Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development
Part Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

Digital Distribution Copy

Prepared For:

Riel Contracting Inc.
213 Lonsberry Lane
Douro-Dummer, Ontario
K0L 3A0

Project #: 17-2323

July 2019

ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

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July 31, 2019

Riel Contracting Inc.
213 Lonsberry Lane
Douro-Dummer, ON
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Attention: **Jason Riel**, President/Owner

Re: Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development
Part Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer, County of Peterborough
Our Project No. 17-2323

Dear Mr. Riel:

We are pleased to provide this Environmental Impact Study (EIS) for the above-referenced site within the village of Warsaw, Ontario.

The subject site is situated within the 120 m adjacent lands area of the *Warsaw Caves Complex* Provincially Significant Wetland (PSW) and contains Unevaluated Wetland and a variety of Significant Wildlife Habitats. As such, the main concern with respect to the proposed development is the potential for impacts on these Natural Heritage Features (NHF). However, by severing and re-zoning the environmentally sensitive lands and implementing the mitigation and protection measures recommended in this report, the risk of impacts will be undetectable or eliminated entirely.

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

Yours truly,
Oakridge Environmental Ltd.

Rob West, HBSc., CSEB
Senior Environmental Scientist

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1.0 Introduction

A Draft Plan of Subdivision application was submitted and approved for the subject site in 1992. Due to the amount of time that has now passed since its initial approval in 1992, supporting studies are now required to determine if the newly proposed residential development meets today's standards and policies. Based on the comments provided by the County of Peterborough dated on June 9, 2017, an unevaluated wetland, floodplain and Warsaw Caves Provincially Significant Wetland Complex (PSW) occur on the property. Therefore, an Environmental Impact Study (EIS) is required to support the updated planning application.

According to published mapping and our knowledge of the area, the known or potential Natural Heritage Features (NHF) that occur on or adjacent to the subject site include the following:

1. The Warsaw Caves Provincially Significant Wetland Complex (PSW);
2. 120 m adjacent lands to the PSW;
3. Significant Woodland;
4. Significant Fisheries;
5. Significant Wildlife Habitat (SWH), and
6. Endangered and/or Threatened Species Habitat.

As such, the mandate of this EIS is to characterize NHF on and adjacent to the site, evaluate the potential for impacts on all of the sensitive features, determine any potential development constraints and provide recommendations with respect to implementing mitigation measures that will protect these features.

2.0 General Site Description and Access

The subject site is situated in Ecoregion 6E, mostly contained within the hamlet of Warsaw, Ontario, on Part Lot 13, Concession 2, in the Township of Douro-Dummer (Figure 1). The total area of the property is approximately 24 hectares (59 acres). Portions of the subject site illustrate evidence of past farm use such as cleared meadows in the south and northwest portion of the property. Other past uses included a small aggregate extraction pit in the southwestern portion of the site. Currently the property is vacant, however, there is an abundance of trails that access the woodlands and waterfront on the site.

The property is accessed via frontage on County Road 4, north of the intersection with English Line South. Although the property also fronts onto the north side of River Lane, the site is readily accessed through a relatively new entrance off County Road 4 on the west end of the property, directly north of the Warsaw Public School property (Figure 2).

For the purpose of this study, the "site" occupies the proposed subdivision property and two adjoining, retained properties also owned by the proponent (Figure 2).

Indian River/Quarry Lake abuts the eastern side of the subject site. The site also contains a mapped unevaluated wetland that surrounds the Warsaw Caves Complex PSW. Another unevaluated wetland is mapped along the northern property boundary, and continues north of the subject site, disconnected from the PSW and associated hydrological features.

3.0 Existing Use and Proposed Development / Site Alterations

3.1 Existing Property Use

The subject site is vacant, lacks any improvement and is for all intents and purposes, un-used (other than as open space). The site appears to have previously been utilized for agricultural purposes, as the site contains remnants of stony hedgerows and fence lines. Given the stony soils, we expect that the site would have been utilized primarily for cattle grazing. Today, these former agricultural lands would best be described as scrub.

The remnants of a small sand and gravel pit occurs in the southwestern part of the site (near the boundary shared with the school property). Aggregate appears to have been extracted from an embankment. It is unlikely that the pit was of any commercial consequence.

An extensive network of existing walking/ATV trails occurs throughout the property and has been used by neighbours for recreational use (Figure 2). A number of neighbours were observed walking their dogs and/or riding bicycles on the trails during the surveys. The waterfront area is commonly used by boaters, as the large bedrock cliffs that abut Indian River/Quarry Lake provide an attractive setting for swimming.

3.2 Proposed Development/Site Alterations

It is anticipated that a privately serviced multi-residential development consisting of estate residential lots is proposed for the site. The proposed lots are expected to front onto a central internal road that will intersect with County Road 4.

The proposed development lots will be largely restricted to the cultural meadows and pine plantation area which occupy approximately three quarters of the subject property. Lot creation is expected to entirely avoid the PSW and related habitat, while accommodating a generous buffer. It is also expected that the proposed development will have regard for any additional NHF identified as part of this EIS and will comply with all setback requirements and recommendations included within. Lot density is expected to be determined by various planning requirements and pending the results of a concurrent hydrogeological study.

It is also understood that the recommended environmental buffer included in this EIS will form the limit of a severance to separate the proposed subdivision from the environmentally sensitive lands that abut the Indian River/Quarry Lake and Warsaw Caves Complex PSW.

The reader is referred to planning application documents that are being prepared by DM Wills Associates Limited (Ltd.) for details about the severance and proposed subdivision. The reader is also referred to those documents for the most recent site plan for the development.

4.0 Policy

4.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) provides policy direction on matters of provincial interest related to land use planning and development. This document stresses the need for appropriate development while protecting resources of provincial interest, public health and safety, and the quality of natural heritage features. Subsection 3.1 of the Planning Act requires that decisions made by planning authorities should be consistent with the PPS.

The excerpt below has been directly taken from Section 2.1 of the PPS (2014):

"2.1 Natural Heritage

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

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

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

2.1.4 Development and site alteration shall not be permitted in:

a) significant wetlands in Ecoregions 5E, 6E and 7E; and
b) significant coastal wetlands.

2.1.5 Development and site alteration shall not be permitted in:

a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and

7E;
b) significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
c) significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
d) significant wildlife habitat;
e) significant areas of natural and scientific interest; and
f) coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b)

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

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

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

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

2.1.9 Nothing in policy 2.1 is intended to limit the ability of agricultural uses to continue."

The proposed development will include lands that are adjacent to a known NHF (i.e., Warsaw Caves PSW complex) and potential NHF. The potential NHF include lands that are potentially suitable habitat for Species At Risk (SAR), Significant Wildlife Habitat (SWH), and potential Significant Woodlands. Based on the preceding, sections of the PPS that are directly or potentially applicable to the proposed development include 2.1.4, 2.1.5 b), 2.1.5 d), 2.1.7 and 2.1.8.

This report has been prepared to comply with the relevant policies of the PPS. The proponent's planning consultant (DM Will Associates Ltd.) has reviewed this EIS to confirm that it complies with the planning requirements of the PPS.

4.2 Growth Plan for the Greater Golden Horseshoe (Growth Plan)

In July of 2017, Ministry of Municipal Affairs (MMA) issued the Growth Plan for the Greater Golden Horseshoe (Growth Plan). The Growth Plan is a planning policy document intended to help planning authorities at all levels of government to implement a set of standardized objectives for development within their jurisdictions. Among other things, the Growth Plan established a Natural Heritage System (NHS), drafted by the Ministry of Natural Resources and Forestry (MNRF) in accordance with the PPS for the entire region. The NHS identifies NHF and prescribes certain setbacks from these features, typically in the form of a "Vegetation Protection Zone" (VPZ), also commonly referred to as a Vegetation Protection Area (VPA)[1]. The NHS and these prescribed setbacks are intended to be applicable to all new development outside the designated settlement areas within the Greater Golden Horseshoe.

Although the policy document was issued by the MMA, it delegates the responsibility to administer the policies to the local municipalities to ensure all new development conforms to the policies prescribed within. Certain NHF mapping is publically available from the MNRF, however, the NHS (and supporting technical documents) fail to define or provide mapping of Significant Woodlands. Since 2017, the Growth Plan was subsequently revised in 2019 and is now referred to as "Places to Grow: Growth Plan for the Greater Golden Horseshoe". Those revisions have placed the onus on the municipal planning level governments to devise their own NHS.

The updated Growth Plan by the province suspends the requirement to complete an evaluation of a woodland's significance until such time as the County of Peterborough and Township of Douro-Dummer identifies potentially Significant Woodland in their own NHS and also establishes their own criteria for assessing woodlands (among other items). Therefore, woodlands do not have to be assessed in the interim until the County updates their OP schedules to include their own Natural Heritage System (NHS) mapping and protocol for evaluating woodlands. Any new drafts of the Municipal level NHS, and related evaluation protocol for significant woodland, would have to undergo an extensive review and approval process. Municipalities within the County of Peterborough may also set their own standards, if they so choose.

In addition to the prescribed NHS, Section 4 of the Growth Plan titled "Protecting What is Valuable" also provides (among other items) a strategy for protecting water resource systems (i.e., key hydrologic features and key hydrologic areas) in addition to lands adjacent to NHF and water resource systems.

The western extent of the property is located within the designated hamlet boundary of Warsaw, Ontario, while a small portion on the eastern extent of the site falls outside of the

[1] For the purpose of this report, VPA is used in place of VPZ in an attempt to prevent confusion with regards to zoning regulations and bylaws.

hamlet boundary and is designated Rural and Provincially Significant Wetland (Appendix A). The residential development is proposed to occur entirely within the western portion of the subject site and is, by consequence, expected to be entirely within the designated settlement area.

Section 4.2.2, Item #1 of the revised Growth Plan, stipulates the following with respect to development within a settlement area boundary:

> "*The Natural Heritage System for the Growth Plan excludes lands within settlement area boundaries that were approved and in effect as of July 1, 2017.*"

While the proposed development is expected to be entirely outside the Growth Plan designated NHS, it is expected that NHS features identified on the site but outside the designated settlement area will require the protections afforded by the Growth Plan.

However, Section 4.2.2, Item #6 of the revised Growth Plan also stipulates the following with respect to locally defined Natural Heritage Systems:

> "*Beyond the Natural Heritage System for the Growth Plan, including within settlement areas, the municipality:*
>
>
>
> *a) will continue to protect any other natural heritage features and areas in a manner that is consistent with the PPS; and*
> *b) may continue to protect any other natural heritage system or identify new systems in a manner that is consistent with the PPS.*"

Therefore, this EIS applies the prescribed VPA to the NHS features and water resource systems identified on and adjacent to the site, thereby complying with the Growth Plan requirements and any applicable municipal (local) requirements (summarized below).

4.3 County of Peterborough Official Plan

The August 2017 County of Peterborough Official Plan (OP) Section 4.1.3.1 requires the completion of an Environmental Impact Assessment for development applications that are located on lands within or adjacent to the municipally designated Natural Heritage Features identified by Section 4.1 of the OP. For the application to be approved by the County, a study must demonstrate that there will be no adverse effects on any NHF identified in the municipality's Natural Heritage System. The guidelines for the Environmental Impact Assessment are also discussed in Section 4.1.3.1 of the OP. Considering the subject site occurs within the 120 m *adjacent lands* of the Warsaw Caves Provincially Significant Wetland Complex and an unevaluated wetland, an EIS is required to comply with policy requirements of the Official Plans (OPs) for the County of Peterborough and for the Township of Douro-Dummer (contained within the County OP).

