a key natural heritage feature or the related minimum vegetation protection zone is prohibited, except the following:*

1. *Forest, fish, and wildlife management.*
2. *Conservation and flood or erosion control projects, but only if they have been demonstrated to be necessary in the public interest after all alternatives have been considered.*
3. *Transportation, infrastructure, and utilities as described in section 41, but only if the need for the project has been demonstrated and there is no reasonable alternative.*
4. *Low-intensity recreational uses as described in section 37.*

Section 37. (1) Low-intensity recreational uses are recreational uses that have minimal impact on the natural environment, and require very little terrain or vegetation modification and few, if any, buildings or structures, including but not limited to the following:

1. *Non-motorized trail uses.*
2. *Natural heritage appreciation.*
3. *Unserviced camping on public and institutional land.*
4. *Accessory uses.*

(2) Small-scale structures accessory to low-intensity recreational uses, such as trails, boardwalks, foot bridges, fences, docks and picnic facilities, are permitted only if the applicant demonstrates that the adverse effects on the ecological integrity of the Plan Area will be kept to a minimum by,

(a) keeping disturbed areas to a minimum; and
(b) avoiding the most sensitive portions of the site, such as steep slopes, organic soils and significant portions of the habitat of endangered, rare or threatened species."

2.3 Regional Municipality of Durham Official Plan

The Region of Durham Official Plan (2015) identifies the subject property as being part of the Oak Ridges Moraine Areas.

Sub-Section 10B.2.1. of the Official Plan states that:

> *"Within the Oak Ridges Moraine designation, only applications for development and site alteration that conform with the Oak Ridges Moraine Conservation Plan will be considered."*

Schedule 'A', Map A2 of the Region of Durham Official Plan indicates the subject property is located as Living Area. There is no Major Open Space identified on or adjacent to the subject property.

Schedule 'B', Map B1b Greenbelt Natural Heritage System and Key Natural Heritage and Hydrologic Features, identifies Key Natural Heritage (KNHF) and Key Hydrologic Features (KHF) within the subject property, and that it is located within the Urban Area. These features are associated with a wetland and a drainage feature occurring at the southeast portion of the property as well as with the forested and wetland areas to the north.

Development is not permitted within KNHFs or HSFs and their associated vegetation protection zones. The location and extent of KNHF may be confirmed through appropriate studies such as an Environmental Impact Study (EIS) in accordance with Policy 2.3.43 of the Official Plan.

2.4 Township of Uxbridge Official Plan

Schedule A, Land Use and Transportation Plan of the Township's Official Plan (Office Consolidation January 2014) identifies the entire subject property as being within the Oak Ridges Moraine Conservation Plan Area with the easterly one third of the subject property within the Urban Area. Within the Urban Area Boundary of the subject property, an Environmental Constraints Areas covers the southeast portion with an Institutional Area located immediately northeast. The remaining half of the subject property located outside the Urban Area Boundary (west) is within Hamlet Area with northwest limits of the subject property containing Natural Linkage Area and Natural Hazard Area.

Schedule B, Natural Heritage System and Supportive Uses Uxbridge Urban Area of the Township's Official Plan identifies the entire subject property lies within the Oak Ridges Moraine. The southeast portion of the subject property is designated wetlands with minimum vegetation protection zone. The northeast portion of the subject property is identified as Institutional Areas. The remaining western portion of the subject property is considered Minimum Area of Influence with Significant Woodlands and wetlands in the northwest portion of the site.

In accordance with Section 2.3.3.2 (iv) "development and site alteration shall not be permitted in the Environmental Constraint Area designation and the associated vegetative protection zones, subject to the confirmation of the boundary in accordance with the policies of Section 2.3.3.6." Outside of these, limited uses are permitted subject to an EIS demonstrating the need for a particular facility and/or that there is no negative impact on the functions and features.

Where development is proposed adjacent to Key Natural Heritage Features, Hydrologically Sensitive Features and Areas of Natural and Scientific Interest (Life Science) a minimum naturally vegetated buffer zone of 30 m shall generally be established.

2.5 Lake Simcoe Region Conservation Authority Policies and Regulations

The Lake Simcoe Region Conservation Authority (LSRCA) regulates hazard lands including watercourses, valleylands, flood hazards, shorelines, and wetlands, and lands adjacent to these features. The LSRCA also provides guidance to the Township of Uxbridge on matters related to natural heritage protection through peer review of Environmental Impact Studies/Natural Heritage Evaluations.

The LSRCA's Watershed Development Policies (2014) implement the *Conservation Authorities Act*, as well as provide guidance on natural heritage feature identification and protection.

The LSRCA developed the Uxbridge Brook Subwatershed Plan (1997) well before its requirement of the ORMCP. The Subwatershed Plan provides a framework to identify areas of natural heritage degradation, areas needing restoration and those requiring protection. Although somewhat out of date, it still provides a useful summary of the features and functions of the Uxbridge Brook Subwatershed.

The LSRCA also provides peer review and technical comment on Environmental Impact Studies and Natural Heritage Evaluations to their municipal partners regarding non-regulated natural heritage features.

The LSRCA regulates watercourses and wetlands greater than 0.5 ha as well as a 30 m area adjacent to these features, and 120 m adjacent to provincially significant wetlands (PSW). For development proposals within the regulated area, the LSRCA can require that an Environmental Impact Study be prepared to the satisfaction of the Authority. The regulation requires the issuance of a permit from the Conservation Authority to allow "interference" with a wetland.

2.6 Lake Simcoe Protection Plan

The purpose of the *Lake Simcoe Protection Act* (2008) is to protect and restore the ecological health of the Lake Simcoe watershed. Section 2, (1) support co-ordination of environmental and resources management programs, land use planning programs and land development programs of the various ministries of the Government of Ontario.

The Lake Simcoe Protection Plan (2009) (LSPP) has separate requirements depending on whether or not the proposed development is located within an existing settlement area. The LSPP states that *settlement areas* are urban areas and rural settlement areas (e.g. cities, towns, villages and hamlets) where development is concentrated and lands are designated in municipal official plans for development over the long term. The LSPP generally defers to municipal Official Plans to guide development and site alteration with respect to natural heritage features and functions within Settlement Areas. The proposed develpoment is located within a settlement area.

2.7 Provincial *Endangered Species Act*

Ontario's *Endangered Species Act, 2007* (ESA) came into effect on June 30, 2008 and replaced the former 1971 Act. The ESA protects species listed as endangered and threatened by the Committee on the Status of Species at Risk in Ontario (COSSARO). The purposes of the ESA are:

- To identify species at risk based on the best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge;
- To protect species that are at risk and their habitats, and to promote the recovery of species that are at risk; and
- To promote stewardship activities to assist in the protection and recovery of species that are at risk.

An Endangered or Threatened species is protected, as is its habitat. Specifically, Section 9 of the ESA prohibits the killing, harming, harassing, possession, collection, buying and selling of extirpated, endangered, and threatened species on the Species at Risk in Ontario (SARO) List; and Section 10 prohibits the damage or destruction of protected habitat of species listed as extirpated, endangered or threatened on the SARO List.

Species specific and seasonal surveys are required to determine the presence or absence of species at risk.

2.8 Federal *Fisheries Act*

The study area contains watercourses that support fish habitat. Fish habitat is protected under the federal *Fisheries Act* (1985). In Ontario, the federal department of Fisheries and Oceans Canada (DFO) manages fish habitat, while the Ontario Ministry of Natural Resources and Forestry (MNRF) manages fisheries.

The *Fisheries Act* has been updated through Bill C-38 which came into effect November 25, 2013. Key changes include the combination of former Sections 32 and 35 into a new Section 35 addressing the removal or Harmful Alteration, Disruption or Destruction (HADD) of fish habitat. The prohibitions on killing fish and causing HADD have been replaced with a single prohibition in Section 35 against causing '*serious harm to fish'* that are part of a commercial, recreational or aboriginal fishery, or to fish that support such a fishery.

> *"Serious harm to fish"* is defined as "*the death of fish or any permanent alteration to, or destruction of, fish habitat*". "*Serious harm to fish"* includes the following:
>
> 1. *The death of fish;*
> 2. *A permanent alteration to fish habitat of a spatial scale, duration or intensity that limits or diminishes the ability of fish to use such habitats as spawning grounds, or as nursery, rearing, or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes; or*
> 3. *The destruction of fish habitat of a spatial scale, duration, or intensity that fish can no longer rely upon such habitats for use as spawning grounds, or as nursery, rearing, or food supply areas, or as a migration corridor, or any other area in order to carry out one or more of their life processes.*

Commercial, recreational or aboriginal fisheries include those fish that fall within the scope of applicable federal or provincial fisheries regulations as well as those that can be fished by aboriginal organizations or their members for food, social or ceremonial purposes, or for purposes set out in a land claims agreement. Fish that support these fisheries are those that contribute to the productivity of a fishery and may reside in bodies of water that contain fisheries or in water bodies that are connected by a watercourse to such water bodies.

