Environmental Impact Study - 1066 Syer Line, Township of Cavan Monaghan, County of Peterborough, Ontario

2021-10-12

Prepared for:
Township of Cavan Monaghan

Cambium Reference No.: 12971-001

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1.0 Introduction

Cambium Inc. (Cambium) was retained by the Township of Cavan Monaghan to conduct an Environmental Impact Study - 1066 Syer Line, Township of Cavan Monaghan, County of Peterborough, Ontario (Figure 1). The proposed development includes a change of land use designation and zoning, allowing for alternative uses of the property. Based on the proposed development, the whole property will be considered the Site for this report.

The Environmental Impact Study (the Study) is required to address potential negative impacts to natural heritage features identified during the preliminary development review process, as required by the Provincial Policy Statement, 2020 (PPS) and the Growth Plan for the Greater Golden Horseshoe, 2020 (GPGGH). The Site contains or is adjacent to (within 120 m) the following mapped natural heritage and/or hydrologic features: watercourse, Life Science Area of Natural and Scientific Interest (ANSI), Cavan Creek Provincially Significant Wetland (PSW), and unevaluated wetlands. The Site is within Ecoregion 6E of Ontario (Crins, Gray, Uhlig, & Wester, 2009). The property is outside any designated settlement areas in the Township of Cavan Monaghan.

The Site is within the jurisdiction of the Otonabee Region Conservation Authority (ORCA) and their regulated area does overlap the Site. As the Site contains wetlands and/or watercourses, the Study will consider regulations on development as imposed by the local Conservation Authority's Regulation under the *Conservation Authorities Act, 1990*.

The *Endangered Species Act, 2007* (ESA) protects endangered or threatened species and their habitats from harm or destruction. Habitat of endangered and threatened species is protected under provincial natural heritage policy; however, it is also the landowner's responsibility to ensure that no harm to these species occurs on their property. This Study includes a habitat-based screening for species of conservation concern to determine if the Site has suitable habitat for any provincial or federal species at risk (SAR).

In order to address the Study requirements of the approval authorities, Cambium has conducted this Study to provide an evaluation of reasonably anticipated ecological impacts,

positive or negative, that may arise as a result of this proposed development to guide the decision-making process.

1.1 Proposed Development and Conceptual Site Plan

The Site is approximately 31.8 ha in size, located on the north side of Syer Line and south of Highway 115. The Site consists primarily of agricultural lands, with a barn, outbuilding and residence located in the centre of the property. The residence is accessed via a laneway from Syer Line. The land use of the surrounding area includes commercial, agricultural, rural residential, and natural areas (forests, wetlands, etc.).

The proposed development involves a change in a change of land use designation under the Official Plan and zoning under the Zoning By-Law, allowing for alternative uses of the property. A formal concept plan has not yet been developed for the Site; Cambium understands that the findings of the EIS will be considered by those preparing, reviewing, and approving site plans.

2.0 Applicable Natural Heritage Policy and Regulation

2.1 Provincial Policy Statement, 2020

Section 2.1 of the Provincial Policy Statement (PPS) (Ministry of Municipal Affairs and Housing, 2020) protects the form and function of natural heritage features as defined by the PPS. Natural heritage features included in the PPS are provincially significant wetlands (PSW), significant coastal wetlands, significant woodlands, significant valleylands, significant wildlife habitat (SWH), significant areas of natural and scientific interest (ANSI), fish habitat, and the habitat of endangered and threatened species. Given their significance, development is prohibited within PSWs in Ecoregions 5E, 6E, and 7E and within significant coastal wetlands. Development in fish habitat and the habitat of endangered and threatened species shall only be permitted in accordance with provincial and federal requirements. Development within other natural heritage features and on lands adjacent to all natural heritage features are permitted only if demonstrated that there will be no negative impacts on the feature or their ecological function. Development includes the creation of a new lot, a change in land use, or the construction of buildings and structures requiring approval under the *Planning Act*.

Section 2.2 of the PPS protects the quality and quantity of water, including the form and hydrologic function of sensitive surface water features and sensitive ground water features. Focus is given to maintaining hydrologic linkages and functions at the watershed scale to minimize potential negative impacts, including cross-jurisdictional and cross-watershed impacts of development. Mitigative measures and/or alternative development approaches should be considered for development near water features.

2.2 Growth Plan for the Greater Golden Horseshoe, 2020

The Greater Golden Horseshoe is one of the most dynamic and fast-growing regions in North America. To address the challenges of increased development within the area, the Growth Plan for the Greater Golden Horseshoe, 2020 (GPGGH) builds on the PPS "*to establish a unique land use planning framework for the Greater Golden Horseshoe that supports achievement of complete communities, a thriving economy, a clean and healthy environment,*

and social equity" (Ministry of Municipal Affairs and Housing, 2020). In general, the GPGGH seeks to preserve agricultural lands, water resources, and natural areas by directing growth to settlement areas as defined in municipal Official Plans. The GPGGH contains policies regarding a provincial Natural Heritage System (NHS), key hydrologic features (KHFs), key hydrologic areas (KHAs), and key natural heritage features (KNHFs) (Table 1). Policies that reference the provincial NHS apply once the municipal Official Plan has incorporated the provincial NHS into their schedules; until that time, the policies that reference the NHS will apply outside settlement areas to the natural heritage systems identified in Official Plans that were approved and in effect as of July 1, 2017. Section 4.2.3 of the GPGGH states that, outside of settlement areas, development or site alteration is generally not permitted in KNHFs that are part of the NHS or in KHFs. Section 4.2.4 states that, outside of settlement areas, a proposal for new development or site alteration within 120 metres of a KNHF within the NHS or a KHF will require a natural heritage evaluation or hydrologic evaluation that identifies a suitable vegetation protection zone (i.e., a development setback). For KHFs, fish habitat, and significant woodlands the vegetation protection zone can be no less than 30 m measured from the outside boundary of the feature.

Table 1 Protected Features of the GPGGH

Key Hydrologic Features	Key Natural Heritage Features	
Permanent Streams	Habitat of Endangered and Threatened Species	Significant Wildlife Habitat
Intermittent Streams	Fish Habitat	Sand Barrens
Inland Lakes and their Littoral Zones	Wetlands	Savannahs
Seepage Areas and Springs	Life Science Areas of Natural and Scientific Interest (ANSI)	Tallgrass Prairies
Wetlands	Significant Valleylands	Alvars
	Significant Woodlands	

2.3 County and Township Official Plan

The County of Peterborough Official Plan identifies the Site as being outside the Settlement Area of Millbrook.

The Township of Cavan Monaghan Official Plan designates the Site as Agricultural, with Natural Linkage Area along the mapped watercourse (Schedule 'A' Land Use). ANSI, Other Wetland, and Provincially Significant Wetland are identified on adjacent lands (Schedule 'B' Natural Heritage System and Environmental Constraints), consistent with provincial mapping. Significant Woodland is also identified on adjacent lands.

2.4 Conservation Authority Regulation

“Conservation Authorities are local watershed management agencies that deliver services and programs to protect and manage impacts on water and other natural resources in partnership with all levels of government, landowners and many other organizations” (Conservation Ontario, 2021). Conservation Authorities each have their own Ontario Regulation under the *Conservation Authorities Act, 1990*. In general, they regulate development within and adjacent to river or stream valleys, Great Lakes and inland lakes shorelines, watercourses, hazardous lands (flood, erosion, unstable soils) and wetlands.

Otonabee Region Conservation Authority regulates these features under Ontario Regulation 167/06: *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*.

2.5 Endangered Species Act, 2007

Species listed as endangered or threatened on the Species at Risk in Ontario (SARO) list are protected under the provincial *Endangered Species Act*, 2007 (ESA) (Government of Ontario, 2007). Section 9(1) of the ESA prohibits a person from killing, harming, harassing, capturing or taking a member of a species listed as endangered, threatened, or extirpated. Section 10(1) of the ESA prohibits the damage or destruction of habitat of species listed as endangered or threatened. Protection of special concern species is provided through designation of their habitat as significant wildlife habitat, a provincially protected natural heritage feature.

2.6 Fisheries Act

Works within and adjacent to lakes, watercourses, and other bodies of water containing fish have the potential to impact fish and/or fish habitat. As a result of amendments to the federal *Fisheries Act* in 2015 and 2019, a proponent-led self-assessment is required for any project near water that could potentially impact fish or fish habitat. The purpose of the self-assessment is to determine whether the harmful alteration, disruption, or destruction (HADD) of fish habitat, as defined by the Act, can be avoided. The Fisheries and Oceans Canada (DFO) Fisheries Protection Program provides a Decision Framework and guidance material for conducing these self-assessments (available on-line at www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html). If it is determined that “HADD” may be unavoidable, the project should be submitted to DFO for review and determination of project approach and conditions of approval.

3.0 Technical Approach and Data Collection Methods

3.1 Background Information Review

Existing background information pertaining to the Site and surrounding landscape was compiled and reviewed, as part of a comprehensive desktop exercise, to better understand local biophysical conditions. In southern Ontario, readily available data includes orthoimagery, topographic base mapping, and geological records. Natural environment and land use schedules prepared in support of Official Plans and Zoning By-Laws were reviewed to acquire municipal data. Natural area records and species occurrences were obtained from digital resources and reference materials. The comprehensive desktop review for this Site included the following resources:

- Natural Heritage Areas: Make-a-map (Ministry of Natural Resources and Forestry, 2018);
- Aquatic Species at Risk Maps - Ontario (Fisheries and Oceans Canada, 2018);
- Aquatic Resource Area Summary Data (Government of Ontario, 2015);
- Fish ON-Line (Ministry of Natural Resources and Forestry, 2018);
- Ontario Reptile and Amphibian Atlas (ORAA) (Ontario Nature, 2018);
- Ontario Breeding Birds Atlas (OBBA) (2001-2005) (Bird Studies Canada, 2005)

Figure 2 shows the mapped natural heritage features present in the general area of the Site.

3.1.1 Ministry Consultation

Depending on the natural feature of the Site, ministry consultation may include the Ministry of Northern Development, Mines, Natural Resources, and Forestry (MNDMRF) and/or the Ministry of Environment, Conservation, and Parks (MECP), as applicable.

In early 2019, the Government of Ontario made changes to the regulating authority on matters related to SAR in the province. The Ministry of Environment, Conservation and Parks (MECP) is now responsible for administering the ESA and providing direction on potential compliance

issues. MECP has prepared a guidance document titled *Client's Guide to Preliminary Screening for Species at Risk* (Ministry of the Environment, Conservation and Parks, 2019). This document aims to "help clients better understand their obligation to gather information and complete a preliminary screening for SAR before contacting the Ministry". This document was used to guide the SAR habitat-based screening for the Study.

3.2 Field Investigations

Information gathered through the background information review was used to guide the development of the fieldwork program. The purpose of the site visit(s) was to verify information acquired through existing documentation and to gather additional site-specific information. The following sections provide the methods that were used to gather site-specific information.

3.2.1 Ecological Land Classification and Vegetation Inventory

The Ecological Land Classification (ELC) System for Southern Ontario (Lee, et al., 1998) was used to classify vegetation communities on the Site. Definitions of vegetation types are derived from the ELC for Southern Ontario First Approximation Field Guide (Lee, et al., 1998) and the revised 2008 tables. ELC units were initially delineated and classified by orthoimagery interpretation. Field investigations served to confirm the type and extent of communities on the Site through vegetation inventory and soil assessment with a hand auger. Where vegetation communities extend off the Site, classification is done through observation from property boundaries and publicly accessible lands.

3.2.2 Wetland Boundary Delineation

In Ontario, wetlands are mapped and evaluated under the Ontario Wetland Evaluation System (OWES). Mapped evaluated wetlands have undergone extensive study and been assessed based on their form and function under four categories: Biological, Social, Hydrological, and Special Features (Ministry of Natural Resources, 2014). Evaluated wetlands that score high enough are deemed Provincially Significant Wetlands (PSW). Evaluated wetlands that did not score high enough to be a PSW are called Locally Significant Wetlands (LSW). The province

also maps unevaluated wetlands. These mapped wetlands are approximate; as such, they require field verification in order to confirm their presence and determine their boundaries.

