Natural Heritage Evaluation
Proposed Turner Street Extension
Residential Development Application (Veltri)
Part Lot 11, Concession 5 (Cavan)
Township of Cavan Monaghan
County of Peterborough

Prepared For:

The Veltri Group
68 King Street East
Bowmanville, Ontario
L1C 3X2

Project #: 15-2013

December 2018

ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

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December 4, 2018

The Veltri Group
68 King Street East
Bowmanville, Ontario
L1C 3X2

Attention: **Mr. Mario Veltri, Property Owner**

Re: Natural Heritage Evaluation (NHE)
Proposed Turner Street Extension Residential Development (Veltri)
Part Lot 11, Concession 5 (Cavan),
Township of Cavan Monaghan, County of Peterborough
ORE File No. 15-2013

Dear Mr. Veltri:

Oakridge Environmental Ltd. (ORE) is pleased to provide this Natural Heritage Evaluation (NHE) for the subject property situated north of Turner Street within Part Lot 11, Concession 5, in Millbrook.

The subject site is situated within 120 m of Little Creek, which is a coldwater tributary that supports a significant coldwater fish habitat. In addition, Township mapping suggests that Significant Woodland occurs on both the north and east side of the site. As such, the main concern with respect to approving the multiple building lots on this property is the potential for impacts on these sensitive features.

It is our opinion that these features can be sufficiently protected, permitted the Vegetation Protection Zones (VPZ) described in this report are adhered to. Recommendations are provided in this report to assist you in this regard.

We trust that this report will be sufficient for any agency reviews. Should you have any questions or require clarification, please do not hesitate to contact our office.

Yours truly,
Oakridge Environmental Ltd.

Original Signed By

Rob West, HBSc., CSEB
Senior Environmental Scientist

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1.0 Introduction

Oakridge Environmental Ltd. (ORE) is pleased to present this Natural Heritage Evaluation (NHE) in support of the proposed residential development application for the Turner Street extension subdivision located within Part Lot 11, Concession 5, in Millbrook.

It is understood that the subject site was previously zoned "Residential", however, the Township has since re-zoned the property according to their Natural Heritage System (NHS). In addition, a portion of the subject site occurs within the Oak Ridges Moraine (ORM). The site possesses three (3) Key Natural Heritage Features (KNHF) of importance that require consideration prior to development under the Township's NHS:

- Little Creek, a tributary of Baxter Creek, is located within the northeastern corner of the site. It is a coldwater creek and considered significant fisheries habitat;

- A series of wetlands and groundwater zones occur less than 120 m from the subject site on the adjacent lands to the east, and

- A Significant Woodland is associated with both the northern edge and eastern slope on-site.

Under the Oak Ridges Moraine Conservation Plan (ORMCP), the subject site possesses the following designations in the western portion of the property:

- Aquifer Vulnerability
- Landform Conservation 1

Given the preceding, the mandate of this NHE is to characterize the current site conditions and determine any potential constraints under the Township's NHS and ORMCP, and to provide recommendations with regard to a "least impact" approach to allow development to proceed without significant impact to the KNHF.

2.0 Site Access and Description

The subject site is comprised of two (2) parcels that occur within Part of Lot 11, Concession 5 (Cavan), Township of Cavan Monaghan. The parcels are situated on the west side of Millbrook, just north of the intersection of Hunter and Turner Street (Figure 1). The site can be accessed directly off the northern limit of Turner Street. The combined approximate area of the two (2) parcels is 26.86 acres (10.87 ha).

An old rail bed runs along the eastern boundary of the site (Township property), and an existing trail network meanders throughout the subject site. The rail corridor enters the subject site through the forest. It parallels the lower parcels length (in the area of Turner Street and King Street West) and crosses an adjacent private parcel to the east.

A tributary of Baxter Creek referred to as "Little Creek" skirts the north edge of this parcel. It crosses the northeastern corner of the property and continues eastward towards the Milbrook Northeast Wetland Complex.

3.0 Proposed Development

The proponent is seeking to subdivide the subject site into ninety-five (95) residential units comprised of single detached (59) and semi detached (26) residences. Since the property contains or is within proximity of Key Natural Heritage Features (KNHF) of the Township's NHS, it will be necessary to locate the proposed residences for each of the lots to ensure that a "least impact" development concept is achieved.

It is understood that according to a decision of an Ontario Municipal Board hearing, the development was approved for this site. However, the proponent was instructed to follow the required NHS protocols, which included the completion of an NHE to determine whether the proposed development can proceed without significant impact to any sensitive features.

4.0 Policy

4.1 Provincial Policy Statement (PPS)

This NHE has regard for the *Provincial Policy Statement* (PPS). Section 2.1.2 of the PPS states the following:

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

The intent of this NHE is to identify the natural linkage areas and demonstrate how the proposed developments can occur while maintaining the ecological function and integrity on the properties.

Section 2.1.8 of the PPS also indicates that:

> *2.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in Policies 2.1.3, 2.1.4 and 2.1.5 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.*

This NHE report constitutes an evaluation of the subject lands and its natural features. It also determines if there will be an impact to the ecological function of all sensitive areas associated with the subject site.

With respect to water, Section 2.2 of the PPS states:

> *2.2 Water*
>
> *2.2.1 Planning authorities shall protect, improve or restore the quality and quantity of water by:*
>
> *a) using the watershed as the ecologically meaningful scale for integrated and long-term planning, which can be a foundation for considering cumulative impacts of development;*
>
> *b) minimizing potential negative impacts, including cross-jurisdictional and cross-watershed impacts;*
>
> *c) identifying water resource systems consisting of ground water features, hydrologic functions, natural heritage features and areas, and surface water features including shoreline areas, which are necessary for the ecological and hydrological integrity of the watershed;*
>
> *d) maintaining linkages and related functions among ground water features, hydrologic functions, natural heritage features and areas, and surface water features including shoreline areas;*
>
> *e) implementing necessary restrictions on development and site alteration to:*
>
> *1. protect all municipal drinking water supplies and designated vulnerable areas; and*
>
> *2. protect, improve or restore vulnerable sensitive surface water features and sensitive ground water features, and their hydrologic functions;*

f) planning for efficient and sustainable use of water resources, through practices for water conservation and sustaining water quality;

g) ensuring consideration of environmental lake capacity, where applicable; and

h) ensuring stormwater management practices minimize stormwater volumes and contaminant loads, and maintain or increase the extent of vegetative and pervious surfaces.

2.2.2 Development and site alteration shall be restricted in or near sensitive surface water features and sensitive ground water features such that these features and their related hydrologic functions will be protected, improved or restored.

Mitigative measures and/or alternative development approaches may be required in order to protect, improve or restore sensitive surface water features, sensitive ground water features, and their hydrologic functions.

The site has been inspected with respect to all of these hydrological features that are pertinent to the above.

4.2 Oak Ridges Moraine Conservation Plan

A small portion of the subject site occurs within the policy boundary for Oak Ridges Moraine Conservation Plan (ORMCP). The ORMCP mapping does not illustrate any known Key Natural Heritage Features (KNHF) and/or Hydrologically Sensitive Features (HSF) within its boundary. However, a very small area of Significant Woodland skirts the edge of the boundary.

The ORMCP references the following designations within the subject site:

- High Aquifer Vulnerability Area;
- Class 1 - Landform Conservation Area.

As such, the NHE must address all ORMCP designations that are known to occur on-site. In addition, site inspections were targeted to identify any other KNHF or HSF that may not have been mapped under the published ORMCP.

4.3 Township of Cavan Monaghan County of Peterborough

The study requirements for an EIS/NHE are provided in the March 2015 Official Plan (OP) these are:

"Before development is approved in the area subject to the EIS, the EIS shall demonstrate that the relevant policies of this Plan are met. The EIS shall demonstrate that the use will:

a) Not have a negative impact on significant natural heritage features and related ecological functions;

b) Not discharge any substance that could have an adverse effect on air quality, groundwater, surface water and associated plant and animal life;
c) Be serviced by an adequate supply of water and that the groundwater taking associated with the use will not have an adverse effect on the quality or quantity of existing water supplies, surface water features and associated plant and animal life;

d) Not cause erosion or siltation of watercourses or unacceptable changes to watercourse morphology;

e) Not interfere with groundwater recharge to the extent that it would adversely affect groundwater supply for any use;

f) Avoid or mitigate factors that could harmfully alter, disrupt or destroy (HADD) fish habitat;

g) Maintain/enhance/restore/rehabilitate the natural condition of affected watercourses, and protect/enhance/restore/rehabilitate aquatic habitat;

h) Not encourage the demand for further development that would negatively affect wetland function or contiguous wetland areas;

i) Enhance and restore endangered terrestrial and aquatic habitat where appropriate and feasible;

j) Not adversely affect with the function of existing or potential natural corridors that are determined to be of significance;

k) Not lead to a reduction of the size of or fragment significant woodlands; and,

l) Not lead to species loss or negative impacts on endangered, threatened or rare species and/or their habitat."

According to the Schedule A (Land Use) within the OP, the designations on-site include Natural Linkage and Natural Core Area.

Schedule B1 (Natural Heritage System and Environmental Constraints - Millbrook Settlement Area) of the OP illustrates that a portion of Significant Woodland and a waterway (that crosses the northeastern corner of the subject parcel) occur on-site. An excerpt from Schedule B1 is provided in Appendix A illustrating these features.

Furthermore, on May 4th, 2018, ORE staff attended a pre-consultation meeting with County, Township and ORCA staff. A copy of the pre-consultation comments is found in Appendix B.

The pre-consultation meeting highlighted the following concerns:

1) The location of the proposed Stormwater Management System (SMS) in relation to the nearby waterways;

2) The Significant Woodland where a portion of the development is proposed.

3) The incorporation of a trail system that would link the proposed subdivision development with existing development along King Street.

The above-mentioned areas of concern have been reviewed and are addressed in this NHE.

4.4 County of Peterborough

According to the Pre-consultation minutes in Appendix B, the County of Peterborough states that a Species at Risk has been flagged in the general area of the subject site.

According to the Make a Map: Natural Heritage provided by the Minisry of Natrual Resources and Forestry, the County's record is for Bobolink (*Dolichonyx oryzivorus*). Bobolink possesses a Threatened status in the Ontario.

ORE staff completed a thorough search of the site for this species including a number of other potential candidate SAR that could be present on-site. The results are provided further on in this report.

Meeting the EIS/NHE requirements stated in the County Official Plan was not discussed at the Pre-consultation meeting nor was it referenced in the Pre-consultation Record and consequently does not appear to be a requirement. Considering the Township possesses a very detailed set of requirements for a study within their Hamlet boundaries, ORE presumes that if the Township's requirements are satisfied, then County of Peterborough's study requirements would also be satisfied.

4.5 Otonabee Region Conservation Authority

Little Creek traverses the subject site along the northeastern corner, thereby falling within the Otonabee Region Conservation Authority's (ORCA) jurisdiction; with respect to the Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

ORCA provided ORE with a Terms of Reference for the NHE on July 10, 2015 (Appendix C). The e-mail from Jasmine Gibson (Planner) states that the subject site occurs within the 120 m adjacent lands of Little Creek. Therefore, an EIS (or NHE in this instance) must be completed to determine no adverse impact to the watercourse or other KNHF.

Little Creek does not possess a flood elevation according to published flood plain mapping. However, the flood plain mapping indicates that a watercourse feature (located south of the Centre Street right-of-way) possesses a flood elevation, which would not be affected by the proposed development application.

ORE also reviewed the site in the context of the Watershed Planning Regulation Policy Manual, 2014.

4.6 Species at Risk (SAR)

4.6.1 SAR Planning Requirements

The Official Plans of the County of Peterborough and Township of Cavan Monaghan require Threatened and Endangered SAR be addressed in a study where development is being considered.

The proponent must identify whether an Threatened or Endangered Species occurs on-site and if so, determine if the development can mitigate for the SAR. If a SAR is detected on the property, then it becomes the jurisdiction of the Ministry of Natural Resources and Forestry (MNRF) to determine whether the development can proceed without impact to the SAR.

Therefore, the following federal and provincial legislations regarding SAR may apply to the site if the SAR or the habitat of SAR is detected on the property.

4.6.2 Species at Risk Act (SARA)

The Species at Risk Act (SARA) was passed in the House of Commons on December 12th, 2002. The Act provides protection for rare species in Canada and shares responsibility for conservation of wildlife among the Provincial Governments. This approach enables government to work cooperatively to pursue the establishment of complementary legislation and programs for the protection and recovery of SAR in Canada.

The purpose of the SARA is to:

"*prevent wildlife species from being extirpated or becoming extinct, and to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened.*"

More specifically, Sections 32 and 33 of the Act indicate that:

32. *(1) No person shall kill, harm, harass, capture or take an individual of a wildlife*

species that is listed as an extirpated species, an endangered species or a threatened species.

(2) No person shall possess, collect, buy, sell or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or any part derivative of such an individual.

33. *No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.*

Recommendations to prevent negative impacts to SAR and SAR habitat (residence) on the subject site have been included in a subsequent section of this report.

4.6.3 Species at Risk Ontario (SARO)

SARO is governed under the Endangered Species Act (ESA) and builds on the SARA legislation. The ESA aims to protect SAR, SAR habitat and promote recovery of species and stewardship activities that lead to the protection and recovery of SAR. The ESA aims to identify SAR based on the "*best available scientific information, including information obtained from community knowledge and aboriginal traditional knowledge*."

An independent body, referred to as "The Committee on the Status of Species at Risk in Ontario" (COSSARO), classifies native plants or animals in 1 of 4 categories of "at risk" status (i.e., Special Concern, Threatened, Endangered and Extirpated). However, only Threatened and Endangered status species obtain both individual and habitat protection measures under the ESA. Special Concern species possess only individual species protection and not habitat protection. The MNRF's Significant Wildlife Habitat schedules protect the habitat of Special Concern species and mitigation measures are provided in the form of a support tools document (discussed in another section).

The complete list of SAR in Ontario is provided by Ontario Regulation 230/08, under the ESA. The most current list of provincial SAR is updated and published on MNRF's Species at Risk Ontario (SARO) website:

https://www.ontario.ca/page/species-risk-ontario

This study (where applicable) has utilized the methodologies and provides recommendations that follow the most current criteria for detecting and protecting Threatened and Endangered, Special Concern, and Area Sensitive species identified within the MNRF documents.

4.7 Supporting Legislation

In addition to the highlighted policies above, other relevant legislation (such as the Migratory Birds Convention Act) have been considered as part of this NHE. Where feasible/relevant, specific reference to these policy documents are included.

5.0 Physical Setting

The subject site occurs where two (2) drumlins coalesce, the drumlins are localized features and surround the village of Millbrook. The average topographic relief in the area is approximately 20 m (Figure 2). The majority of the site occurs on a broad slope facing east, with only a small portion of its eastern quarter being part of a large plain that continues eastward.

The general runoff direction is towards the east and north off the side of the drumlin that the site is perched upon. There are a series of offsite drainage courses that collect runoff and seepage/spring contributions alongside the railway and hydro corridor that convey water south towards King Street. The predominant runoff/drainage from the site contributes flows to these offsite watercourses. There are a number of small wetlands that are associated with these offsite waterways. Little Creek occurs along the north edge of the property and conveys localized runoff in this area eastward towards Baxter Creek. Overall, the subject consists of dry upland/grasslands.

The subject site contains a sliver of land that occurs within the official boundary of the Oak Ridges Moraine (ORM), a regional physiographic and geological feature. The ORM consists of a complex layered sequence of sand, gravel and till deposits which typically exhibit high recharge and rapid percolation rate characteristics.

The physiography and surficial geology of the Millbrook area is complex. Physiographic mapping (Chapman and Putnam, 1972) indicate that Millbrook occurs in an area of ancient sandy glacial lake bed sediments, wedged between drumlins of the Peterborough Drumlin Field (Figure 3). The ancient glacial lake bottom extends from the northern edge of the Oak Ridges Moraine, through Millbrook to the southern edge of Peterborough. In some areas, these sediments consist of varved silt and sand. Silty clay also occurs in this feature.

Surficial geology mapping characterizes the area as mainly a mixture of post-glacial river bed and lake bed sediments, which are overlain onto the Newmarket Till stratum. The till sequence forms a regional aquitard. These granular surficial sediments tend to have high relative permeabilities and high recharge rates. Valleys which are incised into these coarse deposits often exhibit groundwater discharge, forming the headwaters of local streams, such as Little Creek and the other tributaries of the Baxter Creek watershed.

6.0 Information Resources

6.1 Natural Heritage Information Centre (NHIC)

The NHIC is an online database managed by the MNRF. The province has been divided into a grid consisting of 1 km^2 areas or *regional squares,* each given a unique identifier. The squares can be searched for historical *Species at Risk* (SAR) occurrences and for *Areas of Natural and Scientific Interest* (ANSI).

The 1 km square areas containing the subject site is 17QJ03_91 and 17QJ03_92. The NHIC query data are presented in Appendix D. Figure 4 is an excerpt of the main map obtained from the NHIC database geographic query. The map provides the approximate locations of the Element Occurrences and Natural Areas discussed below.

The database includes one (1) Natural Area, consisting of the Millbrook Northeast Wetland Complex which occurs greater than 120 m to the east of the subject site . The query also identified the Cavan Till *candidate* Earth Science ANSI.[1]

In addition, three (3) significant species were identified by the NHIC search. These include the following:

Common Name	**Scientific Name**	**Status**	**Date of Sighting**
Snapping Turtle	*Chelydra serpentina*	Special Concern	2010
Bobolink	*Dolichonyx oryzivorus*	Threatened	2002
Muhlenberg's Weissia	*Weissia muhlenburgiana*	No Status/S2 Rank	1958

Descriptions of these species and their preferred habitat are found in Appendix D.

6.2 Ontario Breeding Bird Atlas (OBBA)

The OBBA provides up-to-date reliable information on bird species found within Ontario; it is managed by Bird Studies Canada. This includes species descriptions, habitats, range, documented sightings, etc.

The site occurs within the 10 km^2 area mapped as 17QJ09, Region 17, Northumberland. The Summary Sheets for the atlas area are provided in Appendix E. According to the OBBA website, significant breeding species that could potentially be associated with habitats in the area of the site include the following:

[1] Note: The OMNRF was contacted to obtain information on the candidate ANSI, however, had not responded at the time of preparing this report.