3. Methodology

The scope of work required for the current application relative to the NHE completed for the previous application was discussed with the LSRCA (C. Burgess pers comm.). It was agreed that the work completed for the previous submission (e.g., staked feature limits, prescribed buffers and vegetation mapping) could be used for this application. As such, the dates of the field investigations noted refer to the initial work undertaken. Current field investigations were conducted to include the new parcel (154 Cemetery Road) and to address the ESA.

3.1 Background Review

Background information was gathered and reviewed at the outset of the project. This involved existing documentation for the subject property, including:

- Ministry of Natural Resources' Natural Heritage Information Centre (NHIC) rare species database (September 2008);
- Ministry of Natural Resources and Forestry (MNRF),
- Aurora District Office information request; and
- Lake Simcoe Region Conservation Authority (LSRCA).

A letter was sent to the Aurora District Office of the MNRF on September 9, 2008 requesting data on species at risk documented in the vicinity of the subject property. In addition, a letter was sent to the LSRCA on September 2, 2008 requesting any available natural heritage data for the subject property. A response was received from both MNRF and the LSRCA and these data have been incorporated in this report.

Other sources of information, such as aerial photography and topographic maps, were consulted prior to commencing a field assessment.

3.2 Field Investigations

Reconnaissance field investigations were undertaken in the 2008 field season by Beacon staff and existing conditions with respect to natural habitats within the subject property were reviewed.

Following the initial survey, field surveys of the subject property to document the existing natural history associated with the property were undertaken on the following dates:

Aquatic Resources	April 16 and June 2, 2008
Amphibian Surveys	April 16 and May 26, 2008
Vegetation Communities and Flora	June 17, 2008
Breeding Bird Surveys	June 17 and 20, 2008
Feature Staking	July 18, 2008
Potential Bat Habitat Assessment, Butternut search, Barn Swallow nest search	September 2016

A survey for species at risk was conducted on September 6, 2016 to include habitat for species listed as endangered and threatened since 2008. This included an assessment for the potential of bat habitat and Butternut (*Juglans cinerea*).

Breeding bird surveys will be conducted in June 2017 to determine whether endangered or threatened species are currently inhabiting the subject property. An addendum to this NHE will be provided following the surveys to report on the findings.

Aquatic Resources

The subject property was surveyed on April 17 and June 2, 2008 by a Beacon Aquatic Ecologist. The aquatic assessment included identifying the presence of watercourses, ponds, water flow regimes (i.e., permanent, intermittent, ephemeral drainage), riparian cover type and extent, stream morphology, bank stability and the presence/absence of fish.

Amphibians

Amphibian surveys were undertaken on the subject property during two amphibian breeding periods. The first survey was conducted on April 16, 2008 to record presence of early breeders, while the second survey was undertaken on May 26, 2008 to record presence of later breeding species.

The surveys involved visiting the subject property after dusk to listen for calling males. Calling amphibians were identified to species and chorus activity was assigned a code from the following options:

0 no calls;
1 individuals of one species can be counted, calls not simultaneous;
2 some calls of one species simultaneous, numbers can be reliably estimated; and,
3 full chorus, calls continuous and overlapping.

Weather conditions during the two surveys are provided below:

Weather Parameters	April 16, 2008	May 26, 2008
Air temperature	13°C	23°C
Water temperature	12°C	21°C
Precipitation	Nil	Humid, misty
Wind speed (Beaufort scale) and direction	calm	1

Vegetation Communities and Flora

An assessment of existing terrestrial conditions on the subject property was undertaken on June 17, 2008 by a Beacon Ecologist. Vegetation communities were mapped according to the Ecological Land Classification (ELC) system for southern Ontario (Lee *et al.*, 1998), and involved delineating vegetation communities on an aerial photograph of the property and recording pertinent information concerning the structure and composition of vegetation in each community. This included an inventory of vascular plant species observed.

Breeding Birds

Two visits to the subject property were made in the early mornings of June 17 and June 20, 2008, to survey the breeding bird community. On both occasions the conditions were clear and calm and the temperature did not deviate > 5°C above or below the average temperature for the time of year. All birds in suitable habitat and showing some propensity to breed (e.g., territorial behaviour) were assumed to be breeding and were tallied by "assumed pair". All parts of the subject property were approached within 50 m.

The barns were searched for Barn Swallow nests in September 2016.

Breeding bird surveys will be completed in June 2017, the results of which will be provided as an addendum to this report.

Potential Bat Habitat Assessment

The existing barns and farmhouse and proposed developable area were assessed for the potential to provide bat habitat in consultation with the MNRF.

Feature Staking

The boundary of the provincially significant Uxbridge Brook Wetland was staked by the MNRF with the LSRCA and Beacon in July 2008. The woodland features were staked by the LSRCA on the same date.

4. Existing Natural Heritage Conditions

The existing natural heritage conditions are illustrated in **Figure 2** and described in detail below.

4.1 Physiography

The subject property is flat to gently rolling with generally well-drained soils that are productive for agriculture. The subject property lies just on the north side of the Oak Ridges Moraine, within the Lake Simcoe watershed. The physiographic region of the north slope of the Oak Ridges Moraine is characterized by a drumlinized, till area of thin sand deposits over glacial deposits (Chapman and Putnam 1984).

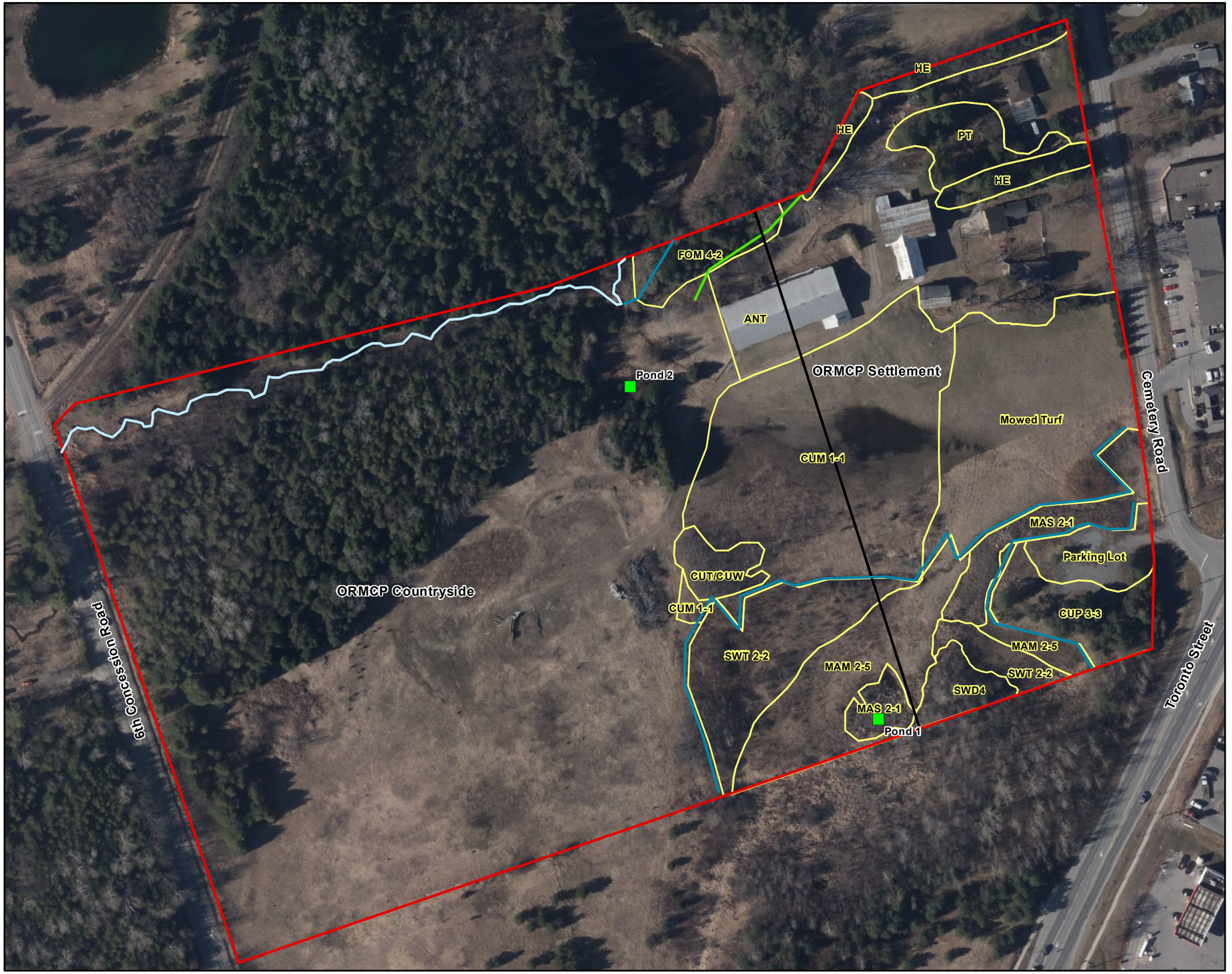
4.2 Watershed

The subject property lies within lands draining to Lake Simcoe, within the Uxbridge Brook Subwatershed area. This subwatershed originates on the Oak Ridges Moraine and is dominated by agricultural uses and natural heritage features, with some small settlement areas, including the urban area of Uxbridge.