The subject wetland was delineated following provincially approved methods outlined in the Ontario Wetland Evaluation System: Southern Manual, 3rd Ed. (Ministry of Natural Resources, 2014). Fieldwork was carried out by provincially certified Cambium staff.

Wetland boundaries were initially delineated and classified by orthoimagery interpretation. The presence/absence of wetlands on the Site was confirmed through field investigations during the growing season (late May through October). Wetland boundaries were determined using the 50% wetland vegetation rule. Where vegetation-based delineation was inconclusive, soil assessment with a hand auger was used to confirm wetland boundaries. Wetland boundaries on the Site were marked with a hand-held GPS unit and staked in the field. Where wetland communities extend off the Site, classification was done through observation from property boundaries and publicly accessible lands.

3.2.3 Aquatic Habitat Survey

A roaming visual survey was completed to identify and map all aquatic features on the Site, including waterbodies, watercourses (permanent and intermittent), seeps, springs, and overland drainage paths. Aerial photography and topographic base mapping was reviewed to identify additional aquatic features on adjacent lands that weren't directly accessible. On-site features were characterized based on in-stream and riparian cover, channel structure/morphology, substrates, hydrologic measurements, and indicators of instability, thermal regime, and permanence of flow, where applicable. Definitions and technical criteria referenced in the Ontario Stream Assessment Protocol (Ministry of Natural Resources and Forestry, 2017) were applied to wadeable streams. In addition, all identified aquatic features were assessed to determine their function as habitat for fish. Fish presence, specialized habitat features, and potential barriers to fish movement were documented. All feature crossings including bridges, culverts, and bed-level crossings, were also noted and georeferenced in the field. Finally, any evidence of erosion or sedimentation was noted, and up-gradient areas were investigated to identify potential sources.

3.2.4 Grassland Bird Surveys

Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) are SAR listed as threatened on the SARO list. These species prefer natural grasslands and agricultural fields, including pasture, hayfields and abandoned fields (CUM vegetation type under ELC), for breeding and nesting sites. One or both of these species have been recorded in the vicinity of the Site within recent years. Bobolink is an area sensitive species that requires a minimum area of 5 ha to support breeding habitat, with larger areas generally providing additional habitat benefits (Ministry of Natural Resources and Forestry, 2018). Eastern Meadowlark are not as strongly area sensitive; however, a minimum area of 5 ha is also required to support preferred breeding habitat (Ministry of Natural Resources and Forestry, 2018).

In order to determine if the Site is being used as nesting habitat by Bobolink or Eastern Meadowlark, avian surveys were conducted following the approved MNDMRF protocol for Eastern Meadowlark (Ontario Ministry of Natural Resources, 2013). This protocol is suitable for use with both of these species. This method involves recording Bobolink and Eastern Meadowlark observations via both point count location(s) and traveling transects between points. The protocol requires that the Site be visited three times between May 21 and July 3 (the nesting season for both of these species) with survey dates being evenly distributed within this period and conducted within 7-10 days of each other. Surveys are conducted between sunrise and four hours after sunrise when wind speed is low (<19 km/h; Beaufort Wind Scale of 3 or lower) and with light or no precipitation.

3.2.5 Amphibian Breeding Surveys

The presence of frog and toad breeding habitat was determined using auditory surveys following the Marsh Monitoring Program Participant's Handbook for Surveying Amphibians (Bird Studies Canada, 2008). According to the protocol, three (3) amphibian surveys should be conducted between April and July, at least 15 days apart, in order to span the breeding seasons of all species that may be present in an area. Air temperature is the primary factor in determining survey dates, as different species call when air and water temperatures reach certain levels; therefore, nighttime air temperature should be greater than 5°C for the first

survey, greater than 10°C for the second survey and greater than 17°C for the third survey. Other weather conditions are also taken into consideration. Conditions are considered appropriate when wind speed is low (<19 km/h; Beaufort Wind Scale of 3 or lower) and there is light or no precipitation occurring (high humidity is ideal but heavier rain can impact ability to hear and differentiate calls). Sample points are established during the first survey, and re-visited during following surveys. At each sample point, calls from all species are aurally surveyed for 3 minutes and noted to the greatest extent possible, on a 100 m semi-circular area in front of the sampling station using call intensity codes established by the protocol:

- Code 0: No calls heard
- Code 1: Calls can be counted individually (calls do not overlap)
- Code 2: Calls overlap, but numbers of individuals can be estimated
- Code 3: Calls overlap and are continuous (full chorus); therefore, a count estimate is unreliable

Recommended monitoring windows for the Site (located between the 43rd and 47th parallels) are 15-30 of April, 15-30 of May, and 15-30th of June.

4.0 Characterization of Natural Features and Functions

Background information and field investigation data is provided in the following sections. Based on the background and field data, an assessment of significance has been completed to identify protected natural heritage features on and/or adjacent to the Site.

The following field investigations were carried out on the Site and are summarized in Table 2. Representative Site photos are included in Appendix A and locations of specific surveys are shown on Figure 3.

Table 2 Summary of Field Investigations

Date	Time On Site	Weather	Observer	Activities
2021-05-06	20:45-21:15	11°C Clear Wind: 0 Noise: 2	T. Jamieson	Amphibian Call Survey #1
2021-05-20	20:30-21:15	25°C Clear Wind: 0 Noise: 2	T. Jamieson	Amphibian Call Survey #2
2021-05-21	7:30-8:00	22°C Clear Wind: 1 Noise: 0	T. Jamieson	Grassland Breeding Bird Survey #1
2021-06-09	7:45-9:00	24°C Clear Wind: 0 Noise: 2	T. Jamieson	Grassland Breeding Bird Survey #2
2021-06-17	7:15-10:15	15-20°C Clear Wind: 1 Noise: 1	T. Jamieson	Ecological Land Classification Grassland Breeding Bird Survey #3
2021-06-17	21:00-21:30	19°C Clear Wind: 1 Noise: 2	T. Jamieson	Amphibian Call Survey #3
2021-07-27	9:00-11:30	19°C Rainy Wind: Noise:	M. Latter & T. Radimer	Aquatic Survey

Notes:

Wind speed is reported as a Beaufort Wind Scale value (0 = 0-2 kph, 1 = 3-5 kph, 2 = 6-11 kph, 3= 12-19 kph, 4 = 20-30 kph, 5 = 31-39 kph, 6 = 40-50 kph)

Noise is reported based on background noise levels: Index 0 – no appreciable effect, 1 – slightly affecting sampling, 2 – moderately affecting sampling, 3 – seriously affecting sampling, 4 – profoundly affecting sampling.

Basking temperature is reported as the temperature measured at ground level.

4.1 Landscape Position and Topography

The Site is within the Mixedwood Plains Ecozone: Lake Simcoe Rideau Ecoregion 6E, which extends southward from a line connecting Lake Huron in the west to the Ottawa River in the east, including Ottawa, Kingston, Peterborough, Barrie, Tobermory, Kitchener, and Toronto. This ecoregion is characterized by a mixed geology that includes both shallow soil areas such as alvar and bedrock plains, as well as deep soil areas such as the Oak Ridges Moraine. It falls within the Great-Lakes St. Lawrence Forest Region, including deciduous and mixed forests; however, over 50% of the landscape in this Ecoregion is currently in use as agricultural land (Lee, et al., 1998).

4.2 Vegetation Communities

The vegetation communities on the Site are summarized in Table 3 and are mapped on Figure 3. A list of identified species and representative photos for each community are provided in Appendix B.

Table 3 Vegetation Communities

No.	ELC Code	Community Description	Community Type	S -Rank
1	CUM1	Cultural meadow	Terrestrial	SNA
2	SWDM4-5	Poplar Mineral Deciduous Swamp	Wetland	S5
3	CUP3-3	Scots Pine Coniferous Plantation	Terrestrial	N/A
4	SWD4	Mineral Deciduous Swamp	Wetland	S5
5	MAM2-2	Reed Canarygrass Mineral Meadow Marsh	Wetland	S5
N/A	OAGM1	Annual Row Crop	Terrestrial	N/A
N/A	CVR	Constructed Residential	Terrestrial	N/A

A search for butternut (*Juglans cinerea*; provincially endangered) was completed as part of the vegetation survey; no butternut were identified.

4.2.1 Significant Woodlands

Significant woodlands are natural heritage features that are afforded protection under provincial policy. Currently, the County of Peterborough has not mapped significant woodlands within their Official Plan; however, the Township of Cavan Monaghan has mapped significant woodlands within their Official Plan. Significant woodlands are shown on Schedule 'B' Natural Heritage System and Environmental Constraints. There are no mapped significant woodlands on the Site but the woodland on adjacent land to the west and northeast are mapped as significant. The planning authority has not explicitly defined the assessment criteria for significant woodlands within their jurisdiction. In the absence of local criteria for evaluating woodlands, the NHRM provides guidance on evaluating woodlands (Ministry of Natural Resources, 2010). In addition, the Greenbelt Plan provided evaluation criteria: *Technical definitions and criteria for key natural heritage features in the Natural Heritage System of the Protected Countryside Area* (Ministry of Natural Resources, 2012). While the Site is outside the Greenbelt Plan area, these technical definitions can be used to guide evaluations in the absence of local criteria using the “North Area” criteria. These criteria were reviewed with respect to the woodland feature on and adjacent to the Site.

The mapped significant woodland on adjacent lands to the west is a Scots Pine Coniferous Plantation (community 3 on Figure 3) that is approximately 3 ha in size measured based on orthoimagery. This represents a non-native, planted vegetation type. It is not large enough to meet the significance criteria under the Greenbelt Plan for size or the ecological functions detailed therein. Furthermore, it does not represent a linkage feature as it is isolated by the 115 highway, commercial development, and agricultural land uses. Based on this assessment, the woodlands to the west are not significant woodlands.

The mapped significant woodland on adjacent lands to the northeast is a Poplar Mineral Deciduous Swamp (community 2 on Figure 3), which is a treed wetland community. This woodland community is part of an extensive treed area, based on orthoimagery interpretation,

that extends to the east of the Site and includes the Cavan Creek Provincially Significant Wetland. It is large enough to meet the significance criteria under the Greenbelt Plan for size and meets the criteria for proximity to other natural features. It also likely meets the natural composition criteria; however, as an adjacent lands feature this could not be field verified. Based on this assessment, the woodlands to the northeast are significant woodlands. Since this woodland is part of a wetland feature directly connected to a PSW, the PSW feature receives the greater level of protection and this community will be discussed herein under the wetland sections.

4.3 Wetland Delineation

There is no mapped wetland on the Site. The Cavan Creek Provincially Significant Wetland is located on adjacent lands to the north of the Site, on the opposite side of Highway 115, and east of the Site outside the 120 m adjacent lands. The PSW is approximately 1337.2 continuous ha, with a total score of 766: 197 Biological Score, 185 Hydrology Score, 209 Social Component Score, and 250 Special Features Score. It is described as composed of 98% swamp and 2% marsh

There is mapped unevaluated wetland adjacent to the Site, south of Syer Line opposite the Site, off the eastern boundary associated with the mapped watercourse, and off the northeast corner.

The wetlands on adjacent lands were confirmed based on vegetation observed from the Site's boundary and Syer Line. The confirmed wetlands were consistent with the mapped wetlands and their boundaries are shown on Figure 3. Since these wetlands were located off-site, their boundaries were mapped using orthoimagery.

4.4 Aquatic Habitat Assessment

A mapped watercourse is present on the Site in the southeast corner. The watercourse is a tributary to Cavan Creek and is part of the Cavan Creek subwatershed. The Cavan Creek subwatershed covers a total area of approximately 168 square kilometres. Cavan Creek is classified as a cold-water system, containing species such as Brook Trout and Brown Trout.

An Aquatic Habitat Assessment was completed on July 27, 2021, identifying a total of five reaches throughout the watercourse that is present on the Site (Figure 3). Reaches 1, 2, 3, and 5 have defined channels with substrate sorting and observed erosion. Reach 4 appears to be a drainage swale that channelizes surface flows and runoff from the adjacent agricultural fields. All reaches are unconfined.

Reach 1 is approximately 250 m in length. Its banks are protected and the reach characteristics are mainly glides. The substrates are mainly organic and with some fines. The reach is highly vegetated with macrophytes (Broad-leaved Cattail).