The County OP identifies that significant Valleylands, Woodlands, Threatened & Endangered species, etc., must be addressed within the EIS. In some instances, the County GIS/NHS identifies historical occurrences of Species at Risk and an approximate map location of the SAR is provided in the pre-consultation materials. However, Significant Woodlands and Valleylands are not identified in the County GIS/NHS. The County relied on the MNRF to provide the criteria/protocols to identify Significant Fisheries Habitat, Significant Woodlands and Significant Valleylands in the past, however, the County is now proposing to draft their own NHS system that will identify these NHF within their region. The County will still rely on the proponent and their consultant to confirm these NHF through site specific investigations as part of an EIS.

Based on the proposed amendments/revisions to the 2019 Growth Plan, the NHS mapping provided in the Growth Plan does not have to be inherited by the Upper Tier and Single Tier Official Plans (OP) allowing these planning authorities to produce their own NHS. Regardless, any municipally defined NHS that is to be introduced into an OP will have to undergo a comprehensive review. Until then, there is no criteria for Significant Woodlands in the County of Peterborough nor in the Township of Douro-Dummer OP.

This report has been prepared to meet the requirements outlined in the County of Peterborough OP.

4.4 Otonabee Region Conservation Authority (ORCA)

As previously described, the property occurs within the 120 m *adjacent lands* of the Warsaw Caves Provincially Significant Wetland Complex, thereby requiring the proposed development to comply with ORCA's *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*. In addition, an unevaluated wetland and a portion of the Warsaw Caves Provincially Significant Wetland Complex also occur on-site, further emphasizing the need to comply with ORCA's requirements.

Ms. Beverly Hurford was contacted on June 16, 2017 to obtain a Terms of Reference (ToR) for the proposed residential development. Ms. Erin McGauley responded by e-mail on June 23, 2017 and stated the following:

"*As a result of the layers of natural heritage features, the inventory and assessment work for this property will be significant. The adjacent areas for the features noted (ANSI and PSW) are both 120m which encompass quite a significant portion of the property. An EIS would need to unequivocally demonstrate that the development would not have an adverse impact on the form or function of the above noted features both from a Conservation Authority policy perspective and through the PPS. Elements including SWH (specialized habitats, Deer Wintering and migration routes, rare tracked species), Species at Risk (bats, birds, plants), wetland feature mapping, ELC would all need to be included in the full EIS. This is a sensitive site that will require a full (not scoped) EIS and a well-developed rationale for any*

development within or adjacent to the identified natural heritage features."

Discussions with Ms. Hurford in a telephone conversation soon after suggested that the Terms of Reference to be applied to the site should reference ORCA's December 4th, 2015 - Environmental Impact Study (EIS) Terms of Reference & Submission Standards.

In addition to the above, ORE staff contacted Ms. Gibson (Planning Ecologist) on May 16, 2018 regarding another planning application near Warsaw, and she provided the following general requirements which would also likely apply:

- The EIS should be consistent with provincial policies, in particular the Growth Plan and PPS (SAR, SWH, PSW, sig. woodland, sig. valleylands, fish habitat). All these features have to be assessed for significance prior to the planning authority rendering a decision under the Planning Act.

- An evaluation of the key natural heritage features and key hydrological features (all wetlands, watercourses, seeps & springs) to be consistent with the Growth Plan, PPS and Official Plans.

  Please note that the provincial policies take precedence over the Official Plan policies. (*This reference was made regarding a property that occurs outside the Hamlet of Warsaw and would apply to only Growth Plan NHS related areas on-site*). Please refer to this Authority's EIS Terms of Reference.

- The province has recommended consulting with the Oak Ridges Moraine Conservation Plan Technical Papers (ORMCP) with respect to natural heritage/hydrological evaluations when it comes to the Growth Plan areas.

- As per provincial direction, any wetland boundaries on the subject property will have to be confirmed using the OWES protocol. A review of the hydrological/functional connectivity of the wetland with the PSW and/or OWES complexing rules/rationale in consultation with MNRF will be required.

- The significance of the woodland cover as per criteria outlined in the Natural Heritage Reference Manual (NHRM) will be required. Otherwise, treat the natural cover as significant. Unfortunately, neither the Township nor the County has a percentage base for woodland cover in their jurisdictions. The ORMCP technical paper for significant woodland can also be referenced.

- Significant Wildlife Habitat should be reviewed based on criteria in the NHRM and SWH Criteria Schedules for Ecoregion 6E (MNRF 2015). The ORMCP technical paper for significant wildlife habitat can also be referenced.

- Breeding bird and amphibian surveys will be required as per ORCA's 2015 ToR.

- Species at Risk table top screening and field work in consultation with MNRF should be completed.

- The Indian River is present, therefore a review of fish habitat and valleylands will be required, as well as presence/absence of any erosion and/or flooding hazard in context of the river.

This EIS has been prepared to address the requirements by ORCA's 2015 ToR and thus comply with the Conservation Authority's regulation.

4.5 Species at Risk (SAR)

4.5.1 Species at Risk Act (SARA)

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

The purpose of the SARA is to:

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

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

> ***32***. *(1) No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species.*
>
> *(2) No person shall possess, collect, buy, sell or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species, or any part derivative of such an individual.*
>
> ***33.*** *No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species, or that is listed as an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.*

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

4.5.2 Species at Risk Ontario (SARO)

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

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

The complete list of SAR in Ontario is provided by Ontario Regulation 230/08, under the ESA. However, this regulated list cannot be easily updated from year to year. Consequently, the list of SAR is updated and published on the SARO website:

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

The MNRF has published a number of methodologies/protocols that aid in assessing properties for the presence/absence of SAR, SAR habitat and "Significant Wildlife Habitat" (SWH). In addition, these protocols provide recommendations for mitigating impacts to SAR, SAR habitat and SWH.

As a result, this study has utilized those methodologies and provides recommendations that follow the most current criteria for detecting and protecting Threatened and Endangered species, Special Concern species, and any SWH identified on and immediately adjacent to the subject site.

4.6 Supporting Legislation

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

5.0 Physical Setting

5.1 Regional Geology

Soils in the study area consist predominantly of till belonging to the Dummer Complex (Figure 3). The Dummer Till is most commonly found in irregular hummocks about a metre to 5 m in height. The hummocks suggest that a stagnating ice mass was involved in deposition of the Dummer Till, possibly as a recessional or terminal moraine. While the Dummer Till matrix is a mixture of sand, silt and clay, this till unit is characterized by its stony texture, containing up to 40% stone (gravel to boulder-size clasts). The stone is almost exclusively angular to sub-angular limestone fragments.

Regionally, exposures of drumlinized Newmarket Till also occur. The matrix of the Newmarket Till is comprised of a mixture of sand, silt and clay. The till generally exhibits a low percentage of sub-angular gravel. This till is interpreted to be sub-glacially deposited and is extremely compact at depth, exhibiting well-developed fissility in some areas. A group of small drumlins is present immediately east of the site (on the east side of Indian River). The Newmarket Till is a dense and comparatively impervious soil, generally viewed as a regional aquitard.

West of the site (i.e., west of County Road 4), a small north-south trending esker occurs. No evidence of the esker appears to occur on the subject site, however, a sandy ridge feature does occur on-site which appears to parallel the Indian River, possibly indicative of a former beach deposit/sand bar. A portion of the materials along the sandy ridge have been historically extracted, presumably for use as aggregate.

Bedrock below the subject site and within the river valley consists of Bobcaygeon Formation limestone. Minor, shallow karst features such as enlarged fractures in the bedrock occur adjacent to Indian River on the site. The eastern portion of the site contains a small bedrock collapse feature, with large blocks of limestone bedrock strewn on the floor of the feature obscuring details about it's origin. It is expected that blocks of bedrock may have been historically mined (quarried) in this area but it is unclear whether the origin of this feature was natural or simply represents a primitive quarry. The feature occurs approximately 50 m from Quarry Lake and is elevated west of the bedrock scarp that abuts the lake, suggesting this feature may simply represent a primitive quarry. The depth of extraction appears to have been on the order of 2 m, likely removing "cap rock" slabs.

There are no known karst hazards (i.e., dolines, caves, etc.) surface expressions on the site despite the site's proximity to well formed karst hazards at the Warsaw Caves Conservation Area, located within 1 km of the subject property.

5.2 Topography and Drainage

Topographic relief across the site is approximately 15 m, as measured from the northern property boundary to Indian River/Quarry Lake (Figure 4). The topography slopes gradually from the northwest to a flat plain associated with the river valley bottom. The slopes are dominated by stony soils whereas the bottom lands mostly consist of sand and limestone bedrock outcrop/subcrop.

Drainage across the site is generally from northwest to southeast, ultimately discharging to Quarry Lake, an artificial lake created by the damming of Indian River in the nearby village to the south of the subject site. The flooded area extends northward, into the Warsaw Caves Conservation Area. The Indian River (and Quarry Lake) is a deeply incised feature which was an ancient glacial spillway during the post-glacial period.

Published mapping indicates that a large Provincially Significant Wetland (PSW) referred to as the "Warsaw Caves Complex" occurs along the site's southeastern shoreline. A mapped unevaluated wetland extends further inland from the PSW. North of the wetland, a steep limestone scarp feature forms the shoreline.

5.3 Published Constraints

ORE staff conducted an initial review of the available databases/published mapping resources. A series of inspections were conducted throughout the growing period to confirm the information provided by these resources. The features identified are summarized below:

- The extent of the Warsaw Caves Provincially Significant Wetland Complex, as provided by published mapping resources, accurately reflected observations made at the site.

- An unevaluated wetland (as mapped by MNRF) in the southern portion of the site, surrounding the PSW, had been identified. Detailed inspections were directed to examine the nature of this mapped feature and determine the accuracy of the available mapping. Considering these features are often mapped utilizing aerial photography and computer software that identifies wetland, it is up to ORE staff's discretion to refine the wetland boundary as necessary in accordance with the Ontario Wetland Evaluation System - Southern Manual.

- A second unevaluated wetland (as mapped by MNRF) in the northern portion of the site was identified in the Land Information Ontario (LIO) database. Detailed inspections were directed to examine the nature of this mapped feature and determine the accuracy of the LIO mapping. Considering these features are often mapped utilizing aerial photography and computer software that identifies wetland, it is up to ORE staff's discretion to refine the wetland boundary as

necessary in accordance with the Ontario Wetland Evaluation System - Southern Manual.

- ORE staff reviewed a series of databases as part of the background research. These databases possess mapping that indicate the presence of historical SAR encounters by others. The site was attended a number of times during the peak season to detect flora and fauna. The site visits were conducted according to the variety of protocols to detect all species of fauna with particular attention given to provincial SAR. A few SAR have been detected either on-site or in the vicinity of the site. This report provides more details regarding the identified SAR.

- In addition to the above, the databases can provide information regarding SWH which can include Areas of Natural and Significant Interest (ANSI), deer wintering areas, caves providing reptile and bat hybernacula, etc. The site was inspected for the potential of SWH based on general habitat characteristics (i.e., vegetation types, etc). This SWH screening exercise aided in directing the detailed field inspections based on the SWH criteria and protocols. These are briefly discussed in a subsequent section of this report.

6.0 Information Resources

6.1 Ministry of Natural Resources and Forestry

6.1.1 Natural Heritage Information Centre (NHIC)

The NHIC is an online database managed by the MNRF. The province has divided the Geographic Information System (GIS) mapping database into a grid consisting of 1 km^2 areas or *regional squares,* each given a unique identifier. The mapping interface allows for each square to be searched for historical SAR occurrences and for *Areas of Natural and Scientific Interest* (ANSI).

The 1 km square area containing the subject site and areas within 120 m of the subject site is 17QK2824. The NHIC query data (as of the date of this report) are presented in Appendix B. Appendix B also contains an excerpt of the main map obtained from the NHIC database geographic query. The map provides the approximate locations of the Element Occurrences and Natural Areas listed below.