Common Name	**Scientific Name**	**Status**
Whip-poor-will	*Caprimulgus vociferus*	Threatened
Chimney Swift	*Chaetura pelagica*	Threatened
Eastern Wood-Pewee	*Contopus virens*	Special Concern
Barn Swallow	*Hirundo rustica*	Threatened
Wood Thrush	*Hylocichla mustelina*	Special Concern
Bobolink	*Dolichonyx oryzivorus*	Threatened
Eastern Meadowlark	*Sturnella magna*	Threatened
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Special Concern
Golden-winged Warbler	*Vermivora chrysoptera*	Special Concern
Least Bittern	*Ixobrychus exilis*	Threatened
Red-shouldered Hawk	*Buteo lineatus*	Not At Risk

Descriptions of the preferred habitats of the above-listed species have been presented in Appendix E.

6.3 Fisheries

ORCA was contacted on July 2, 2015, to obtain fisheries data relevant to the subject site for Baxter Creek. ORCA provided the following list of species that have been caught within Baxter Creek, near the dam in downtown Millbrook:

Common Name	**Scientific Name**	**Status**
Brook Stickleback	*Culaea inconstans*	NAR
Brassy Minnow	*Hybognathus hakinsoni*	NAR
Pearl Dace	*Margariscus margarita*	NAR
Common Shiner	*Luxilus cornutus*	NAR
Bluntnose Minnow	*Pimephales notatus*	NAR
Eastern Blacknose Dace	*Rhinichthys atratulus*	NAR
White Sucker	*Catostomus commersonii*	NAR
Northern Redbelly Dace	*Chrosomus eos*	NAR
Brook Trout	*Salvelinus fontinalis*	NAR
Brown Trout	*Salmo trutta*	NAR
Slimy Sculpin	*Cottus cognatus*	NAR
Mottled Sculpin	*Cottus bairdii*	NAR

NAR = Not at Risk

Although none of the species listed above are Species at Risk (SAR), some are very sensitive and require coldwater stream habitat, such as the Trout species. The OMNRF protects coldwater fish environments and typically requires a minimum 30 m setback from these features[2]. Some of the coarse fish species that also prefer these coldwater stream environments are the Northern Redbelly Dace, Pearl Dace, and Eastern Blacknose Dace.

The MNRF's Coldwater Stream Strategy applies certain setbacks to both the feature itself and any contributing springs and seeps to protect the stream and its associated fisheries.

7.0 Ecological Findings

7.1 Site Inspection Summary

Prior to conducting the detailed site inspections, ORE staff reviewed the lists included in Section 6 to determine which species could potentially occur on the property. The inspections were then conducted to optimize the probability of visually or audibly encountering the listed species.

ORE staff conducted site inspections on the following dates and timing windows:

Date of Inspection and Timing Window	**Temp. ^{o}C**	**Beaufort (Wind) Scale**	**Conditions**	**Survey Targets**
April 6, 2011* Evening 6 PM - 11 PM	6	3 - Gentle Breeze	Sunny	Early spring season Seeps and Springs Minor vegetation surveys before dark. Western Chorus Frog in the evening. Fisheries inspections in Little Creek.
June 2, 2015 Morning: 5AM - 12 PM Evening: 7 PM-11:30 PM (Full Moon)	13	1 -Light Air	Sun and Cloud	Early morning Breeding Bird, evening Amphibian/Breeding Bird, late morning/early evening Herpetile search. Fisheries inpection in Little Creek.

[2] Coldwater Stream Strategy for Peterborough Area (2005b)

June 16, 2015 Morning: 5 AM - 11 AM	22	2 -Light Breeze	Rain the AM, Minor Cloud Cover	Early morning Breeding Bird, late morning/early evening Herpetile search. Fisheries.
June 23, 2015 Morning 5AM - 1PM Evening: 9 PM-11:00 PM	12	4 - Moderate Breeze	After Major Storm Event, Cloudy	Early morning Breeding Bird, evening Amphibian/Breeding Bird, late morning/early evening herpetile search.
July 1, 2015 8 AM - 2PM	22	2 - Light Breeze	Cloud Cover	Early morning Breeding Bird, late morning Herpetile search. ELC/vegetation mapping.
July 19, 2015 7AM- 11 AM	17	3- Gentle Breeze	Cloudy	Mammal inspections plus seeps, springs, and wetlands. Migratory bird and Avian Fledgling Period.
August 5, 2015 8: 30 AM - 4 PM	14	2- Light Breeze	Light Cloud Cover	Confirmatory ELC mapping and fisheries.
June 7, 2018 Morning: 5 AM - 12 PM Evening: 8 PM - 11 PM	15	3 -Gentle Breeze	Cloudy and Clearing	Early morning Breeding Bird, evening Amphibian/Breeding Bird, late morning/early evening herpetile search.

* during a previous investigation

During the inspections, all flora and faunal observations were recorded. A total of 58 hours was spent inventorying the flora and fauna on-site. The number of hours and spacing of the inspections is considered sufficient to detect any SAR and all species at the site. The chart also includes the target species and/or habitats that the inspection included.

The methodologies and protocols for the site inspections are provided below.

7.2 Survey Methodologies/Protocols

7.2.1 Avifauna

ORE staff attended the site a total of three (3) times during the breeding season and collected data at four (4) point count survey locations to encompass the different habitats on-site (Figure 5). Birds observed during the Migratory Period (outside of the Breeding Bird Period) were also recorded according to, and exceeding, the Ontario Breeding Bird Atlas (OBBA) survey techniques. ORE staff aimed to detect all available avian species by sight, calls and notes, within and proximal to the site. Bird calling devices and "pishing and squeaking" were used to attract bird species from within the forest communities to the edge of the property, outside of the morning chorus hours.

All species overheard or observed during the survey were recorded. The surveys were conducted in the early morning chorus hours typically between 5 AM and 9 AM which was ideal for the season. The majority of birds were very active in the early morning, foraging, singing, and dominant males were defending their territories.

The avian surveys did not stop during the early morning time periods; the afternoons were spent searching the habitats for other fauna and identifying plant species on the property within the agricultural and woodland type settings which were also useful in flushing and detecting bird species.

Two (2) night inspections were completed on-site to determine whether any nocturnal Species at Risk avian were present.

7.2.2 Mammals

Mammals were detected utilizing the protocols outlined in the MNRF's March 1998 - Wildlife Monitoring Programs and Inventory Techniques for Ontario. Mammals were generally identified by either visual encounters or via their tracks and/or scat droppings at the site.

Surveys were conducted specifically in areas where tracks could be identified such as the edge of the wetlands and after precipitation events on-site, where fresh tracks could easily be observed in mud.

7.2.3 Herpetiles

The protocol employed for detection of herpetiles followed MNRF's March 1998 - Wildlife Monitoring Programs and Inventory Techniques for Ontario. Furthermore, the December 2016 Survey Protocol for Ontario's Species at Risk Snakes was implemented on-site during the more recent surveys in 2018. The surveys of basking habitats were completed during the spring and summer season, when most herpetiles are active. The surveys were

conducted during low wind conditions and warm weather conditions which were ideal for detecting basking snakes and lizards.

During the inspections, ORE staff conducted visual encounter surveys while searching through brush piles, rolled over lumber and deadfall within the woodland to determine whether any significant species of herpetile could be detected. The visual encounter surveys extended to Turner Street and King Street to identify dead-on-road herpetiles from the previous evening.

ORE staff also checked beneath old building rubble materials, plywood pieces, and other artificial cover objects looking for basking snakes in the early morning and evening heat. Evening surveys were also completed for the purpose of collecting nocturnal avian data and to identify amphibian species utilizing the site.

Bird Studies Canada's Marsh Monitoring Protocol for Amphibian detection and approximate population/distribution was also employed at the site in the evening hours, as per the following:

> *Each amphibian station is surveyed for three minutes and one of three Call Level Codes is used to categorize the intensity of calling activity for each species. The Call Level Codes, adapted from the Ontario Amphibian Road Call Count (see Bishop et al., 1997), are as follows:*
>
> *Code 1: Calling individuals can be counted and calls are not simultaneous. In this instance, exact counts can be made of the number of calling individuals and surveyors are asked to record both the code and their count.*
>
> *Code 2: Calls of individuals can be distinguished but some calling is simultaneous. Under these conditions, an exact count is not possible or expected but the surveyor should be able to make a reliable estimate of the number of individuals calling.*
>
> *Code 3: A full calling chorus with calls continuous and overlapping. Reliable counts and even estimates are unrealistic at this level of calling intensity and no counts are requested.*

The collected data is provided in a following section.

7.2.4 Vegetation

The site has been characterized by its various vegetation communities using the methodologies included in the *Ecological Land Classification (ELC) - First Approximation and It's Applications* (1998). The classification of each vegetation community has been designated in accordance with the Ecological Land Classification for Southern Ontario (FG-02), 1998.

Prior to conducting the site inspections, aerial photography of the subject site was reviewed to delineate communities based on recognizable vegetation differences. Each

identified community was subsequently inspected through soil and vegetation analysis. Dominant vegetation types were recorded and boundaries of the various communities mapped using a differential GPS. Soil characteristics were determined using the methods outlined in the *Field Manual for Describing Soils in Ontario* (2009), where the results were used to further classify the ecological community.

The communities were also investigated from the perspective of whether they are hydrologically sensitive, or whether they may contain Species at Risk.

7.2.5 Fisheries

ORE staff did not enter the tributary to determine the composition of fish species present nor were any traps installed in Little Creek. Baxter Creek and its tributaries are known to be cold headwater streams by the OMNRF and ORCA. Our surveys included a series of field measurements within the tributary to confirm whether Little Creek is, or is not a coldwater fishery habitat. The fisheries data collected by ORCA suggests that it is a coldwater creek system, however, a creek can be cold in one location and not in others.

An assessment of Little Creek included measurements of water quality for pH, conductivity, dissolved oxygen and temperature. These parameters were assessed to determine whether the creek contains suitable habitat for coldwater fish species in the vicinity of the subject properties. The characteristics of the sediments were also observed to assess potential spawning habitat.

The collected data is discussed in a following section.

7.3 Vegetation

7.3.1 General

Based on the site observations, eight (8) main types of vegetation communities (Ecosite Level) were found to be associated with the subject site. As per the Ecological Land Classification for Southern Ontario (FG-02), 1998, these are:

Upland Communities

1. Mineral Cultural Meadow (CUM1)
2. Mineral Cultural Thicket (CUT1)
3. Dry-Fresh White Cedar Coniferous Forest (FOC2-2)
4. Fresh-Moist White Cedar Coniferous Forest (FOC4-1)
5. Fresh-Moist White Cedar- Hardwood Mixed Forest (FOM7-2)
6. Scotch Pine Coniferous Plantation (CUP3-3)
7. Dry-Fresh Deciduous Forest (FOD4)

Waterway Communities

8. Open Aquatic (OAO)

Figure 5 illustrates the distribution of vegetation communities on the property. ELC summary sheets are found in Appendix F. These habitats and their associated vegetation and environmental characteristics are discussed below. Appendix G contains the list of floral species that were identified during the inspection dates. Representative photos of the various communities are found in Appendix H

7.3.2 Upland Communities

1. Mineral Cultural Meadow (CUM1)

The ELC describes the CUM1 communities as resulting from cultural or anthropogenic-based disturbances/alterations to land. Tree cover is typically less than 25% and the presence of shrubs is also less than 25%.

The cultural meadow ecosite in the subject lot constitutes approximately 39% of the vegetation communities, including the layer beneath the Staghorn Sumac (*Rhus typhina*) communities. The CUM1 zone is the result of anthropogenic disturbances and occurs throughout the majority of the property.

The main groundcover associated with this community consists of typical old field meadow-type species such as non-native/native grasses and wildflowers. Typically, these species tend to congregate within broken or disturbed open ground where the trees have been cleared and the area is regenerating. This type of cultural setting occurs throughout the subject site.

The soil auger hole in this polygon was completed to a depth of 100 cm at which point soil conditions refused any further augering. There was an initial dark brown Sandy Loam (SL) that reached 20 cm. Horizon B was observed from 20 cm - 100 cm and also had a soil texture of Sandy Loam (SL). The moisture regime was “Dry -Fresh” (defined as “0-2" in the Field Manual for Describing Soils in Ontario). No gleys or mottles were observed during the soil analysis in this polygon.

2. Cultural Thicket (CUT1)

The ELC states that this thicket community must have less than 25% tree cover and greater than 25% shrub cover and it will possess a high concentration of non-native plant species in the base layers.

This subject site possesses three CUT1 ecosites which vary in age but are composed of very similar species. Staghorn Sumac is the dominant species with associate species including Milkweed (*Asclepias syriaca*), European Buckthorn (*Rhamnus cathartica*), Red

Clover (*Trifolium pratense*), Timothy (*Phleum pratense*), White Sweet Clover (*Melilotus albus*), and minor occurrences of White Pine (*Pinus strobus*). This ecosite has become overgrown with non-native species in the meadow environment beneath the Staghorn Sumac.

The soil auger hole in this polygon was completed to a depth of 40 cm at which point, soil conditions refused any further augering. The soil profile had a consistent effective texture of Sandy Clay Loam (SCL). The moisture regime was "Dry-Fresh" (defined as "0-2" in the Field Manual for Describing Soils in Ontario). No gleys or mottles were observed during the soil analysis in this polygon.

3. Dry - Fresh White Cedar Coniferous Forest FOC2-2

The Dry - Fresh White Cedar Coniferous Forest (FOC2-2) possesses a dry to fresh moisture regime and is therefore dominated by White Cedar and possesses very little understorey species. The ELC characterizes the community as possessing 75% or more canopy cover.

The area comprised of the FOC2-2 ecosite is located along the northern property boundary of the subject site. The FOC2-2 ecosite is dominated by Eastern White Cedar (*Thuja occidentalis*) with only a few other species thriving beneath the cedars, including Wood Fern (*Dryopteris sp.*) and False Solomon's Seal (*Maianthemum racemosum*). Little groundcover was present other than where the stream courses through the northern edge of this vegetation community.

The auger hole in the FOC2-2 ecosite was completed to a depth of 57 cm. There was an initial brown sandy soil to a depth of 13 cm which was followed by a thicker B horizon that had an effective texture of Silt Loam (SiL), with a moisture regime of "moderately dry" (defined as a "0" in the Field Manual for Describing Soils in Ontario). No gley or mottles were observed during the soil analysis in this polygon.

This woodland community is part of the area designated as Significant Woodland by the Township.

4. Fresh - Moist White Cedar Coniferous Forest (FOC4-1)

According to the ELC manual, a Fresh - Moist White Cedar Coniferous Forest (FOC4-1) possesses 60% or more canopy cover, 75% of which must be dominated by a coniferous species. FOC4-1 is typically dominated entirely by Eastern White Cedar and is typically fern rich.

The subject site has one relatively large FOC4-1 ecosite associated with the slopes and low-lying area between Turner Street and the railway corridor. This coniferous habitat is dominated by Eastern White Cedar with minor occurrences of Eastern Hemlock (*Tsuga*

canadensis) and European Buckthorn. Ground cover is fern-rich in select areas and contains an abundance of fallen woody debris, exposed soils, and moss. The low lying moist areas tend to be dominated by Sensitive Fern (*Onoclea sensibilis*) and Horsetail (*Equisetum sp.*) Minor occurrences of Buckthorn and Trembling Aspen (*Populus tremuloides*) were observed near the boundaries of the ecosite.

Soil analysis in the FOC4-1 community was completed to a depth of 90 cm. There was an initial dark black soil horizon to a depth of 37 cm which was followed by a light grey horizon for an additional 20 cm. A final tan coloured soil horizon was observed from 57 cm to 90 cm where conditions refused any further augering. Mottles were observed at a depth of 60 cm and no gleys were present. The effective texture was Sandy Clay Loam (SCL) with a moisture regime of "Very Fresh" (defined as a "3" in the Field Manual for Describing Soils in Ontario).

This woodland community is part of the area designated as Significant Woodland by the Township.

5. Fresh-Moist White Cedar- Hardwood Mixed Forest (FOM7-2)

According to the ELC manual, a Fresh-Moist White Cedar Hardwood Mixed Forest (FOM7-2) possesses 60% or more canopy cover consisting of at least 25% conifer species and at least 25% deciduous species. FOM7-2 is typically dominated entirely by Eastern White Cedar with minor occurrences of Trembling Aspen, Paper Birch, Balsam Poplar and Red Maple sporadically throughout. The soils tend to be on the moist end of the moisture regime gradient.

This ecosite occurs between the mid- to eastern slope over to the eastern border of the subject site. This ecosite is mixed deciduous and coniferous forest. Trembling Aspen and Eastern White Cedar share dominance with other associate species that include Hawthorn (*Crataegus sp.*), Sugar Maple (*Acer saccharum*), White Ash (*Fraxinus americana*) and Staghorn Sumac. The sub canopy is dense, possessing Riverbank Grape (*Vitis riparia*) and Virginia Creeper (*Parthenocissus quinquefolia*). The cedar appears to be a hedge-type cedar that is a multi-stemmed thicket with the occasional secondary succession mature Trembling Aspen. The cedar thicket represents an early succession-type community that is dominating the upper slope on-site. Further down the slope, there is a transition to a more natural Eastern White Cedar (FOC4-1 previous section) dominated woodland that would represent the Significant Woodland.

Soil analysis in the FOM7-2 ecosite in the subject site was completed to a depth of 105 cm. There was an initial black topsoil layer to a depth of 30 cm which was followed by a red-brown B horizon which was observed from 30 cm to 105 cm. Mottles were observed at 50 cm and no gleys were present. The effective texture was determined to be Silty Clay Loam (SCL) with a moisture regime of "Moderately Moist" (defined as a "4" in the Field Manual for Describing Soils in Ontario).

This forest community is part of the area designated as Significant Woodland by the Township.

6. Scotch Pine Coniferous Plantation (CUP3-3)

The ELC describes a Scotch Pine Coniferous Plantation (CUP3-3) as resulting from, or maintained by, cultural or anthropogenic-based disturbances. A CUP3-3 ecosite must be composed of greater than 75% coniferous species and dominated by Scotch Pine.

Two (2) distinct CUP3-3 communities were delineated within the subject site. These areas are almost entirely dominated by Scotch Pine (*Pinus sylvestris*) with minor occurrences of European Buckthorn. The understorey is dominated by Round Leaved Dogwood (*Cornus rugosa*), Canada Goldenrod (*Solidago canadensis*), and Dog Strangling Vine (Vincetoxicum rossicum).