Existing Conditions

Figure 2

154 and 164 Cemetery Road
Moorefield Properties Ltd.



Legend

- Subject Property
- Vegetation Communities
- Wetland Limit (Staked with MNR, July 18, 2008)
- Staked Vegetation Boundary (LSRCA, July 18, 2008)
- Tributary to Uxbridge Brook
- ORMCP Countryside/Settlement
- Ponds

Code	Community Description
ANT	Anthropogenic
CUM1-1	Dry - Moist Old Field Meadow
CUT/CUW	Cultural Thicket/Cultural Woodland
FOM4-2	Dry - Fresh White Cedar - Poplar Mixed Forest
HE	Hedgerow
MAM2-5	Narrow-leaved Sedge Mineral Meadow Marsh
MAS2-1	Cattail Mineral Shallow Marsh
PT	Planted Trees
SWD4	Mineral Deciduous Swamp
SWT2-2	Willow Mineral Thicket Swamp

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Web Mapping Service 2015

UTM Zone 17 N, NAD 83

N
W E
S

0 15 30 60 Metres

1:1,600

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Project 216320
November 2016

The LSRCA completed the Uxbridge Brook Subwatershed Report in 1997, which documents the existing ecological conditions of the subwatershed, identifies deficiencies, and opportunities for improvement.

4.3 Aquatic Resources

Through the aquatic assessment two drainage features have been identified on the subject property.

A tributary of the Uxbridge Brook runs parallel to the northern boundary of the subject property from 6th Concession Road flowing east into a pond located north and outside of the subject property. This watercourse is situated on lands designated as Natural Linkage Areas in the ORMCP and provides direct fish habitat.

A second drainage feature is located at the southeast section of the subject property. Much of the surface water from the PSW located southeast of the subject property is conveyed *via* this ill-defined ephemeral vegetated swale. This drainage feature flows east from the wetland and exits the property through a culvert under Cemetery Road. It then flows through a piped system before draining into the Uxbridge Brook. This feature provides indirect functions such as flow conveyance, attenuation/storage and water quality contributions, but not direct fish habitat.

4.4 Terrestrial Resources

4.4.1 Amphibians

The PSW and two ponds occurring on the subject property have been identified as providing amphibian breeding habitat (**Figure 2**). **Table 1** provides a summary of amphibian breeding activity during the two surveys (2008).

Table 1. Results of the Breeding Amphibians Surveys

Pond Number and Location	Species and Chorus Strength		Comments
	April 16	May 26	
Pond 1	Northern Spring Peeper 3 Wood Frog 2	Northern Spring Peeper 1 Gray Treefrog 2 Green Frog 2 Northern Leopard Frog 1 American Toad 1	Primary Breeding Habitat
Pond 2	Northern Spring Peeper 1 Wood Frog 2	Northern Spring Peeper 1 Gray Treefrog 1 American Toad 2	Primary Breeding Habitat
PSW in the southeast portion	Northern Spring Peeper 3 Wood Frog 2	Northern Spring Peeper 1	Mostly off-site

All species observed on the subject property are common in Ontario (NHIC 2008). The April survey identified two early spring breeding species: Northern Spring Peeper (*Pseudacris crucifer*) and Wood Frog (*Rana sylvaticus*). These species depend on the presence of fish-free temporary ponds teeming with invertebrates that provide food for amphibians. They also appear to be less tolerant of disturbance or changes to water quality. Pond 1 and Pond 2, as well as the PSW which is located south of the property, supported the highest number of frogs for both species.

Green Frogs are mostly aquatic rely on deeper permanent waters and may be found in relatively poor quality water. Northern Leopard Frogs are semi-aquatic and require open meadows or fields for summer habitat which is present on the subject property. American Toads are habitat generalists and they will use temporary or permanent breeding ponds and a variety of summer habitats, but they do require 'burrowable' soil for hibernation.

Based on the survey results, Pond 1 can be considered to represent a productive amphibian breeding site. This pond supports high species diversity (five species) and greater numbers of breeding individuals for each species. This pond provides a shallow water aquatic marsh community that maintains standing water well into July, and therefore supports a hydro period that allows for tadpole maturation into adults for all the species of frogs and toad that are documented to occur on the site. These conditions also provide habitat for the more aquatic frog species including Green Frogs that were documented to be breeding in the pond.

Pond 2 supports breeding habitat for four species and also provides shallow open water marsh habitat. However, given the low volume of standing water in the pond, it most likely experiences dry conditions during years with less than average precipitation during April, May and June. As such this pond maybe less productive, which is supported by the occurrence of low numbers of individuals for the species that were found to be breeding there.

4.4.2 Vegetation Communities

Ecological Land Classification designations for the subject property are described below and illustrated in **Figure 2**.

Dry-Fresh White Cedar – Poplar Mixed Forest Type (FOM4-2)

This is a small forested unit which occurs in the north just beyond the staked vegetation boundary. The dominant tree species in the canopy are White Cedar (*Thuja occidentalis*) and Balsam Poplar (*Populus balsamifera*).

Scotch Pine Coniferous Plantation (CUP3-3)

This community consists of planted Scots Pine (*Pinus sylvestris*) in the canopy, with generally non-native, weedy terrestrial forbs below, such as Dandelion (*Taraxacum officinalis*), Oxeye Daisy (*Leucanthemum vulgare*), Tall Buttercup (*Ranunculus acris*), and English Plantain (*Plantago lanceolata*).

Dry – Moist Old Field Meadow (CUM1-1)

Species in this community are a mixture of terrestrial forbs and grasses. Dominant species include Canada Goldenrod (*Solidago canadensis*), Oxeye Daisy, Common Yarrow (*Achillea millefolium*), Meadow Timothy (*Phleum pratense*), Quack Grass (*Elymus repens*) and Black Bentgrass (*Agrostis gigantea*). This community includes areas of regenerating Trembling Aspen (*Populous tremuloides*).

Planted Trees and Hedgerows (PT/HE)

The northern parcel (154 Cemetery Road) includes a number of mature planted trees (PT) in the garden, including: White Pine (*Pinus strobus*), Sugar Maple (*Acer saccharum*), Norway Maple (*A. plataniodes*), and White Cedar. These trees contribute the tree cover in the area, but do not constitute cultural woodland.

A mature hedgerow (HE1) of White Spruce (*Picea glauca*) occurs along the north side of the existing driveway (to 164 Cemetery).

Another hedgerow (HE2) occurs along the fence line at the rear of 154 Cemetery Road. This hedgerow is dominated by Red Pine (*P. resinosa*), Scots Pine, and Norway Spruce (P. abies) with Buckthorn (*Rhamnus carthartica*), White Cedar, and Trembling Aspen in the understory.

The hedgerow (HE3) along the northern property boundary is mixed, comprised of: Manitoba Maple (*A. negundo*), Red Pine, Silver Maple (*A. saccharinum*), and Scots Pine.

Uxbridge Brook Headwaters Provincially Significant Wetland Complex:

Mineral Deciduous Swamp (SWD4)

This is a small unit which occurs on a slight mound. The dominant tree species in the canopy are Trembling Aspen (*Populus tremuloides*) and Balsam Poplar (*Populus balsamifera*). There are dense shrubs in the understorey, mostly willows (*Salix* sp.), Red-osier Dogwood (*Cornus stolonifera*) and American Black Currant (*Ribes americanum*). The groundcover is mostly Climbling Nightshade (*Solanum dulcamara*), Woodland Strawberry (*Fragaria vesca*), goldenrods (*Solidago* spp.) and Field Horsetail (*Equisetum arvense*).

Willow Mineral Thicket Swamp (SWT2-2)

The swamp thicket community is dominated by willow shrubs (*Salix* spp.) and includes Narrow-leaved Meadowsweet (*Spiraea alba*) in the area adjacent to the forest unit. Groundcover varies, but is generally made up of Sensitive Fern (*Onoclea sensibilis*), Spotted Joe-pye-weed (*Eupatorium maculatum*), Boneset (*Eupatorium perfoliatum*), rushes (*Juncus effusus*, *J. dudleyi*) and goldenrod. The microtopography is varied so the community does contain some terrestrial pockets.

Narrow-leaved Sedge Mineral Meadow Marsh (MAM2-5)

The meadow marsh is dominated by sedges (*Scirpus atrovirens*, *Carex* spp.) and rushes. It also contains spike-rush (*Eleocharis* sp.), Blue-flag (*Iris versicolor*), Purple Avens (*Geum rivale*), and Purple-stemmed Aster (*Symphyotrichum puniceum*). There appears to be groundwater seepage in some areas, particularly around the base of the mound which supports the forest unit.

Cattail Mineral Shallow Marsh (MAS2-1)

The small cattail marsh adjacent to the forest on the subject property is dominated by both cattails (*Typha angustifolia*, *T. latifolia*) and also contains a small amount of open water. There is a larger area of cattail marsh in a generally east-west strip terminated at Cemetery Road.