Common Name	Scientific Name	S-Rank	SARO Status	Date
Eastern Wood-Pewee	*Contopus Virens*	S4B	Special Concern	N/A

Natural Feature Name	Common Name
Natural Area	Warsaw Caves
Natural Area	Warsaw Caves Complex

The NHIC also states that the subject site is known to possess Stratum 2 Deer Wintering SWH that extend north towards the Warsaw Caves area.

6.1.2 MNRF District Office

ORE staff contacted the MNRF Peterborough District Office on March 14, 2018 to obtain a list of potential SAR on file for the general area of the subject site. MNRF staff also typically provide recommendations for the survey periods and protocols for completing the surveys to detect SAR in these EISs.

Ms. Liz Spang (MNRF District Planner) provided a response on March 21, 2019. The MNRF response has been included in Appendix B.

The SAR in the list provided by the MNRF were searched/investigated for as per the currently preferred methodologies.

6.2 Ontario Breeding Bird Atlas (OBBA)

The OBBA provides up-to-date reliable information regarding birds within Ontario and is managed by Bird Studies Canada (BSC). This includes species descriptions, habitats, ranges, documented sightings, etc.

The site occurs within the 10 km^2 area mapped as Square 17QK22 - Peterborough Region. The Summary Sheets for this atlas area are provided in Appendix C.

According to the OBBA, significant breeding species that could potentially be associated with habitats in the site area include the following:

Common Name	**Scientific Name**	**SARO Status**
Bank Swallow	*Riparia riparia*	Threatened
Barn Swallow	*Hirundo rustica*	Threatened
Black Tern	*Chlidonias niger*	Special Concern
Bobolink	*Dolichonyx oryzivorus*	Threatened
Chimney Swift	*Chaetura pelagica*	Threatened
Common Nighthawk	*Chordeiles minor*	Special Concern
Eastern Meadowlark	*Sturnella magna*	Threatened

Eastern Wood-Pewee	*Contopus virens*	Special Concern
Grasshopper Sparrow	*Ammodramus savannarum*	Special Concern
Least Bittern	*Ixobrychus exilis*	Threatened
Olive-sided Flycatcher	Contopus cooperi	Special Concern
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Special Concern
Wood Thrush	*Hylocichla mustelina*	Special Concern
Eastern Whip-poor-will	*Caprimulgus vociferus*	Threatened

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

6.3 Significant Wildlife Habitat

The MNRF maintains a database of wintering habitats collected from the Natural Resources Values Information System (NRVIS) which is publically available to download from Land Information Ontario (LIO). According to the database, a Stratum 2 Deer Yard occurs on and immediately adjacent to the site. An assessment of this SWH is included in a subsequent section of this report.

Currently, with the exception of wintering habitats, there is no central database that can be utilized to identify all SWH in Ontario. Rather, the MNRF provides criteria for SWH on an Ecoregion basis for agencies and other professionals to assess potential SWH based on site specific conditions. Therefore, our study relies on the criteria found in the document titled *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6e* (MNRF, January 2015) for the assessment.

6.4 e-Bird

According to the e-Bird Geographic Information System (GIS) database, a "hotspot" location referred to as the Warsaw Caves Conservation Area site occurs approximately 4.5 km north of the subject site.

A total of one hundred and eleven (111) bird species were detected at this hotspot. Among the birds detected, the following SAR species were identified:

- Bald Eagle
- Barn Swallow
- Canada Warbler
- Common Nighthawk
- Eastern Wood-Pewee
- Evening Grosbeak
- Grasshopper Sparrow
- Olive-sided Flycatcher
- Whip-poor-will
- Wood Thrush

The status of these bird species is already provided in the Section 6.2 above. These species are consistent with the information provided by OBBA and are likely the same occurrence data.

Among the SAR birds, six (6) of the species may find the subject site and immediately surrounding areas attractive: Canada Warbler, Common Nighthawk, Eastern Wood-Pewee, Olive-sided Flycatcher, Whip-poor-will and Wood Thrush.

The hotspot data set for Warsaw Caves Conservation Area is provided in Appendix D.

6.5 iNaturalist

According to the iNaturalist Geographic Information System (GIS) database, one (1) Special Concern species has been identified in the general vicinity of the subject site, including the following:

- Midland Painted Turtle *Chrysemys picta marginata*

There is suitable habitat for Midland Painted Turtle within the unevaluated wetland and the PSW on the east side of the subject site and/or within the Indian River. Although the Midland Painted Turtle is not listed as a SAR in Ontario, this species is considered as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and would have some local significance. However, this species is not listed in Schedule 1 of the Species at Risk Act (SARA).

6.6 Fish ON-Line

Fish ON-Line is a Geographic Information System (GIS) database for water bodies located in Ontario, which is currently run by the Ministry of Natural Resources and Forestry (MNRF). This GIS database provides information of fish stocking by MNRF and observations made by the public. The following fish species have been detected within Quarry Lake/Indian River in Warsaw according to the database:

- Common Carp *Cyprinus carpio*
- Largemouth Bass *Micropterus salmoides*
- Muskellunge *Esox masquinongy*
- Pumpkinseed *Lepomis gibbosus*
- Walleye *Sander vitreus*
- Smallmouth Bass *Micropterus dolomieu*
- Rock Bass *Ambloplites rupestris*
- White Sucker *Catostomus commersonii*
- Yellow Perch *Perca flavescens*

ORE staff conducted surveys from the surface of the water and attended the shoreline area during the evening hours to detect Walleye.

Based on the fisheries and hydrological importance/sensitivity of Indian River/Quarry Lake, ORE staff considers Indian River/Quarry Lake to be a Significant Fisheries habitat.

7.0 Ecological Findings

7.1 Site Inspection Summary

Prior to conducting the detailed site inspections for this EIS, ORE staff reviewed the species listed within Section 6 of this report and the species associated with SWH that could occur on the property. The inspections were then conducted to optimize the probability of visually or audibly encountering the listed species. These frequent inspections enabled detection of all species, including species not already listed in this report. Recent inspections were conducted according to the new protocols offered by the MNRF for certain SAR, where suitable habitat was present on-site.

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

Table 1: Field Inspection Summary

Date and Time of Inspection	Temp. ^{o}C	Beaufort Wind Scale	Purpose of Inspection	Conditions
August 1, 2017 8 AM	26	2 - Light Breeze	Initial Site Inspection to detect SAR such as Butternut, Migratory Birds, staging areas, preliminary ELC mapping etc.	Hot and Humid - Dry with Minor Breeze. Sunny with Minor Cloud Cover.
November 8, 2017 10 AM- 4:30 PM	-7	3 - Gentle Breeze	Late Fall Season/early winter for deer wintering browsing, fall grasses and sedges. Bat Snag mapping.	No Snow - Grey 100% Cloud Cover
January 9, 2018 10 AM- 5 PM	-12	4 - Moderate Breeze	Winter season Deer Wintering and Bat Snag mapping. Winter Birds such as Evening Grosbeak.	Sunny with Minor Cloud - Snow The Night Before, Breezy Swaying Branches and Windchill.

Date and Time of Inspection	Temp. ^{o}C	Beaufort Wind Scale	Purpose of Inspection	Conditions
May 1, 2018 9 PM to 12 PM.	20	3 - Gentle Breeze	Early Breeding Bird and spring ephemeral flora. Flooding and early amphibian detection for Western Chorus Frog. Reptile Emergence.	Cloudy and Cool
May 29, 2018 6 PM to 11 PM	14	1 - Light Air	Prime time Nocturnal Breeding Bird Surveys, detection of all fauna. SAR Reptile Detection Methods Employed	Clear
June 5, 2018 5 AM to 10 AM	11	2 - Light Breeze	Early Morning Breeding Bird. Fauna and Flora Surveys. ELC mapping and soils work.	Overcast
June 25, 2018 5 AM to 11 AM 8 PM to 11 PM	16	1 - Light Air	Early Morning and Evening Breeding Bird. Fauna and Flora Surveys. ELC mapping and soils work.	Clear Skies
July 4, 2018 5 AM to 11 AM	18	1 - Light Air	Early Morning Breeding Bird. Fauna and Flora Surveys. Refining of ELC mapping.	Clear Sky, 10% Clouds.
July 29, 2018 5 PM to 11 PM	29	1 - Light Air	Late summer Grass and Sedge Identification. Migratory Birds/Fledgling Period.	Clear Sky, 10% Clouds.

During the inspections, all flora and faunal observations were recorded. A considerable amount of hours were spent inspecting flora and fauna, not including the initial site inspections and observations made by ORE staff during concurrent technical investigations. It is the author's opinion that the number of hours and spacing of the inspection dates was sufficient to detect all species.

In addition, ORE hydrogeological staff have been trained internally to identify a large majority of SAR in the field and were periodically on-site from April 2018 (additional hydrogeological investigations are on-going at the time of this report).

The methodologies and protocols for the site inspections are provided below. The results of the inspections are summarized in a subsequent section of this report.

7.2 Survey Methodologies/Protocols

7.2.1 Vegetation

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

Prior to conducting the site inspections, aerial photography of the subject site was reviewed to roughly delineate communities based on recognizable vegetation differences. Each identified community was subsequently inspected through soil and detailed vegetation analysis/inventories. Dominant vegetation types were recorded and boundaries of the various communities mapped using a differential GPS. Soil characteristics were determined using the methods outlined in the *Field Manual for Describing Soils in Ontario* (2009) where the results are used to further classify the ecological community.

The site possesses some wetland-type vegetation communities and these areas were investigated from the perspective of whether they were mapped correctly and/or whether they may contain a Species at Risk. The extent of wetlands that occur on the site were confirmed and/or refined by a Southern Ontario Wetland Evaluation System (OWES) qualified ORE staff member/evaluator.

With respect to the PSW, the purpose of the inspections was not to re-evaluate the PSW, but simply to confirm the boundary of this feature and to detect whether any SAR occur within 120 m of the wetland boundary.

7.2.2 Avifauna

ORE staff attended the site a total of five (5) times during the breeding bird season and conducted point-count surveys according to, and exceeding, the OBBA survey protocol. During the July 4th site visit, a total of fifty-four (54) species of bird were detected, and therefore should be considered breeding bird period data. ORE staff attempted to detect all available avian species by sight, calls and notes, both within and proximal to the property. Bird calling devices and "pishing and squeaking" were used to attract bird species from within the forest communities to the edge of the property, outside of the morning chorus hours. A total of seven (7) point count locations were attended during the surveys, however, ORE staff detected all species at all times while conducting vegetation surveys, etc., at the site.

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

The avian surveys did not stop during the early morning time periods; the afternoons were spent searching the wetlands and inventorying plant species on the property within the agricultural and woodland settings, which were also useful in flushing and detecting bird species.

Four (4) night inspections were completed on-site to determine whether any nocturnal Species at Risk avian were present. The nocturnal surveys were completed between 9 PM and 12 AM on May 1st, 29th, June 25th, and July 29th, 2018. The timing for these site inspections were ideal for identifying whether nocturnal SAR are using the site as all four inspection dates are within four days of the full moon phase which is ideal for detecting Eastern Whip-poor-will and other nocturnal bird species.

7.2.3 Mammals

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

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

Potential deer wintering areas were inspected in January 2018 when 20 cm (or greater) snow accumulations were present on the subject property.

Bat snag surveys to examine potential roosting habitats were conducted in November 2017 and January 2018 following the methodology described by the Guelph District MNRF protocols issued in 2017 for wooded ecosites.