A soil analysis was not completed in this ecosite. Conditions are assumed to be similar to adjacent communities.

7. Dry-Fresh Deciduous Forest (FOD4)

The ELC describes a Dry-Fresh Deciduous Forest (FOD4) ecosite as having greater than 60% tree cover, 75% of which must be deciduous species. Tree species tend to be relatively uncommon or are a result of a disturbance. Soils have moderately dry (0) to fresh (1, 2, 3) moisture regimes and occur on upper to middle slopes.

The FOD4 ecosite occurs along the most western boundary of the subject site. It is co-dominated by Manitoba Maple (*Acer negundo*) and European Buckthorn. Both dominant species were covered in Riverbank Grape. Minor occurrences of European Mountain Ash (*Sorbus aucuparia*) trees were also found in this ecosite. Ground cover was dominated by the highly invasive Dog Strangling Vine and Virginia Creeper.

A soil analysis was not completed in this ecosite. Conditions are assumed to be similar to adjacent communities.

7.3.3 Waterway Communities

8. Open Aquatic (OAO)

According to the ELC, an Open Aquatic habitat has no macrophyte vegetation on the bottom, and no tree or shrub cover. Water depth must be greater than 2 m depth and the waterway has a trophic status.

This community refers to Little Creek. Although there is some vegetation along the

embankments, there is no vegetation directly in the creek, only braided sediments of sands and silts. The bottom consists of some minor gravel beds, however, it is dominated by brown and grey silts and sands.

Some downed woody debris occurs within the creek which provides structure and cover for the fisheries within this coldwater stream. The creek appears to posses a minor meander in the area of the subject site. Little Creek crosses the northeast corner of the subject site.

Water depths could be 2 m or greater during the spring freshet period. ORE observed a series of seeps and springs that appear to be groundwater discharging to this feature. No shrub or tree species grow directly in the creek corridor.

7.3.4 SAR Flora

During the detailed vegetation mapping described above, inspections for SAR flora were conducted. No SAR flora were identified on-site. However, one (1) Butternut was located on the adjacent parcel to the east of the subject site. The location is illustrated on Figure 6.

7.4 Fauna

7.4.1 Avifauna

A total of eighteen (18) avifauna species were identified, two (2) of which are identified as species of significance. The Chimney Swift (threatened) and the Eastern Wood-Pewee (special concern) were discovered on-site and are discussed below. A complete list of all avifauna species that were observed on the subject site is presented in Appendix G.

7.4.2 Herpetiles

ORE attended three point count locations, three (3) times in the evening hours for the purpose of collecting amphibian data. The following species were identified:

April 6, 2011:

1) Spring Peeper - Abundance Code is 1, point count location number 1 (PCL-1).

June 23, 2015:

1) Nothing detected at PCL-1;
2) Gray Treefrog - Abundance Code is 2 near southeast corner of site (PCL-2);
3) Nothing detected at PCL-3.

June 7, 2018

1) Gray Treefrog - Abundance Code is 1 (two individuals calling), point count location number 1 (PCL-1).
2) Gray Treefrog - Abundance Code is 1 (one individual calling), point count location number 1 (PCL-2);
3) Nothing detected at PCL3.

The abundance codes are provided below:

> *Code 1: Calling individuals can be counted and calls are not simultaneous. In this instance, exact counts can be made of the number of calling individuals and surveyors are asked to record both the code and their count.*
>
> *Code 2: Calls of individuals can be distinguished but some calling is simultaneous. Under these conditions, an exact count is not possible or expected but the surveyor should be able to make a reliable estimate of the number of individuals calling.*
>
> *Code 3: A full calling chorus with calls continuous and overlapping. Reliable counts and even estimates are unrealistic at this level of calling intensity and no counts are requested.*

Other than the creek/riparian habitat, the majority of the subject property area does not represent suitable habitat for breeding amphibians. The Gray Treefrog was the only species overheard directly on-site, the remainder were overheard closer to the waterways.

The creek area does not possess ephemeral pool habitat in the early spring season and therefore Western Chorus Frog (*Pseudacris triseriata*) is unlikely to occur on or directly adjacent to the property. This frog species was not detected during the surveys which seems to corroborate the lack of suitable breeding habitat on-site.

The location of the creek is illustrated on Figure 5.

7.4.3 Fish Habitat Data

According to the field measurements of pH, conductivity, dissolved oxygen and temperature, the creek appears to be a coldwater stream environment that could sustain coldwater fish species such as Brook Trout. No fish species were directly observed within Little Creek during the inspections, although there is evidence of good habitat throughout the watercourse. The stream provides plenty of downed woody debris and snags as well as bank undercuts for fish species to inhabit.

The sediments were a mixture of sands, silts and interwoven gravels.

Photos showing the stream conditions and the field water quality data for Little Creek are provided in Appendix H and Appendix I, respectively.

7.5 Endangered, Threatened or Special Concern Species

The Endangered Species Act and many municipal level Official Plans provide regulation and guidelines with respect to protection of endangered and threatened species.

Two (2) faunal species of significance listed within the ESA were observed to the east of the subject site during our surveys. Eastern Wood-Pewee has a status of special concern by the province and was overheard within the mature woodland directly adjacent to the subject site along the eastern limit. Chimney Swift is a threatened species and was also overheard and observed further east of the subject site, on adjacent lands owned by the proponent.

Neither species were observed on-site, however, the site (and adjacent areas) would be suitable nesting and foraging habitat for these species.

Although Butternut was nor observed directly on-site it was observed on an adjacent parcel to the east of the subject site. Butternut is a relatively common tree species, however, the Butternut Canker (a blight) is culling the trees and significantly reducing the populations of this species throughout Ontario and Quebec. Butternut is listed as Endangered by the ESA. The location of the Butternut is provided on Figure 6.

8.0 Impact Assessment

8.1 Oak Ridges Moraine Conservation Plan

The ORM regulated boundary occurs as a portion along the western extent of the subject site. According to the ORMCP mapping, there are no known KNHF or HSF within those ORM lands.

ORE's inspections of this area did not result in any KHNF or HSF being detected. The thin fragmented forest would not represent a significant wildlife habitat or a significant woodland.

However, the ORMCP mapping does designate this area as High Aquifer Vulnerability, which attempts to limit the use of harmful or potentially hazardous materials within the ORM.

In addition to the High Aquifer Vulnerability designation, a portion of the site occurs within the area referred to as *Landform Conservation 1,* of the ORMCP. According to Section 30 of the ORMCP, an application for development or site alteration with respect to lands in a landform conservation area (Category 1) shall identify planning, design and construction practices that will minimize disturbances to landform character.

8.2 General Considerations

8.2.1 Significant Woodland

According to the OMNRF and Township of Cavan Monaghan Schedule B1, Significant Woodland covers approximately 4.26 ha of the subject site.

Based on our field observations, it is our opinion that the forest type and limit represented by the Township's Schedule B1 is reasonably accurate, with the exception of the FOM7-2 ecosite described above. This community was noted to contain mainly immature early succession hedge-type species (i.e., Eastern White Cedar and Trembling Aspen) and was abundant with invasive species (i.e., Scot's Pine, Riverbank Grape and Virginia Creeper). As such, Figure 6 illustrates a more representative boundary of the Significant Woodland. It is our opinion that this Significant Woodland would be the principal constraint with respect to future development on the subject site.

Notwithstanding, there is potential for this woodland to be altered during construction of access roads and/or the dwellings. As such, mitigation to minimize loss or impact to the forest (e.g., loss of mature trees) will be required, as detailed in the Section 3.26 of the Township of Cavan-Monaghan's Official Plan.

Based on the most recent Concept Plan, approximately 1.57 ha of significant woodland would be altered during the construction process (Figure 6).

Specific recommendations in this regard are presented in a following section.

8.2.2 Watercourses

Little Creek is a coldwater feature that occurs in the northeastern corner of the subject site. A 30 m Vegetation Protection Zone (VPZ) is recommended to protect this feature in this setting. At that distance, there will be no Harmful Alteration, Disruption or Destruction (HADD) of fish habitat as a result of the development. The 30 m setback will also encapsulate the important springs and seeps that feed this feature. The majority of the springs and seeps were within 2 m to 3 m of the creek bank.

A series of small ephemeral wetland pockets occur between the railway corridor and the subject site. These wetlands occur offsite and downgradient of the proposed stormwater management pond. The railway represents a barrier to overland flows creating these wetland pockets that occur approximately 100 m (or greater) east of the property line abutting the railway corridor.

Specific mitigation recommendations pertaining to maintaining a positive drainage regime to the creek during and after construction will be necessary to maintain the on-site hydrologic functions. Therefore, the post-development infiltration characteristics of the site will need to remain very similar to existing conditions. An Engineer specializing in

stormwater management and drainage should be consulted in this regard.

Specific recommendations are presented in a following section.

8.2.3 Wetlands

There are no known or mapped wetlands associated with the subject site. A very narrow swath is associated with Little Creek. Overall, the site is relatively dry as it occurs on higher ground than the lands to the east. The western portion of the site does not occur within 120 m of any wetlands.

8.3 Development Envelope

The site contains areas of Significant Woodland (Figure 6) that represent the main constraint, if the Township's NHS were *fully* applied to the site. However, portions of this woodland are still considered to be immature and scrubby regrowth with an abundance of invasive trees and groundcover. Although the forests do have some valuable buffering capacity with respect to the watercourses that occur on- and off-site, they do not represent pristine natural forest cover.

Therefore, it is our opinion that the property owner and the Township NHS requirements meet halfway on the issue of development within the treed areas on-site. We agree with the premise of protecting the forest communities (in order to protect the waterways), however, protecting the existing woodland on one property should not be imposed to compensate for the loss of forests from other properties. The property owner should be allowed to develop a reasonable portion of the property while still maintaining or exceeding the existing tree coverage and inherent naturalness of the site.

This concentration of development within the Millbrook Hamlet boundary also complies with the new Greater Golden Horseshoe Growth Plan (although not required to). The Growth Plan attempts to target development within the boundary limits of the Cities, Towns and Hamlets within the GGHGP while maintaining rural, natural and agricultural areas.

Considering the proposed subdivision occurs within the growth area and Hamlet limit of Millbrook, some consideration should be given to allowing some of the vegetation to be removed for development purposes. This is provided that sufficient woodland remains to buffer the downgradient wetland and streams to the north and east and that the continuity of the woodland tract is maintained for linkage purposes. Section 3.26 of the Townships Official Plan recognizes that some tree loss for new developments may be unavoidable and that replacement plantings will be considered.

Therefore, specific recommendations with regard to selected areas for future development and tree loss mitigation are presented in a following section.

8.4 Construction Related Impacts

The main potential impacts associated with future construction relate to the following:

- loss of habitat (i.e., primarily woodland degradation);
- erosion by wind and water on soils that are exposed by construction alterations;
- operation of equipment (i.e., noise and vibration), and
- presence of construction debris and waste materials both during and post construction.

Recommendations for mitigation of the above are presented in a following section.

8.5 Breeding Birds and Woodlands

The available background information suggests that the property and surrounding areas have potentially attractive habitat for several species which are identified under the Provincial and/or Federal Endangered Species Act or Species at Risk Act:

- Whip-poor-will
- Chimney Swift
- Eastern Wood-Pewee
- Barn Swallow
- Wood Thrush
- Bobolink
- Eastern Meadowlark
- Red-headed Woodpecker
- Golden-winged Warbler
- Least Bittern
- Red-shouldered Hawk

Among the species listed by the OBBA, Chimney Swift (Threatened), Bobolink (Threatened), Eastern Meadowlark (Threatened), Eastern Wood-Pewee (Special Concern) and Golden-winged Warbler (Special Concern) would be the most likely species to occur directly on-site. Others could occur in the general vicinity.

The Eastern Wood-Pewee could occur within the mature woodlands on-site that occur along the periphery of the property. However, by retaining the majority of the mature significant woodland areas around the edge of the property and in the creek area, the existing habitat of the Eastern Wood-Pewee will be virtually unaffected by the future development. Its preferred nesting sites and foraging areas, which are integral to this species, will be retained. Similarly, the forest interior birds and inherently the SWH would be maintained and allowed to succeed in the remaining treed areas. Enhancement to these areas would be beneficial.

The Chimney Swift was observed flying over an adjacent parcel east of the subject site. If some lots were developed within the open field areas and early succession woodlands/thickets surrounding the field areas, it would not impact the Chimney Swift. It is possible that the residences and any outbuildings, could eventually provide additional nesting structures, and the developed areas would remain open and available for the Chimney Swift to forage within. In addition, Chimney Swift houses have been erected in certain public areas within the City of Peterborough. Therefore, a similar approach could be taken to erect a Chimney Swift house on-site within a park or recreational area on-site.

The Bobolink, Eastern Meadowlark and Golden-winged Warbler were not observed on the subject site, although marginal habitat is present on-site as the site has not been managed as a farm for many years. It is doubtful that the Bobolink and Eastern Meadowlark would find the highly fragmented habitat appealing as the site is overgrown by woodland rows and thicket which is not ideal for either species. Impacts to this marginal habitat would result from the stripping and removal of habitat for construction purposes. The Golden-winged Warbler would prefer the disturbed willow areas at the edge of Little Creek; this species would only be impacted if disturbances were allowed to occur directly adjacent to the creek. Other suitable habitat is available off-site and to the east of the subject parcel towards the railway corridor.

Given the above, the main potential impact of development on the lands would be the degradation or loss of habitat due to the amount of existing forest cover being altered or removed. Avian species in the area do utilize the tree cover on-site for nesting and foraging purposes. Similarly, bird species that are sensitive to noise and vibration (e.g., from heavy equipment), especially during the breeding bird season, could be impacted as a result of the development.

Recommendations for environmentally sensitive design considerations, construction controls and practices, and other mitigation measures are presented in a following section.

8.6 Post Construction Impacts

Post construction impacts are those that may occur during the long-term use of the site, including:

- improper handling of fuels, wastes, chemicals, pesticides or other deleterious materials;
- disturbance related to minor alterations, further clearing of land (e.g., to extend lawns, gardens, laneways, dumping of garden waste, etc.), and
- impacts related to the use of inappropriate external lighting and excessive noise.

9.0 Recommendations

9.1 Oak Ridges Moraine Conservation Plan

ORE staff did not identify any KNHF or HSF within the ORMCP regulated area situated in the western portion of the subject site. However, this area does possess a High Aquifer Vulnerability and a Landform 1 Conservation Area.

High Aquifer Vulnerability

All of the ORM lands, approximately 1.55 ha (3.77 acres), within the western portion of the site are designated High Aquifer Vulnerability as illustrated by the ORMCP mapping. As indicated by Section 29 of the ORMCP, that area is subject to the certain prohibitions, including:

> *1. Generation and storage of hazardous waste or liquid industrial waste.*
>
> *2. Waste disposal sites and facilities, organic soil conditioning sites, and snow storage and disposal facilities.*
>
> *3. Underground and above-ground storage tanks that are not equipped with an approved secondary containment device.*
>
> *4. Storage of a contaminant listed in Schedule 3 (Severely Toxic Contaminants) to Regulation 347 of the Revised Regulations of Ontario, 1990.*

None of the above apply directly to the proposed developments, which will be entirely residential use. Minor fuel handling may occur on-site for lawnmowers or other small engines, however, no underground storage tanks or significant volumes of fuel would be present.

When handling fuel, lot owners should ensure that all equipment at the site is in optimal working condition, and that no leaks are present. Fuelling should be completed in the garage or shed where any spills can easily be contained, collected and disposed of in a proper manner.

Category 1 Lands

The total site area occurring within the Category 1 designation is estimated to be approximately 1.55 ha (3.77 acres). As such, the total area of all disturbances within this designation should be limited to no more than 0.38 ha (0.95 acres), based on the 25% criterion.

A second limitation with respect to the Category 1 lands requires that impervious surface materials applied to the site must be less than 15%. Consequently, the total area of

impervious surfaces within the Category 1 designated areas would need to be limited to no more than 0.23 ha (0.57 acres).

According to the most recent design, only a sliver of development is proposed to occur within the ORM area on-site. A total of 0.17 ha (0.42 acres) will require grading to allow for lots 1 through 16 to meet the minimum lot size requirements. Therefore, the proposed encroachment into the ORM lands will be less than the 15%, satisfying the ORMCP limitation.

The remainder of the ORM lands will remain untouched. This area currently possesses a fencerow and open grassland habitat. This area would be ideal for creating a new vegetation buffer/strip as a means of compensating for any larger diameter (>10 cm dbh) tree loss in the immature FOM7-2 community where the development is proposed to occur.

9.2 Site Constraints

Development Area and Significant Woodland

In addition to the constraints outlined above for the areas that occur within the ORM, the following site constraints will be necessary to comply with the Township's Natural Heritage System (NHS), on a best-efforts basis.

The subject site possesses a component of Significant Woodland. As a means of reducing the impact on the core areas of the woodland, it is recommended that a Vegetation Protection Zone (VPZ) of 30 m be applied to the Significant Woodland communities on-site. The VPZ is illustrated on Figure 6.

Since these setbacks will be continuous from one significant feature to another, the result will be one large Potential Development Area (PDA) for the property. Notwithstanding, some minor areas of the NHS - Significant Woodland may be removed during the construction process (approximately 1.57 ha).

A silt fence should be installed to demarcate the limits of the PDA to confine the physical works and to reduce potential construction related impacts related to sedimentation, runoff, etc. No disturbances or site alterations shall occur outside of the defined areas.

To mitigate the vegetation loss in this area, native species will be replaced by the applicant once construction is complete. The plantings could be targeted within any available open areas on the subject property (totalling approximately 2.67 ha). The largest area available for planting purposes is the ORM lands on-site. The following benefits would result from planting the compensatory vegetation within the ORM lands:

- The plantings would improve upon or enhance an area of the ORM;

- The plantings would create a new enhanced buffer strip on-site that would eventually become a better quality significant woodland feature than what exists currently in the PDA;

- The plantings in this area would compensate for the tree loss in the PDA and create a 1.27 ha (3.15 acre) corridor for migratory and breeding fauna on-site. The new corridor would maintain the linkage between NHF to the north and south of the site.

The following shall be implemented on-site to offset the tree loss on the subject site:

1) A Qualified Person will attend the property to accurately map the tracts of mature forest and demarcate the boundary of these features in the field.