4.4.2.1 Flora

The botanical inventory resulted in the identification of 53 species of vascular plants, with 25 (or 47%) species non-native to Ontario. This is a high percentage of non-native species for a specific site, compared with about 25% of the flora of Ontario being non-native. At the subject property level, a high percentage of non-native species is indicative of higher levels of disturbance and in this case a lower floristic quality. Non-native species were recorded from all vegetation community types with higher numbers found in areas such as the cultural vegetation communities. Highly invasive species observed include European Buckthorn (*Rhammus cathartica*) and Scotch Pine.

4.4.2.2 Rarity

One plant is listed as locally rare in the Regional Municipality of Durham, in MNRF Site District 6E7 and within the LSRCA watershed (based on Varga *et al.* 2000). This species, Hard-stemmed Bulrush (*Schoenoplectus acutus*), was recorded from the PSW southeast of the subject property. Two other species are locally uncommon in the area (Table 3); Purple Avens was recorded in the wetland community MAM2-5 and Toad Rush was recorded in the Open Water pond community. No other species of conservation concern were recorded.

4.4.3 Birds

Table 2 presents the species and numbers of breeding bird pairs that were found during the 2008 survey to be present on the subject property. The Table has been updated to reflect the current status of the species.

Table 2. Results of the Breeding Birds Survey

Common Name	Scientific Name	COSSARO	Prov. S-rank	# of Pairs
Killdeer	*Charadrius vociferus*		S5	1
Eastern Wood-Pewee	*Contopus virens*	SC	S4	1
Eastern Phoebe	*Sayornis phoebe*		S5	1
N. Rough-winged Swallow	*Stelgidopteryx serripennis*		S4	1
Barn Swallow	*Hirundo rustica*	THR	S4	1
Blue Jay	*Cyanocitta cristata*		S5	1
Black-capped Chickadee	*Poecile atricapillus*		S5	2
American Robin	*Turdus migratorius*		S5	1
Cedar Waxwing	*Bombycilla cedrorum*		S5	1
European Starling	*Sturnus vulgaris*		SE	1
Yellow Warbler	*Dendroica petechia*		S5	2
Northern Waterthrush	*Seiurus noveboracensis*		S5	1
Common Yellowthroat	*Geothlyphis trichas*		S5	2
Northern Cardinal	*Cardinalis cardinalis*		S5	1
Indigo Bunting	*Passerina cyanea*		S5	1
Chipping Sparrow	*Spizella passerine*		S5	2
Savannah Sparrow	*Passerculus sandwichensis*		S4	2
Song Sparrow	*Melospiza melodia*		S5	4
Red-winged Blackbird	*Agelaius phoeniceus*		S5	5
Common Grackle	*Quiscalus quiscula*		S5	1
Baltimore Oriole	*Icterus galbula*		S5	1
American Goldfinch	*Cardeulis tristis*		S5	3

Key to Table

Provincial S-Rank (from MNR's Natural Heritage Information Centre) shown for breeding status if: S1 (critically imperilled), S2 (imperilled), S3 (vulnerable), S4 (apparently secure), S5 (secure) and SE (exotic, i.e. introduced).COSSARO: SC – Special Concern; THR - Threatened

Except for the European Starling (*Sturnus vulgaris*), which is considered an exotic species (SE), all but four of the breeding birds encountered on the subject property are considered to be "secure" by the MNRF (S5). Four species are listed as S4 ('apparently secure'): Eastern Wood-Pewee, Northern Rough-winged Swallow, Barn Swallow, and Savannah Sparrow.

One species, Barn Swallow is listed nationally and provincially as Threatened. The existing structures were surveyed in 2016 for the presence of Barn Swallow nests. Structures with Barn Swallow nests are regulated under the ESA. No Barn Swallow nests were found in any of the structures on the subject property and it was concluded that nesting was not occurring on the subject property (and may not have been in 2008). The 2008 record was of a foraging Barn Swallow. As this species was not listed until January 2012, there would not have been a nest search conducted in 2008.

Eastern Wood-Pewee is listed as Special Concern and is not subject to the ESA. The habitat for Species of Special Concern may be considered Significant Wildlife Habitat based on the guidance provided in the Natural Heritage Reference Manual (MNRF 2005). Only one pair was recorded from the adjacent woodland to the north and west.

Area-sensitive species are those that are generally considered to be productive only in larger areas of contiguous suitable habitat. On the subject property, and using the MNRF determination of area-sensitivity, only one species, the Savannah Sparrow (*Passerculus sandwichensis*) is considered to fall into this category as an open country species. However, Savannah Sparrows are common and abundant in rural areas.

To a greater extent the breeding bird community already reflects the disturbance that is created by the mosaic of the adjacent development and agricultural land uses. The breeding bird list can be subdivided into four principal communities. These are: woodland edge, old field, wetland/marsh and urban tolerant/generalist communities. These are discussed in the following paragraphs.

Woodland Edge

This is situated in the western portion of the subject property that is designated as Natural Linkage Area. Forested habitat situated in the western portion of the subject property probably support productive habitat for these species. The community is characterized by a small number of pairs of such species including Black-capped Chickadee (*Poecile pooetes*), Cedar Waxwing (*Bombycilla cedrorum*), Eastern Wood-Pewee (*Contopus virens)* and Baltimore Oriole (*Icterus galbula*).

Old Field/Early Successional

This community constitutes cultural meadows and golf course rough, thickets and cultural woodlands. It is dominated by Red-winged Blackbird (*Sturnella magna*), American Goldfinch, Song Sparrow, Savannah Sparrow (*Passerculus sandwichensis*), Yellow Warbler (*Dendroica petechia*), Chipping Sparrow (*Spizella passerine),* Barn Swallow (*Hirundo rustica)* (foraging only) and Killdeer (*Charadrius vociferous*). Successional habitats favour species such as Indigo Bunting (*Passerina cyanea*).

Urban Tolerant

This is a group of birds that are common in anthropogenic habitats as well as a variety of natural habitat types. The group is represented by American Robin, Common Grackle (*Quiscalus quiscula*), and Northern Cardinal (*Cardinalis cardinalis*).

4.4.4 Mammals

The mammals of the settled landscapes of southern Ontario are mostly those species that have benefited from agricultural expansion and other human activities. Since many of the sensitive species have already been extirpated, the remaining species are generally widespread and common, as were species detected on the subject property, with the exception of bats.

There are three species of bats that could occur in southern Ontario that have been listed as Endangered: Little Brown Myotis (*Myotis lucifugus*), Eastern Small-footed Myotis (*M. leibii*), Tri-coloured Bat (*Perimyotis subflavus*). These species are generally seek woodland habitat, but can roost in old buildings such as old churches, school houses and farm houses. This is addressed in section 4.6.

Two mammal species were encountered in the wood area in the northwest during field investigations. These were: White-tailed Deer (*Odocoileus virginianus*) and Hairy-tailed Mole (*Parascalops breweri*). The White-tailed Deer is common to abundant in Ontario. Both species are common to abundant in Ontario. Although deer, which are frequently encountered locally, do utilize the woodland and wetlands associated with the watercourse to the north of the property. Other common mammalian species such as Gray Squirrel (*Sciurus carolinensis*), Red Squirrel (*Tamiasciurus hudsonicus*), Eastern Chipmunk (*Tamias striatus*), Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Coyote (*Canis latrans*) and Red Fox (*Vulpes vulpes*) are also expected to occur on the subject property.

4.5 Landscape Connectivity

Landscape connectivity, including the concept of wildlife corridors, has become recognized as an important part of natural heritage planning. Although there is not universal agreement on the net benefits of corridors, a wide range of benefits can be attributed to maintaining connectivity within the natural landscape. In the fragmented landscape of southern Ontario, connectivity functions range from low, where major development features (e.g., highways, railways) fragment a pathway, to high, where natural features dominate the landscape and are more or less contiguous.

The subject property occurs is in an area where the local landscape is dominated by agricultural lands, on the edge of residential and commercial development. The property is not part of a core natural area, except to the extent that the larger forested area extends from the northwest onto the subject property along the watercourse. Based on the existing conditions, landscape connectivity function at a regional level is a patchwork of varying habitat types including meadow, wetland and woodland.

Local connectivity within the subject property is maintained between the wetland area in the southeast and the wetland and forested area located in the northwest. The woodland associated with the valleylands in the northwest section of the subject property extends off-site to both the northeast and northwest.

4.6 Significant Wildlife Habitat

Significant wildlife habitat is defined by the guidelines of the Natural Heritage Reference Manual and is intended to identify important wildlife functions (rather than habitat for Species at Risk). This includes: seasonal concentrations areas; rare vegetation communities or specialized habitat for wildlife; habitats of species of conservation concern; and animal movement corridors.

Seasonal concentrations of breeding amphibians were located in the two breeding ponds. No rare vegetation communities were located, nor specialized habitat for wildlife. One species of conservation concern was identified in the 2008 breeding bird survey: Eastern Wood-Pewee. Only one pair was recorded from the woodland north and west of the developable area. One pair of a species of conservation concern in our professional opinion, does not constitute significant wildlife habitat. Further,

there will be no development in or within 10 m of the woodland. The interface of the development with the woodland is only several metres in length. There were no identified animal movement corridors.

4.7 Species at Risk

Review of the NHIC database (2016) identified no records of rare species from one or within one kilometre of the subject property. A complete list of vascular plant species recorded from the subject property is provided in **Appendix A**.