7.2.4 Herpetiles

The protocol employed for detection of Herpetiles followed MNRF's March 1998 - Wildlife Monitoring Programs and Inventory Techniques for Ontario. The surveys of basking habitats were completed during the spring and summer season, when most herpetiles are active. The surveys were conducted during warm, low wind conditions, which were ideal for detecting basking snakes and lizards.

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

ORE staff also checked beneath rubble materials, plywood pieces, and other artificial cover objects looking for basking snakes in the early morning and evening heat.

In addition, ORE staff completed evening surveys for the purpose of collecting nocturnal avian data and to identify amphibian species utilizing the site. The amphibian surveys were conducted according to the MNRF's Marsh Monitoring Program (MMP). This program identifies the abundance of amphibians according to a numerical scale (from 1-3) such that:

- 1 = 1 to 2 individuals calling;
- 2 = there are several individuals calling, however, the number of individuals can still be identified; and,
- 3 = an abundance of amphibians calling and it is either very difficult to or impossible to determine the number of individuals due to overlap in the number of calling males.

The primary PSW body would likely provide suitable habitat for SAR turtles from the spring into mid-summer. However, water levels tend to decline in these large shallow marshlands in the late summer, which would cause this turtle to look elsewhere for deep water cover during this period. The elevated waters during the spring season would however, allow any females seeking nesting sites to migrate further upland during this elevated water season.

7.2.5 Fisheries

The Indian River, located adjacent to the property to the east, was visually inspected for fish species. ORE staff did not obtain a licence to collect fish from the MNRF, as the location of the development is approximately 85 m (or greater) from the edge of the river.

ORE staff also attended the site during the prime spawning period (May-June) to observe the use of Indian River. Flashlights were utilized to detect the number and types of spawning species, and daytime observations were also made.

7.2.6 Significant Wildlife Habitat (SWH)

As indicated above, SWH has been evaluated utilizing the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 6e*, published by the MNRF in January 2015.

Potential SWH identified as part of the initial site inspection included the woodlands, grasslands and waterways. Those areas were evaluated according to the criteria outlined in the schedules for candidate SWH. The SWH tables were consulted to assess whether the site possesses Seasonal Concentration Areas of Animals, Rare Vegetation Communities, Specialized Habitats of Wildlife considered SWH, and Animal Movement Corridors.

The potential SWH and SAR habitats contained within the site or immediately adjacent to the site are discussed in detail in a subsequent section of this report.

7.3 Vegetation

7.3.1 General

Based on our site observations, ten (10) types of vegetation communities were identified within or immediately adjacent to the subject property (i.e., within 120 m). As per the Ecological Land Classification for Southern Ontario (FG-02), 1998, the vegetation communities identified on and immediately adjacent to the site include the following:

Wetland/Aquatic Habitats:

1. Cattail Mineral Shallow Marsh (MAS2-1)
2. White Cedar-Hardwood Mineral Mixed Swamp (SWM1-1)

Cultural Habitats:

3. Mineral Cultural Meadow (CUM1)
4. Sumac Cultural Thicket (CUT1-1)

Forested Habitats:

5. Fresh-Moist White Cedar Coniferous Forest (FOC4-1)
6. Dry-Fresh White Pine-Red Pine Coniferous Forest (FOC1-2)
7. Dry-Fresh Cedar Coniferous Forest (FOC2)
8. Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1)
9. Fresh-Moist White Cedar Coniferous Forest (FOC4)
10. Dry-Fresh White Pine-Maple-Oak Mixed Forest (FOM2)

Figure 5 illustrates the distribution of vegetation communities on-site as well as the locations of the soil analysis. These habitats and their associated vegetation and environmental characteristics are discussed below. Figure 6 illustrates the conditions on-site.

Appendix E contains the list of floral species that were identified on the property during the inspections. The ELC cards are found in Appendix F.

7.3.2 Wetland/Aquatic Habitats

1. Cattail Mineral Shallow Marsh (MAS2-1)

According to the ELC, MAS2-1 communities can experience variable flooding regimes and water depths of up to 2 m. These zones typically have mineralized substrates, are seasonally flooded and represent the core zone within the wetland.

This habitat comprises the majority of the PSW that is located in the southeast portion of the site and is surrounded by wooded swamp. This community is dominated by Broad-leaf Cattail (*Typha latifolia)* and Narrow-leaved Cattail (*Typha angustifolia*), with minor occurrences of Canada Blue-joint (*Calamagrostis canadensis*) and Reed Canary Grass (*Phalaris arundinacea*).

The MAS2-1 aquatic community would be ecologically sensitive to any encroachment or imposition by any development. However, the proposed development will not occur within nor encroach on this Ecosite. A soil analysis was not completed in this Ecosite.

2. White Cedar-Hardwood Mineral Mixed Swamp (SWM1-1)

The ELC describes the White Cedar-Hardwood Mineral Mixed Swamp (SWM1-1) as having tree cover present in greater than 25% of the Ecosite, with a relatively even mix of deciduous and coniferous species. This Ecosite is dominated by Eastern White Cedar (*Thuja occidentalis*) and hardwood species such as American Elm (*Ulmus americana*) and Red Maple (*Acer rubrum*). The ground cover consists of a mixture of Rock Polypody (*Polypodium virginianum*), Sensitive Fern (*Onoclea sensibilis*) and Ostrich Fern (*Matteuccia struthiopteris*) with varying occurrences of woody debris (trunks and branches) from fallen trees on the forest floor.

The SWM1-1 Ecosite contains shallow bedrock topography, with exposed fractured bedrock visible on the surface. As a result, it is expected that this area represents an important recharge area immediately adjacent to the Indian River/Quarry Lake.

This type of habitat constitutes the unevaluated wetland area that surrounds the PSW. The mixture of conifer and deciduous species occur as a result of the discharge and recharge conditions on the slopes in this area. The types of tree species observed in this community on-site are Eastern White Cedar, Yellow Birch (*Betula alleghaniensis*), Paper Birch (*Betula papyrifera*), White Ash (*Fraxinus americana*), Trembling Aspen (*Populus tremuloides*), Black Ash (*Fraxinus nigra*), and the occasional Red Maple. The groundcover consists of Spinulose Wood Fern (*Dryopteris carthusiana*), Wild Sarsaparilla (*Aralia nudicaulis*), minor Jack-in-the Pulpit (*Arisaema triphyllum*) and Sensitive Fern, among other damp to moist related species.

This wooded swamp occurs within the boundary of the PSW and the unevaluated wetland,

slightly upgradient of the marshy areas associated with the PSW. The SWM1-1 forms the wetland boundary illustrated on Figure 5 and is considered sensitive, as cool waters from this feature contribute to both the PSW and Quarry Lake system. None of the proposed development is to occur within this Ecosite.

Soil analysis was not completed in this Ecosite.

7.3.3 Cultural Habitats

3. Mineral Cultural Meadow (CUM1)

CUM communities result from cultural or anthropogenic-based disturbances/alterations to land. Tree cover is typically less than 25% and the presence of shrubs is also less than 25%.

The main groundcover associated with this community consists of meadow-type species such as non-native and native grasses and wildflowers. Typically, these species tend to congregate within recently or continually broken or disturbed open ground where the trees have been cleared.

The proposed development area is intended to occur predominantly within these cultural vegetation areas in the western portion of the site (i.e., west of the wooded swamp described above).

The cultural meadow on the property contains species such as Cheatgrass (*Bromus tectorum*), Orchard Grass (*Dactylis glomerata*), Wild Timothy (*Phleum pratense*), Wild Carrot (*Daucus carota*), Annual Bluegrass (*Poa annua*), Canada Goldenrod *(Solidago canadensis*), New York Aster (*Symphyotrichum novi-belgii*), etc.

The shrubs mostly consist of European Buckthorn (*Rhamnus cathartica*), White Pine (*Pinus strobus*), Common Juniper (*Juniperus communis*), Eastern Red Cedar *(Juniperus virginiana*) and Tartarian Honeysuckle (*Lonicera tatarica*).

A hand auger probe was conducted in this Ecosite to explore the soil composition in this area. Hand Auger 1 (HA-1) was completed to a depth of 41 cm where it was met with bedrock refusal. An initial light brown silty sand horizon was observed to a depth of 16.5 cm deep. The following layer exhibited a brown sandy loam composition that persisted to end bottom of the auger at 41 cm. No mottles or gley were observed during this soil analysis.

This is not a significant community in the province of Ontario and is a common cultural habitat.

4. Sumac Cultural Thicket (CUT1-1)

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

The most southerly CUT1-1 community consists of Staghorn Sumac (*Rhus typhina*) which is the dominant species. However, the Ecosite also possesses other cultural species observed in the previous community beneath the sumac, including Common Milkweed (*Asclepias syriaca*), European Buckthorn (*Rhamnus cathartica*), Red Clover (*Trifolium pratense*), Meadow Timothy (*Phleum pratense*), White Sweet-Clover (*Melilotus albus*), and minor occurrences of Scots Pine (*Pinus sylvestris*). This Ecosite has become overgrown with non-native species in the meadow environment beneath the Staghorn Sumac.

A second hand auger probe (HA-2) was conducted within this Ecosite and was completed to a depth of 85 cm where it was met with refusal, presumably on a boulder/bedrock. The A horizon had a consistent effective texture of Sandy Clay Loam (SCL) to a depth of 35 cm. The B horizon possessed a texture of Sandy Loam at the depth of 35 cm to 46 cm. The final C horizon ranged from 46 cm to 85 cm and possessed a texture of sand. The moisture regime was "Dry-Fresh" (defined as "0 to 2" in the Field Manual for Describing Soils in Ontario). No gleys or mottles were observed during the soil analysis in this polygon suggesting that water does not elevate to shallow substrates in this community.

This is not a significant community in the province of Ontario and is a common cultural habitat.

The proposed development area is intended to occur predominantly within the cultural vegetation areas on the site.

7.3.4 Forested Habitats

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

The Fresh-Moist White Cedar Coniferous Forest (FOC4-1) possesses a damp to moist moisture regime that can possess a variety of wetland related species. In this instance, the tract of white cedar forest occurs on a slope in the northern forested portion of the property (Figure 5) and would be considered the damp end of the moisture regime, rather than moist.

This wooded area is dominated by Eastern White Cedar with a few other species thriving beneath the canopy in the sunny openings, other than Buckthorn in the interstitial spaces. The slope is a cool damp regime beneath the cedars. Typically, a mature cedar stand is much less scrubby, and more open between stems. This community is almost exactly the same as the FOC4 (discussed later on) community identified on-site other than some slight differences

in vegetation content (i.e., larger percentage of Eastern White Cedar).

The FOC4-1 Ecosite contains shallow bedrock topography, with exposed fractured bedrock visible on the surface. As a result, it is expected that this area represents an important recharge area immediately adjacent to the Indian River/Quarry Lake. Seasonal groundwater discharge at the base of the Dummer Moraine topography immediately west of this community can be observed during the spring freshet. As a result, this woodland would be considered a significant groundwater discharge/recharge feature. The presence of bedrock at surface precluded soil probe investigations.

A hand auger probe (HA-5) was attempted in this area, however, the soils were too shallow and bedrock refusal was almost immediate. Therefore soil analysis were not completed.

6. Dry-Fresh White Pine-Red Pine Coniferous Forest (FOC1-2)

The Dry-Fresh White Pine-Red Pine Coniferous Forest, as per the ELC, possesses 60% or more canopy cover, 75% of which must be dominated by a coniferous species. FOC1-2 must possess White Pine (*Pinus strobus*) or Red Pine (*Pinus resinosa*) separately, dominant or in variable mixtures.