2) Once the areas are accurately mapped, the Qualified Person will tally the number of native trees to be removed from within the Significant Woodland that are present within the PDA. Once construction is complete, the proponent will be required to plant native nursery stock trees (greater than 1 m in height) at a ratio of 3:1 for each tree between 10 and 20 cm diameter at breast height (dbh) and 5:1 for each tree greater than 20 cm dbh lost during construction. A Qualified Person should be retained to assist with any tree removal and facilitate the plantings.

3) Plantings will be targeted in the areas identified on Figure 6. The areas will establish a natural tree corridor along the western boundary the site (primarily within the area of the ORM regulated boundary), which will increase connectivity with the existing Significant Woodlands to the north and south of the subject site. Plantings should also be directed within the 30 m VPZ (adjacent to Lots 14 through 27), in order to expand on the existing core woodland habitat (ie. ORE's Significant Woodland).

4) The applicant will be responsible for maintaining the planted trees on-site. Watering and maintenance will be required to ensure that the new trees survive. Therefore, should a newly planted tree die, that tree must be replaced within the first two (2) years of dying on a 1 for 1 basis. A Qualified Person will attend the site to ensure the trees are succeeding.

5) A public access trail is proposed to be constructed on-site connecting the proposed subdivision to King Street. To achieve this, the trail will have to cross the proposed VPZ and Significant Woodland on-site. The trail does not represent a significant impact to the woodland, and should be possible to route the trail through the woodland avoiding the majority of trees that are 6 m or taller. In order to minimize impacts on the woodland, it is recommended that the width of the trail not exceed 2 m and must be constructed of natural materials. Considering a number of cedars may be

available once they are removed from within the PDA, these downed trees could be used to construct the trail system. Provided the trail can meet the above mentioned requirements, no compensation would be necessary.

6) Under no circumstances (with the exception of the area of 1.57 ha described above and the public trail system) will the development be allowed to extend beyond the limit of the PDA.

Watercourses

A 30 m setback shall be applied to Little Creek to protect this feature and is shown on Figure 6. Based on the location of the creek, the 30 m buffer is situated well back from the PDA. As such, all of the seeps and springs, ephemeral pools and some minor wetland vegetation will be virtually unaffected by the development. The hydrological function of Little Creek and its network of off-site watercourses will be maintained.

A stormwater engineer should determine how best to convey the run-off/drainage on-site such that it maintains both the quality and quantity of overland flows to the creek and the offsite watercourses east of the subject site. The proposed Stormwater Management Pond is located 100's of metres from the wetland pockets observed off-site. As such, it will be possible to infiltrate the stormwater and have undetectable impacts on the quality of these ephemeral wetland pockets further east of the site. The Stormwater Management Plan should be consulted in this regard. Furthermore, considering the flow gradient is towards the side of the railway bed, the ephemeral water discharged at the surface within these wetland pockets will be further attenuated within the railway bed materials, before discharging to the creek channel south of the railway bed system.

It is our opinion that the recommendations pertaining to construction activities outlined herein are considered sufficient to protect the watercourse features in this instance. Given the large separation distances from the PDA and provided reasonable construction procedures are followed, no adverse impacts are expected from the proposed development.

Butternut

Only one (1) Butternut was observed adjacent to the subject site, off of Turner Street. The Butternut will be unaffected as no development is to occur within this area due to the Significant Woodland designation in this area. Consequently, the Significant Woodland setbacks will create a buffer that is greater than the OMNRF's setback of 50 m to protect both the individual Butternut tree and its habitat. It will not be necessary to complete a health assessment on this tree, as it will not be removed.

9.3 General Design Considerations

Only clean fill should be imported to the site to elevate low-lying areas. Culverts and permeable materials such as sand, gravel and rock screenings can be used on-site, provided those materials and/or any associated excavations do not result in lowering of the water table.

The use of permeable materials will aid in maintaining the infiltration characteristics of the site.

9.4 Construction Mitigation

Grading Plans

The Grading Plan (and/or Site Plan) should indicate the PDA limit, volumes of fill to be imported to the site and final grades that will be achieved. The plans should illustrate the location of any future plantings. Any other information required by the Township, ORCA, and the County should be included.

Erosion / Sediment Controls

The proponent or contractor should submit an *erosion and sediment control plan* with, or incorporated into, the Grading Plan (or Site Plan). Proper erosion/sedimentation controls will be required at all times while heavy equipment is in operation. A light-duty silt fence should be installed along both PDA limits. The Ontario Provincial Standard Drawing (OPSD) for silt fence installation is provided in Appendix J.

Bales of straw should be strategically located inside the silt fence, especially in areas where heavier sediment loads may occur during precipitation events. The bales can also be used at the corners of the silt fence to further stabilize the fence. Bales alone do not provide enhanced filtration of sediments. However, the bales could be wrapped and staked in place with a geo-textile cloth that would halt eroded sediments from being transported to within the forest buffers.

Construction should not continue during heavy precipitation events and, after these events, the fence and bales should be checked to ensure their effectiveness.

ORE staff did not observe any concentrated runoff channel features within the PDA. Silt fence and hay bales are intended to mitigate sheet runoff and not concentrated flows. If significant concentrated flow is determined to occur on either site by the contractor a different type of erosion/sediment control measure to ensure any sediment laden runoff is released outside of the PDA.

To reduce the potential for post-construction sedimentation/erosion, any disturbed areas

should be quickly seeded or sodded to re-establish vegetation cover. Planting of native trees and shrubs is also encouraged at this stage, especially with respect to any required compensatory plantings. Once the seeding or sodding is determined to be a success and the site soils are stable, the erosion/sedimentation controls can be removed.

The majority of the native plantings should be targeted within the ORM tract and VPZ. The remainder of the trees can be distributed throughout the PDA. Areas where trees could be planted within the PDA include residential yards, stormwater management areas. A Landscape Architect should provide a schematic/plan of how the subdivision can be vegetated. Hardy native species should be applied, where possible.

Construction Schedule

There is a potential for Eastern Wood-Pewee, Bobolink, Eastern Meadowlark, Chimney Swift and Golden-winged Warbler to occur in the general area of the subject site. Therefore, the following mitigation (as per the 2007 Endangered Species Act) must be applied:

- With regard to migratory breeding birds utilizing the woodland and nearby waterway habitats, potential impacts on these species could include noise during the breeding season. To mitigate the potential for impacts on these birds during the breeding season/migration, no heavy equipment operation will occur on the subject site between April 1st and August 30th corresponding to the Migratory Bird Convention Act.

  It may be possible to conduct some work during this period, however, a Qualified Person must verify what can be done with little to no effect on the breeding birds in the area during the above mentioned window.

- If construction cannot occur until this year (2018), ORE recommends that two (2) inspections be completed to confirm the presence of any SAR birds. These inspections would be completed during the Breeding Bird season. Any additional information regarding breeding evidence should be incorporated into the registry and the agencies updated in the form of an addendum. If the SAR birds are not present at the time of the inspection, the proponent would be allowed to commence with any necessary clearing on-site.

9.5 Post-Construction Environmental Mitigation

Potential post-construction impacts to the natural features can occur as a result of excessive yard and structure lighting. Some bird species such as owls, night hawks and Nightjars are sensitive to excessive lighting. In addition, breeding amphibians and reptiles associated with the creek are also sensitive to light. Spot lights or motion sensor lights should not be installed on the properties. Softer lighting such as low wattage coach

lights, pot lights, or ground lighting should mitigate potential light-related impacts on these species. This type of post construction mitigation is not regulated by any agency and is for any future lot owners.

End of Natural Heritage Evaluation Report

Yours truly,
Oakridge Environmental Limited

Original Signed By

Rob West, HBSc. CSEB
Senior Environmental Scientist

Selected References

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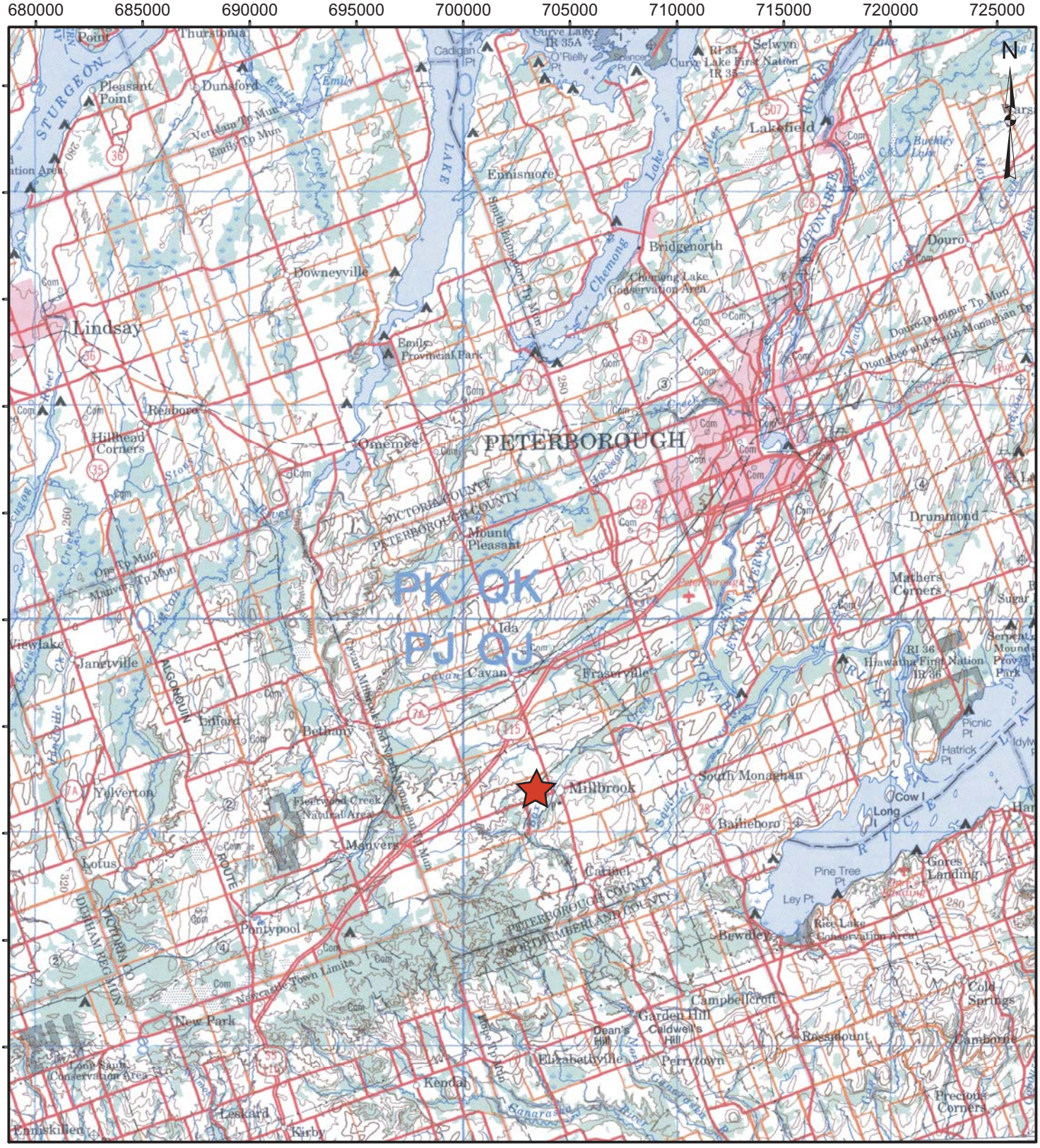
Figures



North American Datum 1983 UTM Zone 17

Scale: 1:250,000

Approximate Site Location

0 3 6 12 km

Natural Heritage Evaluation
Proposed Residential
Development Application (Veltri)
Part Lot 11, Concession 5 (Cavan)
Township of Cavan Monaghan

TITLE
General Location

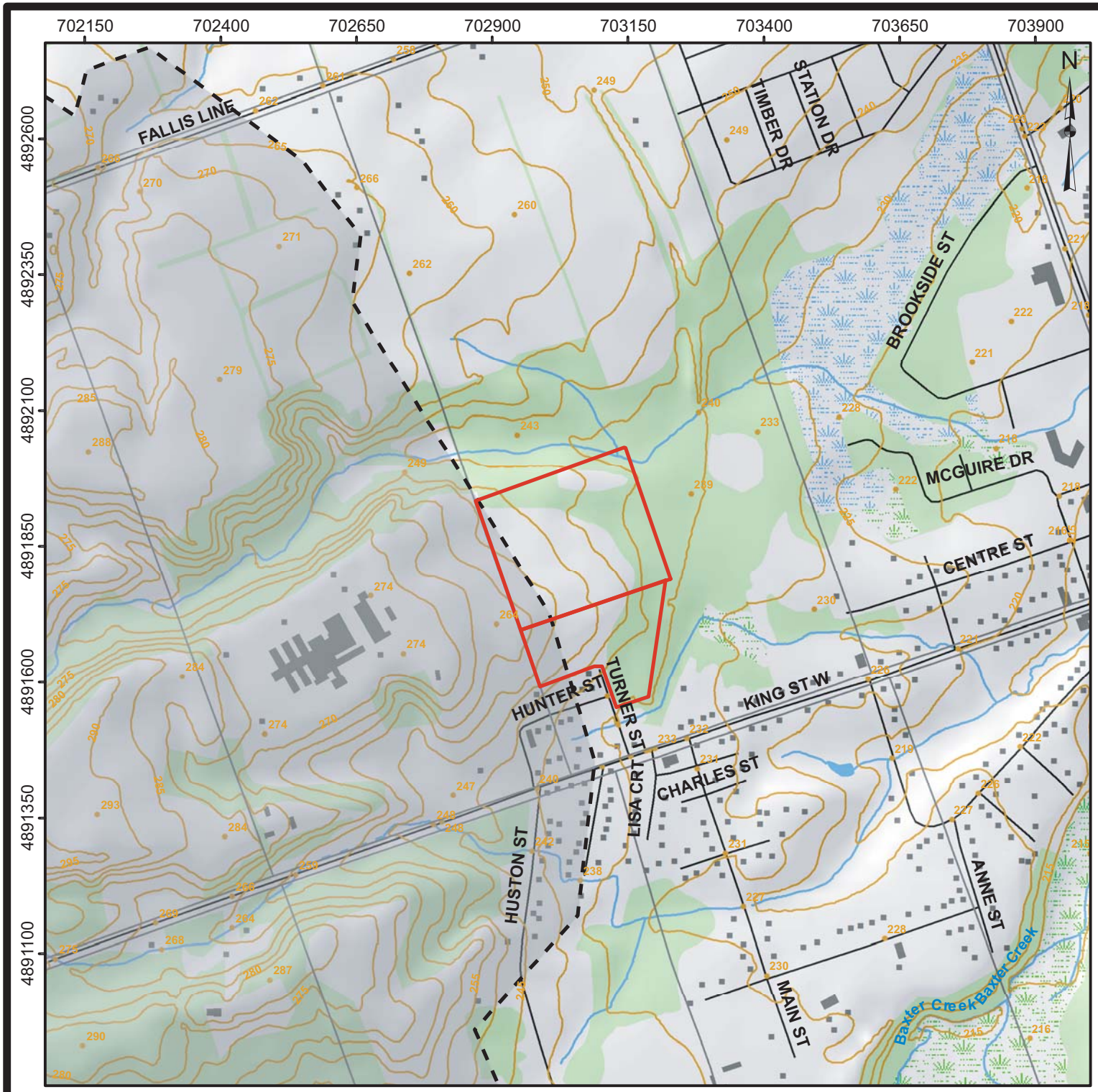
ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #
15-2013

FIGURE NO.
1

DATE
December 2018

Note: Base map provided by Natural Resources Canada, NTS 31-D (2003)



North American Datum 1983 UTM Zone 17

Natural Heritage Evaluation
Proposed Residential Development Application (Veltri)
Part Lot 11, Concession 5 (Cavan)
Township of Cavan Monaghan

LEGEND

- Approximate Site Location
- Oak Ridge Moraine Boundary
- Unevaluated Wetland
- Evaluated Wetland
- Watercourse
- Waterbody
- Wooded Area
- Contour Line (5 m interval)
- Spot Height
- Building
- Railway
- Road
- Lot Fabric

Scale: 1:10,000

0 125 250 500 m

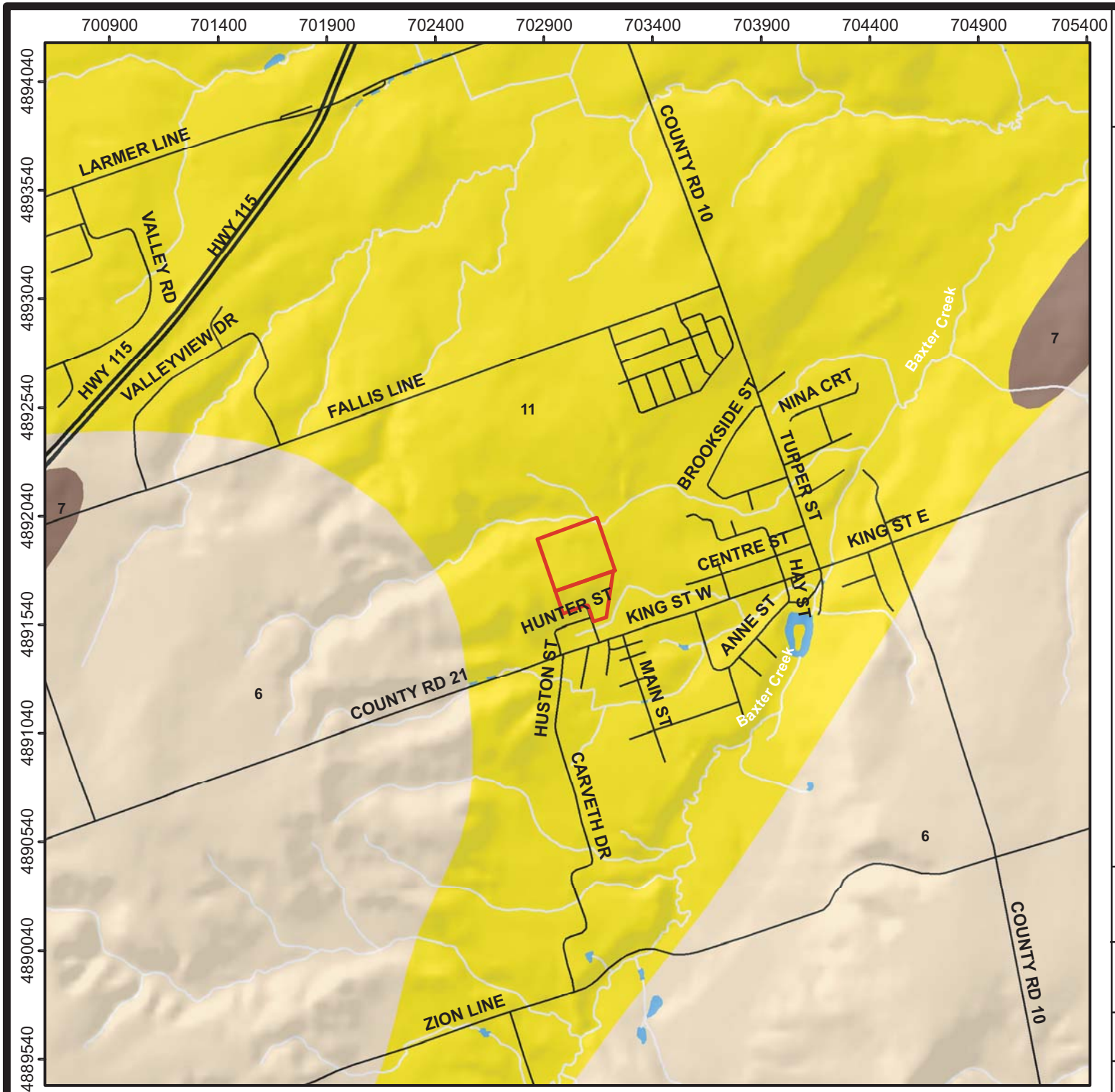
Note: Base map provided by the Ministry of Natural Resources Land Information Database, Copyright the Queen's Printer (2018).