The endangered tree, Butternut is known to occur within the Oak Ridges Moraine. No Butternut were located on or adjacent to the subject property despite species-specific searches.

The MNRF were consulted (M. Epplett pers comm.) and it was determined that the key assessment would focus on the old farmhouse. A pest control company examined the attic for signs of bat activity. None was found, as documented in their report (**Appendix B**). The barns are not likely provide potential suitable habitat as they are not heated. The developable portion of the property does not include any vegetation communities as listed by the MNRF as having the potential to provide habitat. These communities do occur in the woodland adjacent to the subject property.

Through the breeding bird surveys the presence/absence of endangered or threatened bird species will be confirmed. In the 2008 surveys, the only such species was Barn Swallow. Thorough searches of the barns did not identify any Barn Swallow nests. Chimney Swift (*Chaetura pelagica*) were not recorded and the chimneys on the farm house have been capped precluding any nesting opportunities.

5. Summary of Key Functions and Attributes

Field investigations of the flora and fauna on the subject property did not identify the occurrence of species designated as Endangered, Threatened or Species at Risk. This will be confirmed through breeding bird surveys to be conducted in 2017. Review of the NHIC database identified no records of rare species from within one kilometre of the subject property.

Based on field investigations and analysis, the following attributes have been identified on the subject property:

- breeding amphibians;
- wetland features and functions;
- vegetation communities and flora;
- breeding birds; and
- landscape connectivity.

These attributes and functions have also been used as a surrogate for other wildlife values. Existing information was also integrated into this existing conditions assessment. **Table 3** provides a summary of the key functions and attributes that have been identified on the subject property by this study.

Table 3. Summary of Key Functions and Attributes

Key Functions	Attributes	Location
Amphibian breeding habitat	• Two productive amphibian breeding areas on-site	• Pond 1 along the southern boundary; Pond 2 in north
Habitat for wetland associated flora and fauna	• Wetland associated breeding birds and amphibians	• Southeast portion of property • West of proposed development
Habitat for forest associated flora and fauna	• Forest associated breeding birds and mammals	• North and west of proposed development
Landscape Connectivity	• Local connectivity	• Wetlands in the southeast and in the northwest

6. Development Proposal

The subject properties are divided into two parcels: the north parcel (approximately 1.45 ha); and the south parcel (approximately 0.15 ha).

The development proposal for the north parcel consists of a plan of condominium fronting onto the west side of Cemetery Road just north of its intersection with Toronto Street (**Figure 3**). The townhome development consists of 56 units, with open space and a parkette. The development will be accessed by two private roads (Lane 'A' and Lane 'B') from Cemetery Road. An open space block is proposed at the north western portion of the property, adjacent to the key natural heritage features to the north and west. A parkette is proposed along the southern boundary of the north parcel between the rear of the units and the wetland. The parkette is intended to provide an interface between the wetland and the condominium development.

The south parcel is proposed for a three story apartment building consisting of 12 units and a parking lot.

The stormwater management plan has been prepared by Cole Engineering as described in the Functional Servicing and Stormwater Management Report (October 2016). The stormwater management plan has been designed to meet LSRCA's Technical Guidelines and Township standards by providing: Level 1 Enhanced quality control; post-to pre peak flow attenuation of the 1:2 year and 1:1 year storm events; and a pre- to post- water balance.

Stormwater management of the subject properties will occur on site and generally involves providing underground attenuation adjacent to the wetland buffer. Please refer to the Functional Service Report (Cole Engineering Group 2016) for details.

7. Effects Assessment and Mitigation

The proposed development is within lands designated as Settlement Area in the ORMCP (Figure 3). Limited. There will be no development within the Countryside portion of the property.

7.1 Effects Assessment

There will be no development or grading with the KNHFs or the respective buffers. There will be some tree cover loss of Scots Pine plantation associated with the south parcel. There will also be a loss of tree cover with the removal of the hedgerows and planted trees on the north parcel.

Potential impacts of the proposed development of the property could include:

- direct loss of vegetation and habitat;
- potential effects on vegetation communities and wetlands due to changes in groundwater or surface water;
- direct loss of vegetation through trampling and cutting;
- the dumping of compost/clippings/waste;
- noise and light effects;
- soil compaction; and
- increase in wildlife predation as a result of the intrusion of domestic pets into the wetland and woodland.

In addition to these, more or less direct effects of the proposed development, there are effects that can be anticipated as the general landscape urbanizes. Based on the fact that there is already development on and adjacent to the subject property, the area already receives indirect impact from noise, lights and pets.

Hydrology and Hydrologeology

The hydrogeological assessment for the subject property was originally completed by Norbert Woerns (February 2009), which considered a different application to what is now proposed; the main difference being the addition of 154 Cemetery Road. This report was peer reviewed for Moorefield Properties Ltd. by Cole Engineering (October 28, 2016) to consider the report in the context of the current proposed development. The Woerns Report and the Cole Engineering report were also reviewed by WSP (2016), which provided a third party analysis of the two reports and recommendations.

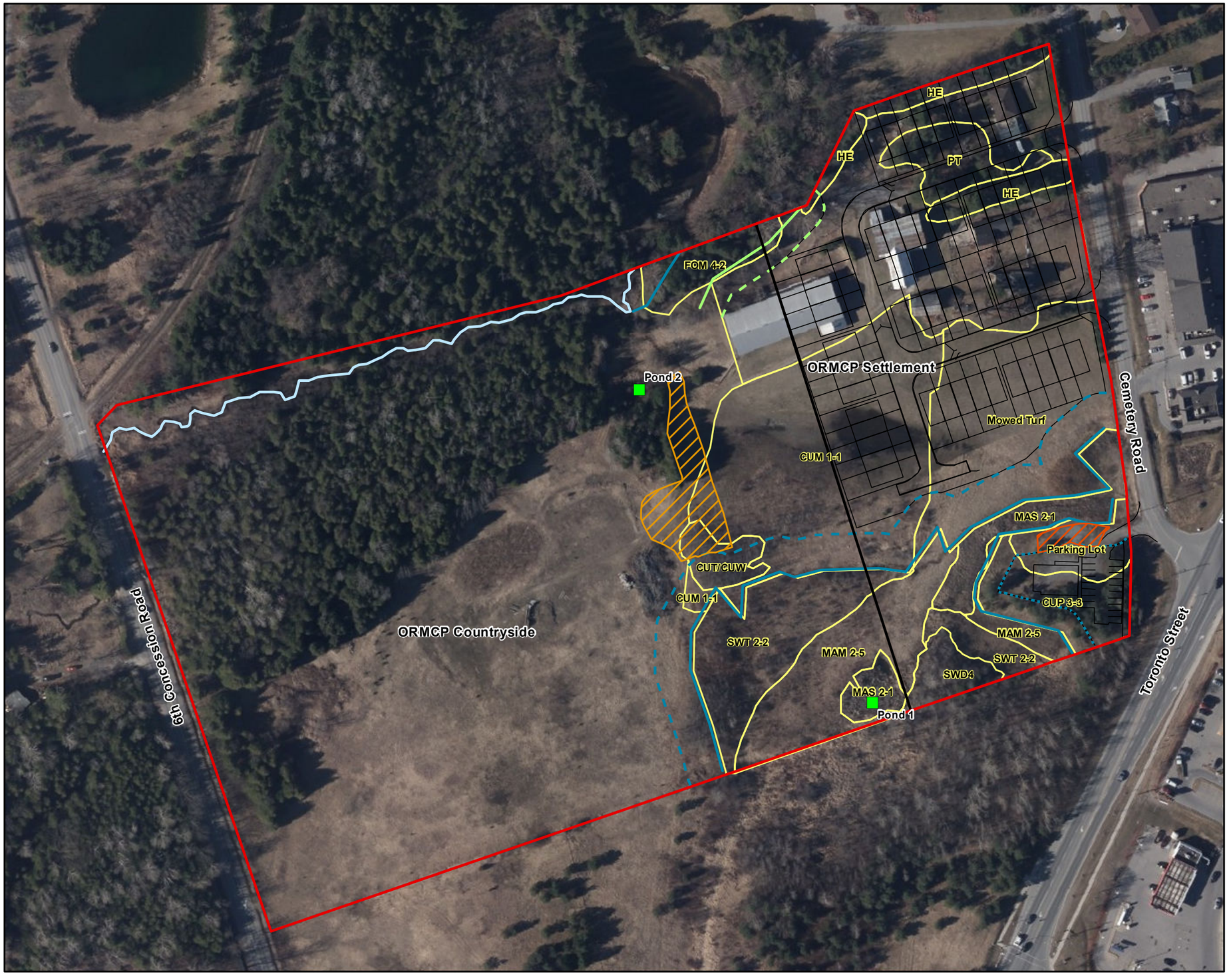
The original report provides a characterization of the hydrogeological conditions of the site and its surrounding area. The report indicates that the property contributes to seasonal groundwater discharge to the ephemeral drainage feature and associated wetland located at the southern portion of the property. Therefore, the groundwater recharge function at the property should be maintained to support the groundwater discharge function. This conclusion was confirmed by WSP (2016).