This Ecosite community occurs within the western portion of the site (abutting the Warsaw Public School fields) and consists of a planted woodland that has evolved into a somewhat naturalized woodland. The succession of Sugar Maple (*Acer saccharum*) and other native understorey species suggests that this community is becoming a more naturalized woodland. However, it is still in the early stages of this succession with the majority of non-plantation species in the understorey being only a few metres tall, or less. It also contains an abundance of European Buckthorn, Tartarian Honeysuckle (*Lonicera tatarica*) and minor occurrences of Glossy Buckthorn (*Rhamnus frangula*).

Hand Auger 3 (HA-3) was conducted in this Ecosite to explore the soil composition in this area. The auger probe was completed to a depth of 65 cm where it was met with bedrock refusal. An initial brown loam horizon was observed to a depth of between a depth of 0 cm to 23 cm. The next layer exhibited a brown light loam composition that persisted to a depth of 56 cm. The final horizon was observed from a depth of 56 cm to 64 cm and possessed a sandy loam texture. No mottles or gley were observed during this soil analysis.

Although this woodland has some value with respect to cover and stabilization of soils, it is still considered a cultural woodland community and would not be considered significant, especially in comparison to the more mature woodlands on the property.

Therefore, it is expected that the development could be targeted within this community. Tree retention on the proposed lots as a means of maintaining the vegetated cover should be considered.

7. Dry-Fresh Cedar Coniferous Forest (FOC2)

The ELC describes the Dry-Fresh Cedar Coniferous Forest (FOC2) as possessing coniferous species, dominated by Eastern White Cedar (*Thuja occidentalis*), in greater than 75% of the canopy. Ground cover may include Bracken Fern (*Pteridium aquilinum*) and Wild Sarsaparilla (*Aralia nudicalis*), typically over shallow sands with a Dry to Fresh soil moisture regime.

This community occurs as a small young tract that divides the two cultural meadow communities (CUT1-1 to the north and CUM1 to the south). This community represents a former fencerow left over from past agricultural activities on the site. An existing trail now crosses through this community in the approximate mid-portion of the property.

The woodland consists of relatively young Eastern White Cedar regrowth that occurs in clumps which dominate the area. Very little groundcover species were observed beneath the canopy of this community, other than in the minor openings where the cedar is unable to compete. In these minor openings, the groundcover species associated with the meadow-type species tends to congregate.

Some minor Bracken Fern and Wild Sarsaparilla were observed in the minor openings of this woodland. This young coniferous woodland does not represent a significant feature and could be developed.

A soil analysis was not completed in this Ecosite, however, the terrain was observed to be similar to that of the CUT1-1 community.

8. Dry-Fresh Sugar Maple Deciduous Forest (FOD5-1)

According to the ELC, this wooded area is dominated by Sugar Maple (*Acer saccharum*), and can also contain minor amounts of Hop Hornbeam (*Ostrya virginiana*), American Basswood (*Tilia americana*), Red Oak (*Quercus rubra*) and Large-tooth Aspen (*Populus grandidentata*). The moisture regime is moderately dry to fresh, possessing a shallow sandy substrate on relatively well drained slopes or tablelands.

These deciduous forest segments occur in the upland areas west of the white cedar coniferous swamp areas (Figure 6). The forest was observed to be comprised mainly of mature native deciduous tree species with a minor mix of coniferous species and shrubby scrub areas on the edge of this feature. The core of this tract is a mature wooded late succession community, however, the edges have been infiltrated by an abundance of non-native species from the surrounding cultural communities.

On the site, this type (or a derivative) of this upland community occurs along the base of the slope on the fringe of the Dummer Moraine topography. It is assumed that this forest type

likely covered the majority of the upper agricultural areas prior to agricultural activities on the site. This is evident as the main portion of the forest (i.e., approximately 90% by area) occurs north of the site on an adjacent property.

Hand Auger 4 (HA-4) was conducted within the deciduous forest in the northeast portion of the site. The soil analysis was conducted to a depth of 40 cm where it was met with refusal. The first horizon went to a depth of 23 cm and consisted of a silty sand texture. The following layer was from a depth of 23 cm to 40 cm and possessed a sandy loam texture. Gley and mottles were not observed in the soil analysis.

According to the MNRF database, a portion of this community is mapped as unevaluated wetland/wooded swamp north of the property and extending south into the property (Figure 4). However, the woodland was observed to contain an abundance of upland species, mostly comprising of Sugar Maple. As a result of the inspections, the unevaluated wetland that is shown to extend onto the property appears to be a mapping error and should be disregarded. It is possible that the MNRF mapped the upland wooded area as wetland due to a trough-like feature between hummocks that is characteristic of the Dummer Moraine Complex. During the spring freshet, snow melt would be slower than the surrounding lands and runoff would be directed through this trough-like area.

As this mature upland woodland community represents the only deciduous community on the site, it is expected that this Ecosite would be considered SWH for a wide variety of species (some Special Concern) known to frequent the general area. As a result, mitigation will need to be considered if development is anticipated to encroach or enter this community.

9. Fresh-Moist White Cedar Coniferous Forest (FOC4)

The ELC describes a Fresh-Moist White Cedar Coniferous Forest (FOC4) as being dominated by Eastern White Cedar with associate species including Balsam Fir, Hemlock, Sugar Maple, and Yellow Birch (*Betula alleghaniensis*). This Ecosite likely possesses moist to fresh soil moisture regimes.

The ELC also states that this forest/woodland type possesses 60% or more canopy cover, 75% of which must be dominated by a coniferous species. FOC4 is typically dominated entirely by Eastern White Cedar and is typically fern rich.

This woodland contains the above mentioned associate species including Yellow Birch which makes it slightly different than the FOC4-1 community discussed previously. It also contains fern species such as Bulblet Fern (*Cystopteris bulbifera*), Spinulose Wood-fern (*Dryopteris caruthsiana*), and Sensitive Fern.

The FOC4 Ecosite has similar conditions to the FOC4-1 community and also contains shallow bedrock topography, with exposed fractured bedrock visible on the surface. As a result, it is

expected that this area represents an important recharge area immediately adjacent to the Indian River/Quarry Lake. Seasonal groundwater discharge at the base of the Dummer Moraine topography immediately west of this community can be observed during the spring freshet. As a result, this woodland would be considered a significant groundwater discharge/recharge feature and an extension of the FOC4-1 community.

This woodland is considered sensitive/significant as it is a mature woodland community and contains little to no exotic species, in addition to playing an important role in buffering Quarry Lake and the PSW. Development is not proposed within this woodland.

Despite discontinuous soils, Hand Auger probe 6 (HA-6) was completed within this Ecosite to determine the soil composition. A 10 cm organic layer was observed at the start of the soil analysis. The probe was completed to a depth of 25 cm where it was met with bedrock refusal. This was the only layer observed and possessed a clay loam texture, mottles were observed around 20 cm.

10. Dry-Fresh White Pine-Maple-Oak Mixed Forest (FOM2)

According to the ELC, this community possesses a dry to moderately fresh regime with shallow soils over bedrock, sands and coarse loams. It is well drained due to the sandy soils which result in dry conditions in these upper to middle slope and tableland type habitats.

The ELC also states that the dominant species are White Pine (*Pinus strobus*), Sugar Maple, Red Oak (*Quercus rubra*) and to a lesser extent White Oak (*Quercus alba*).

The ELC describes a Dry-Fresh White Pine-Oak Mixed Forest (FOM2) as having a mix of greater than 25% coniferous species and greater than 25% deciduous species, which are comprised of primarily White Pine (*Pinus strobus*) and Oak species. This Ecosite tends to have low herb and shrub cover and will likely have dry to fresh soil regimes that consist of sand, coarse loam and shallow soils over bedrock or rock.

The subject site's woodland community has the White Pine dominating the upper canopy while the Red Oak catches up in the lower canopy levels. Only a few occurrences of White Oak were observed in the northern portion of this Ecosite. The groundcover consisted of an abundance of grass species observed in the cultural meadow communities to the north and south of this woodland that have imposed on this community. There were relatively large areas of Dog Strangling Vine (Black Swallow-Wort and Pale Swallow-Wort). There was also some Wild Sarsaparilla and Poison Ivy (*Toxicodendron radicans*) in this woodland.

The woodland has undergone significant cultural alterations in the past and is still displaying the majority of the characteristics of an altered/impacted community. This woodland is not considered sensitive, however, the trees are mature and an effort should be made to retain these trees within the proposed development, where possible.

Similar to the FOD5-1 community to the north, the MNRF mapping suggests that an unevaluated wetland occurs in the northern portion of this ELC community, however, this appears to have been inaccurately mapped and should be disregarded.

A soil analysis was not completed in this Ecosite, however, it does contain similar terrain as the FOD5-1 and CUT1-1 communities.

7.3.5 SAR Flora and Provincially Rare Ecosites

During the detailed vegetation mapping described above, inspections for Species at Risk flora were conducted. No SAR flora were identified within the vegetation communities observed on or immediately adjacent to the site, nor were any of the vegetation communities considered provincially rare as per the NHIC website database.

7.3.6 Snag Surveys

Surveys for dead or dying trees with cavities (snags) were conducted on November 8, 2017 and January 9, 2018. The results of the snag surveys revealed that the majority of snags occurred in the FOC4 and FOC4-1 communities. Due to the harsh conditions associated with shallow bedrock topography and rapid recharge, snags tend to be more prevalent in these communities. Comparatively fewer snags were identified in the other woodland communities found on the site namely, FOD5-1. It is likely that any dead deciduous trees were harvested from the FOD5-1 community which would suggest why there was comparatively fewer snags in this woodland. However, clusters of snags do occur within the FOD5-1 community, typically located in the interior of this community (i.e. away from the margins of this woodland community).

Although the proposed development is not expected to encroach on the FOC4 and FOC4-1 communities, mitigation measures for the encroachment into the FOD5-1 community should be considered.

The collected snag survey information has been tabulated in Appendix G.

7.4 Fauna

7.4.1 General

On-site surveys for fauna were conducted mainly in the active morning and evening hours and were based on sightings or vocalizations of species. Targeted searches were conducted to determine whether suitable habitat for SAR fauna could occur on the subject property and surrounding adjacent lands. The list of faunal species observed at the site are presented in

Appendix E. A brief summary of the notable fauna is included below.

7.4.2 Avifauna

ORE staff attended the site in the early morning and evening hours to detect avifauna. ORE staff targeted all of the habitats on the property in order to detect all species including those identified in the OBBA list in Section 6.2 and the e-Bird Hotspot Data.

Point-count locations for avian surveys were selected based on the results of the avian species identified in the background data review outlined in Section 6.0.

The Eastern Whip-poor-will, Eastern Wood-Pewee and Common Nighthawk were detected during the inspections (and were included in the list of OBBA species). However, one (1) additional SAR was detected that was not in the OBBA list:

- Golden-winged Warbler (*Vermivora chrysoptera*).

The Eastern Whip-poor-will was overheard to be calling from a property across Quarry Lake during the June 25, 2018 site visit.

The Golden-winged Warbler was overheard calling from a hydro wire on the farm property across Water Street/County Road 4 (to the west of the existing entranceway).

The Eastern Wood-Pewee was overheard calling within the mature woodland tract to the north of the FOD5-1 and FOC4-1 communities identified on Figure 5. The Eastern Wood-Pewee did not cross the property boundary and seemed satisfied with the wooded conditions on the property to the north of the subject site. The woodland on this property appears to extend further west and is a much larger tract. Regardless, the on-site woodland in the eastern portion of the site would be considered suitable habitat for Eastern Wood-Pewee.

The Common Nighthawk was observed flying overtop of the west end of the property near the existing entranceway off County Road 4. However, the cedar-dominated treed shallow bedrock terrain areas in the east end of the property associated with the FOC4 and FOC4-1 would be considered suitable nesting habitat for this SAR.

The list of all faunal species observed at the site are presented in Appendix E.