TITLE

Topography and Drainage

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
15-2013	2
DATE	
December 2018	



North American Datum 1983 UTM Zone 17

Natural Heritage Evaluation
Proposed Residential
Development Applications (Veltri)
Part Lot 11, Concession 5 (Cavan)
Township of Cavan Monaghan

LEGEND

- Approximate Property Boundary
- 6: Till Plains (Drumlinized)
- 7: Drumlins
- 11: Sand Plains
- Waterbody

N

Scale: 1:25,000

0 250 500 1,000 m

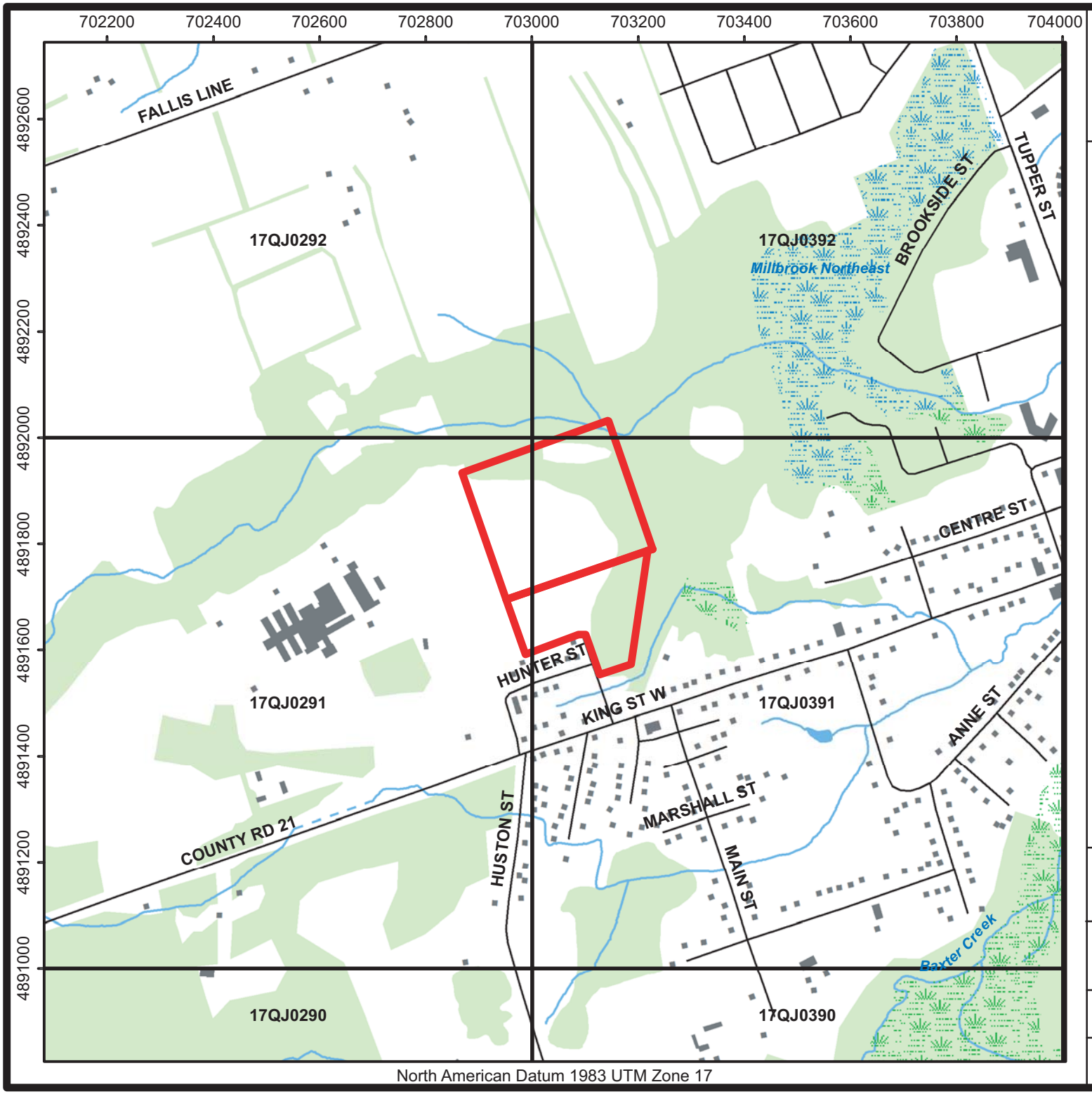
Note: Base map provided by Chapman, L.J. and Putnam, D.F. (2007).

TITLE

Physiography

ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
15-2013	3
DATE	
December 2018	



Natural Heritage Evaluation
Proposed Residential
Development Application (Veltri)
Part Lot 11, Concession 5 (Cavan)
Township of Cavan Monaghan

LEGEND

- Approximate Site Location
- NHIC 1 km squares
- Wooded Area
- Waterbody
- Watercourse
- Lot Fabric
- Unevaluated Wetland
- Evaluated Wetland

N

Scale: 1:10,000

0 125 250 500 m

Notes: Base map provided by the Ministry of Natural Resources Land Information Database, copyright the Queen's Printer (2018).

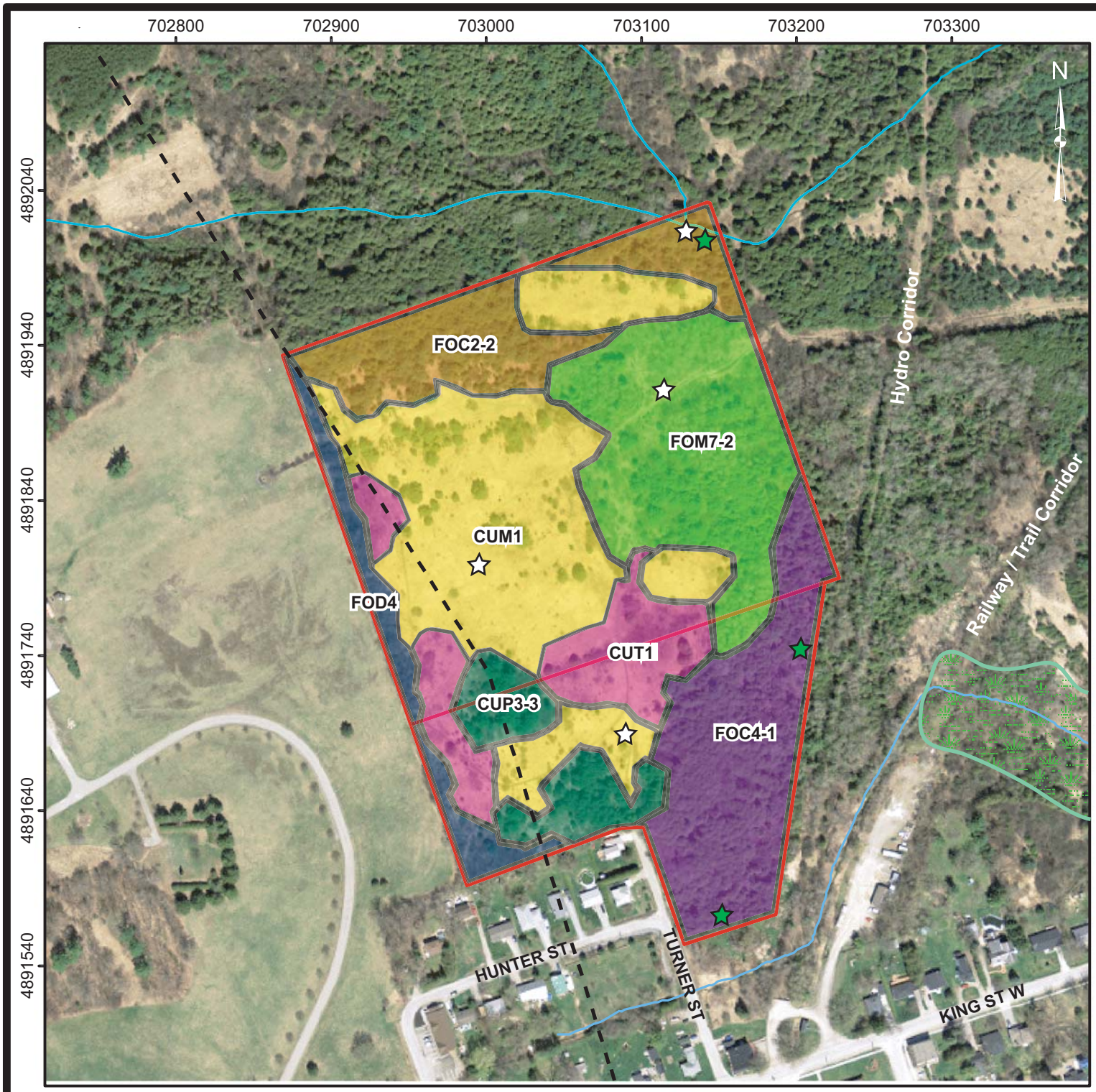
TITLE

NHIC Query

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
15-2013	4
DATE	
December 2018	

Natural Heritage Evaluation
Proposed Residential Development Application (Veltri)
Part Lot 11, Concession 5 (Cavan)
Township of Cavan Monaghan



LEGEND

- Approximate Site Boundary
- Fresh-Moist White Cedar-Hardwood Mixed Forest (FOM7-2)
- Fresh-Moist White Cedar Coniferous Forest (FOC4-1)
- Mineral Cultural Thicket (CUT1)
- Mineral Cultural Meadow (CUM1)
- Dry-Fresh Deciduous Forest (FOD4)
- Dry-Fresh White Cedar Coniferous Forest (FOC2-2)
- Scotch Pine Coniferous Plantation (CUP3-3)
- Unevaluated Wetland (MNRF)
- Watercourse (MNRF) - Open Aquatic (OAO)
- Ontario Breeding Bird Atlas Survey Point Count Location
- Marsh Monitoring Program Survey Point Count Location
- Oak Ridges Moraine Boundary

Scale: 1:3,500

0 37.5 75 150 m

Notes: Aerial Photography provided by ESRI, Digital Globe, 2010

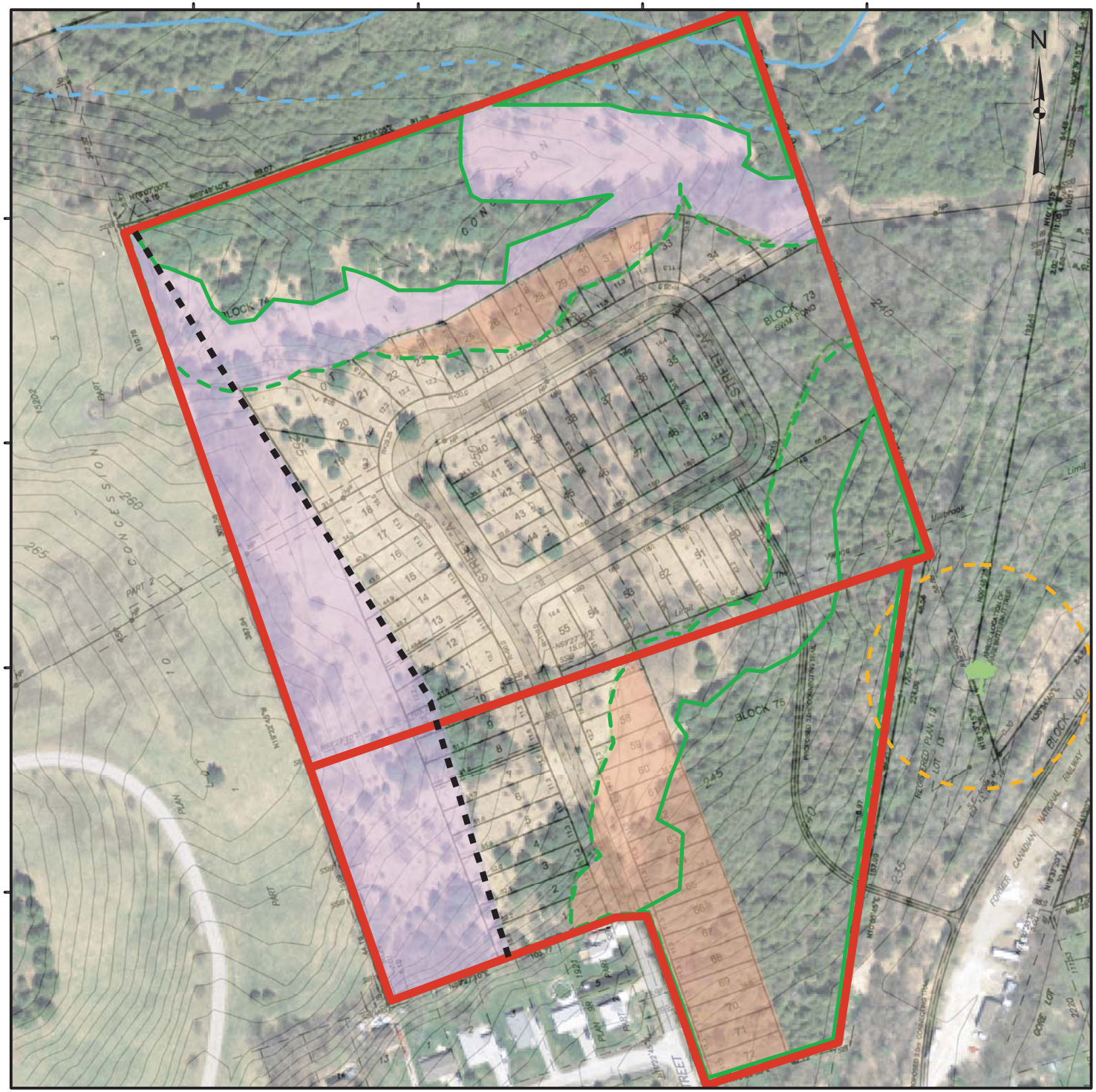
TITLE

Vegetation

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
15-2013	5
DATE	
December 2018	

North American Datum 1983 UTM Zone 17



North American Datum 1983 UTM Zone 17

Natural Heritage Evaluation
Proposed Residential
Development Application (Veltri)
Part Lot 11, Concession 5 (Cavan)
Township of Cavan Monaghan

LEGEND

- Approximate Property Boundary
- Watercourse
- Watercourse Setback (30m)
- Butternut
- Butternut Setback (50m)
- Oak Ridge Moraine Boundary
- Significant Woodland (Township of Cavan Monaghan OP)
- Vegetation Protection Zone (30m setback)
- Limit of Woodland Encroachment (Approximate Area = 0.89 ha)
- Proposed Planting Area (Approximate Area = 2.53 ha)

Scale: 1:2,500

0 25 50 100 m

Notes: Aerial Photography provided by ESRI, Digital Globe, 2010

Best fit lot layout after Preliminary Draft Plan prepared by D.G. Biddle and Associates Ltd. (January 2018).