Reach 2 is approximately 150 m in length. Its banks are protected and the reach characteristics are mainly made of glides. The substrates are mainly organic with some fines and limited cobble. The reach is highly vegetated with macrophytes (Broad-leaved Cattail).

Reach 3 is approximately 150 m in length. Its banks are protected and the reach is characteristics are mainly made of glides. The substrate is mainly fines with some gravel. The reach is highly vegetated with macrophytes (Marsh Horsetail).

Reach 4 is approximately 70 m in length. Its banks are protected and the reach was dry at time of the survey. the substrates are mainly fines. The reach is highly vegetated with macrophytes (Marsh Horsetail) in many of the areas, and exposed soil near the southern portion.

Reach 5 is approximately 140 m in length. Its banks are protected and the reach characteristics is mainly made of glides. The substrates are mainly organics. The channel is highly vegetated with macrophytes (Broad-leaved Cattail, Marsh Horsetail, Willow Shrubs).

Riparian habitat throughout all reaches are cultural meadows in the form of fallow agricultural fields.

Where possible, measurements were collected to determine bankfull width, bankfull depth, wetted width, wetted depth, and hydraulic head as shown in Table 4, below. Measurements could not be collected in some areas due to the abundance of emergent aquatic plants (Broad-leaved Cattail).

Table 4 Aquatic Habitat Assessment Reach Measurements

#	Average Bankfull Width (m)	Average Bankfull Depth (m)	Average Wetted Width (m)	Average Wetted Depth (cm)	Average Hydraulic Head (cm)
1	4.63	1.08	0.60	7.00	0.75
2	4.13	0.76	0.76	10.5	0.50
3	5.50	0.56	0.15*	3*	0.50
4	2.15	0.42	Dry	Dry	Dry
5	5.08	0.47	0.61*	8.30*	0.50

*indicates that an area of this reach was observed to be dry.

As part of the Aquatic Habitat Assessment, fish passage was considered throughout. Three culverts were observed at the Site. Two are along Syer Line, and one is located along the laneway to the Site. All three are corrugated steel pipe (CSP), ranging from 80 cm wide to 100 cm wide. Both culvers along Syer Line were embedded, with no issues concerning fish passage. The culvert observed crossing the laneway was perched 5 cm on the west side and 15 cm on the east side. The culvert was observed to be compressed, with structural repairs (metal I-beams) in the centre of the culvert. Due to the culvert perched height, during period of low water, fish passage would not be possible through this culvert.

Due to the connection with Cavan Creek, this tributary has potential to sustain fish and fish habitat.

4.5 Wildlife Survey Results

4.5.1 Birds

Grassland breeding bird surveys were completed as a part of the current study. Seven survey stations were established at the Site and are provided in Figure 3. The following observations were made during the surveys:

- During the June 9, 2021 survey, a Bobolink (Threatened) was observed at station GBS1. The Bobolink flew over the Site to the southwest, towards an adjacent property with suitable habitat.
- A Grasshopper Sparrow (Special Concern) was heard calling at station GB2 during the June 9 2021 survey. No Grasshopper Sparrows were heard during any of the other surveys or survey stations.

Based on the above observations, the Site does not provide breeding habitat for grassland birds.

In addition, bird species observations were recorded during all Site visits. These included American Crow (*Corvus brachyrhynchos*), American Goldfinch (*Spinus tristis*), Mourning Dove (*Zenaida macroura*), Red-tailed Hawk (*Buteo jamaicensis*), Red-winged Blackbird (*Agelaius phoeniceus*), and Savannah Sparrow (*Passerculus sandwichensis*).

4.5.2 Amphibians

Amphibian breeding surveys were completed and a total of 1 species was identified on or adjacent to the Site, as shown in (bold species were located on the Site). Of these, none had call level codes of 3. None of the species observed are federal or provincial SAR.

Table 5 Summary of Amphibian Survey Results

Sample Point	Survey Direction	Species	Maximum Call Intensity	# of Individuals	Inside or Outside 100 m Sample Plot
MMP1	E	None	-	-	-
MMP2	E	None	-	-	-
MMP3	E	**Green Frog**	1	1	Inside
MMP4	N	None	-	-	-

Notes: "-" indicates no calls heard

For this Study, the first amphibian survey was conducted in early May due to unsuitable weather conditions in late April. Appropriate early-season weather conditions for amphibians were present at the time of the May 6 survey; as such, the survey captured the required amphibian breeding periods.

4.6 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) guidance documents produced by the MNRF were used as a guide to identify and confirm SWH on the Site (MNR, 2000). The Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (Ministry of Natural Resources and Forestry, 2015) apply to the proposed works. Information gathered during the background review and field investigations were compared to SWH criteria to identify SWH habitat at the Site. Based on our observations during field investigations and the ELC classifications described in Section 4.2, the Site does not meet the criteria for designation as SWH. Details on species of conservation concern and their protected habitat is provided under Section 4.7.

4.7 Species of Conservation Concern

A list of species of conservation concern, including species at risk, with potential to occur in the general vicinity of the Site has been compiled based on known species' ranges, habitat requirements, and review of background information sources (as listed in Section 3.1). In addition, the list has been augmented with direct field observations from the current study, as

detailed in the previous sections. Cambium has employed a habitat-based screening, supplemented with targeted field surveys when necessary, in order to identify suitable habitat for species located on or adjacent to the Site. A detailed habitat suitability analysis is provided in Appendix C and a discussion of the results is provided below.

4.7.1 Endangered and Threatened Species

Barn Swallows are listed as threatened both federally and provincially. They require open habitats including grassy fields, pastures, agricultural crops, shorelines, cottage areas, wetlands, or sub-artic tundras which are also in close association with human populations as this swallow typically nests inside man-made structures such as abandoned barns or other buildings with sufficient openings or road culverts. The barn on the Site may be nesting habitat for this species. Prior to the removal of the barn, it should be inspected for nests and, if nests are found, removal of the barn should adhere to the requirements of the ESA.

4.7.2 Special Concern Species

Eastern Wood-pewee lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It prefers intermediate-age forest stands with little understory vegetation. There is potential habitat for this species on adjacent lands; however, there is no suitable habitat on the Site. Given the existing agricultural use of the Site, there is no potential impact to the habitat of this species, and it will not be addressed further in this report.

4.8 Significant Areas of Natural and Scientific Interest

Areas of Natural and Scientific Interest (ANSI) are natural heritage features identified by the MNDMRF. There are two types of ANSIs: Life Science and Earth Science. ANSIs represent important natural features that are not found in protected areas. The Natural Heritage Reference Manual provides the following definitions for ANSIs (Ministry of Natural Resources, 2010):

> Life science ANSIs are significant representative segments of Ontario’s biodiversity and natural landscapes, including specific types of forests, valleys, prairies, savannahs, alvars

> and wetlands, their native plants and animals, and their supporting environments. They contain relatively undisturbed vegetation and landforms, and their associated species and communities. Provincially significant life science ANSIs include the most significant and best examples of the natural heritage features in the province, and many will correspond to other significant features and areas such as wetlands, valleylands and woodlands. Earth science ANSIs are geological in nature, consist of some of the most significant representative examples of the bedrock, fossils and landforms in Ontario, and include examples of ongoing geological processes.

A regional Life Science ANSI overlaps the very northeast corner of the Site. Given that this corner is active agricultural lands, and that the wetland associated with the ANSI does not overlap the Site in this corner, the features and functions of the ANSI do not extend onto the Site itself. The adjacent lands in this corner were confirmed as wetland; as such, the adjacent lands of the ANSI will be addressed through protection of the wetland. The ANSI will not be addressed further in this Study.

5.0 Constraints, Impact Assessment and Mitigation Measures

The proposed development involves a change in a change of land use designation under the Official Plan and zoning under the Zoning By-Law, allowing for alternative uses of the property. A formal concept plan has not yet been developed for the Site; Cambium understands that the findings of the EIS will be considered by those preparing, reviewing, and approving site plans. The following sections address potential impacts to protected features identified on and adjacent to the Site that may result from the proposed development and site alteration:

- Wetlands
- Permanent/Intermittent Streams & Fish Habitat
- Habitat of Endangered or Threatened Species

No other natural heritage features protected by provincial policy were confirmed on or adjacent to the Site.

Mitigation measures and best management practices have been recommended to ensure that the integrity of the current existing natural features are protected and/or enhanced and furthermore that their functions are not negatively impacted during or following construction.

5.1 Other Wetlands

A 30 m setback is recommended for the wetlands adjacent to the Site, as shown on Figure 4. The 30 m setback is considered sufficient to protect the existing form and function of local wetland features provided that the area be replanted with native vegetation buffers as part of the re-development of the Site. These native vegetation buffers should be allowed to naturally self-sustain (i.e., a buffer area where no vegetation removals or grading is allowed).

Runoff from the Site is expected to increase with the introduction of impermeable surfaces (i.e., building roofs, roadways, and walkways) and compacted surfaces with reduced infiltration capacity. Measures to increase infiltration of run-off from these surfaces should be encouraged and, where possible, included in the Site Plan for the development. Eaves trough downspouts should be directed to vegetated areas (such as lawn, or gardens) and not onto hardened

surfaces, to encourage infiltration. It is anticipated that a hydrogeological and stormwater management study will be prepared in support of the proposed development application. These studies should specifically address potential stormwater-related impacts to the hydrological regime of the surrounding wetlands, through a feature-based water balance study.

Prior to any construction activities taking place, it is essential that erosion and sediment control (ESC) measures in the form of perimeter sediment fencing be installed around construction areas. Fencing should be properly keyed into the ground and securely fastened to vertical supports spaced ≤ 2 m apart. This key control measure will help prevent sediment from entering surface water features (i.e., wetlands and the watercourse) in the surrounding landscape. All sediment fencing should be regularly maintained and kept in good working condition, until the area has been stabilized and/or successfully revegetated. Any observed overland drainage channels originating from Site, that may or may not have arisen as a result of erosion, should be directed to a check dam structure, prior to discharging to off-site areas.

5.2 Permanent/Intermittent Streams & Fish Habitat

A 30 m setback is recommended for the watercourses and drainage features on the Site, as shown on Figure 4. The 30 m setback is considered sufficient to protect the existing form and function of these features provided that the area be replanted with native vegetation buffers as part of the re-development of the Site. These native vegetation buffers should be allowed to naturally self-sustain (i.e., a buffer area where no vegetation removals or grading is allowed).

Replacement of the existing culvert on the laneway should ensure that fish habitat connectivity is restored using an appropriately sized culvert and embedding that culvert within the substrates (i.e., avoiding a perched culvert). Replacement of this culvert would be subject to review/approval by the DFO. Prior to culvert replacement, a fisheries biologist should review the plans and a Request for Review should be submitted to the DFO.

All of the channels on the Site have been historically altered through channelization into linear features. There is potential for restoration of these features through natural channel design and realignment, subject to additional study with respect to water flows and fish habitat. If completed, realignment may result in changes to the feature setbacks that could allow for a

reduction in overall setback area on the Site. Cambium is available to discuss this option in more detail if requested by the Township.

5.3 Habitat of Endangered or Threatened Species

The barn on the Site may be nesting habitat for Barn Swallows, a species listed as threatened both federally and provincially. Prior to the removal of the barn, it should be inspected for nests. If nests are found, removal of the barn should adhere to the requirements of the ESA. The barn swallow is eligible for a streamlined approval process under the ESA, whereby the landowner is required to demonstrate compliance with rules for altering or removing a structure that is habitat for barn swallow. This exemption under the ESA, as described in Section 23.5 of O. Reg. 242/08, provides a list of conditions that must be met in order for the habitat protection provisions of the ESA not to apply in a particular instance. The conditions set out in the regulation are summarized below.

- Register the work and the affected species with the Ministry before work begins.

  This is an on-line registration process.

- Prepare a Barn Swallow Mitigation And Restoration Record before work begins.

  Documentation of the existing structure, number and location of nests, amount of habitat, proposed alteration/modification to the existing habitat, and description of the new habitat created. This record must be updated regularly, including information collected during the required annual monitoring.

- Minimize the adverse effects of the activity on the barn swallow.

  Avoid harming the birds and prevent the birds from building nest in subsequent years within structures that are no longer being provided as habitat.

- Complete work that may impact the species outside of the nesting season (nesting season generally includes the period from May 1 to August 31).