It was noted that the proposed development will result in the creation of impervious surfaces which will alter the natural water balance for the site resulting in a loss of infiltration. The recharge function should

Proposed Development

Figure 3

154 and 164 Cemetery Road
Moorefield Properties Ltd.



Legend

- Subject Property
- Proposed Development
- Tributary to Uxbridge Brook
- ORMCP Countryside/Settlement
- Vegetation Communities
- Wetland Limit (Staked with MNR, July 18, 2008)
- Wetland Limit + 10 m
- Wetland Limit + 15 m
- Staked Vegetation Boundary (LSRCA, July 18, 2008)
- Staked Vegetation Boundary + 10 m
- Ponds
- Approximate Linkage Area
- Approximate Area of Fill Removal

Code	Community Description
ANT	Anthropogenic
CUM1-1	Dry - Moist Old Field Meadow
CUT/CUW	Cultural Thicket/Cultural Woodland
FOM4-2	Dry - Fresh White Cedar - Poplar Mixed Forest
HE	Hedgerow
MAM2-5	Narrow-leaved Sedge Mineral Meadow Marsh
MAS2-1	Cattail Mineral Shallow Marsh
PT	Planted Trees
SWD4	Mineral Deciduous Swamp
SWT2-2	Willow Mineral Thicket Swamp

First Base Solutions
Web Mapping Service 2015

UTM Zone 17 N, NAD 83

0 15 30 60 Metres

1:1,700

BEACON ENVIRONMENTAL

Project 216320
November 2016

be protected during construction and post-development through maintaining the pre-development ground water recharge rates and general distribution. This has been assessed through a water budget analysis in the Functional Servicing and Stormwater Management Plan report (Cole Engineering October 2016). Recommendations to maintain the recharge and discharge functions are found in the Cole Engineering review (October 2016) of the Woerns Hydrogeological Investigation (February 2009) and supported by the WSP (2016) review.

Controlled post-development release rates from the site will not exceed the pre-development release rates (Cole Engineering 2016) and therefore negative effects on the wetland are not anticipated. A proposed oil/grit separator will contribute to the removal of phosphorous from the site drainage before the flows enter the wetland.

It is also worth noting that as the wetland is dominated by marsh and shrub swamp small changes in hydrology are unlikely to result in negative effects to the biological attributes. Marshes in particular are adapted to variable water levels.

In addition to the above, the following mitigation measures are recommended to limit or avoid potential impacts.

7.2 Mitigation Measures

The following mitigation measures have been identified to avoid, reduce or mitigate for the potential effects of the proposed residential development on the adjacent and surrounding natural heritage system.

7.2.1 Tree Preservation

There may be some tree preservation opportunities in the north-west corner within the Open Space block. The area currently includes mature trees along the fence line. Some of these trees may be retainable depending on the detailed grading plan. However, it is recommended that only desirable trees be retained. For example, it is recommended that the Manitoba Maple be removed as they tend to grow large and become hazardous, which is not suitable within an Open Space area.

Where trees have been identified for retention through the Tree Preservation Plan, tree preservation fencing should be installed prior to any vegetation removal or grading.

7.2.2 Minimum Vegetation Protection Zones/Buffers

Generally, the Oak Ridges Moraine Conservation Plan directs that natural features on the Oak Ridges Moraine be retained along with MVPZs of at least 30 m. However, through an appropriate study and Official Plan Amendment process an alternative minimum vegetation protection zone (MVPZ) or buffer can be determined in Settlement Areas. Details of the specific buffer limits that have been applied to features on the subject property are discussed below.

Woodland

A 10 m buffer has been applied to the staked vegetation boundary in the northeast portion of the subject property. As this woodland is on the Oak Ridges Moraine, the ORMCP guidance for delineating a feature was applied and the tree trunk limits were staked accordingly in 2008. Although there are some exceptions, the standard woodland buffer in many southern Ontario jurisdictions has become 10 m on dripline. In this case, the buffer from the dripline is slightly less than 10 m. However, as the interface of the woodland and development is restricted to a corner of a rear lot and the Open Space area, this buffer is adequate to prevent disturbance to the woodland and its functions. The distance from the proposed development and the staked wetland boundary associated with this woodland is approximately 85 m.

Wetland

With regards to the wetland occurring in the southeast portion of the subject property, the following buffers have been applied to provide protection for the wetland:

- 15 m between the northern limit of the wetland boundary and the development limit; and
- 10 m between the southern wetland boundary and the limit of development on the south parcel.

A buffer of 15 m is recommended on the northern wetland limit to ensure there is space to capture and attenuate surface flow from the proposed development. As the parkette is located between the development and the wetland buffer, it provides an additional area of distance, increasing the distance to nearly 40 m from the rear yards to the wetland limit in some locations. The closest rear yard occurs closest to the road, which is also the most highly disturbed area of the wetland. Although the parkette will be graded and sodded, it will provide an additional area of pervious surface for infiltration.

The southern wetland buffer is 10 m due to the highly disturbed nature of this area and the wetland. It is in close proximity to an intersection with a main road and has an area of previous fill placement. The adjacent wooded area is a cultural plantation on Scots Pine. On this basis a 10 m buffer from the proposed development of an apartment block and parking lot will be adequate to maintain the function of this wetland, particularly with the restoration of the buffer, while balancing efficient use of land.

These buffers will add habitat features that are currently absent and help protect existing features from intrusion, garbage and composting; they will generally mitigate noise and light effects and will assist in maintaining hydrological conditions, including surface water quality. The buffer areas will also provide habitat for species such as Northern Leopard Frog and American Toad, as well as contribute to landscape connectivity.

7.2.3 Buffer Restoration

It is recommended that the buffer area between the wetland and the development to the north and south be naturalized with plantings of native trees and shrubs. This will provide further protection of the wetland in this urbanizing location.

The existing buffer on the south wetland boundary includes an area of existing fill. This fill will be removed as part of the mitigation plan and replaced with suitable soil and will be restored with naturalized plantings.

The buffer to the woodland in the north-west corner will also be naturalized with native plantings.

7.2.4 Linkage Area

To replace the loss of tree cover associated with hedgerows, planted trees and the Scots Pine plantation, an area of approximately 0.14 ha between the southern wetland complex and the woodland/wetland complex to the north will be naturalized with trees and shrubs as a draft plan condition (**Figure 3**). Species to be planted would be based on the specific site and hydrological conditions, but would include native species found in the adjacent woodland, such as: White Pine, Eastern White Cedar, White Spruce, Sugar Maple, Black Cherry (*Prunus serotina*), Elderberry (*Sambucus canadensis*), and Alternate-leaved Dogwood (*Cornus alternifera*).

7.2.5 Planting Plans

As a draft plan condition, planting plans will be prepared for the restoration of the buffers and the linkage area.

7.2.6 Water Balance

The maintenance of the hydrology of the PSW during and following construction is required by LSRCA and provincial policy. Cole Engineering (November 2016) provides details regarding the mitigation to match pre to post hydrological conditions of the PSW. This involves providing underground storage adjacent to the 15 m buffer through which water will be dispersed to the wetland. There is a general effort to infiltrate as much water as possible to ensure that ground water contributions are not subject to a negative effect (Cole Engineering 2016).

7.2.7 Erosion and Sediment Control

To help ensure that heavy equipment does not impinge on natural areas and reduce soil compaction and sediment movement, filter fabric and paige wire fencing should be installed to define the development limit prior to site alteration and it should be maintained during the development process. All silt fencing should be removed when development work is completed and exposed soils stabilized.

Standard Best Management Practices should also be employed during the construction process. The Toronto and Region Conservation Authority's Erosion and Sediment Control Guidelines for Urban Construction (2006) could be consulted for best practices.

7.2.8 Timing

The federal *Migratory Bird Convention Act* protects the nests, eggs and young of most bird species from harm or destruction. As the breeding bird season in southern Ontario is generally from mid-April to late August, the clearing of vegetation should be outside of these periods. For any proposed clearing of vegetation within these dates, or where birds may be suspected of nesting outside of typical dates, an ecologist should undertake detailed nest searches immediately prior to site alteration to ensure that no active nests are present. As many woodland species are cavity nesters, this is a particularly difficult task in mature trees.

7.2.9 Other General Measures

Other measures to avoid, reduce or eliminate the potential effects of residential development adjacent to the natural heritage system include: minimizing lighting and where it is necessary, to direct lighting down and away from natural features; and fencing of the rear lots to discourage residents from expanding into the adjacent natural area.

8. Policy Conformity

8.1 Provincial Policy

This study has identified that the natural heritage features that occur on the site that are provincially significant or specifically identified by the planning authorities will be maintained and protected. This includes: the Provincially Significant Wetlands in the northwest and southeast portions of the subject property and Significant Valleyland associated with the tributary of Uxbridge Brook in the north.

As the policies of the ORMCP are more restrictive, the test of policy compliance will be against that policy document.

8.2 Oak Ridges Moraine Conservation Plan

With respect to the policies and regulations of the ORMCP, Key Natural Heritage and Hydrologically Sensitive Features were identified through the determination of the existing natural heritage features and functions.

The following sections present evaluations of the criteria for all seven KNHF and four HSF considered under the ORMCP.