7.4.3 Mammals

The NHIC search did not indicate the presence of SAR mammals in the general area and none were observed during site inspections. A list of detected mammals within the study area is presented in Appendix E.

During the inspections, ORE staff noted that a number of White-tailed Deer cross County Road 4 and enter on the northwest corner of the property. The deer quickly enter the adjacent property to the north to access better cover once they can navigate the existing page-wire fence between the two properties.

During the winter season site visit in January, ORE staff observed deer utilizing the wooded corridor in the eastern portion of the site. The deer did not appear to be browsing as there was very little evidence of this when tracking the movement of the deer within these woodlands. The deer tend to migrate through the woodland on a northward trending orientation. Fewer deer tracks and deer appeared to be heading in a southerly direction on the property.

These observations appear to be consistent with the MNRF mapping of a Stratum 2 Deer Yard both associated with the subject site and the woodlands on the adjacent parcel to the north. Thus, the deer are not congregating on-site, but utilizing the woodland to access the better quality yards to the north.

7.4.4 Herpetiles

Although no SAR herpetiles were listed by the NHIC, Snapping Turtle (Special Concern) is known to occur within Quarry Lake in the area of the Warsaw Caves Campground. No nesting sites were observed along any of the shoreline areas on or immediately adjacent to the subject site. This is not unexpected considering the majority of the site's shoreline consists of steep bedrock slopes, with the exception of the Warsaw Caves Wetland Complex in the southeastern portion of the site.

According to our findings on iNaturalist, there is a record of Midland Painted Turtle in Quarry Lake. ORE staff observed Midland Painted Turtle perched atop some rocks on the east shoreline of Quarry Lake. This turtle is listed as a Special Concern species by COSEWIC and would have local significance. The two (2) turtles were basking in the sunlight during the May 29th site visit.

The location of the Midland Painted Turtle is illustrated on Figure 5.

Amphibian surveys in the study area only detected common species. The surveys were conducted as per the Marsh Monitoring Program (MMP) and detected the following at the subject site:

- Spring Peeper (*Pseudacris crucifer*)
- Gray Tree Frog (*Hyla versicolor*)
- Green Frog (*Lithobates clamitans*)
- American Toad (*Anaxyrus americanus*)

The list of amphibians detected during the site investigations are included in Appendix E. ORE staff identified some relatively significant populations of amphibian associated with the PSW and unevaluated wetland which likely represents SWH.

No SAR snakes were observed during site inspections. A list of commonly occurring snakes detected during the site surveys is included in Appendix E.

7.4.5 Fisheries

As previously stated, the shoreline of Quarry Lake was visibly inspected for fish species. Inspections by kayak were also conducted later in the spring season.

The fish species detected were Muskellunge, Largemouth Bass, Smallmouth Bass, Pumpkinseed, Yellow Perch, and Rock Bass. Walleye were observed to be utilizing the small offshore islands, however, the depths would be too deep for walleye spawning. The sediments in this area consisted of a mixture of sands and gravels with minor accumulations of organic detritus from leaf decay which is ideal for most spawners. Walleye were not observed at any other location along the shoreline associated with the subject site.

The site possesses minor Muskellunge spawning in the area of the PSW, however, better quality shallow bays occur further north of the subject site.

ORE staff considers the Indian River/Quarry Lake system to be sensitive fish habitat.

7.5 SAR Summary

The ESA and many municipal level Official Plans provide regulations and guidelines with respect to protection of Endangered and Threatened species in Ontario. Federal Species at Risk are protected by the Species at Risk Act (SARA) and the Migratory Bird Convention Act. The SARA regulates SAR for all of Canada but targets mainly federal lands (such as federal parks) that contain many of these rare species.

Potential SWH (and habitat for SAR) species that occur on or immediately adjacent to the site has been presented in Appendix H. Only species with potential suitable habitat are presented in Appendix H, however, ORE staff had regard for all SAR and locally significant species during the site investigations.

It was anticipated by ORE that the most likely SAR to occur in the area of the proposed development would be Eastern Wood-Pewee and Wood Thrush. Of the two, only Eastern Wood-Pewee was detected. This species has a Special Concern status according to the province's ESA.

Other SAR detected proximal to the site, such as Eastern Whip-poor-will and Common Nighthawk, would also consider the woodland tract in the eastern portion of the property to be suitable habitat for parts of their life cycle. These species are listed as Threatened and Special Concern, respectively.

Golden-winged Warbler was overheard west of the subject property. The subject site does not possess suitable habitat for the Golden-winged Warbler. Golden-winged Warbler is listed as Special Concern according to Species at Risk Ontario (SARO).

Midland Painted Turtle (Special Concern) was detected within the iNaturalist website database and two (2) were observed on the adjacent shore of Quarry Lake. Their location is illustrated on Figure 5.

The ESA protects both the individual and the habitat of Threatened and Endangered species, however, the ESA has no provisions for Special Concern listed species. Special Concern species and their habitat are protected by the Significant Wildlife Habitat Criteria, as discussed below.

7.6 Significant Wildlife Habitat (SWH)

The assessment of SWH is divided into five (5) broad categories, consisting of Seasonal Concentration Area of Animals; Rare Vegetation Communities; Specialized Habitat for Wildlife; Habitat for Species of Conservation Concern (other than Endangered or Threatened), and Animal Movement Corridors. A summary table is provided in Appendix H indicating the potential for SWH to occur based on the criteria provided by the MNRF and whether the site has suitable habitat and/or species occurrences. The following provides a discussion of areas deemed to be confirmed SWH (based on the MNRF criteria) and as indicated in Appendix H.

The SWH that have been confirmed/identified on-site are summarized below:

Wetland and Associated Woodlands

- Raptor Wintering and Nesting Areas for Red-tailed Hawk (assumed);
- Bat Maternity Colonies (assumed);
- Bat Hibernacula (potential, shallow fractured bedrock topography);
- Turtle Wintering Areas (assumed);
- Reptile Hibernacula (assumed);
- Deer Yarding Areas, Wintering Congregation Areas and Movement Corridors (Stratum 2 Deer Yard confirmed);
- Waterfowl Nesting Areas (assumed);
- Turtle Nesting Areas (assumed);
- Seeps and Springs (confirmed, seasonal);
- Amphibian Breeding Habitats (confirmed);

- Woodland Area-Sensitive Breeding Bird Habitat (potential);
- Marsh Breeding Bird Habitat (potential), and
- Special Concern and Rare Wildlife Species Habitat (confirmed, Common Nighthawk, Eastern Wood-Pewee, Golden-winged Warbler, Midland Painted Turtle).

The eastern woodland and wetland areas possess the majority of the Significant Wildlife Habitat (SWH) in the study area.

Mitigation for SWH is provided in the 2014 Significant Wildlife Habitat Mitigation Support Tool (SWHMiST). Recommendations for mitigation are provided in the following sections and have regard for the tools outlined for Ecoregion 6e.

Brief descriptions of the confirmed SWH on and immediately adjacent to the property are provided in Appendix H.

8.0 Impact Assessment and Recommended Mitigation

8.1 General Impact Considerations

A multi-residential development is proposed for the subject site. It is expected that the proposed development will mostly occupy the old field/meadow and the cultural wooded (pine plantation) areas on the property, all entirely within the hamlet boundary (Figure 7). As a result of the investigations related to the proposed subdivision, it is understood that any environmentally sensitive features and associated buffers on the eastern extent of the site (abutting Quarry Lake) will be severed and joined with a neighbouring existing occupied residential parcel. It is understood that the severed lands will be zoned Environmental Protection (EP).

As described above, the Natural Heritage Features (NHF), Hydrologically Sensitive Features, Species at Risk (SAR) Habitat and Significant Wildlife Habitat (SWH), including locally important species, have been thoroughly examined as part of this EIS. Those features are briefly summarized below:

- The Warsaw Caves Provincially Significant Wetland Complex (PSW) boundary provided by MNRF has been confirmed and contains Ecological Land Classification (ELC) communities consisting of SWM1-1 and MAS2-1. The PSW would be sensitive to encroachment by the future development, therefore, appropriate mitigation is required.

- The unevaluated wetland surrounding the PSW appears to be have been mapped correctly in the Land Information Ontario (LIO) database.

- The unevaluated wetland in the LIO database located on the north side of the property was inaccurately mapped. A trough between mounds characteristic of the Dummer Moraine Complex occurs in this area and some of the stone had been removed from the surface, which may allow water to accumulate during the spring freshet, but it drains/infiltrates very quickly through sandy soils. This area possessed upland woodland and cultural meadow species that exemplify dry conditions and not wetland conditions.

- A large area to the north of the Warsaw Caves Wetland Complex has been determined to be a sensitive groundwater discharge/recharge area within the FOC4 and FOC4-1 communities. Groundwater discharge and recharge areas are sensitive ("Seeps and Springs") in the Growth Plan and within the County of Peterborough NHS, therefore a suitable setback shall be applied to this area to preserve this feature. Although groundwater discharge was primarily observed to occur within within the delineated wetland boundary and FOC4-1 community, minor discharge conditions were also noted at the northeastern boundary between the FOD5-1 and FOC4 communities. As the FOC4 and FOC4-1 communities contain fractured bedrock at or near the surface, these areas are expected to also promote rapid groundwater recharge and should be afforded the same protections as discharge zones. As a result, ORE staff have extended the important groundwater recharge/discharge boundary from the edge of the PSW boundary north, through the FOC4 and FOC4-1 communities to preserve the entire tract of sensitive groundwater conditions. This extension of the boundary also helps protect a variety of SWH associated with these woodland communities. The SWH are discussed in a later section of this report.

- According to the mapping, the Warsaw Caves Life Science ANSI occurs within the wetland and white cedar woodland along the shoreline of Indian River/Quarry Lake. Although no visible expressions of karst hazards exist in this area, ORE staff has designated this area as a significant recharge/discharge area.

- Despite the lack of a definition for "Significant Woodlands" in the County of Peterborough, in an effort to adhere to the Growth Plan policies (and as a conservative measure), the eastern woodland tract within the mapped extent of the NHS is assumed to be "significant". This is based on the presence of potential SWH, the ELC types and typical criteria used for Significant Woodlands in other jurisdictions (i.e., under the Greenbelt Plan). As outlined by the Growth Plan policies, while the eastern portion of the woodland located within the mapped NHS limits would require a VPA, the western portion that extends into the settlement area for Warsaw, Ontario, would not. Typically, the Growth Plan would apply a 30 m setback from the boundary of any Significant Woodland. In this instance, a woodland VPA is not necessary, as the VPA applied to another NHF (hydrological feature) occurs in the same area and would encompass any VPA applied to the woodland within the NHS.

- Eastern Whip-poor-will is a threatened species that appears to be utilizing the tracts of woodland along the Indian River/Quarry Lake corridor, which includes the subject site woodlands for part of their life cycle. Mitigation shall be applied to the woodlands to protect this habitat for this Species at Risk.

- Common Nighthawk, Eastern Wood-Pewee and Golden-winged Warbler are all Special Concern species according to Species at Risk Ontario (SARO). In addition, Midland Painted Turtle is listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). None of these species receive protection under the Endangered Species Act (ESA), but rather, their habitat is preserved/mitigated via the 2014 Significant Wildlife Habitat Mitigation Support Tool SWHMiST.

- Potential SWH were examined on-site and confirmed using the MNRF criteria. SWH is summarized in tabular format in Appendix H.

The following provides further details on the potential impacts that could occur as part of the proposed development. Also included below are specific recommendations for avoiding negative impacts to the features listed above.