- Create replacement habitat (i.e. a building/structure with nest cups) for any barn swallow nests that are removed or destroyed.

Replacement habitat can be a new structure or modifying an existing structure to accommodate Barn swallow nesting. This replacement habitat must be located within 1 km of the original structure.

- Maintain the replacement habitat for three (3) years and monitor and report on the replacement habitat use by barn swallows for three (3) years after the habitat is created.

Cambium is available to provide additional consultation with respect to ESA requirements.

5.4 Best Management Practices - Wildlife

The absence of nesting birds was confirmed through the surveys conducted under this Study. Fallow agricultural fields can develop into suitable grassland nesting habitat if left to re-grow in grasses and herbaceous vegetation. To avoid habitat creation for grassland birds on this Site, it is recommended that the Township consider actively farming the land as annual row crop until the proposed development is ready to move forward.

Nesting birds are protected under the *Migratory Birds Convention Act, 1994*. Vegetation clearing on the Site should occur outside the breeding bird season, which extends from April 15 to August 15 in the local area (as per Environment and Climate Change Canada Guidelines). If vegetation clearing is to occur between April 15 and August 15, the vegetation should be investigated by a qualified biologist to confirm if any nests are present. Vegetation clearing can proceed provided there are no active nests. If active nests are confirmed, the nests should be left undisturbed until young have fledged or the nest is determined to be inactive.

In the event that construction is planned to proceed during the breeding season, the area should be investigated for the presence of breeding birds and nests containing eggs and/or young, prior to Site alteration. Nests discovered should be left undisturbed until young have fledged or the nest is determined to be inactive.

If any species at risk are encountered, they should be photographed and allowed time to move out of harm's way. Species at Risk observations, including most species of snakes and turtles, should be reported to the Natural Heritage Information Centre.

6.0 Summary of Mitigation, Compensation, and Best Practices

The following recommendations are provided with respect to the proposed development of the Site:

1. Site Plans developed for the proposed development should include the confirmed wetlands and watercourses and their respective development setbacks, as shown on Figure 4.
2. The wetland and watercourse setbacks should be replanted with native vegetation and these native vegetation buffers should be allowed to naturally self-sustain.
3. Measures to increase infiltration of run-off from hardened surfaces should be encouraged and, where possible, included in the Site Plan for the development.
4. The hydrogeological and stormwater management study should specifically address potential stormwater-related impacts to the hydrological regime of the surrounding wetlands through a feature-based water balance study.
5. Erosion and sediment control (ESC) measures in the form of perimeter sediment fencing should be installed around construction areas. Fencing should be properly keyed into the ground and securely fastened to vertical supports spaced ≤ 2 m apart. All sediment fencing should be regularly maintained and kept in good working condition, until the area has been stabilized and/or successfully revegetated.
6. Replacement of the existing culvert on the laneway should ensure that fish habitat connectivity is restored using an appropriately sized culvert and embedding that culvert within the substrates (i.e., avoiding a perched culvert). Replacement of this culvert would be subject to review/approval by the DFO. Prior to culvert replacement, a fisheries biologist should review the plans and a Request for Review should be submitted to the DFO.
7. There is potential for restoration of the watercourse features through natural channel design and realignment, subject to additional study with respect to water flows and fish habitat. Cambium is available to discuss this option in more detail if requested by the Township.

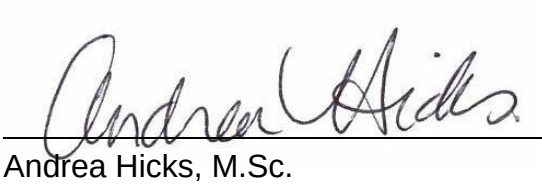
8. Prior to the removal of the barn, it should be inspected for Barn Swallow nests. The barn swallow is eligible for a streamlined approval process under the ESA, whereby the landowner is required to demonstrate compliance with rules for altering or removing a structure that is habitat for barn swallow (Section 23.5 of O. Reg. 242/08). Cambium is available to provide additional consultation with respect to ESA requirements.
9. To avoid habitat creation for grassland birds on this Site, it is recommended that the Township consider actively farming the land as annual row crop until the proposed development is ready to move forward.
10. Vegetation clearing on the Site should occur outside the breeding bird season, which extends from April 15 to August 15 in the local area (as per Environment and Climate Change Canada Guidelines).
11. In the event that construction is planned to proceed during the breeding season, the area should be investigated for the presence of breeding birds and nests containing eggs and/or young, prior to Site alteration. Nests discovered should be left undisturbed until young have fledged or the nest is determined to be inactive.
12. If any species at risk are encountered, they should be photographed and allowed time to move out of harm's way. Species at Risk observations, including most species of snakes and turtles, should be reported to the Natural Heritage Information Centre.

7.0 Closing

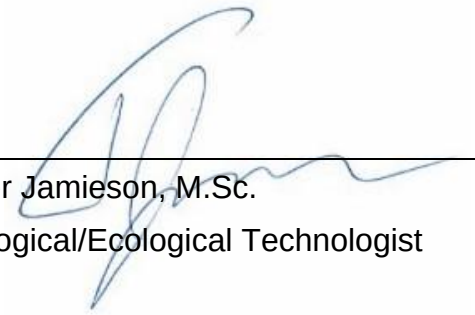
In closing, potential negative impacts associated with the proposed development and site alteration can be appropriately minimized, provided that the recommendations outlined in Section 6.0 are adhered to. Based on the existing natural heritage and hydrologic constraints identified on the Site, there is a potential Developable Area of 27.63 ha. This Developable Area is subject to revision based on development constraints identified through other studies. Cambium is available to provide additional review and input on conceptual Site Plans with respect to development of the Site.

Respectfully submitted,

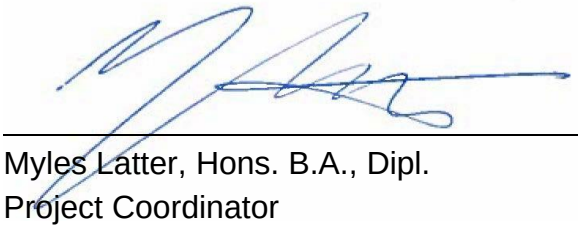
Cambium Inc.



Andrea Hicks, M.Sc.
Natural Science Group Manager



Tyler Jamieson, M.Sc.
Biological/Ecological Technologist



Myles Latter, Hons. B.A., Dipl.
Project Coordinator

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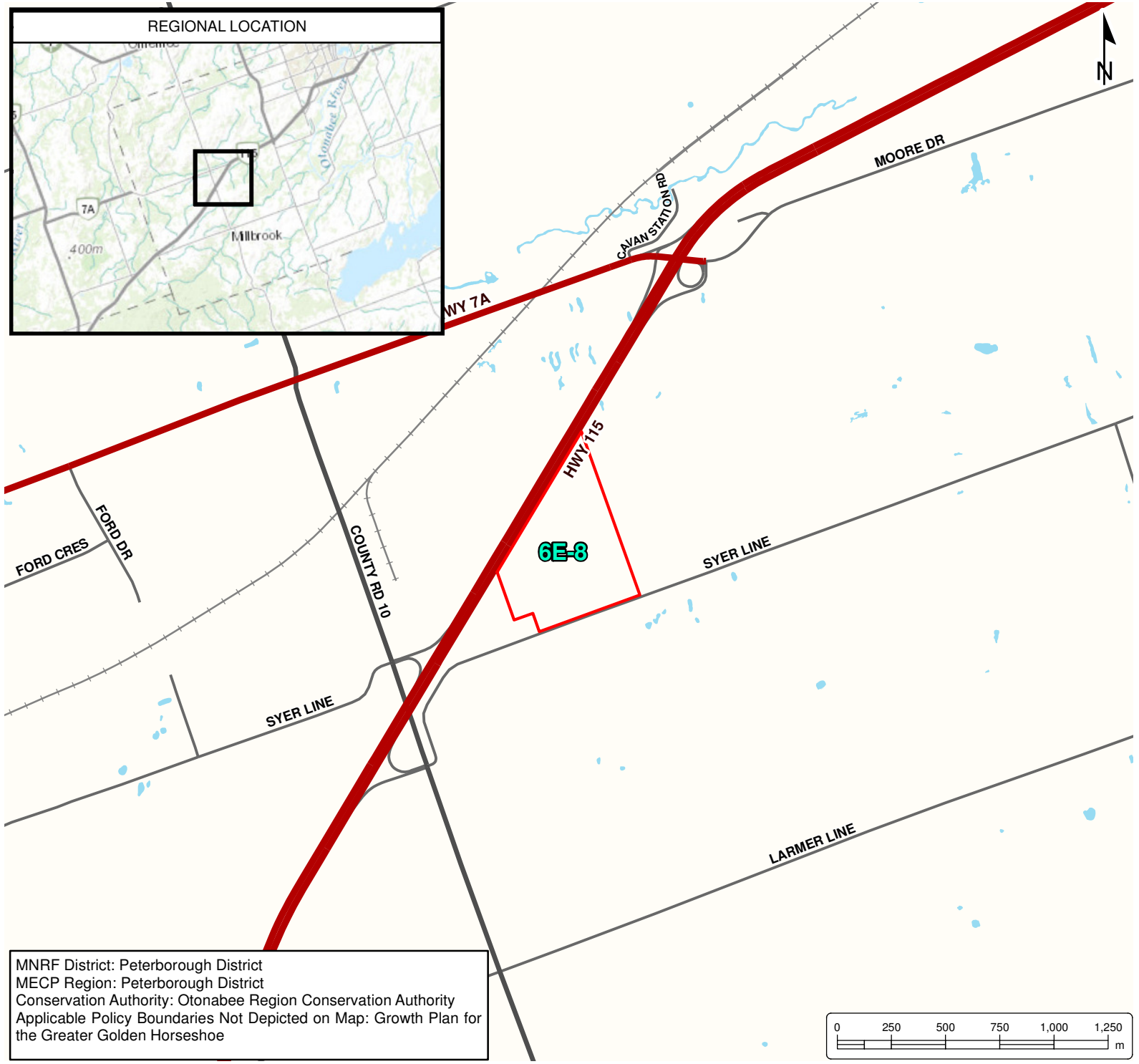
Glossary of Terms

ANSI: Area of Natural and Scientific Interest
ARA: Aquatic Resources Area
ARA: Aggregate Resources Act
AS: Agricultural System
ATK: Aboriginal Traditional Knowledge
BMA: Bear Management Area
BMP: Best Management Practice
CA: Conservation Authority
CEAA: Canadian Environmental Assessment Act/Agency
CFA: Canadian Forestry Association
CFIP: Community Fisheries Involvement Program
CFS: Canadian Forestry Service
CHU: Critical Habitat Unit
CH: Cultural Heritage
CLI: Canada Land Inventory
CLU: Crown Land Use
COSSARO: Committee on the Status of Species at Risk in Ontario
CR: Conservation Reserve
CWIP: Community Wildlife Involvement Program
CWS: Canadian Wildlife Service
DFO: Fisheries and Oceans Canada
EA: Environmental Assessment
EAA: Environmental Assessment Act
EAB: Emerald Ash Borer
EBR: Environmental Bill of Rights
EIA: Environmental Impact Assessment
EIS: Environmental Impact Study/Statement
ELC: Ecological Land Classification System
ELUP: Ecological Land Use Plan
END: Endangered species
EPA: Environmental Protection Act
ER: Environmental Registry
ESA: Endangered Species Act (2007)
ESA: Environmentally Sensitive Area
ESC: Erosion and Sediment Control
GIS: Geographic Information System
GLSL: Great Lakes – St. Lawrence
GPGGH: Growth Plan for the Greater Golden Horseshoe
GPS: Global Positioning System
HSA: Habitat Suitability Analysis
HIS: Habitat Suitability Index
KHA: Key Hydrologic Areas
KHF: Key Hydrologic Features
KNHF: Key Natural Heritage Features
LCFSP: Licence to Collect Fish for Scientific Purposes
LIO: Land Information Ontario
LRIA: Lake and Rivers Improvement Act
LUP: Land Use Permit or Plan
MA: Management Area
MAFA: Moose Aquatic Feeding Area
MCEA: Municipal Class Environmental Assessment
MECP: Ontario Ministry of Environment, Conservation and Parks
MNDMRF: Ontario Ministry of Natural Resources and Forestry
NER: Natural Environment Report
NHIC: Natural Heritage Information Centre
NHIS: Natural Heritage Information System
NHS: Natural Heritage System
OBM: Ontario Base Map
OFIS: Ontario Fisheries Information System
OLI: Ontario Land Inventory
OMAFRA: Ontario Ministry of Agriculture, Food and Rural Affairs
OWES: Ontario Wetland Evaluation System
PPS: Provincial Policy Statement (2014)
PSW: Provincially Significant Wetland
RLUP: Regional Land Use Plan
RMP: Regional Management Plan
R.P.F.: Registered Professional Forester
SAR: Species at Risk
SARO: Species at Risk in Ontario
SC: Special Concern species