8.2.1 Wetlands

All identified wetlands 0.5 ha or greater in size; or all wetlands (regardless of size), evaluated as provincially significant in accordance with the Ontario Wetland Evaluation System and accepted by OMNR are considered a KNHF and HSF (MMAH 2002).

The wetland in the southeast portion of the property is part of the provincially significant Uxbridge Brook Headwaters Wetland Complex and is comprised of four ELC wetland communities: a swamp thicket (SWT2-2), a sedge marsh (MAM 2-5), a cattail marsh (MAS 2-1) and a meadow marsh (MAM2-5). Collectively, these units are 0.94 ha in area. The wetland on the subject property has been evaluated by the OMNR and designated as a PSW and meets the minimum size criteria to be considered a KNHF and HSF.

The MNRF staked the wetland boundaries in July 2008 with the LSRCA and Beacon in attendance.

The buffer to the wetland forms the southern boundary of the north parcel. A buffer of 15 m is recommended between the staked wetland limit and the proposed development. Grading should not occur within this buffer.

The buffer to the southern edge of the wetland forms the northern limit of the south parcel. A buffer of 10 m from the staked wetland boundary is recommended on the southern wetland limit. The existing gravel access from Cemetery Road in to this parcel is within the 10 m buffer that will remain and will be upgraded; the area of fill within the 10 m buffer west of the access road will be restored.

8.2.2 Habitat for Endangered Species

Although the ORMCP refers to this attribute as 'significant portions of the habitat of endangered and threatened species', it is recognized that some permissions are available through the provincial *Endangered Species Act* (2007) with regard to the habitat of endangered and threatened species.

Field investigations (2008 and 2016) identified Barn Swallow, which is now listed as Threatened. However, recent searches (2016) of the barns did not reveal any Barn Swallow nests.

A pest control company was retained to determine whether there was any evidence of use of the farm house by bats. None was found.

No provincially rare vegetation communities were identified; and no endangered or threatened species were found, including Butternut (*Juglans cinerea*).

As such, there is no habitat for endangered and threatened species present on the subject property. This will be confirmed through the breeding bird surveys that will be conducted in June 2017.

8.2.3 Fish Habitat

The ORMCP (2002) defines "fish habitat" as: *"… the spawning grounds and nursery, rearing, food supply and migration areas on which fish depend directly or indirectly in order to carry out the life processes, as further identified by the Department of Fisheries and Oceans (Canada)."*

The tributary of the Uxbridge Brook that occurs north of the boundary of the subject property is a permanently flowing feature and is considered a KNHF.

The ephemeral drainage feature that occurs in the southeast corner of the subject property provides indirect functions such as flow conveyance, but does not provide fish habitat and thus is not a KNHF for fish habitat.

Both of these features will be retained with buffers. The northern tributary will have a minimum buffer of approximately 60 m, while the southern feature is within the PSW which has buffers of 10 m and 15 m.

8.2.4 Areas of Natural and Scientific Interest (ANSI)

Review of the NHIC database identified no records of Life Science ANSIs within one kilometre of the subject property.

8.2.5 Significant Valleylands

The ORMCP defines "valleyland" as: *"…a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year."*

Significant valleylands include:

- all streams with well-defined valley morphology (i.e. floodplains, meander belts and valley slopes) having an average width of 25 m or more;
- all spillways* and ravines with the presence of flowing or standing water for a period of no less than two months in an average year. Such features must be greater than 50 metres in length; 25 metres in average width with a well-defined morphology (i.e. two valley walls of 15% slope or greater with a minimum height of 5 metres, and valley floor), and having an overall area of 0.5 ha or greater; and
- additional features identified by the approval authority, that are consistent with one or more of the functions described above.

The portion of the valley associated with the watercourse that traverses the northwest section of the subject property meets the criteria (i.e., is of sufficient average width and possessing a well-defined morphology) to be considered a significant valleyland in the context of the ORMCP and therefore a KNHF.

As the top of bank was not staked in the field, there is no defined limit of this feature. However, the vegetation contiguous with the valleyland (FOM4-2) was staked, and a 10 m buffer has been applied to that limit. Therefore this feature will be retained with a minimum buffer of 10 m.

8.2.6 Significant Woodlands

For the purposes of applying the policies of the ORMCP, significant woodlands are determined with the guidance of the ORMCP Technical Paper #7. Significant woodlands are generally those which are:

a) 4 hectares or larger in size located in the Countryside or Settlement Areas of the ORMCP; or

b) *0.5 hectare or larger in size located in the Natural Core or Natural Linkage Areas of the ORMCP; or*
c) *0.5 hectare or larger located within or intersecting with a key natural heritage feature or hydrologically sensitive feature or their vegetation protection zone.*

Woodlands occur at the northwest section of the property within lands designated as Natural Linkage Area in the ORMCP. The woodland has a tree crown cover of over 60% of the ground and is greater than 0.5 ha in size and is therefore considered significant woodland in the context of the ORMCP and therefore a KNHF.

The coniferous plantation at the southeast corner of the subject property does not meet criteria as a significant woodland as it is does not meet the minimum width measurements (of 40 m).

8.2.7 Significant Wildlife Habitat

There are four categories within this designation:

1. Seasonal Concentrations Areas;
2. Rare Vegetation Communities or Specialized Habitat for Wildlife;
3. Habitats of Species of Conservation Concern; and
4. Animal Movement Corridors.

Pond 1 in the southeast corner of the subject property and the Pond 2 in the north could be considered as providing seasonal concentration areas for breeding amphibian species. These occur outside of the Settlement area and are within areas designated as KHNF that are being maintained.

There are no rare vegetation communities, specialized habitat for wildlife or habitat for conservation concern that occur on the subject property as defined by the ORMCP technical paper. Animal movement corridors are associated with the wooded valley that likely provide opportunities for wildlife movement at a local scale and extends off-site to both the northeast and the northwest. Features within the wooded valley are being maintained. This function will be improved with the implementation of the strengthening of the linkage area.

One pair of Eastern Wood-Pewee (*Contopus virens*) (Special Concern) was recorded in the woodland associated with the valleyland to the north and west of the property in 2008. As only one pair was recorded, the portion of the woodland adjacent to the property would not be considered Significant Wildlife Habitat. However, there will be no loss of woodland and a 10 m buffer is being provided, so it is unlikely that there would be an effect on the breeding bird community of this woodland.

8.2.8 Sand Barrens, Savannah, Tallgrass Prairie

As defined in the ORMCP, these communities are comprised of the sand barrens and tallgrass prairies, and savannahs as described by the Ecological Land Classification System (Lee *et al.* 1998). None of these characteristics occur on the subject property.

8.2.9 Permanent and Intermittent Streams

As described in section 8.2.3, the tributary of the Uxbridge Brook that occurs in the north of the subject property is a permanently flowing system providing direct fish habitat. This tributary is thus considered a KHF. The drainage feature identified in the south is an ephemeral feature and therefore does not qualify as a KHF based on the ORMCP guidelines.

8.2.10 Kettles Lakes

The ORMCP defines "Kettle Lakes" as *a depression formed by glacial action and permanently filled with water.* No such feature occurs within the developable portion of the subject property.

8.2.11 Seepage Areas and Springs

The ORMCP defines 'Seepage Areas' as: *areas where groundwater emerges from the ground over a diffuse area*, and 'Springs' as: *points of natural, concentrated discharge of groundwater*. These conditions have not been observed within the developable portion of the subject property.

8.3 Regional Municipality of Durham Official Plan

The Durham Region Official Plan (2015), Schedule B – Greenbelt Natural Heritage System and Key Natural Heritage and Hydrologic Features, indicates that there are KNHF and HSFs located on the subject lands.

As required by the Region's Official Plan, an EIS (NHE) has been completed to identify, delineate and determine appropriate buffers for these features to ensure that the proposed development will have no negative effects on these features and functions. The EIS (NHE) has demonstrated consistency with the Regional Municipality of Durham requirements.

8.4 Town of Uxbridge Official Plan

This natural heritage evaluation has:

- Established a scope of work with appropriate agencies and provided an independent assessment of the environmental implications of the proposal on the subject property as required by the Township of Uxbridge;
- Identified planning, design and construction practices that will maintain the existing environmental features and functions on the subject property;
- Identified an opportunity to improve existing natural heritage features and functions;
- Determined compliance with the various applicable legislation and policies; and
- Minimized the effects of the development by applying appropriate mitigation measures.

This NHE has demonstrated consistency with the Township of Uxbridge requirements.

8.5 Lake Simcoe Region Conservation Authority Regulations and Policies

The developable portion of the subject property includes lands that are regulated by the LSRCA under Ontario Regulation 179/06. The regulated areas include wetlands (PSW), lands within 120 m of the PSW, and hazard lands associated with valleylands. A permit from the LSRCA will be required. This NHE will satisfy the requirement for an EIS/NHE for a permit.

The boundaries of the PSW was staked in the field and buffers of 10 and 15 m have been recommended. There will be no development within the buffers or the wetland, with the exception of some restoration of the southern buffer of the wetland.