TITLE

Constraints

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
15-2013	6
DATE	
December 2018	

Appendix A

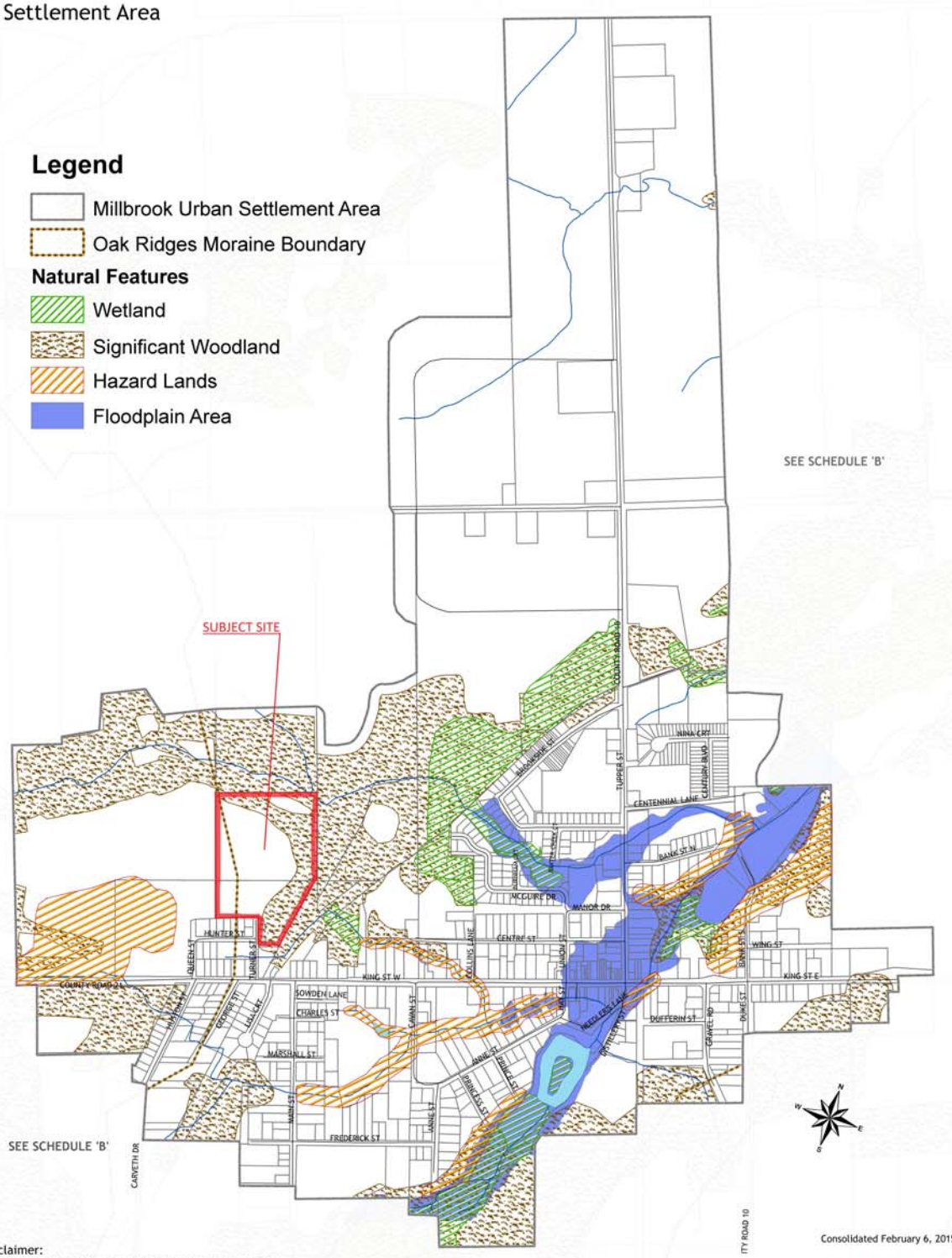
Township OP Schedules / Oak Ridges Moraine Mapping

Township of Cavan Monaghan
Official Plan - Schedule 'B-1'

Natural Heritage System and Environmental Constraints

MILLBROOK

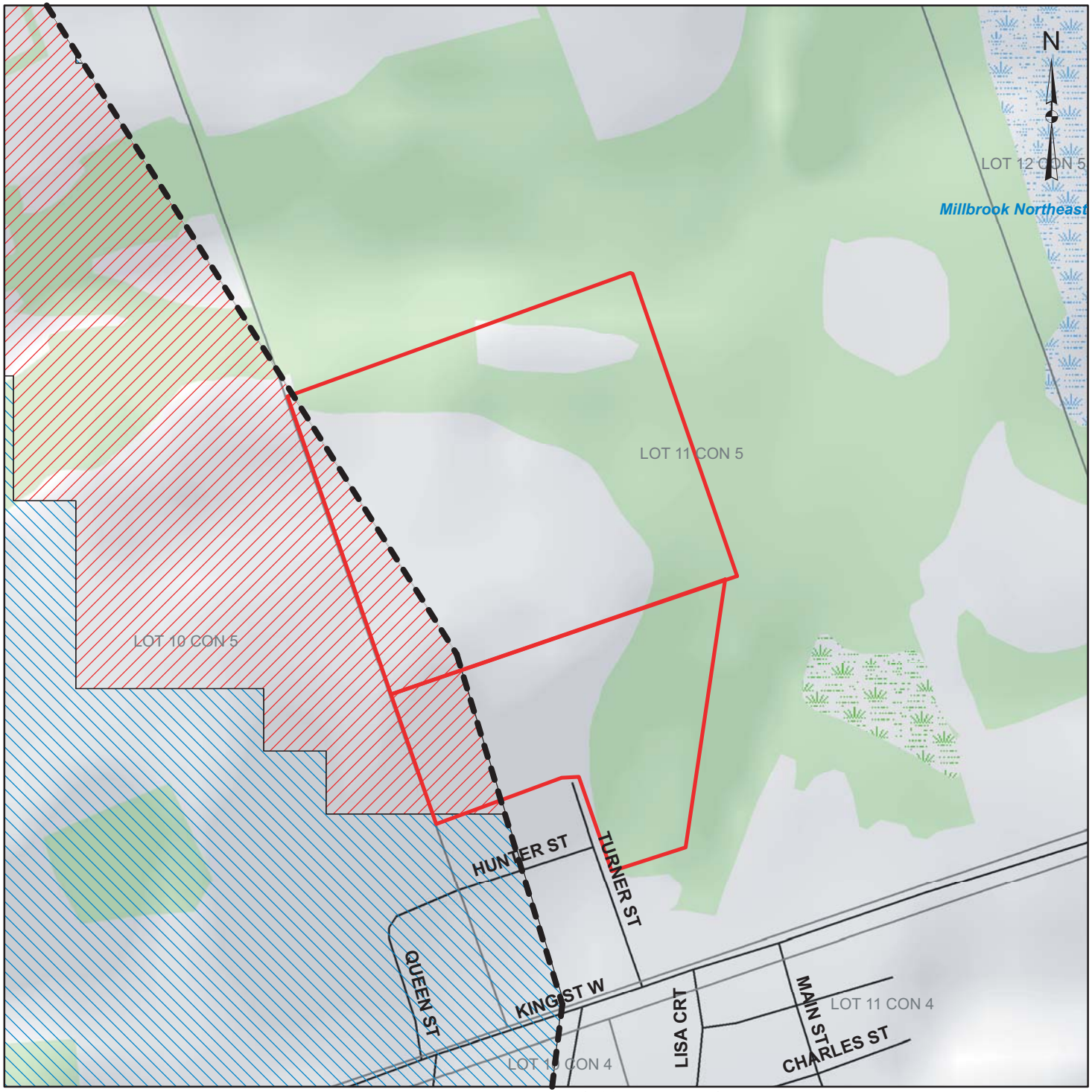
Settlement Area



Disclaimer:
Floodplain areas shown on this Schedule are a general indicator only. The floodplain areas are not a legal plan of survey and should not be relied on for the location of features within the floodplain. The floodplain areas on this Schedule are subject to further review.

Consolidated February 6, 2015

TOWNSHIP OF CAVAN MONAGHAN
Have it all. Right here.



North American Datum 1983 UTM Zone 17

Natural Heritage Evaluation
Proposed Residential
Development Applications (Veltri)
Part Lot 11, Concession 5 (Cavan)
Township of Cavan Monaghan

LEGEND

- Approximate Property Boundary
- Oak Ridge's Moraine Boundary

Aquifer Vulnerability

- Area of High Aquifer Vulnerability
- Area of Low Aquifer Vulnerability

MNR Land Information Database

- Unevaluated Wetland
- Evaluated Wetland
- Wooded Area

Scale: 1:4,500

0 50 100 200 m

Notes: Base map provided by Ministry of Natural Resources and Forestry, copyright the Queen's Printer (2018).

TITLE

ORM Mapping

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	APPENDIX NO.
15-2013	A
DATE: November 2018	

Appendix B

Pre-Consultation Meeting Minutes

Record of Pre-Consultation

Prepared by the Peterborough County Planning Department

Name: Frank Veltri and Mario Veltri **Agent:** D.G. Biddle & Associates

Lot: 11 **Concession:** 5 **Municipality:** Millbrook Ward
Township of Cavan Monaghan

Municipal Address: 2 Turner Street Roll No.(s) 1509-020-020-16300 &1509-010-020-19000 .

Phone: **Email:** michael.fry@dgbiddle.com **Office Phone:** 905.576.8500(A)

Communication Sent To: **Owner:** ☐ **Agent:** ☒

Meeting Date: 2018-05-04 *(yyyy-mm-dd)*
Meeting Location: Township of Cavan Monaghan Township office
988 County Rd 10

Attendees:
Frank Veltri, Proponent
Mario Veltri, Proponent
Michael Fry, D.G. Biddle & Associates
Michael Carswell, D.G. Biddle & Associates
Terri Cox, Otonabee Region Conservation Authority
Bev Hurford, Otonabee Region Conservation Authority
Rob West, Oakridge Environmental Ltd.
Karen Ellis, Township of Cavan Monaghan
Christina Coulter, Township of Cavan Monaghan
Evan Grieger, Township of Cavan Monaghan
Iain Mudd, County of Peterborough
Per Lundberg, County of Peterborough
A copy of the complete Record of Pre-Consultation will be sent to all attendees ☐

Existing Parcel Description	
County O.P. Description	Settlement Areas
Municipal O.P. Designation	Residential, Natural Linkage Area & Natural Core Area *Part of the site is within the Oak Ridges Moraine Conservation Plan area to which the ORMCP settlement areas polices apply.
Municipal Zoning	(R1), (D), (RU), (ORMRS) & (ORMEPR)
Area/Lot Dimensions	±11 Ha
Existing Use/Buildings	Vacant

Pre-consultation completed for:

☒ Plan of Subdivision (*Application submitted to County*)
☐ Plan of Condominium **(***Application submitted to County)*
☐ Official Plan Amendment for
    ☐ County Official Plan *(Application submitted to County*)
    ☐ Local Component of County Official Plan *(Application submitted to County*)
    ☐ Municipal Official Plan (*Application submitted to Township*)
☒ Zoning By-law Amendment (*Application submitted to Township*)

Proposal Summary/Description: The proposed residential draft plan of subdivision is for a total of 75 lots/blocks of which 72 lots/blocks will be developed for a total of 85 single detached and semi-detached dwellings. The Township also understood that there would be some link housing, but this is not shown on the plan that was circulated at the meeting. One block will be developed for stormwater management and two blocks will be used as open space areas. Turner Street is proposed to be extended via Street "A".

Discussion:

D.G. Biddle & Associates

- An overview of the proposal was provided.
- Due to the grades on the property, the subdivision stormwater will be handled by the proposed new storm water management pond for the lands at the north end of the subdivision while storm water sewer upgrades along Turner Street will handle storm water for the lands to the south end of the subdivision.
- Records show that the formerly approved subdivision for the site was removed sometime in the 1980's.
- Low Impact Development measures will be incorporated into the design of the stormwater management plan as required by the Township and ORCA.
- The Environmental Impact Study work will justify a change in the limits of the Natural Linkage Area and Natural Core Area designations to accommodate the proposed subdivision within the Residential designation. An OPA will not be required if the environmental review suggests the natural heritage boundaries can be revised.
- No parkland is noted in the plan. A cash-in-lieu contribution will be required.
- The two existing lots on the property will be incorporated into the plan of subdivision.

Otonabee Region Conservation Authority (ORCA)

- The subdivision is partially within a wellhead protection area.
- Due to the transport pathways that the subdivision will introduce, the wellhead protection area will likely change.
- A hydrogeological study will be required by ORCA as part of the study submissions to facilitate their review of the project.

- The proponent is advised to contact Terri Cox at the Otonabee Region Conservation Authority for further information on the submission/study requirements under the Clean Water Act and Trent Source Protection Plan.
- Terri Cox can be reached by phone at 705-745-5791 x 219 or by email at tcox@otonabeeconservation.com
- Please note that a Source Water Protection notice must be obtained from Terri Cox at ORCA for each Planning Act application.
- The Township must prepare a Notice under O. Reg 287/07 (Clean Water Act) to advise the Source Protection Committee of the development proposal.

Township of Cavan Monaghan

- The Township requires that Turner Street be urbanized to King Street.
- The Township requested a pedestrian link to the existing trail system. If this is not possible due to environmental constraints, justification for not including a link should be provided in the Planning Study/Analysis.
- Open Space blocks 74 and 75 need to be discussed. The Township will accept these as a donation, but not as parkland.
- No medium density development is noted in the plan of subdivision.
- A justification for the lack of medium density development will need to be provided.
- The Township will impose architectural design controls.
- Municipal standards for sidewalks and the planting of indigenous trees will be required.
- Justification and relief from the standard 8% grade to a 10% grade will be required in order to address the existing driveways fronting on Turner Street.
- The limit of the “environmental buffer” should be revised on the draft plan in accordance with the results of the work completed by Oakridge Environmental Ltd.
- The Township will require conceptual servicing and grading details and additional SWM information.
- The Township strongly encourages the proponent to have an informal public meeting prior to the statutory public meeting to be held by the Township.
- Should the source water transport pathways change as a result of this proposal, the new vulnerable area can be included in the local component of the County Official Plan via the County Official Plan Update process.

County of Peterborough

- County Public Works will need to review the Stormwater Management Plan and Traffic Impact Study
- Following the meeting, the existing lots on the property were reviewed with the County Land Division secretary. County Land Division records indicate the two lots were created by consent through Land Division files B-568-88 and B-569-88 for which the deeds were stamped by the Land Division secretary on July 10, 1989

- The proponent is advised to seek legal/planning advice regarding the best approach, consent or part lot control, to incorporate these two lots into the plan of subdivision
- A Species At Risk flag was noted on the property through the County GIS.
- Species at Risk will need to be addressed in the EIS being completed by ORE.
- Based on the number of lots, the County application fee for the plan of subdivision is $8500
- A peer review and reimbursement agreement (PRRA) will also need to be completed and filed with the County of Peterborough
- The deposit required for the PRRA is $10000 + a $565 ($500 +HST) administrative fee to set up the fund.

Fees: A copy of the current Peterborough County Planning Fees schedule is attached with applicable Peterborough County planning fees emphasized (i.e. highlighted or circled). ☒

Other applicable fees should be confirmed through staff at the local Township, Conservation Authority and/or Peterborough Public Health.

***Record Completed By*: Per Lundberg**

⌦ **Please Note**: *Personal information contained on this form is collected under the authority of Section 29(2) of the Municipal Freedom of Information and Protection of Privacy Act, R.S.O. 1990, c.M.56 as amended and will be used to assist in the correct processing of the application. If you have any questions about the collection, use or disclosure of this information by the County of Peterborough, please contact the CAO or Clerk, County of Peterborough, 470 Water Street, Peterborough, Ontario K9H 3M3 (705-743-0380).*

Study Requirements for Official Plan Amendments & Subdivision/Condominium Developments

Turner Street – Veltri & Son Ltd.

May 4, 2018

Please note that any technical study submitted to the County (e.g. EIS, traffic impact study, hydrogeological study etc.) will be peer reviewed at the County's request. Both the cost of the study and the peer review(s) will be at the applicant's expense.

- ☒ Servicing Options Report (for developments > 5 units; letter or paragraph describing how developer arrived at servicing choice (i.e. private, communal, municipal) and why))
- ☒ Hydrogeological Studies to determine water quality and quantity and sewage servicing capabilities (in accordance with MOE guidelines and regulations) (if private individual systems are accepted, proponent should prepare a detailed hydro-g prior to planning approval. 95% of hydro-g's rec'd by MOEE are unacceptable)
- ☒ Functional Servicing Report
- ☒ Geotechnical Study
- ☒ Storm Water Management Plan
- ☒ Source Water Protection (if in Vulnerable Area, require RMO review – Terri Cox, Mark Majchrowski)
- ☐ Market Analysis/Justification Study
- ☒ Environmental Impact Analysis (when on a lake or river to determine impact on water quality, any shoreland development ≥25 lots or units or 50 or more tourist accommodation beds, wetlands, fish habitat (any development within 30 metres of thehigh water mark of all watercourses), wildlife, Species At Risk, ANSI's etc.)
- ☒ Archaeological Study (known site; 3 or more new lots; on a water course, zbla/opa for golf course)
- ☒ Planning Study/Analysis
- ☐ Natural Resource Analysis (aggregates, mineral non-aggregates, forests, etc.)
- ☐ Noise Impact Study
- ☒ Traffic Study
- ☐ Agricultural Land Usage Justification
- ☒ Review of Impact on Municipal/Other Services – fire, waste disposal, school busing, road conditions, etc. (if the Township requests) (Include in Planning Study/Analysis)
- ☒ Financial Impact Study
- ☐ Phase 1 Environmental Site Assessment (generally for lands previously used for commercial and industrial uses)

Study Requirements for Official Plan Amendments & Subdivision/Condominium Developments

Turner Street – Veltri & Son Ltd.

May 4, 2018

Please note that any technical study submitted to the County (e.g. EIS, traffic impact study, hydrogeological study etc.) will be peer reviewed at the County's request. Both the cost of the study and the peer review(s) will be at the applicant's expense.

- ☐ Record of Site Condition (converting from a commercial/industrial use to a sensitive (agricultural, residential, parkland or institutional) use)
- ☐ Minimum Distance Separation Calculation (where barns exist within 1 km) Include in Planning Study/Analysis)
- ☒ Peer Review and Planning Reimbursement Agreement

Recommended key agencies to contact:

☒ Township	☐ Trent Severn Waterway	☐ MTO
☒ Conservation Authority	☐ Health Unit	☐ Other: _____
☒ Peterborough County Public Works Dept.		☐ First Nation

Appendix C

ORCA Requirements

From: Jasmine Gibson [mailto:jgibson@otonabee.com]
Sent: July 10, 2015 3:34 PM
To: christa@oakridgeenvironmental.com
Cc: Rob West
Subject: FW: terms of reference for Millbrook Lots

Hi Christa,

As discussed on the phone today here is the mail with the ToRs.

To confirm the wetland to the northeast is evaluated but non-PSW (Millbrook Northeast Wetland); and if stream crossing are required a hydraulic study will also be required and if springs and seeps are found a hydrogeology study may also be required.

Enjoy the weekend.

Regards,
Jasmine

From: Erin McGauley
Sent: July 10, 2015 12:30 PM
To: Jasmine Gibson; rob@oakridgeenvironmental.com
Subject: RE: terms of reference for Millbrook Lots

Hi Jasmine and Rob,
I'd suggest that the EIS cover the following elements given the planning act focus and location of the proposed development:

. Significant woodland evaluation – areas to the east and north are noted as S.W. per the Township OP.

.Watercourse impacts. This watercourse is called Little Creek and is a coldwater stream with the following species according to MNR: brook stickleback, brassy minnow, pearl dace, common shiner, bluntnose minnow, eastern blacknose dace, white sucker, northern redbelly dace.
ORCA has caught Brook and Brown Trout in the watercourse as well as Slimy Sculpin and Mottled Sculpin (2010 data).

.Policy conformity re. the environmental protection designations on the property.

.Bird and wildlife SAR searches in the field as well as desktop surveys. These should be done with an eye towards SWH if any field features suggest that this type of habitat may be present on site.

.Wetland evaluation of the unevaluated wetland area shown on ORCA mapping – see red markup below.