F&W: Fish and Wildlife
FA: Fisheries Act (Federal)
FEC: Forest Ecosystem Classification
FMP: Forest Management Plan
FRI: Forest Resources Inventory
FWCA: Fish and Wildlife Conservation Act
GGH: Greater Golden Horseshoe
GHP: General Habitat Protection
SWH: Significant Wildlife Habitat
SWM: Stormwater Management
THR: Threatened species
TOR: Terms of Reference
TPP: Tree Preservation Plan
WIA: Woodlands Improvement Act
WMU: Wildlife Management Unit

Appended Figures



MNRF District: Peterborough District
MECP Region: Peterborough District
Conservation Authority: Otonabee Region Conservation Authority
Applicable Policy Boundaries Not Depicted on Map: Growth Plan for the Greater Golden Horseshoe

ENVIRONMENTAL IMPACT STUDY

TOWNSHIP OF CAVAN-MONAGHAN
1066 Syer Line,
Cavan-Monaghan, Ontario

LEGEND

- Highway
- Major Road
- Minor Road
- Railroad
- Water Area
- Ecodistrict
- Subject Property (32.14 ha) (approximate)

Notes:
- Base mapping features are © Queen's Printer of Ontario, 2019 (this does not constitute an endorsement by the Ministry of Natural Resources and Forestry or the Ontario Government).
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.

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SITE LOCATION AND SPECIAL PLANNING AREAS

Project No.: 12971-001		Date: August 2021	Rev.:
Scale: 1:25,000		Projection: NAD 1983 UTM Zone 17N	
Created by: MAT	Checked by: ALH	Figure: 1	

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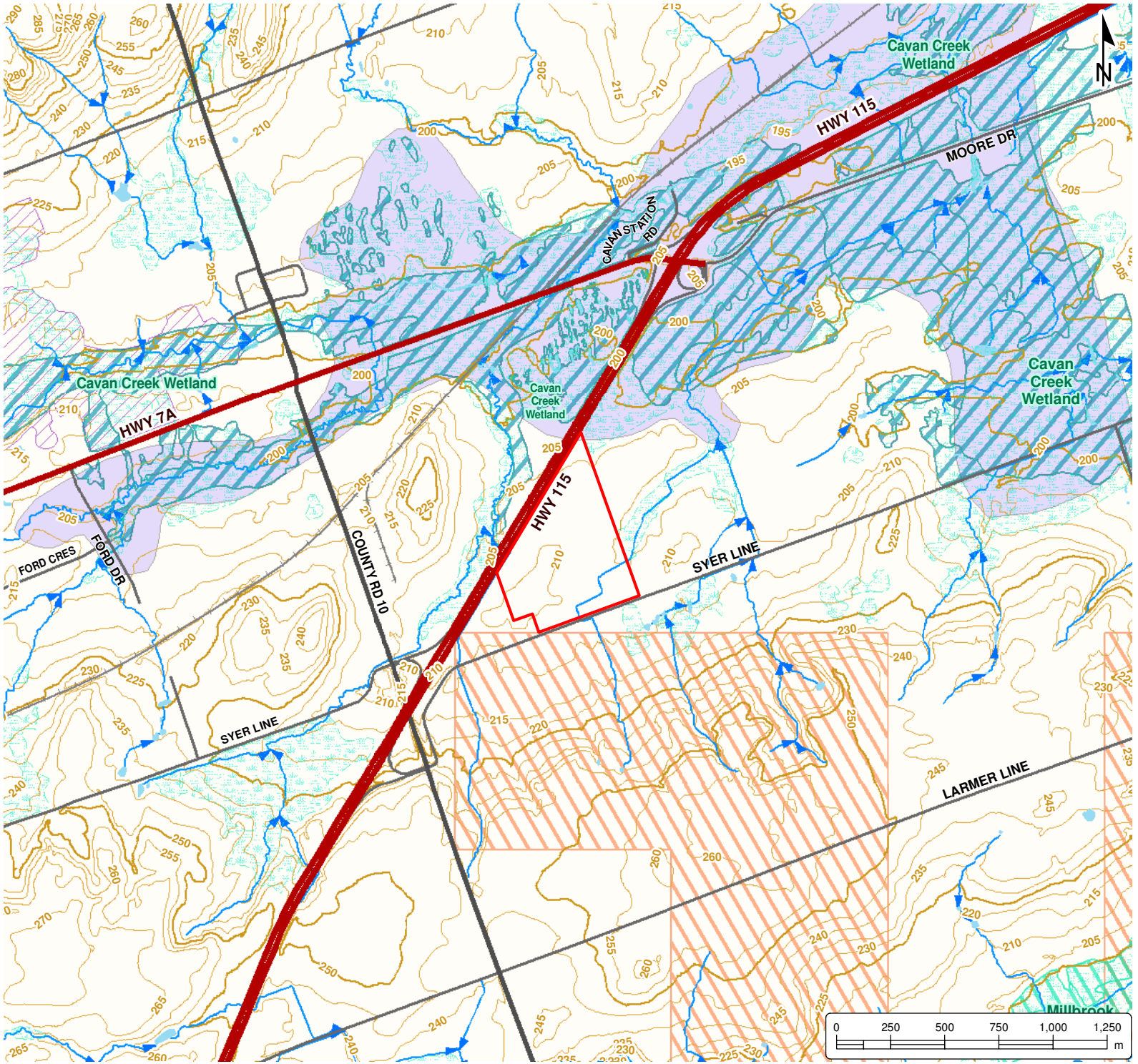

ENVIRONMENTAL IMPACT STUDY

TOWNSHIP OF CAVAN-MONAGHAN

1066 Syer Line,
Cavan-Monaghan, Ontario

LEGEND

- Highway
- Major Road
- Minor Road
- Railroad
- Watercourse, Permanent
- Contour 5m Interval (Major)
- Contour 5m Interval (Minor)
- Unevaluated Wetlands
- Locally Significant Wetlands
- Provincially Significant Wetlands
- Water Area
- Deer Wintering Area (Stratum 2)
- ANSI, Life Science
- Candidate ANSI, Life Science
- Subject Property (32.14 ha) (approximate)

Notes:
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LOCAL NATURAL HERITAGE FEATURES

Project No.:	12971-001	Date:	August 2021
		Rev.:	
Scale:	1:25,000	Projection:	NAD 1983 UTM Zone 17N
Created by:	MAT	Checked by:	ALH
Figure:	2		

O:\GIS\MXDs\12900-12999\12971-001 Township of Cavan-Monaghan - EIS - 1066 Syer Line\2021-08-04 FIG 2 - Local Natural Heritage Features.mxd

ENVIRONMENTAL IMPACT STUDY

TOWNSHIP OF CAVAN-MONAGHAN
1066 Syer Line,
Cavan-Monaghan, Ontario

LEGEND

- Amphibian Survey Location (MMP)
- Grassland Bird Survey Location (GBS)
- Aquatic Habitat Reach
- Culvert
- Lane
- Watercourse, Permanent
- Contour 5m Interval (Major)
- Contour 5m Interval (Minor)
- Vegetation Community
- 120m Adjacent Lands
- Wetland
- Provincially Significant Wetlands
- Subject Property (32.14 ha) (approximate)

Notes:
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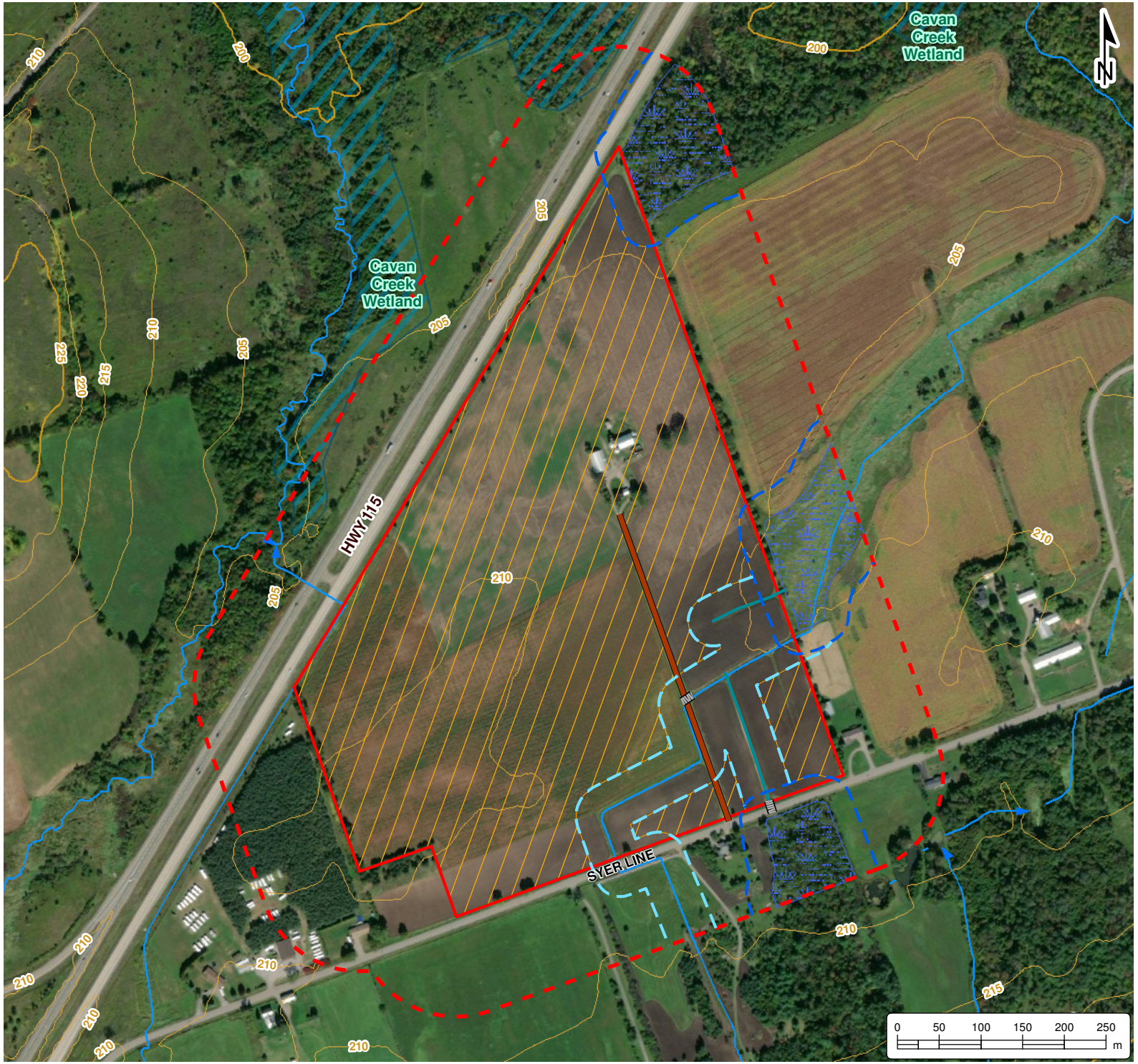
SITE NATURAL HERITAGE FEATURES

Project No.: 12971-001		Date: August 2021	Rev.:
Scale: 1:6,500		Projection: NAD 1983 UTM Zone 17N	
Created by: MAT	Checked by: ALH	Figure: 3	

O:\GIS\MXDs\12900-12999\12971-001 Township of Cavan-Monaghan - EIS - 1066 Syer Line\2021-08-04 FIG 3 - Site Natural Heritage Features.mxd



ENVIRONMENTAL IMPACT STUDY

TOWNSHIP OF CAVAN-MONAGHAN

1066 Syer Line,
Cavan-Monaghan, Ontario

LEGEND

- 30m Watercourse Setback
- 30m Wetland Setback
- Culvert
- Drainage Feature
- Lane
- Watercourse, Permanent
- Contour 5m Interval (Major)
- Contour 5m Interval (Minor)
- 120m Adjacent Lands
- Wetland
- Provincially Significant Wetlands
- Developable Area (27.63 ha)
- Subject Property (32.14 ha) (approximate)

Notes:
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SITE NATURAL HERITAGE CONSTRAINTS

Project No.: 12971-001		Date: August 2021	Rev.:
Scale: 1:6,500		Projection: NAD 1983 UTM Zone 17N	
Created by: MAT	Checked by: ALH	Figure: 4	

O:\GIS\MXDs\12900-12999\12971-001 Township of Cavan-Monaghan - EIS - 1066 Syer Line\2021-08-04 FIG 4 - Site Natural Heritage Constraints.mxd

Appendix A
Photographic Log

PROJECT NUMBER: 12971-001 DATE: May 6 & July 27, 2021 LOCATION: 1066 Syer Line, Cavan-Monaghan FIELD STAFF: Tyler Jamieson, Myles Latter, Tessa Radimer

Photo Appendix

Barn structure and silo located on the northeast side of the property, looking south. (TJ)

Barn structure and silo located on the northeast side of the property, looking northwest. (TJ)

Silo located on the northeast side of the property, looking east. (TJ)

Watercourses and Drainage Features:

Watercourse – reach 1 vegetation.