8.2 Hydrological Features

8.2.1 Potential Impacts

The proposed development is expected to occur adjacent to wetlands and groundwater discharge/ recharge which are considered Hydrologically Sensitive Features and/or Natural Heritage Features (NHF) under the Growth Plan and County of Peterborough NHS. These hydrologically sensitive NHF and the potential impacts resulting from the proposed development are listed below:

1. The Warsaw Cave Provincially Significant Wetland (PSW)/unevaluated wetland complex, and

2. Seeps and springs (seasonal groundwater discharge/recharge zone) within the cedar dominated and mixed wood habitats that occur upgradient of Quarry Lake and the Warsaw Cave PSW Complex.

Based on our assessment, it is expected that potential impacts to the hydrological features could include the following:

a) Encroachment of the development into these sensitive features, displacing the habitat and potentially redirecting flows as a result of filling and grading

activities.

b) Sedimentation/erosion of materials from the development being directed to these features during the construction and/or post-construction periods.

c) Impacting the habitat of related faunal SWH that would either migrate, breed, nest or forage within these woodland corridors.

d) Removal of potential groundwater discharge sources for wintering species, such as deer, etc.

e) Dewatering of watercourses and potentially impacting local moisture regimes resulting in changes to flora and breeding fauna in an area.

f) Future encroachment by individual lot owners placing unwanted fill, invasive weeds, etc. in these natural areas.

g) Excavation into or short-circuiting natural shallow groundwater flows resulting in water quality and quantity changes, potentially impacting the wetlands.

h) Directing of untreated stormwater from impermeable surfaces into these features that could contaminate discharge and impact the temperature of the cool moisture regime in these woodlands.

8.2.2 Recommended Development Mitigation

To mitigate against the potential impacts described above and to maintain the integrity of these sensitive areas, a 30 m wide environmental setback has been proposed around all of the above-mentioned watercourses, wetlands and discharge/recharge features. The purpose of the environmental setback is to establish a contiguous Vegetation Protection Area (VPA) that will mitigate the above-mentioned potential impacts associated with the proposed development. As a result, the property boundary for each lot will terminate at the 30 m VPA thereby constraining future development (and lot owners) from imposing on these sensitive areas. To further protect these lands, it is understood that the VPA portion and associated NHF of the site will be severed from the subdivision property, providing a clear dividing line. The 30 m setback, thus proposed severance line is illustrated on Figure 7.

The establishment of the VPA around these features satisfies the following general requirements:

- The mandated 30 m setback requirements of the Growth Plan;
- Setback requirements specified by the Peterborough County and the

Township of Douro-Dummer Official Plans and NHS, and

- In all cases, meeting or exceeding the setbacks outlined in Otonabee Region Conservation Authority's Ontario Regulation 159/06.

The recommended VPA is illustrated on Figure 7.

8.2.3 Severance Discussion

Based on the mapped VPA included in this report, it is understood that the VPA and the contained NHF will be severed from the parent subdivision property. It is further understood that the severed parcel will become part of an adjacent existing occupied residential property. Although the NHF and associated VPA are expected to be protected through zoning the lands as "Environmental Protection" (EP), the potential impacts from the severance are similar to those of the proposed subdivision. The eventual owner of the EP lands should be made aware that the same mitigation recommended in this section of the report would apply to their ownership of the severed EP lands.

From an ecological perspective, since the subdivision will abut the severed parcel and since the severance application has arisen from the subdivision investigations, the constraints on future development and mitigation discussed in this report are applicable to both the severance and subdivison planning applications equally. The proposed severance along the VPA mapped on Figure 7 simply provides a clearer limit for future development within the proposed subdivision lands.

As construction, encroachment and other potential impacts on the VPA and SAR can occur from any type of residential property use, the recommended mitigation discussed below with respect to the proposed subdivision is also fully applicable to the severed lands.

8.2.4 Recommended Construction Mitigation

To mitigate against potential impacts related to construction activities, careful attention to the limits associated with building/grading envelopes and maintaining VPA discussed above will be needed. Specific recommendations for mitigating potential impacts to the hydrologically sensitive features of the site associated with construction activities are presented below:

- Prior to any construction, a suitable silt curtain fence should be installed around each construction zone (i.e., footprint), ensuring that the erosion control measures are outside of the setbacks described above (as illustrated on Figure 7) and fully within the lands retained for the subdivision. The contractor should ensure that *no construction* occurs within the VPA discussed above (i.e., outside

the subdivision lands).

- Similarly, should construction occur on the existing residential parcel that will contain the VPA (i.e., the severed lands), the lot owner should be made aware of the limit of the VPA and the mitigation recommendations provided herein to prevent encroachments into and/or potential impacts on this area.

- In addition to the silt curtain fence, bales of straw (staked and wrapped in Geotextile fabric) should be strategically located inside the silt fence, particularly in areas where heavier sediment loads may be transported. The bales can also be used at the corners of the silt fence to further stabilize the fence itself. These reinforcements are particularly important when heavy equipment is being operated on-site. Construction should not continue during heavy precipitation events. Immediately after any such events, the silt fence and bales should be checked to ensure their effectiveness. Any/all erosion controls placed around the edge of the construction zone shall not be removed until such time as the construction area is considered not at risk of erosion/sedimentation. This should be determined by a qualified person within the construction team experienced with erosion/sedimentation controls.

- Members of the construction crew(s) should be educated on the importance of the construction zone limitations and informed not to unnecessarily remove any additional trees or infringe with machinery on the environmental setbacks.

- As a planned action against the spread of invasive species under the Ontario Biodiversity Strategy (MNRF, 2005) and the Invasive Alien Species Strategy for Canada (Environment Canada, 2004), only clean fill and screened topsoil should be applied to where it may be necessary to raise areas of the site. The fill and topsoil should not contain plant debris that may be a source of exotic or invasive species that can compete with native species in the nearby woodlands or wetlands.

- To reduce potential post-construction slope failure and/or erosion effects, disturbed areas should be quickly seeded or sodded to re-establish root structures within the upper soils. Planting of native species of trees and shrubs is also encouraged at this stage. Once the seeding or sodding is determined to be a success, the erosion/sedimentation controls can be removed.

- To further reduce the potential for impacts from erosion/sedimentation, excess materials should be stockpiled for only short periods and all excess materials from excavations should be removed from the site once the construction is complete. At no time should any fill materials be allowed within the VPA (i.e., outside the limit of the proposed subdivision).

- An Erosion and Sediment Control (ESC) plan should be drafted prior to construction, illustrating the fill areas and the measures by which the developer will contain and stabilize all disturbed soils on the site as it relates to common elements (i.e., roads, etc.). Individual residential lots should be required to produce a similar ESC plan at the time of applying for a building permit.

8.3 SAR Fauna

8.3.1 Potential Impacts to Terrestrial & Aquatic/Semiaquatic SAR

Terrestrial SAR

The OBBA listed fourteen (14) SAR avian that occur within the 10 km^2 area Square 17QK22, Region 16, Peterborough. e-Bird listed an additional four (4) SAR avian in addition to the OBBA. Based on our site inspections and the habitats present on the site, it is our opinion that four (4) of the avian identified by the OBBA and e-Bird database queries could find the site's vegetation communities and the associated habitats attractive. Although, Golden-winged Warbler was not listed within either database it was overheard on the adjacent private property to the west. The vegetation communities on the subject site are not conducive to Golden-winged Warbler use.

The SAR birds in the OBBA and e-Bird databases that would find the vegetation communities on-site suitable for their habitat are as follows:

- Wood Thrush;
- Eastern Wood-Pewee;
- Eastern Whip-poor-will, and
- Common Nighthawk.

The Wood Thrush (Special Concern) was not detected on-site. Wood Thrush tends to inhabit secondary succession woodlands where regrowth is occurring from a disturbance. There is not much of this habitat on the subject site, and this is likely the reason it was not detected. However, there is an abundance of this habitat on neighbouring lands that could have resulted in this species being detected in the general area.

The Eastern Wood-Pewee (Special Concern) was overheard calling from the property directly north of the subject site. The woodland that it was calling from was an extension of the FOD5-1 community on the adjacent parcel, however, it widens on the neighbouring property potentially making it more attractive to nest within. At no time did the Eastern Wood-Pewee cross the property line and call.

Eastern Whip-poor-will (Threatened) was overheard calling from across Quarry Lake within a wooded corridor during the peak full moon period surveys. Eastern Whip-poor-will inhabits

forested areas in general. It will nest in a variety of woodland habitats provided they are upland, well drained/dry regimes so that the eggs are never inundated. The wooded rock barren habitats along the shore and the deciduous woodland tract just east of the cedar dominated woodlands would be attractive to this species.

Common Nighthawk (Special Concern) was observed flying by the west entrance along County Road 6 heading away from the property. However, it was during the evening hours and the flight-path suggests it could have been heading to the agricultural fields on the adjacent parcel to the west, to forage. The cedar-rich bedrock dominated/carbonate rock barren shoreline in the eastern part of the property does exemplify excellent quality habitat for Common Nighthawk to nest and roost during the daylight hours.

In addition to the species listed by the available databases, Golden-winged Warbler (Special Concern) was overheard calling from a hydro line on the west side of County Road 4. ORE staff expects that the typical habitat of this species consisting of wetland margins containing reedy species, dogwoods and willows exists on the adjacent property to the west.

Recommended actions and mitigation for the Threatened Eastern Whip-poor-will are discussed below. The remaining SAR detected during the surveys are Special Concern species and are discussed in the SWH section of this report.

Aquatic/Semiaquatic SAR

Midland Painted Turtle (Special Concern) was observed along the east shore of Quarry Lake across from the subject site. This turtle could be utilizing the PSW/unevaluated wetland to access the cultural meadows on-site to nest within. Therefore, the development should have a contingency for this turtle species.

8.3.2 Recommended Action

The 2007 Endangered Species Act provides the following requirements in regards to Eastern Whip-poor-will. The following excerpt was taken directly from the ESA website in regards to these birds:

> "*Habitat Categorization for Eastern Whip-poor-will (Caprimulgus vociferus):*
>
> *Category 1 - Nest and the area within 20 m of the nest*
>
> *Category 2 - The area between 20 m and 170 m from the nest or centre of approximated defended territory*
>
> *Category 3 - The area of suitable habitat between 170 m and 500 m of the nest or centre of approximated defended territory*"

In regards to the above categorization, the Whip-poor-will was not nesting on-site which negates Category 1/Category 2 and based on the faintness of the calls (considering their call is typically quite loud) we suspect its territory would fall on the outer margins of the Category 3 distance range. That being said, the ESA states the following with respect to Category 3 Habitats:

"*The area of suitable habitat between 170 m and 500 m of the nest site or centre of approximated defended territory is included in Category 3 and is considered to have a high level of tolerance to alteration.*"

Habitat for this species mostly occurs within the VPA and is considered minimal within the footprint of the proposed subdivision development. As the VPA is intended to preserve habitat for this species and maintain a corridor with the expansive woodlands to the north, the proponent will not need to obtain a Permit under the ESA for destruction of habitat.

8.3.3 Recommended Mitigation for Eastern Whip-poor-will Habitat

To further mitigate for the Threatened Whip-poor-will, it is anticipated that the entire wooded areas of FOC4-1 and FOC4 will be severed from the subdivision lands and zoned EP. This will not only preserve the potential habitat of the Whip-poor-will but eventually increase the habitat area once the open areas within these lands are able to succeed. Since the entirety of the FOD5-1 community will not be included in the severed lands, development into or encroachment on this community will require mitigation in accordance with the SWHMiST.

Provided the MNRF is satisfied with this approach, the Official Plans of both the County and the Township should be satisfied with regard to their caveat regarding Threatened and Endangered species. The remaining SAR detected during the surveys are Special Concern species and discussed in the SWH section of this report.