Consistent with the Watershed Development Policies, a buffer of 10 m has been applied to the woodland as staked by the LSRCA.

Opportunities for enhancing the natural heritage system include the naturalization of the buffers (including fill removal from the southern wetland buffer) and the strengthening of a linkage between the southern wetland and the woodland/wetland complex to the north.

8.6 Endangered Species Act

The *Endangered Species Act* applies to all individuals and habitat of species listed as Endangered and Threatened in Ontario.

Seasonal surveys to-date have confirmed that there are no Endangered or Threatened species or habitat within the developable portion of the subject property. The potential for bats has been addressed in consultation with the MNRF Aurora District, and it has been determined that there is no suitable habitat that will be removed or affected. No Butternut were found. This reach of Uxbridge Brook has not been identified by the MNRF as occupied for Redside Dace (*Clinostomus elongatus*). No Barn Swallow nests were found in extensive searches of all structures.

As no field investigation for breeding birds have occurred since 2008, breeding bird surveys are required in June 2017 prior to site alterations, to confirm that no Endangered or Threatened breeding birds are present. An addendum to this report will be provided upon completion of the surveys with recommendations based on the results.

8.7 Fisheries Act

There is one watercourse adjacent to the subject property providing fish habitat. There is no development or site alteration proposed within 60 m of this feature. Therefore, there is no action required pursuant to the *Fisheries Act*.

9. Summary of Recommendations

To ensure there is no effect on the ecological features and functions of the existing natural heritage attributes on and adjacent to the proposed development, it is recommended that mitigation measures as described in section 7.2 are implemented:

1. Tree Preservation – as a draft plan condition and through a Tree Preservation Plan identify trees for preservation once the detailed plan is complete; seek opportunities to retain additional desirable trees;

2. MVPZs/Buffers – provide a 10 m buffer to the woodland in the north-west corner; a 15 m buffer on the north limit of the wetland; and a 10 m buffer on the south limit of the wetland;

3. Buffer Restoration – remove existing fill from the southern wetland buffer area; naturalize all buffers with suitable native species;

4. Linkage Area – the ecological connection between the southern wetland unit and the woodland/wetland complex to the north, west of the proposed development will be enhanced through naturalization plantings;

5. Planting Plans – as a draft plan condition, planting plans will be provided for the buffers and linkage area;

6. Water Balance – recommendations of the FSR (Cole Engineering 2016) pertaining to the provision of maintaining the hydrology of the wetland should be implemented;

7. Erosion and Sediment Control – establishment and maintenance of suitable erosion and sediment control in accordance with current Best Management Practices;

8. Timing – vegetation clearing must occur within the parameters of avoidance of the breeding bird window (i.e., not occur between April 10 and August 30);

9. Breeding bird surveys are required in June 2017 prior to site alterations, to confirm that no Endangered or Threatened breeding birds are present. An addendum report be provided upon completion of the surveys with recommendations based on the results; and

10. General Measures – minimizing of lighting and direct it down and away from natural features, and fencing of rear yards.

10. Summary

A background review and detailed seasonal field investigations were undertaken in preparation of this NHE, followed by an analysis of features and functions. An assessment of potential effects was undertaken and mitigation measures have been recommended to avoid and/or reduce effects of the proposed development on the natural heritage system.

There will be no intrusion of development or grading into the staked limits of the KNHFs and HSFs or their respective buffers. Appropriate buffers (MVPZs) have been applied to all features.

It is our opinion that the development as proposed with the implementation of the mitigation measures, can proceed in a manner that is consistent with the policies and regulations of: the ORMCP, Regional Municipality of Durham, the Town of Uxbridge and the Lake Simcoe Region Conservation Authority.

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Appendix A

Plant Species List

Appendix A

Plant Species List

SCIENTIFIC NAME	COMMON NAME	LSRCA status	Durham Region Status	Provincial Status
Dryopteridaceae	**Wood Fern Family**			
Onoclea sensibilis	Sensitive Fern	-	-	S5
Equisetaceae	**Horsetail Family**			
Equisetum arvense	Field Horsetail	-	-	S5
GYMNOSPERMS	**CONIFERS**	-	-	
Cupressaceae	**Cedar Family**			
Thuja occidentalis	Eastern White Cedar	-	-	S5
Pinaceae	**Pine Family**			
Pinus sylvestris	Scotch Pine	-	-	SE5
Asteraceae	**Composite or Aster Family**			
Achillea millefolium ssp. *millefolium*	Common Yarrow	-	-	SE?
Aster puniceus	Purple-stemmed Aster	-	-	S5
Chrysanthemum leucanthemum	Ox-eye Daisy	-	-	SE5
Cirsium vulgare	Bull Thistle	-	-	SE5
Erigeron annuus	Daisy Fleabane	-	-	S5
Eupatorium perfoliatum	Perfoliate Thoroughwort	-	-	S5
Eupatorium maculatum	Spotted Joe-pye-weed	-	-	S5
Solidago canadensis	Canada Goldenrod	-	-	S5
Sonchus arvensis	Field Sow-thistle	-	-	SE5
Taraxacum officinale	Common Dandelion	-	-	SE5
Tussilago farfara	Coltsfoot	-	-	SE5
Boraginaceae	**Borage Family**			
Myosotis laxa	Smaller Forget-me-not	-	-	S5
Brassicaceae	**Mustard Family**			
Barbarea vulgaris	Yellow Rocket	-	-	SE5
Capsella bursa-pastoris	Shepherd's Purse	-	-	SE5
Cornaceae	**Dogwood Family**			
Cornus stolonifera	Red-osier Dogwood	-	-	S5
Cucurbitaceae	**Gourd Family**			
Echinocystis lobata	Prickly Cucumber	-	-	S5
Fabaceae	**Pea Family**			
Trifolium pratense	Red Clover	-	-	SE5
Trifolium repens	White Clover	-	-	SE5
Vicia cracca	Tufted Vetch	-	-	SE5
Grossulariaceae	**Gooseberry or Currant Family**			
Ribes americanum	Wild Black Currant	-	-	S5
Guttiferae	**St. John's-wort Family**			
Hypericum perforatum	Common St. John's-wort	-	-	SE5
Plantago lanceolata	Ribgrass	-	-	SE5
Plantago major	Common Plantain	-	-	SE5

SCIENTIFIC NAME	COMMON NAME	LSRCA status	Durham Region Status	Provincial Status
Polygonaceae	**Smartweed or Buckwheat Family**			
Rumex crispus	Curly-leaf Dock	-	-	SE5
Rhamnaceae	**Buckthorn Family**			
Rhamnus cathartica	Common Buckthorn	-	-	SE5
Rosaceae	**Rose Family**			
Fragaria vesca ssp. *americana*	Woodland Strawberry	-	-	S5
Geum rivale	Purple Avens	-	U	S5
Potentilla recta	Rough-fruited Cinquefoil	-	-	SE5
Rubus idaeus	Red Raspberry	-	-	SE1
Spiraea alba	Narrow-leaved Meadow-sweet	-	-	S5
Salicaceae	**Willow Family**			
Populus balsamifera ssp. *balsamifera*	Balsam Poplar	-	-	S5
Populus tremuloides	Trembling Aspen	-	-	S5
Salix pentandra	Bay-leaved Willow	-	-	SE2
Salix petiolaris	Slender Willow	-	-	S5
Scrophulariaceae	**Figwort Family**			
Linaria vulgaris	Butter-and-eggs	-	-	SE5
Solanaceae	**Potato or Nightshade Family**			
Solanum dulcamara	Bitter Nightshade	-	-	SE5
Cyperaceae	**Sedge Family**			
Eleocharis spp.	Spike-rush species	-	-	
Schoenoplectus acutus	Hard-stemmed Bulrush	W	R	S5
Scirpus atrovirens	Dark-green Bulrush	-	-	S5
Iridaceae	**Iris Family**			
Iris versicolor	Multi-coloured Blue-flag	-	-	S5
Juncaceae	**Rush Family**			
Juncus bufonius	Toad Rush	-	U	S5
Juncus dudleyi	Dudley's Rush	-	-	S5
Juncus effusus ssp. *solutus*	Soft Rush	-	-	S5
Poaceae	**Grass Family**			
Agrostis gigantea	Red-top	-	-	SE5
Elymus repens	Quack Grass	-	-	SE5
Phalaris arundinacea	Reed Canary Grass	-	-	S5
Phleum pratense	Timothy	-	-	SE5
Typhaceae	**Cattail Family**			
Typha angustifolia	Narrow-leaved Cattail	-	-	S5
Typha latifolia	Broad-leaved Cattail	-	-	S5

Key to Table

LSRCA Rank: W = Rare within the Lake Simcoe Watershed, **P** = Provincially Rare, **NE** = Nationally Endangered, **NC** = Species of Special Concern – LSRCA 2003.

Durham Region: C = common, **R** = locally rare, **U** = locally uncommon, **N** = new record, **n** = not listed – Varga *et al*., 2000.

Provincial S-Rank (from MNR's Natural Heritage Information Centre) shown for breeding status if: S1 (critically imperilled), S2 (imperilled), S3 (vulnerable), S4 (apparently secure), S5 (secure) and SE (exotic, i.e. introduced).