Watercourse – reach 2 outlet

Watercourse - reach 2 inlet

Watercourse – reach 2 vegetation.

Watercourse - reach 3

Watercourse - reach 3 vegetation

Watercourse – reach 4

Watercourse – reach 5 vegetation

Laneway culvert, west side.

Laneway culvert interior.

Laneway culvert, east side

Syer Line culvert, west of laneway, looking north

Syer Line culvert, west of laneway, looking north

Syer Lane culvert, east of laneway, looking south

Syer Line culvert, east of laneway, looking south

Syer Line culvert, east of laneway, looking south

Syer Line culvert, east of laneway, looking north

Appendix B
Vegetation Species List

VEGETATION COMMUNITY CLASSIFICATION: CUM1 COMMUNITY #: 1 LOCATION: 1066 Syer Line COORDINATES: 44.1953005, -78.4835413

PROJECT NUMBER: 12971-001 DATE: June 17, 2021 PROJECT MANAGER: Andrea Hicks FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Annual Fleabane	*Erigeron annuus*	*Asteraceae*	3	0			S5
Annual Ryegrass	*Lolium multiflorum*	*Poaceae*					SNA
Black Medick	*Medicago lupulina*	*Fabaceae*	3				SNA
Canada Goldenrod	*Solidago canadensis var. canadensis*	*Asteraceae*	3	1			S5
Canada Horseweed	*Erigeron canadensis*	*Asteraceae*	3	0			S5
Canada Thistle	*Cirsium arvense*	*Asteraceae*	3				SNA
Common Goatsbeard	*Aruncus dioicus var. vulgaris*	*Rosaceae*	3				SNA
Common Lamb's-quarters	*Chenopodium album*	*Chenopodiaceae*	3				SNA
Common Mullein	*Verbascum thapsus ssp. thapsus*	*Scrophulariaceae*	5				SNA
Common Peppergrass	*Lepidium densiflorum*	*Brassicaceae*	3				SNA
Common Plantain	*Plantago major*	*Plantaginaceae*	3				SNA
Common Timothy	*Phleum pratense ssp. pratense*	*Poaceae*	3				SNA
Field Horsetail	*Equisetum arvense*	*Equisetaceae*	0	0			S5
Field Pennycress	*Thlaspi arvense*	*Brassicaceae*	5				SNA
Field Sow-thistle	*Sonchus arvensis*	*Asteraceae*	3				SNA
Oxeye Daisy	*Leucanthemum vulgare*	*Asteraceae*	5				SNA
Philadelphia Fleabane	*Erigeron philadelphicus var. philadelphicus*	*Asteraceae*	-3	1			S5
Smooth Sow-thistle	*Sonchus arvensis ssp. uliginosus*	*Asteraceae*	3				SNA
Tall Tumble Mustard	*Sisymbrium altissimum*	*Brassicaceae*	3				SNA
Tufted Vetch	*Vicia cracca*	*Fabaceae*	5				SNA
White Campion	*Silene latifolia*	*Caryophyllaceae*	5				SNA
Yellow Sweet-clover	*Melilotus officinalis*	*Fabaceae*	3				SNA

NOTES: Fallow field. No thatch layer- patches of bare soil under weeds. Dominated by weedy agricultural species.

VEGETATION COMMUNITY CLASSIFICATION: CUM1

COMMUNITY #: 1

LOCATION: 1066 Syer Line

COORDINATES: 44.1953005, -78.4835413

PROJECT NUMBER: 12971-001

DATE: June 17, 2021

PROJECT MANAGER: Andrea Hicks

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: SWDM4-5 COMMUNITY #: 2 LOCATION: 1066 Syer Line COORDINATES: 44.1977079, -78.4554789

PROJECT NUMBER: 12971-001 DATE: June 17, 2021 PROJECT MANAGER: Andrea Hicks FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Black Ash	*Fraxinus nigra*	*Oleaceae*	-3	7			S3
Bur Oak	*Quercus macrocarpa*	*Fagaceae*	3	5			S5
Canada Enchanter's Nightshade	*Circaea canadensis ssp. canadensis*	*Onagraceae*	3	2			S5
Common Elderberry	*Sambucus canadensis*	*Caprifoliaceae*	-3	5			S5
Crack Willow	*Salix euxina*	*Salicaceae*	0				SNA
Eastern White Cedar	*Thuja occidentalis*	*Cupressaceae*	-3	4			S5
European Buckthorn	*Rhamnus cathartica*	*Rhamnaceae*	0				SNA
Field Horsetail	*Equisetum arvense*	*Equisetaceae*	0	0			S5
Highbush Cranberry	*Viburnum opulus ssp. trilobum var. americanum*	*Caprifoliaceae*	-3	5			S5
Nannyberry	*Viburnum lentago*	*Caprifoliaceae*	0	4			S5
Narrow-leaved Cattail	*Typha angustifolia*	*Typhaceae*	-5				SNA
Purple-stemmed Aster	*Symphyotrichum puniceum var. puniceum*	*Asteraceae*	-5	6			S5
Red Ash	*Fraxinus pennsylvanica*	*Oleaceae*	-3	3			S4
Reed Canarygrass	*Phalaris arundinacea var. arundinacea*	*Poaceae*	-3	0			S5
White Elm	*Ulmus americana*	*Ulmaceae*	-3	3			S5

NOTES: Swamp. Boundary follows property line. On private property – surveyed from property boundary.

VEGETATION COMMUNITY CLASSIFICATION: SWDM4-5

COMMUNITY #: 2

LOCATION: 1066 Syer Line

COORDINATES: 44.1977079, -78.4554789

PROJECT NUMBER: 12971-001

DATE: June 17, 2021

PROJECT MANAGER: Andrea Hicks

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: CUP3-3 COMMUNITY #: 3 LOCATION: 1066 Syer Line COORDINATES: 44.1887652, -78.4565608

PROJECT NUMBER: 12971-001 DATE: June 17, 2021 PROJECT MANAGER: Andrea Hicks FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Black Cherry	*Prunus serotina var. serotina*	*Rosaceae*	3	3			S5
Bur Oak	*Quercus macrocarpa*	*Fagaceae*	3	5			S5
Canada Goldenrod	*Solidago canadensis var. canadensis*	*Asteraceae*	3	1			S5
Common Apple	*Malus pumila*	*Rosaceae*	5				SNA
European Buckthorn	*Rhamnus cathartica*	*Rhamnaceae*	0				SNA
European Swallowwort	*Vincetoxicum rossicum*	*Apocynaceae*	5				SNA
Red Ash	*Fraxinus pennsylvanica*	*Oleaceae*	-3	3			S4
Scots Pine	*Pinus sylvestris var. sylvestris*	*Pinaceae*	3				SNA
Smooth Brome	*Bromus inermis*	*Poaceae*	5				SNA
Staghorn Sumac	*Rhus typhina*	*Anacardiaceae*	3	1			S5
Tatarian Honeysuckle	*Lonicera tatarica*	*Caprifoliaceae*	3				SNA
Virginia Creeper	*Parthenocissus quinquefolia*	*Vitaceae*	3	6			S4?
White Elm	*Ulmus americana*	*Ulmaceae*	-3	3			S5
White Oak	*Quercus alba*	*Fagaceae*	3	6			S5

NOTES: Edge is native species, then into CUP. Berm along edge. Community off site – surveyed from property boundary.

VEGETATION COMMUNITY CLASSIFICATION: CUP3-3

COMMUNITY #: 3

LOCATION: 1066 Syer Line

COORDINATES: 44.1887652, -78.4565608

PROJECT NUMBER: 12971-001

DATE: June 17, 2021

PROJECT MANAGER: Andrea Hicks

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: SWD4 COMMUNITY #: 4 LOCATION: Syer line COORDINATES: 44.1906546, -78.4492463

PROJECT NUMBER: 12971-001 DATE: June 17, 2021 PROJECT MANAGER: Andrea Hicks FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Broad-leaved Cattail	*Typha latifolia*	*Typhaceae*	-5	1			S5
Common Reed	*Phragmites australis*	*Poaceae*	-3	0			S4?
Narrow-leaved Cattail	*Typha angustifolia*	*Typhaceae*	-5				SNA
Red-osier Dogwood	*Cornus sericea*	*Cornaceae*	-3	2			S5
Reed Canarygrass	*Phalaris arundinacea var. arundinacea*	*Poaceae*	-3	0			S5
Riverbank Grape	*Vitis riparia*	*Vitaceae*	0	0			S5
Spotted Joe Pye Weed	*Eutrochium maculatum var. maculatum*	*Asteraceae*	-5	3			S5
Trembling Aspen	*Populus tremuloides*	*Salicaceae*	0	2			S5
White Elm	*Ulmus americana*	*Ulmaceae*	-3	3			S5
Willow Species	*Salix spp.*	*Salicaceae*	-				-

NOTES: South of Syer line. Dominant cover is trees.

VEGETATION COMMUNITY CLASSIFICATION: SWD4

COMMUNITY #: 4

LOCATION: Syer line

COORDINATES: 44.1906546, -78.4492463

PROJECT NUMBER: 12971-001

DATE: June 17, 2021

PROJECT MANAGER: Andrea Hicks

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

VEGETATION COMMUNITY CLASSIFICATION: MAM2-2 COMMUNITY #: 5 LOCATION: 1066 Syer Line COORDINATES: 44.1953005, -78.4835413

PROJECT NUMBER: 12971-001 DATE: June 17, 2021 PROJECT MANAGER: Andrea Hicks FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

Common Name	Scientific Name	Family	CoW	CoC	SARA	SARO	S-Rank
Broad-leaved Cattail	*Typha latifolia*	*Typhaceae*	-5	1			S5
Narrow-leaved Cattail	*Typha angustifolia*	*Typhaceae*	-5				SNA
Reed Canarygrass	*Phalaris arundinacea var. arundinacea*	*Poaceae*	-3	0			S5
Spotted Joe Pye Weed	*Eutrochium maculatum var. maculatum*	*Asteraceae*	-5	3			S5
Willow Species	*Salix spp.*	*Salicaceae*	-				-

NOTES: Meadow Marsh to east of site. Species consistent with this observed in mapped watercourse channel that extends into Site. Photo of channel in site.