.Since this is a headwater area, please note any seeps or spring and document their location and possible impacts per PPS section 2.2.

Sincerely,
Erin

Erin McGauley, MSc.
Watershed Biologist
Otonabee Region Conservation Authority
250 Milroy Drive
Peterborough, ON K9H 7M9
(705) 745-5791 x 221

From: Jasmine Gibson
Sent: Wednesday, July 08, 2015 3:12 PM
To: Erin McGauley; Ian Boland
Subject: FW: terms of reference for Millbrook Lots

Hi,

I have attached a map of the DCA for the area. It appears that there has been some floodplain mapping for the watercourse…any thoughts?

I have not contacted Rob yet regarding the proposed development. There does not appear to be public road access for these properties so not sure what is being proposed. It does not appear that the ORMCP extends to this property but SAR does.

Erin would you be able to contact Rob and provide a terms of reference? Or, provide me with info to follow-up; thanks.

Regards,

J

From: Rob West [mailto:rob@oakridgeenvironmental.com]
Sent: July 1, 2015 11:32 AM
To: Jasmine Gibson
Subject: Re: terms of reference for Millbrook Lots

Hi Jasmine,

Could you please provide me with a terms of reference regarding three existing lots of record in Millbrook?

They are located at the end of Centre Street on Part Lot 11, Concession 5, Township of Cavan-South Monaghan (Cavan), County of Peterborough.

It is a triangular piece that Mr. Veltri owns. Attached is a topo/location plan illustrating the location of the site.

I am completing the NHE, and was wondering if there is anything ORCA requires due to flood plain mapping etc.? We have gone through the site and located all of the KNHF's based on the ORMCP and have contacted the Township already.

Rob West
Senior Environmental Scientist
Oakridge Environmental Limited
Ph. (705)745-1181
Fax: (705) 745-4163
rob@oakridgeenvironmental.com
www.oakridgeenvironmental.com

Appendix D

NHIC Data

NHIC Query

Square Number 17QJ0291

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
SPECIES	Bobolink	Dolichonyx oryzivorus	S4B	THR	THR	2002-07-04	101928
SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC		180294
SPECIES	Muhlenberg's Stubble Moss	Weissia muhlenbergiana	S2			1958-05-22	35650

Square Number 17QJ0391

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
NATURAL AREA	Cavan Till						7509
NATURAL AREA	MILLBROOK CONSERVATION AREA						19183
NATURAL AREA	Millbrook Northeast						9400
SPECIES	Bobolink	Dolichonyx oryzivorus	S4B	THR	THR	2002-07-04	101928
SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC		180294
SPECIES	Muhlenberg's Stubble Moss	Weissia muhlenbergiana	S2			1958-05-22	35650

Square Number 17QJ0392

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
NATURAL AREA	Millbrook Northeast						9400
SPECIES	Muhlenberg's Stubble Moss	Weissia muhlenbergiana	S2			1958-05-22	35650

Appendix E

OBBA Data

Square Summary (17QJ09)

#species (1st atlas)				#species (2nd atlas)				#hours		#pc done	
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
9	34	55	98	36	34	42	112	82	87	33	4

Region summary (#17: Northumberland)

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
41	39	41	170	187	1388	1025

Target number of point counts in this square: 21 road side, 4 off road (1 in deciduous forest, 1 in coniferous forest, 1 in mixed forest, 1 in pasture/grassland). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Canada Goose	FY	FY	58	95	Green Heron §	CF	H	89	95	Caspian Tern †			7	4
Mute Swan			2	31	Black-crown N.-Heron † §			15	2	Black Tern † §			46	24
Wood Duck	S	FY	84	95	Turkey Vulture	H	P	76	95	Common Tern §			33	9
Gadwall			10	19	Osprey		V	43	75	Mourning Dove	NY	AE	100	97
American Wigeon ‡			2	14	Northern Harrier	T	T	97	92	Yellow-billed Cuckoo			15	21
American Black Duck			61	43	Sharp-shinned Hawk		H	48	87	Black/Yell-billed Cuckoo			0	21
Mallard	NY	FY	102	95	Cooper's Hawk	T	H	33	78	Black-billed Cuckoo	N	H	74	92
Blue-winged Teal	FY	FY	100	80	Northern Goshawk	H		17	36	Eastern Screech-Owl	T	A	48	73
Northern Shoveler			7	9	Red-should Hawk †	T		35	43	Great Horned Owl	T	H	84	92
Northern Pintail			12	4	Broad-winged Hawk	T	H	43	63	Barred Owl		S	23	58
Green-winged Teal			0	34	Red-tailed Hawk	A	DD	94	95	Long-eared Owl			12	14
Redhead †			2	2	American Kestrel	CF	P	97	95	Short-eared Owl †			5	4
Ring-necked Duck ‡			0	9	Merlin ‡			0	26	North Saw-whet Owl	T		28	34
Lesser Scaup ‡			0	0	King Rail †			2	2	Common Nighthawk	T	H	61	51
Hooded Merganser			10	65	Virginia Rail		A	43	95	Whip-poor-will	NY	S	64	60
Common Merganser			20	26	Sora		A	53	73	Chimney Swift	AE	V	69	60
Red-breast Merganser ‡			2	4	Common Moorhen			66	60	Ruby-thr Hummingbird	NY	H	87	95
Ruddy Duck †			0	4	American Coot			17	12	Belted Kingfisher	CF	T	97	97
Ring-necked Pheasant		H	20	29	Coot/Moorhen			0	0	Red-headed Woodpecker †	N		79	53
Ruffed Grouse	NY	FY	92	92	Sandhill Crane ‡			0	14	Red-bell Woodpecker			10	41
Wild Turkey		NE	7	95	Killdeer	NY	FY	102	95	Yellow-bellied Sapsucker	P	A	64	85
Northern Bobwhite †			0	2	Rock Dove	NY	AE	100	95	Downy Woodpecker	NY	N	97	95
Common Loon		H	51	53	Spotted Sandpiper	T	H	92	95	Hairy Woodpecker	AE	N	97	92
Pied-billed Grebe			23	51	Upland Sandpiper	FY		48	51	Black-backed Woodpecker ‡			2	0
Double-crest Cormorant §			17	21	Common Snipe	H	S	82	80	Northern Flicker	FY	AE	100	95
American Bittern	T	S	66	70	American Woodcock	D	S	76	95	Pileated Woodpecker	AE	H	87	92
Least Bittern †	T		25	41	Ring-billed Gull §			12	12	Olive-sided Flycatcher			10	9
Great Blue Heron §	H	H	97	85	Herring Gull §			43	19	Eastern Wood-Pewee	CF	D	97	95
Great Egret †			0	2	Great Black-backed Gull †			10	7	Alder Flycatcher	S	S	56	92

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Ontario Breeding Bird Atlas - Summary Sheet for Square 17QJ09 (page 2 of 3)

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Willow Flycatcher	T	A	66	92	Marsh Wren		S	48	68	Prairie Warbler †			2	2
Least Flycatcher	T	T	100	92	Golden-crown Kinglet			10	31	Cerulean Warbler †			2	9
Eastern Phoebe	NY	NB	100	95	Ruby-crown Kinglet ‡			5	2	Black-white Warbler	T	A	87	87
Gr Crested Flycatcher	FY	T	100	97	Blue-gr Gnatcatcher			33	31	American Redstart	T	P	92	90
Eastern Kingbird	NY	D	102	95	Eastern Bluebird		CF	58	92	Ovenbird	T	NY	97	95
Loggerhead Shrike †			12	4	Veery	T	S	97	90	North Waterthrush	T	A	87	90
Yellow-throated Vireo			20	14	Hermit Thrush		A	2	51	Mourning Warbler		S	71	90
Blue-headed Vireo			2	48	Wood Thrush	FY	NY	100	92	Common Yellowthroat	FY	DD	102	95
Warbling Vireo	FY	P	97	95	American Robin	NY	NY	100	100	Hooded Warbler †			0	7
Philadelphia Vireo ‡			0	9	Gray Catbird	CF	A	100	95	Canada Warbler			38	63
Red-eyed Vireo	FY	NE	100	97	Northern Mockingbird	S		20	36	Eastern Towhee		S	82	75
Blue Jay	FY	A	100	100	Brown Thrasher	D	A	100	95	Chipping Sparrow	NY	CF	100	97
American Crow	NY	CF	100	97	European Starling	NY	AE	102	95	Clay-colored Sparrow		S	17	48
Common Raven			0	60	Cedar Waxwing	CF	FY	100	97	Field Sparrow	T	CF	87	92
Horned Lark	P	FY	84	82	Blue-winged Warbler ‡			2	36	Vesper Sparrow	FY	CF	97	95
Purple Martin	T	H	79	70	Golden-winged Warbler		V	23	36	Savannah Sparrow	A	FY	100	95
Tree Swallow	NY	NY	102	95	Blue/Gold-wing Warbler			0	9	Grasshopper Sparrow	S	CF	79	90
North Rgh-wing Swallow	NY	H	94	87	Brewster's Warbler †			0	12	Henslow's Sparrow †			5	0
Bank Swallow §	NY	AE	94	90	Nashville Warbler		H	61	80	Song Sparrow	NY	FY	102	97
Cliff Swallow §	NY	NB	79	85	Northern Parula ‡			0	7	Lincoln's Sparrow ‡			0	14
Barn Swallow	NY	CF	100	95	Yellow Warbler	NY	DD	102	95	Swamp Sparrow		S	97	95
Black-capped Chickadee	NY	A	100	95	Chestn-sided Warbler	T	S	87	95	White-throat Sparrow	T	A	92	92
Red-breast Nuthatch		S	30	80	Magnolia Warbler		S	7	53	Dark-eyed Junco ‡			5	2
White-breast Nuthatch	CF	FY	87	95	Cape May Warbler ‡			2	0	Scarlet Tanager	T	A	76	80
Brown Creeper	T	H	48	70	Black-thr Blue Warbler			0	36	Northern Cardinal	CF	FY	84	97
Carolina Wren ‡			0	12	Yellow-rumped Warbler			23	63	Rose-breast Grosbeak	FY	NB	100	95
House Wren	NY	AE	100	95	Black-thr Green Warbler		A	38	85	Indigo Bunting	FY	S	100	92
Winter Wren	T	S	51	78	Blackburnian Warbler			28	51	Bobolink	FY	P	100	95
Sedge Wren			7	17	Pine Warbler		S	30	87	Red-wing Blackbird	NY	CF	102	95

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Ontario Breeding Bird Atlas - Summary Sheet for Square 17QJ09 (page 3 of 3)

SPECIES	Code		%	
	1st	2nd	1st	2nd
Eastern Meadowlark	FY	CF	100	95
Western Meadowlark ‡	S		2	0
Common Grackle	NY	CF	100	95
Brown-head Cowbird	NY	P	100	95
Orchard Oriole			10	34
Baltimore Oriole	NY	CF	100	95
Pine Grosbeak ‡			0	0
Purple Finch		A	43	87
House Finch		S	17	95
Red Crossbill			7	12
White-winged Crossbill ‡			2	12
Pine Siskin			33	24
American Goldfinch	CF	T	100	97
Evening Grosbeak ‡			2	12
House Sparrow	NY	CF	100	95

This list includes all species found during the Ontario Breeding Bird Atlas (1st atlas: 1981-1985, 2nd atlas: 2001-2005) in the region #17 (Northumberland). Underlined species are those that you should try to add to this square. They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. In the species table, "BE 2nd" and "BE 1st" are the codes for the highest breeding evidence for that species in square 17QJ09 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #17). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), or † (provincially rare). Current as of 9/07/2018. An up-to-date version of this sheet is available from http://www.birdsontario.org/atlas/summaryform.jsp?squareID=17QJ09

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Barn Swallow is listed as "Threatened" by SARO and is protected under the ESA. The Barn Swallow inhabits open-rural and urban sites where buildings are situated near watercourses. Nesting is typically within loose colonies on building structures, bridges and other suitable overhanging structures. Structures are chosen because they keep the half "cup-like" mud nest dry and have edges that the nest can adhere to. The Barn Swallow feeds on insects by catching them on its wing.

Bobolink is listed as "Threatened" by SARO and is protected under the ESA. The Bobolink prefers large tracts of tallgrass areas, either true prairies or hay fields, as it forages low to the ground in search for larvae and seeds.

Chimney Swift is listed as "Threatened" by SARO and is protected under the ESA. The Chimney Swift is a somewhat generalist species. It will utilize empty cavity nests found in dead trees within fencerows (etc.), or may utilize unused chimneys as suggested by its common name. This species is most active in early morning and early evening (i.e., dawn and dusk). It will venture outside of the nesting area and feast on insects during these times. It then flies back to the nesting site, entering the nesting feature one after another in an orderly funnel-shaped sequence.

Common Nighthawk is listed as "Special Concern" by SARO and is protected under the ESA. The Common Nighthawk is part of the Nightjar family which prefers forest openings, bogs and sometimes open field/meadow areas. Nesting is on bare ground where both adults feed the young. Feeding can take place during day or night, while the species constantly forages for all types of insects.

Eastern Wood-pewee is listed as "Special Concern" by SARO and is protected under the ESA. This species prefers mixed deciduous and coniferous woodlands which are open or considered edge habitat. Nesting occurs on a tree branch as the species catches insects from a perch.

Eastern Meadowlark is listed as "Threatened" by SARO and is protected under the ESA. The Eastern Meadowlark is similar to Bobolink, as this species also prefers large tracts of agricultural fields or tallgrass prairies to nest within. Eastern Meadowlark is a ground nester, thus requiring tallgrass to conceal its nest and eggs. Feeding includes beetles, crickets, and spiders.

Eastern Whip-poor-will is listed as "Threatened" by SARO and is protected under the ESA. The Whip-poor-will prefers a combination of large natural tracts of forest, watercourses and edge habitat consisting of meadow areas with open, deciduous and pine woodlands. The Whip-poor-will does not construct a nest, but rather utilizes the soft leaf litter on the ground to form a nest and lay the eggs directly on the ground. The Whip-poor-will is a nighttime hunter, calling it's own name while searching for large flying insects, beetles, moths, mosquitos and sometimes

grasshoppers. The Whip-poor-will often choose pine species adjacent to waterways from which to call.

Golden-winged Warbler is listed as "Special Concern" by *Species at Risk Ontario* (SARO) and is protected under the *Endangered Species Act* (ESA). The Golden-winged Warbler prefers woodland edge habitat with young secessional tree species and moist shrubby fields. This species gleans insects on shrubs and the forest floor and nesting occurs on the ground.

Least Bittern is listed as "Threatened" by Species at Risk Ontario (SARO) and is protected under the Endangered Species Act (ESA). The Least Bittern inhabits freshwater marshes where tall, impenetrable stands of emergent vegetation are utilized for coverage. The Least Bittern may build up a hunting platform in search of small fish, insects, and amphibians.

Red-shouldered Hawk no longer possesses a status in Ontario, although is still considered to be a "sensitive" species with respect to development. It prefers mature deciduous dominated forests, often nesting within hundreds of metres of the edge of wetlands or waterways. The nest will often occur in the crotch of deciduous trees. It prefers slopes where it can easily fly to the tree-tops and overlook the waterway for foraging purposes, hunting for small mammals, birds, reptiles and amphibians.

Red-headed Woodpecker is listed as "Special Concern" by SARO and is protected under the ESA. It prefers a combination of deciduous forests and rural development areas, similar to a park-like setting. The deciduous species can be oak or maple, however, the understoreys must be meadow-like or a maintained lawnspace. The species will nest within cavities that it constructs or it will take over cavity nests that other woodpeckers have constructed. The Red-headed Woodpecker feeds on beetles, caterpillars and common insects that are found within the bark of trees.

Wood Thrush is listed as "Threatened" by SARO and is protected under the ESA. The Wood Thrush enjoys relatively undisturbed, mature woodlands. Nesting occurs low in the fork of a tree as this species forages for berries and insects at ground level. Similar to the Eastern Wood-pewee, this species prefers large tracts of woodland.