VEGETATION COMMUNITY CLASSIFICATION: MAM2-2

COMMUNITY #: 5

LOCATION: 1066 Syer Line

COORDINATES: 44.1953005, -78.4835413

PROJECT NUMBER: 12971-001

DATE: June 17, 2021

PROJECT MANAGER: Andrea Hicks

FIELD STAFF: Tyler Jamieson

FIELD SHEET – Vegetation Species List

VEGETATION COMMUNITY PHOTOS:

Appendix C

Species Of Conservation Concern Screening

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Birds								
Bald Eagle	*Haliaeetus leucocephalus*	No Status	SC	S2N,S4B	The Bald Eagle is a bird of prey with a white head, neck and tail, a massive bright yellow beak, powerful legs, and a wingspan of over 2 m. It nests in a variety of habitats and forest types, almost always near a major lake or river where they do most of their hunting. These nests are usually on islands in freshwater lakes or in large trees such as the pine and poplar. During the winter, they may also be found near open bodies of water that do not freeze (1).	No	Known to occur in the general area	No further consideration required
Bank Swallow	*Riparia riparia*	THR	THR	S4B	The Bank Swallow is a small songbird of around 12 cm long with a distinctive dark breast band, that flies with quick and erratic wingbeats (1). It nests in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. This can include banks of rivers and lakes, bluffs, active sand and gravel pits, road cuts and stockpiles of soils. However, they prefer sand-silt substrates for excavating their nest burrows. They often use large wetlands as communal nocturnal roosts post-breeding or during wintering periods (2).	No	Known to occur in the general area	No further consideration required
Barn Swallow	*Hirundo rustica*	THR	THR	S4B	The Barn Swallow is a mid-sized songbird with steel-blue backs and wings, glossy in males, and a line of white spots across its upper tail. It lives in a variety of open habitats for foraging, such as grassy fields, pastures, certain agricultural crops, shorelines, cottage areas, wetlands, or subarctic tundra (2). They prefer to nest within human made structures such as barns, bridges, and culverts. Barn Swallow nests are cup-shaped and made of mud, typically attached to horizontal beams or vertical walls underneath an overhang (1).	Yes: on-site	Known to occur in the general area	Potential habitat for endangered or threatened species on-site
Black Tern	*Chlidonias niger*	No Status	SC	S3B	The Black Tern is a small waterbird with a forked tail, straight pointed bill, slender shape, and black head during breeding season. It builds floating nests in loose colonies in shallow marshes, with a preference for cattails. They breed primarily in the marshes along the edges of the Great Lakes, but may also use wetlands further north if suitable (1).	No	Known to occur in the general area	No further consideration required
Bobolink	*Dolichonyx oryzivorus*	THR	THR	S4B	The Bobolink is a mid-sized songbird of tan colour with black stripes, except for males during summer breeding season who are black with a white back and yellow collar. It prefers tall, grassy meadows, hayfields and some croplands, and feeds (largely on insects) on the ground in dense grasses (1). It tends to nest in forage crops: hayfields and pastures dominated by species including clover, bluegrass, and broadleaf plants (2).	Yes: on-site and adjacent lands	Confirmed absent through targeted surveys	No further consideration required
Canada Warbler	*Cardellina canadensis*	THR	SC	S4B	The Canada Warbler is a small songbird with bright yellow underparts and bluish-grey back and tail (1). It can be found in a variety of forest types, but is most abundant in moist, mixed forests with a well-developed, dense shrub layer. Nests are usually located on or near the ground on mossy logs, and along stream banks (3).	No	Known to occur in the general area	No further consideration required
Cerulean Warbler	*Setophaga cerulea*	END	THR	S3B	The Cerulean Warbler, a small songbird, is blue-green with white eyebrows and two prominent white wing bars (1). It requires relatively large tracts of mature deciduous forest (>100 ha), and nests in older, second-growth deciduous forests. During breeding season, it is found in relatively large tracts of mature deciduous forests that feature large, tall trees and an open understorey (4).	No	Known to occur in the general area	No further consideration required
Chimney Swift	*Chaetura pelagica*	THR	THR	S4B,S4N	The Chimney Swift is a small bird, between 12 and 14 cm, with a brown, cigar-shaped body, slender wings, and an erratic flight pattern. Prior to settlement, the Chimney Swift would mainly nest in cave walls and hollow trees. Now, it is found mostly near urban and suburban areas where the presence of chimneys or other manmade structures provide nesting and roosting habitat. They also tend to stay in habitat close to the water (1).	No	Known to occur in the general area	No further consideration required

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Common Nighthawk	*Chordeiles minor*	THR	SC	S4B	The Common Nighthawk is a medium-sized bird with long, pointed wings, a long tail with a notch, and and large eyes. Its plumage of dark brown with black and white specks blends with its roost site. It is typically found in open areas such as gravel beaches, rock outcrops and burned woodlands, that have little to no ground vegetation. This species can also be found in highly disturbed locations such as clear cuts, mine tailing areas, cultivated fields, urban parks, gravel roads, and orchards (1).	No	Known to occur in the general area	No further consideration required
Eastern Meadowlark	*Sturnella magna*	THR	THR	S4B	The Eastern Meadowlark is a medium-sized migratory songbird with a bright yellow throat and belly, a black V shape on its chest, and a pointed bill. It prefers pastures and hayfields, but is also found to breed in orchards, shrubby fields, human-use areas such as airports and roadsides, or other open areas. The Eastern Meadowlark can nest from early May to mid-August, in nests that are built on the ground and well-camouflaged with a roof woven from grasses (1).	Yes: on-site and adjacent lands	Confirmed absent through targeted surveys	No further consideration required
Eastern Whip-poor-will	*Antrostomus vociferus*	THR	THR	S4B	The Eastern Whip-poor-will is a medium-sized bird with mottled brown and grey feathers to blend in with its surroundings, a large flattened head, and small bill. They are usually found in areas with a mix of open and forested areas such as patchy forests with clearings, forests that are regenerating after major disturbances, savannahs, open woodlands or openings in more mature forests. Breeding habitat is dependent on forest structure rather than composition, although common tree associations are pine and oak, and it nests directly on the forest floor (2). The species prefers to nest in semi-open or patchy forests with clearings as it forages in open areas and uses forested areas for roosting (1).	No	Known to occur in the general area	No further consideration required
Eastern Wood-Pewee	*Contopus virens*	SC	SC	S4B	The Eastern Wood-pewee is a species of 'flycatcher', a bird that eats flying insects. It grows to approximately 15 cm, has greyish-olive upper parts and pale bars on its wings. This species lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It prefers intermediate-age forest stands with little understory vegetation (1). It typically creates nests on tree branches 2-12 m in height (2).	Yes: adjacent lands only	Known to occur in the general area	Potential significant wildlife habitat on adjacent lands
Evening Grosbeak	*Coccothraustes vespertinus*	No Status	SC	S4B	The Evening Grosbeak is a large songbird with a thick greenish bill. It is a social bird that is often found in flocks, particularly during the winter months. Their preferred habitat is thick coniferous forest. During their breeding season, they are generally found in open, mature mixed forests dominated by Firs, White Spruce, or Trembling Aspen (1).	No	Known to occur in the general area	No further consideration required
Golden Winged Warbler	*Vermivora chrysoptera*	THR	SC	S4B	The Golden-winged Warbler is a small songbird with distinctive yellow wing patches and patches behind their eyes. It inhabits early successional habitat of old fields and favour areas where trees are spread out or forest edges to use for perching, singing, and searching for food. They seem to prefer regeneration zones with young shrub growth, surrounded by mature forest, locations that have recently been disturbed, such as field edges, hydro or utility right-of-ways, or logged areas for their breeding sites; often frequenting clusters of herbaceous plants and low bushes (1).	No	Known to occur in the general area	No further consideration required
Grasshopper Sparrow	*Ammodramus savannarum*	SC	SC	S4B	The Grasshopper Sparrow is a small songbird with a streaked back, a white stripe down the center of its crown, a flattish head, and a conical beak. It inhabits open grasslands and prairies with well-drained soil, preferring areas that are sparsely vegetated. It will also nest in hayfields and pastures, as well as alvars and occasionally grain crops such as barley (1).	Yes: on-site and adjacent lands	Confirmed absent through targeted surveys	No further consideration required

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Least Bittern	*Ixobrychus exilis*	THR	THR	S4B	The Least Bittern is a small member of the heron family, reaching around 30 cm in length. It has brown and beige plumage with chestnut patches on its wings (1). The species nests in marshes (> 5 - 10 ha) and swamps dominated by emergent vegetation, preferably cattails, interspersed with patches of woody vegetation and open water. They require dense vegetation and open water with stable levels within 10 m for nesting, and access to clear, open water for foraging (4).	No	Known to occur in the general area	No further consideration required
Loggerhead Shrike	*Lanius ludovicianus*	END	END	S2B	The Loggerhead Shrike is a small bird with a black, hooked bill, grey crown, and white throat and chest. This species has specific habitat requirements that are dependent on active livestock grazing, or grassland areas that have naturally short grass cover (i.e. alvar communities). They also require spiny, multi-branched shrubs, or barbed fencing, to catch prey. They prefer grassland habitats that have sporadic occurrences of low trees and shrubs; particularly hawthorn species, which are used as part of their feeding behaviour (1).	No	Known to occur in the general area	No further consideration required
Olive-sided Flycatcher	*Contopus cooperi*	THR	SC	S4B	The Olive-sided Flycatcher is a medium-sized songbird with olive colouring, often seen perching on top of tall trees waiting to catch their prey. It prefers open areas along natural mature forest edges, forest edges near natural openings such as rivers or swamps, human-made openings, or burned forest openings with numbers of dead trees. Breeding habitat usually consists of coniferous or mixed forests adjacent to rivers or wetlands, in Ontario often nesting in White and Black Spruce, Jack Pine, and Balsam Fir (1).	No	Known to occur in the general area	No further consideration required
Red-headed Woodpecker	*Melanerpes erythrocephalus*	THR	SC	S4B	The Red-headed Woodpecker is a mid-sized bird, at around 20 cm long, with a vivid red head, neck and breast as well a strong bill. The species can be found in open woodland and woodland edges, often near man-made landscapes such as parks, golf courses and cemeteries. These areas must contain a large number of dead trees for perching and nesting (1).	No	Known to occur in the general area	No further consideration required
Short-eared owl	*Asio flammeus*	SC	SC	S2N,S4B	The Short-eared Owl has a large round head with small tufts of feathers, long wings, a short tail, and cryptic colouring of brown streaks. This species is found in scattered pockets across the province where suitable open habitat, including grasslands, tundra, peat bogs and marsh, can be found in sufficient quantities. Adults build nests on the ground in grassy areas and occasionally agriultural fields (1). The main factor influencing their choice in habitat is believed to be an abundance of their food source, primarily rodents and other small mammals (2).	No	Known to occur in the general area	No further consideration required
Wood Thrush	*Hylocichla mustelina*	THR	SC	S4B	The Wood Thrush is a medium-sized songbird of around 20 cm with rusty brown coloured upper parts and white underparts with large dark spots. It breeds in deciduous and mixed forests with moderate understories, shade and abundant leaf litter where it forages for food, including larval and adult insects as well as plant material. They prefer moist stands of trees with well-developed undergrowth and tall trees for perches (1).	No	Known to occur in the general area	No further consideration required
Fish								
American Eel	*Anguilla rostrata*	No Status	END	S1?	The American Eel is a long, slender bodied fish, with one long fin extending down the back and around the tail, and two small pectoral fins. It has thick lips, and a protruding lower jaw that extends out above the upper jaw. At the juvenile stage, they swim up the St. Lawrence River to reach Lake Ontario and connected tributaries where they will remain for 8 to 23 years before migrating back to their spawning grounds. In Ontario, the American eel prefers mud, sand or gravel substrates during the juvenile stage when they reside primarily in the benthic zone of waterbodies. More mature eels are able to thrive in most environments provided there is available cover during daylight hours, and the habitat is accessible (2).	No	Known to occur in the general area	No further consideration required

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Lake Sturgeon	*Acipenser fulvescens*	No Status	END	S2	The Lake Sturgeon, a large freshwater fish, has an extended snout with four whisker-like organs hanging near the mouth and is dark to light brown or grey on its back and sides with a lighter belly. In Ontario, this fish is found in the rivers of the Hudson Bay Basin, the Great Lakes basin, and their connecting waterways. Lake Sturgeon's live almost exclusively in freshwater lakes and rivers with soft bottoms of mud, sand or gravel and are usually found at depths of 5 to 20 m. They spawn in relatively shallow, fast-flowing water or if available deeper water habitat as well (1).	No	Known to occur in the general area	No further consideration required
Herptiles								
Blanding's Turtle	*Emydoidea blandingii*	THR	THR	S3	Blanding's Turtles are identifiable by their bright yellow throat and chin and domed shell. They spend the majority of their life cycle in the aquatic environment, usually in large wetlands or shallow lakes with high densities of water plants (1). These turtles prefer shallow, nutrient rich water with organic sediment and dense vegetation. They use terrestrial sites for travel between habitat patches and to lay clutches of eggs, often going hundreds of meters from their nearest water body. Blanding's Turtles nest in dry coniferous and mixed forest habitats, as well as fields and roadsides (2). From late October until the end of April, they hibernate in the mud at the bottom of permanent water bodies (1).	No	Known to occur in the general area	No further consideration required
Eastern Musk Turtle	*Sternotherus odoratus*	SC	SC	S3	The Eastern Musk Turtle is small with a narrow carapace, a dark brown body and two light stripes on each side of their head (5). It is a small freshwater turtle found primarily in slow moving water bodies with abundant emergent vegetation and mucky bottoms along the southern edge of the Canadian Shield within which they burrow into overwinter. Nesting sites vary, but must be close to the water and exposed to direct sunlight (1).	No	Known to occur in the general area	No further consideration required
Midland Painted Turtle	*Chrysemys picta marginata*	SC	-	S4	The Midland Painted Turtle has a olive to black carapace with red or dark orange markings on the marginal scutes, as well as red and yellow stripes on the head and neck. The species uses a variety of waterbodies including, ponds, marshes, lakes and slow-moving creeks with a soft bottom and an abundance of basking sites and aquatic vegetation. This species usually hibernates on the bottom of waterbodies (5).	No	Known to occur in the general area	No further consideration required
Northern Map Turtle	*Graptemys geographica*	SC	SC	S3	The Northern Map Turtle is a medium sized turtle identified by its carapace's map contour-like patterning. It lives in larger lakes and rivers, requiring high water quality to support their primary prey species: molluscs. This species can often be seen in large groups basking together on rocks and logs. In the winter, the Northern Map Turtle can be found hibernating on the bottom of slow-moving rivers (1).	No	Known to occur in the general area	No further consideration required
Snapping Turtle	*Chelydra serpentina*	SC	SC	S3	The Snapping Turtle, with its large serrated carapace, small plastron, and spiked tail, is Canada's largest freshwater turtle (5). It spends the majority of its life in water, preferring shallow water with soft mud and leaf litter, and will travel upland to gravel or sandy embankments, roadsides, along railway lines or beaches to lay their eggs (1).	No	Known to occur in the general area	No further consideration required
Spotted Turtle	*Clemmys guttata*	END	END	S2	The Spotted Turtle is named after the distinct yellow spots on its carapace. The species is semi-aquatic and prefers ponds, marshes, bogs and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation. This species usually hibernates in wetlands or seasonally wet areas with structures such as overhanging banks, hummocks, tree roots, or aquatic animal burrows (1).	No	Known to occur in the general area	No further consideration required

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Wood Turtle	*Glyptemys insculpta*	THR	END	S2	The Wood Turtle has orange coloured front legs, neck and chin and a sculpted carapace with raised, pyramidal scutes (5). They prefer clear rivers and streams that have moderate current, and sandy or gravelly substrates. This species spends more time on land than other turtle species including in meadows, swamps and fields. Wooded areas are an essential habitat component, and the species uses aquatic habitats for hibernation and mating. Nesting occurs in areas with sandy soil and abundant light (1).	No	Known to occur in the general area	No further consideration required
Eastern Hog-nosed Snake	*Heterodon platirhinos*	THR	THR	S3	The Eastern Hog-nosed Snake can be a variety of colours and patterns so is most easily identified by its flattened, upturned nose. They prefer sandy well-drained habitats such as beaches and dry forests because they lay their eggs, hibernate and burrow in these areas. The main diet of this snake is toads and frogs, so they usually stay close to water including marshes and swamps, where they have an increased chance of finding their preferred prey (1).	No	Known to occur in the general area	No further consideration required
Eastern Milksnake	*Lampropeltis triangulum*	SC	NAR	S4	The Eastern Milksnake's colouration is grey or tan with reddish alternating blotches otlines in black along its back and sides (5). It has recently been delisted from being a species at risk in Ontario (1). This species tends to use open habitats such as rocky outcrops, fields and forest edges. The preferred prey of milksnakes are mice, small rodents, and ground nesting birds which are amply found in and surrounding agricultural outbuildings. The milksnake is secretive and is not likely to be encountered during the day or at night while hunting (5).	Yes: on-site and adjacent lands	Known to occur in the general area	No further consideration required
Eastern Ribbonsnake	*Thamnophis sauritus*	SC	SC	S4	The Eastern Ribbonsnake is slender with three bright yellow stripes running down its back and sides and a white crescent in front of each eye. This snake is usually found close to water as they are strong swimmers, often fleeing predators by diving into shallow water. It prefers wetland habitats where its prey species, frogs and small fish, are abundant. Over winter, they congregate in underground burrows or rock crevices to hibernate (1).	No	Known to occur in the general area	No further consideration required
Common Five-lined Skink (Southern Shield Population)	*Plestiodon fasciatus*	SC	SC	S3	The Common Five-lined Skink is Ontario's only lizard species. Its Southern Shield population can be found underneath rocks on open bedrock in forests and like to bask on sunny rocks and logs. They hibernate in crevices among rocks or buried in the soil (1). They hibernate in groups under rocks and tree stumps or in rotting wood (5).	No	Known to occur in the general area	No further consideration required
Western Chorus Frog	*Pseudacris triseriata*	THR	-	S3	The Western Chorus Frog is small with a dark stripe running through its eye and a light stripe underneath (5). It is primarily a lowland terrestrial species that requires access to terrestrial and aquatic habitats in close proximity to one another. Relying on marshes and wooded wetlands adjacent to forested habitats, this species also requires isolated, predator free pools for breeding. Temporary pools, such as vernal pools in wooded areas, are preferred. This species hibernates terrestrially in a variety of environments, including leaf litter, wood debris, and vacant animal burrows (2).	No	Confirmed absent through targeted surveys	No further consideration required
Invertebrates								
Monarch Butterfly	*Danaus plexippus*	SC	SC	S2N,S4B	The Monarch is an orange and black butterfly with small white spots and a wingspan of around 10 cm. It relies on milkweed plants as a food source for growing caterpillars, but the adult butterflies forage in diverse habitats for nectar from wildflowers (1).	No	Known to occur in the general area	No further consideration required

APPENDIX: Species of Conservation Concern - County of Peterborough

COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Mottled Duskywing	*Erynnis martialis*	No Status	END	S2	The mottled duskywing is a medium-sized butterfly in the skipper family with a wingspan of 25-42 mm. It is dark grey with yellow-brown spots on its hind wings that give the species its mottled appearance and its name. The wings of freshly emerged adults have a purplish iridescence that fades with age. The mottled duskywing tends to live in dry habitats with sparse vegetation. These include open barrens, sandy patches among woodlands, and alvars. In Ontario, the mottled duskywing will only deposit their eggs on two closely-related plants: New Jersey tea and prairie redroot (1).	No	Known to occur in the general area	No further consideration required
West Virginia White	*Pieris virginiensis*	No Status	SC	S3	The West Viginia White is a small, dingy white butterfly. This species is found in moist deciduous woods, and requires a supply of toothwort, a small, spring-blooming plant, which provides the only source of food for its larvae. The West Virginia White is found mostly in the central and southern parts of Ontario, but its range extends north to Manitoulin and St. Joseph islands (1).	No	Known to occur in the general area	No further consideration required
Yellow-banded Bumble Bee	*Bombus terricola*	SC	SC	S3S5	The Yellow-banded Bumble Bee is a medium-sized bumble bee with a distinct yellow and black abdominal band pattern found on its queens, males, and workers. This species is a forage and habitat generalist, able to use a variety of nectaring plants and environmental conditions. It can be found in mixed woodlands, particularly for nesting and overwintering, as well as a variety of open habitat such as native grasslands, farmlands and urban areas. The Yellow-banded Bumble Bee ranges from the Mixedwood Plains of southern Ontario to the Hudson Bay Lowlands in the north (1).	No	Known to occur in the general area	No further consideration required
Mammals								
Tri-colored Bat	*Perimyotis subflavus*	END	END	S3?	The Tri-colored Bat is small, with pale brown with orange-red forearms, muzzle, and ears. It is named for the black, yellow, and brown hairs on its back. It is considered rare in this region of Ontario which is at the northernmost limit of the natural range. These bats prefer to nest in foliage, tree cavities and woodpecker holes, but are occasionally found in buildings; though this is not their preferred habitat. Winter hibernation takes place in caves, mines and deep crevices. Tri-colored Bats prefer an open forest habitat type in proximity to water (6).	No	Known to occur in the general area	No further consideration required
Eastern Small-footed Myotis	*Myotis leibii*	No Status	END	S2S3	The Eastern Small-footed Myotis has fur with black roots and shiny brown tips as well as very small feet. In the spring and summer, the Eastern Small-footed Myotis will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. They change their roosting locations daily and hunt at night for insects. They hibernate in winter, often in caves and abandoned mines choosing colder and drier sites than other similar bats (1).	No	Known to occur in the general area	No further consideration required
Little Brown Myotis	*Myotis lucifugus*	END	END	S4	The Little Brown Myotis has glossy brown fur and a fleshy projection covering the entrance to its ears. This species roosts in trees and buildings, often selecting attics, abandoned buildings and barns for summer colonies where they can raise their young. Little Brown Bats hibernate from October/November to March/April, most often in caves or abandoned mines that are humid and remain above freezing (1).	No	Known to occur in the general area	No further consideration required
Northern Myotis	*Myotis septentrionalis*	END	END	S3	The Northern Myotis has dull yellow-brown fur with pale bellies and long, rounded ears. This species is found in boreal forests, roosting under loose bark and in the cavities of trees. These bats hibernate from October/November to March/April, most often in caves or abandoned mines (1).	No	Known to occur in the general area	No further consideration required

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COMMON NAME	SCIENTIFIC NAME	Federal SARA	Provincial SARO	Provincial S-RANK	SPECIES DESCRIPTION AND HABITAT REQUIREMENTS	SUITABLE HABITAT	SPECIES OBSERVATIONS	ASSESSMENT
Algonquin Wolf	*Canis lycaon*	SC	THR	S4	Formerly called the Eastern Wolf, this canine was recently renamed the Algonquin Wolf. In the southern portion of the province, this species prefers deciduous and mixed forest landscapes while their northern range include mixed and coniferous forests. It is most prevalent in areas with abundant prey species which include Beaver, White-tailed Deer and Moose. Dens sites are usually found in coniferous forests with easily excavated soil types like sand and close to a permanent water source (1).	No	Known to occur in the general area	No further consideration required
Trees, plants, fungi and lichens								
American Ginseng	*Panax quinquefolius*	END	END	S2	American Ginseng is a perennial plant which grows up to 60 centimetres in height. The leaves typically have five leaflets arranged in a whorl at the end of the leaf stem. The root looks like a gnarly parsnip. The flowers are an inconspicuous green-white in colour, but the berries are bright red and arranged in a cluster. In Ontario, the American Ginseng typically grows in rich, moist, and mature deciduous woods dominated by Sugar Maple, White Ash, and American Basswood. It typically grows in deep, nutrient rich soil over limestone or marble bedrock (1).	No	Known to occur in the general area	No further consideration required
Butternut	*Juglans cinerea*	END	END	S2?	The Butternut is a medium sized tree reaching 30 m in height. It has large compound leaves with 11 to 17 leaflets. The fruit is oval, fuzzy and sticky. In Ontario, the Butternut prefers moist, well-drained soil, often along streams, or occasionally well-drained gravel sites. It grows alone or in small groups in deciduous forests (1).	No	Confirmed absent through targeted surveys	No further consideration required
Pale-bellied Frost Lichen	*Physconia subpallida*	END	END	S3	The Pale-bellied Frost Lichen resembles a light dusting of frost on a dark tree trunk. This species is found throughout eastern North America, growing in wooded areas rich in hardwood species, such as White Ash, Hop Hornbeam (Ironwood), Black Walnut, and American Elm. It is also common to find this species growing on fenceposts or boulders within or near these wooded areas. In Ontario, this species has been found in the following counties: Frontenac, Haliburton, Hastings, Peterborough, Lanark and Renfrew (1).	No	Known to occur in the general area	No further consideration required

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