Appendix F

Flora & Fauna Species List

Species Occurrences

Birds

COMMON NAME	SCIENTIFIC NAME	RANK
American Kestrel	Falco sparverius	S4
Ruffed Grouse	Bonasa umbellus	S4
Veery	Catharus fuscescens	S4B
Clay-colored Sparrow	Spizella pallida	S4B
Indigo Bunting	Passerina cyanea	S4B
Belted Kingfisher	Megaceryle alcyon	S4B
Gray Catbird	Dumetella carolinensis	S4B
Northern Flicker	Colaptes auratus	S4B
American Woodcock	Scolopax minor	S4B
Baltimore Oriole	Icterus galbula	S4B
Tree Swallow	Tachycineta bicolor	S4B
Savannah Sparrow	Passerculus sandwichensis	S4B
Eastern Kingbird	Tyrannus tyrannus	S4B
Ovenbird	Seiurus aurocapilla	S4B
Brown Thrasher	Toxostoma rufum	S4B
Chimney Swift	Chaetura pelagica	S4B,S4N
Black-capped Chickadee	Poecile atricapillus	S5
Pileated Woodpecker	Dryocopus pileatus	S5
Canada Goose	Branta canadensis	S5
Blue Jay	Cyanocitta cristata	S5
Red-breasted Nuthatch	Sitta canadensis	S5
Mourning Dove	Zenaida macroura	S5
Nashville Warbler	Vermivora ruficapilla	S5B
Yellow-bellied Sapsucker	Sphyrapicus varius	S5B
Hermit Thrush	Catharus guttatus	S5B
Eastern Bluebird	Sialia sialis	S5B
Yellow-rumped Warbler	Dendroica coronata	S5B
Chipping Sparrow	Spizella passerina	S5B
Magnolia Warbler	Dendroica magnolia	S5B
White-throated Sparrow	Zonotrichia albicollis	S5B
Song Sparrow	Melospiza melodia	S5B
Dark-eyed Junco	Junco hyemalis	S5B
Alder Flycatcher	Empidonax alnorum	S5B
Yellow Warbler	Dendroica petechia	S5B
Red-eyed Vireo	Vireo olivaceus	S5B
American Crow	Corvus brachyrhynchos	S5B
Ruby-throated Hummingbird	Archilochus colubris	S5B
Common Grackle	Quiscalus quiscula	S5B
Winter Wren	Troglodytes troglodytes	S5B
House Wren	Troglodytes aedon	S5B

American Goldfinch	Carduelis tristis	S5B
Turkey Vulture	Cathartes aura	S5B
American Robin	Turdus migratorius	S5B
Common Yellowthroat	Geothlypis trichas	S5B
Black-and-white Warbler	Mniotilta varia	S5B
European Starling	Sturnus vulgaris	SNA
Bohemian Waxwing	Bombycilla garrulus	SNA

Fish

COMMON NAME	SCIENTIFIC NAME	RANK
White Sucker	Catostomus commersoni	S5

Mammals

COMMON NAME	SCIENTIFIC NAME	RANK
Woodchuck	Marmota monax	S5
Deer Mouse	Peromyscus maniculatus	S5
Striped Skunk	Mephitis mephitis	S5
Red Squirrel	Tamiasciurus hudsonicus	S5
Star-nosed Mole	Condylura cristata	S5
Northern Raccoon	Procyon lotor	S5
Muskrat	Ondatra zibethicus	S5
Coyote	Canis latrans	S5
Eastern Cottontail	Sylvilagus floridanus	S5
Red Fox	Vulpes vulpes	S5
Eastern Chipmunk	Tamias striatus	S5

Vascular Plants

COMMON NAME	SCIENTIFIC NAME	RANK
Macoun Buttercup	Ranunculus macounii	S4
June Grass	Koeleria macrantha	S4
Whorled Loosestrife	Lysimachia quadrifolia	S4
Canadian Yew	Taxus canadensis	S4
Common Hop	Humulus lupulus	S4
Old Switch Panic Grass	Panicum virgatum	S4
Autumn Willow	Salix serissima	S4
Awnless Graceful Sedge	Carex formosa	S4
Pointed Blue-eyed-grass	Sisyrinchium angustifolium	S4
White Ash	Fraxinus americana	S4?
Virginia Creeper	Parthenocissus quinquefolia	S4?
Northern Downy Hawthorn	Crataegus submollis	S4S5
Speckled Alder	Alnus incana	S5
White Oak	Quercus alba	S5
Paper Birch	Betula papyrifera	S5
Beaked Hazelnut	Corylus cornuta	S5
Marsh Marigold	Caltha palustris	S5
False Solomon's-seal	Maianthemum racemosum	S5

Dark-green Bulrush	Scirpus atrovirens	S5
Peach-leaved Willow	Salix amygdaloides	S5
Balsam Fir	Abies balsamea	S5
Pussy Willow	Salix discolor	S5
Shining Willow	Salix lucida	S5
Meadow Willow	Salix petiolaris	S5
Virginia Blue Flag	Iris virginica	S5
Marginal Wood-fern	Dryopteris marginalis	S5
Trembling Aspen	Populus tremuloides	S5
White-grained Mountain-ricegrass	Oryzopsis asperifolia	S5
Canada Rush	Juncus canadensis	S5
Spinulose Shield Fern	Dryopteris carthusiana	S5
Ostrich Fern	Matteuccia struthiopteris	S5
Sensitive Fern	Onoclea sensibilis	S5
Field Horsetail	Equisetum arvense	S5
Water Horsetail	Equisetum fluviatile	S5
Eastern White Pine	Pinus strobus	S5
Woodland Horsetail	Equisetum sylvaticum	S5
Lake-bank Sedge	Carex lacustris	S5
Bracken Fern	Pteridium aquilinum	S5
Woodland Sedge	Carex blanda	S5
Marsh Fern	Thelypteris palustris	S5
White Spruce	Picea glauca	S5
Ground Juniper	Juniperus communis	S5
Eastern White Cedar	Thuja occidentalis	S5
Broad-leaf Cattail	Typha latifolia	S5
Dwarf Scouring Rush	Equisetum scirpoides	S5
Riverbank Grape	Vitis riparia	S5
New England Aster	Symphyotrichum novae-angliae	S5
Large-leaf Wood-aster	Eurybia macrophylla	S5
Wild Mock-cucumber	Echinocystis lobata	S5
Spreading Dogbane	Apocynum androsaemifolium	S5
Fleabane	Conyza canadensis	S5
Blue Vervain	Verbena hastata	S5
Red-osier Dogwood	Cornus sericea	S5
Common Butterwort	Pinguicula vulgaris	S5
Northern Prickley Ash	Zanthoxylum americanum	S5
American Basswood	Tilia americana	S5
Fly Honeysuckle	Lonicera involucrata	S5
Spotted Jewel-weed	Impatiens capensis	S5
Brown-fruited Rush	Juncus pelocarpus	S5
Box Elder	Acer negundo	S5
Balsam Poplar	Populus balsamifera	S5
Marsh Willow-herb	Epilobium palustre	S5

Fireweed	Chamerion angustifolium	S5
Choke Cherry	Prunus virginiana	S5
Wild Black Cherry	Prunus serotina	S5
Self-heal	Prunella vulgaris ssp. lanceolata	S5
Path Rush	Juncus tenuis	S5
Pearly Everlasting	Anaphalis margaritacea	S5
Virginia Strawberry	Fragaria virginiana	S5
Climbing Poison Ivy	Toxicodendron radicans	S5
Yellow Birch	Betula alleghaniensis	S5
Downy Yellow Violet	Viola pubescens var. pubescens	S5
Slender St. John's-wort	Hypericum mutilum	S5
Woolly Blue Violet	Viola sororia	S5
Kansas Milkweed	Asclepias syriaca	S5
Flat-top White Aster	Doellingeria umbellata var. pubens	S5
Blueflag	Iris versicolor	S5
Corn Mint	Mentha arvensis	S5
Canada Goldenrod	Solidago canadensis var. canadensis	S5
Field Pussytoes	Antennaria neglecta	S5
Annual Ragweed	Ambrosia artemisiifolia	S5
Yarrow	Achillea millefolium	S5
Common Boneset	Eupatorium perfoliatum	S5
Philadelphia Fleabane	Erigeron philadelphicus	S5
Starved Aster	Symphyotrichum lateriflorum	S5
White Heath Aster	Symphyotrichum ericoides var. ericoides	S5
Staghorn Sumac	Rhus typhina	S5
Reed Canary Grass	Phalaris arundinacea	S5
Early Meadowrue	Thalictrum dioicum	S5
Black Chokeberry	Photinia melanocarpa	S5
Sugar Maple	Acer saccharum var. saccharum	S5
Small Enchanter's Nightshade	Circaea alpina	S5
Smooth Serviceberry	Amelanchier laevis	S5
American Mountain-ash	Sorbus americana	S5
Prickly Gooseberry	Ribes cynosbati	S5
Canada Anemone	Anemone canadensis	S5
White Avens	Geum canadense	S5
Downy Hawthorn	Crataegus mollis	S5
Norwegian Cinquefoil	Potentilla norvegica	S5
American Elm	Ulmus americana	S5
Japanese Barberry	Berberis thunbergii	SNA
Common Sowthistle	Sonchus oleraceus	SNA
Sheep Sorrel	Rumex acetosella	SNA
Nettle-leaf Goosefoot	Chenopodium murale	SNA
Greater Burdock	Arctium lappa	SNA
White Clover	Trifolium repens	SNA

Oxeye Daisy	Leucanthemum vulgare	SNA
Canada Bluegrass	Poa compressa	SNA
Annual Bluegrass	Poa annua	SNA
Tall Butter-cup	Ranunculus acris	SNA
A Dandelion	Taraxacum erythrospermum	SNA
Lady's Thumb	Persicaria maculosa	SNA
Dill	Anethum graveolens	SNA
Meadow Goat's-beard	Tragopogon pratensis	SNA
Rugosa Rose	Rosa rugosa	SNA
Creeping Cinquefoil	Potentilla reptans	SNA
Chicory	Cichorium intybus	SNA
Hard Fescue	Festuca trachyphylla	SNA
White Pigweed	Amaranthus albus	SNA
Maiden's Tears	Silene vulgaris	SNA
Black Bindweed	Fallopia convolvulus	SNA
Bouncing-bet	Saponaria officinalis	SNA
White Poplar	Populus alba	SNA
European Lily-of-the-valley	Convallaria majalis	SNA
Morning Glory	Ipomoea hederacea	SNA
Tufted Vetch	Vicia cracca	SNA
Black Medic	Medicago lupulina	SNA
Yellow Alfalfa	Medicago falcata	SNA
Red Clover	Trifolium pratense	SNA
Low Hop Clover	Trifolium campestre	SNA
Wild Carrot	Daucus carota	SNA
Buckthorn	Rhamnus cathartica	SNA
Field Penny-cress	Thlaspi arvense	SNA
Common Red Raspberry	Rubus idaeus ssp. idaeus	SNA
Prairie Rose	Rosa arkansana	SNA
Field Brome	Bromus arvensis	SNA
Perennial Quaking Grass	Briza media	SNA
Meadow Timothy	Phleum pratense	SNA
Creeping Woodsorrel	Oxalis corniculata	SNA
Cultivated Oat	Avena sativa	SNA
White Sweet Clover	Melilotus albus	SNA
Spearmint	Mentha spicata	SNA
Yellow Rocket	Barbarea vulgaris	SNA
Great Mullein	Verbascum thapsus	SNA
Butter-and-eggs	Linaria vulgaris	SNA
Yellow Foxglove	Digitalis grandiflora	SNA
Meadow Fescue	Schedonorus pratensis	SNA
Common Lilac	Syringa vulgaris	SNA
Scotch Pine	Pinus sylvestris	SNA
Bull Thistle	Cirsium vulgare	SNA

A Sedge	Carex hirta	SNA
Smooth Crabgrass	Digitaria ischaemum	SNA
Orchard Grass	Dactylis glomerata	SNA
A St. John's-wort	Hypericum perforatum	SNA
English Plantain	Plantago lanceolata	SNA
Redtop	Agrostis gigantea	SNA
Alsike Clover	Trifolium hybridum	SNA
Wild Marjoram	Origanum vulgare	SNA
Hairy Crabgrass	Digitaria sanguinalis	SNA
Black-eyed Susan	Rudbeckia hirta var. hirta	SU

Appendix G

Site Photos

Photo A (Left) The CUT1 (Mineral Cultural Thicket) ecosite that occurs on-site. The dominantspecies in this habitat is the Staghorn Sumac. Beneath the Sumac Canopy, vegetation typical of a Cultural Meadow (CUM1) is abundant.

Photo B (Right) .is of the FOD4 (Dry-Fresh Deciduous Forest) that occurs on-site along the western property boundary, European Buckthorn and Manitoba Maple are common through out this ecosite.

Photo C (Left) is taken looking at the FOC4-1 (Fresh-Moist Coniferous White Cedar Forest) in the southern corner of the property boundary.

Site photos were taken in June 2015.

Natural Hertitage Evaluation (NHE)
Proposed Residential Development Applaiction
Part Lot 11, Concession 5 (Cavan)
Township of Cavan Monaghan

TITLE
Site Photos

ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT # 15-2013

DATE November 2018

APPENDIX NO. **G**

Appendix H

Water Quality Data

Water Quality
June 16th 2015

Station 1	South Stream
UTM- 17 T	703527 / 4891693
DO (ppm)	2.38
pH	7.02
Conductivity (µs)	586
Temp - Bank 1 (Celc)	18
Temp - Bank 2 (Celc)	16.5
Temp - Stream (Celc)	16.3
Temp - Avergage (Celc)	16.93333333

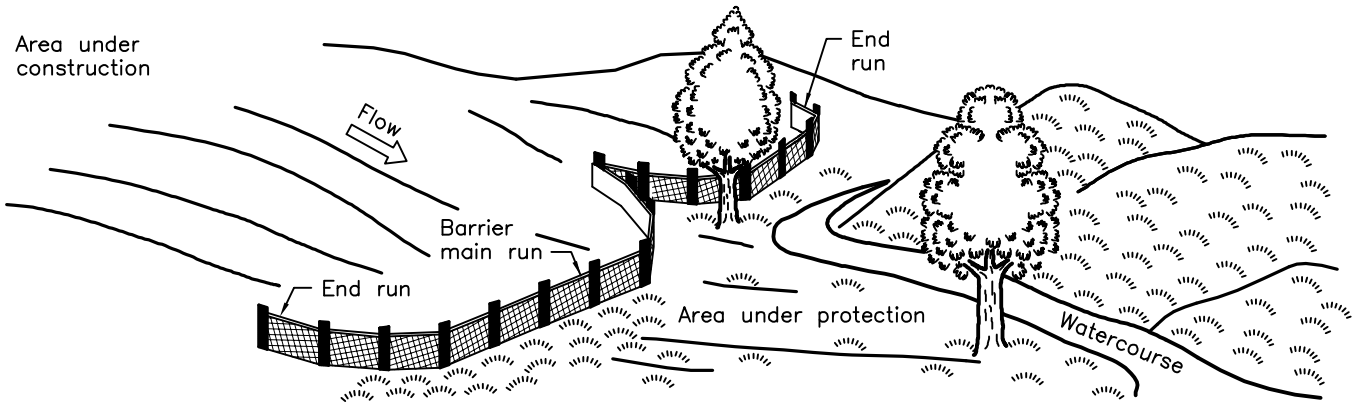
Station 2	North West Corner
UTM - 17 T	7032890 / 04892107
DO (ppm)	7.35
pH	7.72
Conductivity (µs)	452
Temp - Bank 1 (Celc)	21.6
Temp - Bank 2 (Celc)	18.9
Temp - Stream (Celc)	14.1
Temp - Avergage (Celc)	18.2

Station 3	Mid Stream
UTM - 17 T	7033550 / 04892142
DO (ppm)	7.55
pH	7.76
Conductivity (µs)	458
Temp - Bank 1 (Celc)	17.7
Temp - Bank 2 (Celc)	17.7
Temp - Stream (Celc)	14.5
Temp - Avergage (Celc)	16.63333333

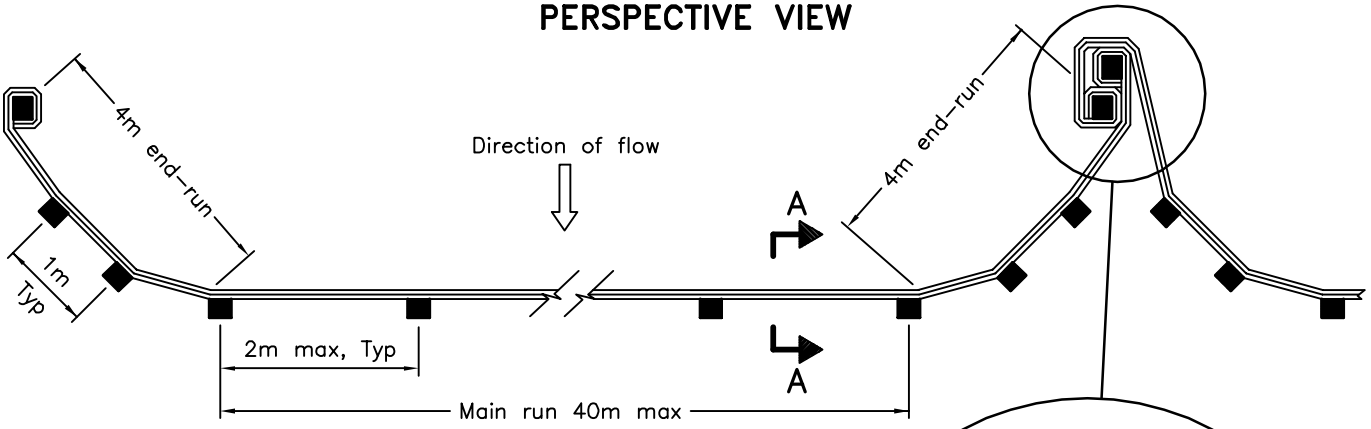
Station 4	North East Corner
UTM - 17 T	703400 / 4892163
DO (ppm)	7.53
pH	7.68
Conductivity (µs)	473
Temp - Bank 1 (Celc)	19.3
Temp - Bank 2 (Celc)	18.4
Temp - Stream (Celc)	15.3
Temp - Avergage (Celc)	17.66666667

Appendix I

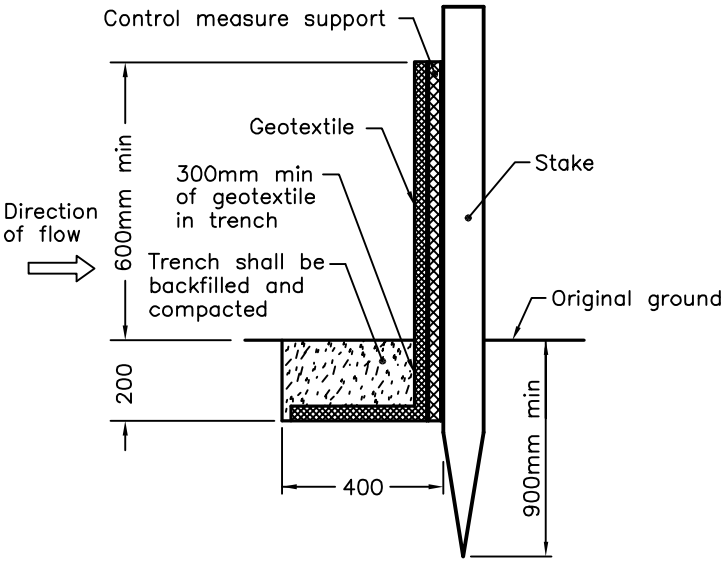
OPSD ESC



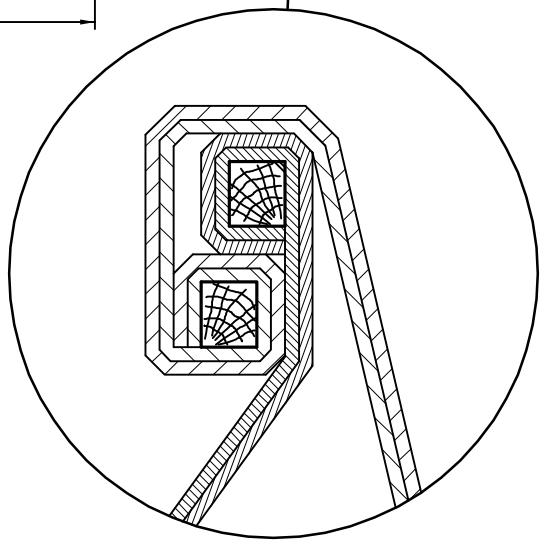
PERSPECTIVE VIEW



PLAN



SECTION A–A



JOINT DETAIL

NOTE:

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
HEAVY–DUTY SILT FENCE BARRIER			
	OPSD 219.130		