8.3.4 Mitigating Potential Impacts to Aquatic/Semiaquatic SAR

As outlined above, the only herpetile identified within Quarry Lake adjacent to the subject property was the Midland Painted Turtle. Although designated as Special Concern species by COSEWIC, this species is not afforded any habitat protection under the ESA. However, the waterway indicated on Figure 7 would be considered Significant Wildlife Habitat for this and other herpetiles that may be present. Suitable habitat also occurs on the adjacent residential lands and open field areas, especially where the former pit operation occurred (as the soils are sandy and lack vegetation), as the turtle could migrate up to the cultural meadow area via the wetland complex to nest. The remainder of the shoreline consists of rock shelf that is somewhat steep and inaccessible to this species.

As the ESA does not provide any type of management plan or recovery strategy for Midland

Painted Turtle, ORE staff consulted the Species at Risk Act – Public Registry website to determine if the Federal government has any documents regarding Midland Painted Turtle and no recovery strategies are provided other than some specific strategies offered by cities in Canada to try and retain the habitat of the species.

However, the website provides a 2016 (proposed) *Management Plan for Snapping Turtle (Chelydra serpentina) in Canada* completed by Environment and Climate Change Canada. Snapping Turtle is known to occur in this section of the Indian River. Although the plan is for Snapping Turtle, it does identify certain threats that would also apply to Midland Painted Turtle such as:

- Conversion of aquatic or riparian habitats for agriculture and urban development purposes incompatible with the species' needs;
- Water level management;
- Dredging;
- Road network;
- Fishing bycatch;
- Collisions with boats;
- Legal and illegal harvesting;
- Chemical contamination;
- Persecution;
- Subsidized predators, and
- Knowledge gaps.

Among the threats listed above, the following potential impacts would apply to the subject site and proposed development:

- Conversion of aquatic or riparian habitat (high level threat) - potential encroachment on the adjacent PSW and modification of any watercourse, drainage feature or pond on or immediately adjacent to the property;

- Road network (high level threat) - increased road mortality on internal roadways and added traffic to County Road 6/Water Street;

- Persecution (medium level threat) - unlikely, as the Midland Painted turtle species is not aggressive when defending itself in any way;

- Chemical contamination (low level threat) - potential impacts from the over application of road salt for de-icing in the winter, and

- Human-subsidized predators (medium level threat) - introduction of canine and feline species into the area that may be a threat to, or curious, about young herpetiles.

In addition to the above listed potential threats, there is also a potential for the Midland Painted Turtles to be collected as pets:

- Collection for pets (high level threat) - Midland Painted Turtle is a somewhat small docile turtle species, possessing attractive colours, therefore it may be collected as a pet by newcomers in the development that are unfamiliar with the negative connotations of collecting wild animals as pets.

To mitigate the above mentioned impacts, the following should be applied to the site:

- To reduce the potential for turtle mortality on internal roadways during construction, a light duty silt fence or a barrier should be applied to the boundary of the VPA (i.e., severed lands) and along drainage ditches. Where possible any ditch crossings should be raised and steeply cut to ensure turtles cannot migrate up onto the road surface. A barrier can also be applied to the ditch corridor to prevent turtles from accessing the roadways. The site engineer should offer a design that can be effective in deterring the turtles from entering onto the internal roads which is also inexpensive to implement on-site. Awareness in the form of a pamphlet can be provided to contractors that recommends awareness mitigation practices.

- A rock retaining wall should be constructed on either side of the main access roadway that enters the development, as turtles can often migrate up through the ditch corridors to nest in upland areas. The rock retaining wall should key into the top of the bank on either side ditch. The wall will prevent turtles from crossing both the access road surface and County Road 4, and will direct turtle movement beneath the roadway through the culvert. If stormwater management requires conveyance of water through swales on-site, then similar preventative measures shall be applied to these crossings.

  While the preventative measures are being constructed, light duty silt fence should be installed during the filling and grading phase. This will allow for the work to proceed and also prevent turtles from entering the work zone during this period. The silt fence will remain in place until such time as the roadsides are deemed stable and the retaining wall becomes the stable structure in these instances.

- Drainage course crossings should be constructed outside of the main breeding and hatching window for most turtles which is between April 1 and July 31 each year.

- A pamphlet discussing and illustrating the potential SAR and other significant species that could occur on-site should be provided to the new property owners as part of an awareness program. The Midland Painted Turtle should be included

in these awareness materials.

8.4 Woodlands

The County of Peterborough (and Township of Douro-Dummer) have not accepted/adopted the Growth Plan requirements for Significant Woodland into the County's consolidated OP. As a result, there is currently no specific criteria available for identifying Significant Woodlands within the County.

Consequently, the woodland within the Growth Plan NHS (ie. FOC4 and FOC4-1) would be considered significant woodland based on a directive provided by ORCA with regards to assessing woodlands within the Growth Plan NHS. Outside of the Growth Plan NHS boundary (i.e., within the settlement area), the planning policy that governs the (FOD5-1) woodland on the site, which is linked with the significant woodland, is unknown. As a result, a VPA has not been recommended for this portion of the woodland.

Regardless, the FOD5-1 woodland is considered SWH and would be protected through mitigation/compensation recommendations provided in the Significant Wildlife Habitat Mitigation Support Tool. In addition to the FOD5-1 being SWH, it also abuts the FOC4 and FOC4-1 communities which are considered to contain sensitive hydrological features. Therefore, the majority of the FOD5-1 community will inherently be protected by the recommended 30 m VPA appended to these features and will be severed from the subdivision property. Provided the owner of the lot that will contain the severed (EP) lands is aware of the limits of the EP zoning, impacts related to the use of the severed parcel should be effectively mitigated by the restrictions inherent to the EP zoning.

The following section discusses SWH and will provide recommendations with respect to mitigating potential impacts to the FOD5-1 community that will remain within the subdivision lands.

8.5 Significant Wildlife Habitat (SWH)

8.5.1 General

Based on the tabulated assessment of SWH included in Appendix H, the confirmed SWH that occur on or immediately adjacent to the subject site have been discussed in Section 7.6 of this report. As indicated in Section 7.6, most of the SWH that occurs on the site is associated with Indian River/Quarry Lake, the wetland complex, and the wooded corridor in the eastern portion of the property. Potential impacts and recommended mitigation measures for the hydrological features are discussed in Section 8.2 of this report.

Additional habitat and species specific impacts and/or recommended mitigation measures are

briefly outlined below.

8.5.2 Woodland Area Sensitive Bird SWH

The main potential impact to the Area Sensitive Bird SWH described in Appendix H would be associated with clearing of the woodlands adjacent to the wetland features on the property. Considering that all Hydrologically Sensitive Features and Significant Woodland within the NHS will have a 30 m VPA (as recommended in previous sections) extended from their boundaries (and eventually be removed from the subdivision property), the Area Sensitive Bird SWH will remain intact and unaffected by the proposed development.

Therefore, absolutely no development will impose on the habitat of the Area Sensitive Bird's SWH as long as the 30 m VPA is adhered to regarding the FOC4 and FOC4-1 communities. In regards to the FOD5-1 wooded area, some imposition may be necessary to establish a residential footprint, however the development footprint on any lot(s) within this woodland should be situated such that it utilizes the woodland edge or openings, thus maintaining the core woodland. If this is not possible, compensation for the loss of mature deciduous trees is recommended.

The following are additional recommendations to assist in preventing negative impacts to sensitive bird species in the area:

- As per the Migratory Bird Convention Act and with regard to the nesting period described by Bird Studies Canada, trees should not be removed between April 15th and August 31st each year. Preferably any/all tree removal would be completed late in the summer or early fall season. Any compensatory vegetation plantings on the margins of the proposed 30 m VPA should also be targeted for the fall season.

- Should tree clearing need to take place during the period covering April 15th to August 31st, it is recommended that a qualified assessor inspect the site for nesting avian species immediately prior to these activities. If a nesting species or significant species is observed or overheard during these inspections, the qualified assessor should provide recommendations on when tree clearing activities could resume.

- As a precaution to protect breeding avian, construction activities proposed to occur between April 15th and August 31st may be limited. It is preferable that construction occur before or after this period. However, if the agencies or developer requires an opinion as to whether certain construction activities can proceed during this period, this can be provided by the author and/or qualified assessor prior to commencing. It may be possible to apply specific mitigation measures that could allow some activities to proceed, provided a non-impact

statement can be approved by the agencies.

- In the post construction phase, outdoor lighting should be kept to a minimum and directed away from the SWH adjacent to the proposed development. The awareness information package should be provided to each lot owner and should include information on directional lighting and dimmed lighting on pathways. This pertains to breeding amphibians, the Common Nighthawk and Whip-poor-will as these species are light sensitive. The directive should be to co-exist with these species, not sterilize the habitat with excessive lighting.

- The predominant mitigation measure in the SWHiMST is avoidance of the SWH altogether. However, the SWHMiST allows for some development to occur within the SWH, provided the aerial extent of the development can be minimized and that any loss of habitat can be mitigated for. The Planner and the Property Owner should discuss lot layouts that attempt to avoid tree removal in the FOD5-1. If tree removal is necessary, then compensation for tree loss in the form of tree planting should be explored. The enhancements would be directed in areas that would increase the SWH.

8.5.3 Marsh Breeding Bird and Waterfowl Nesting Area Habitats

The cattail marsh associated with the Warsaw Caves Wetland Complex represents a SWH. The combination of open water in the Indian River provides easy access for waterfowl to the marshy sections of the riverine wetland system. There are other 30 m setbacks proposed from the wooded swamp section of this wetland and the Significant Woodland habitats that will provide additional buffering to this marsh habitat within the PSW, therefore, no additional requirements are necessary.

8.5.4 Raptor Wintering and Nesting Habitat

In addition to the Common Nighthawk observation and mitigation discussed in Section 8.3 of this report, Red-tailed Hawk was observed a number of times flying over the property and farm area to west of the subject site on an adjacent parcel.

Red-tailed Hawk(s) were observed during the fall and winter month inspections and are presumed to be utilizing the woodland corridor along Quarry Lake (no nests observed on-site). Risk of impact to hawk nesting is extremely low. It is expected that the PSW and adjacent woodlands represent most of the SWH in the study area for hawk nesting. The 30 m VPA off the wetland and hydrologically sensitive features within the woodland boundaries (described above) would preserve the woodland for this type of SWH.

8.5.5 Amphibian Breeding Habitat (Woodland)

The wetlands and the ephemeral pools associated with the periodic discharge/recharge zones in the eastern woodland tract would represent SWH for breeding amphibians.

As a result, the recommended VPA for the Significant Wetland and hydrologically sensitive features contained in the woodland communities on the eastern extent of the site should sufficiently preserve this SWH.

8.5.6 Amphibian Breeding Habitat (Wetland)

Similar to the woodland amphibian breeding habitat, the wetland breeding habitat is associated with the riverine wetland system in the southeastern portion of the site. The wetland complex represents the main wetland breeding habitat for amphibians on the property.

Therefore, the recommended 30 m VPA from the groundwater discharge/recharge zone and wetland should be more than sufficient to protect this SWH.

8.5.7 Turtle Nesting and Wintering Areas

The turtle nesting areas observed within the study area were found to be associated with the cultural meadow areas and the adjacent residential properties along the shore of Indian River/Quarry Lake. Open water environments suitable for wintering occur within the Indian River and Quarry Lake open water habitats. Considering the river and lake will not be impacted by the development the turtle wintering areas will not be impacted by the proposed development.

The potential nesting sites will be impacted by the development, as the majority of the development is being targeted within these previously disturbed areas. However, the VPA and lawn space created by the proposed development will provide ample nesting habitat. The awareness materials (discussed above) should indicate to prospective purchasers/future homeowners that turtles will likely nest within their lawnspace from time to time. The turtle and the eggs should not be disturbed or removed from the property. If the property owner wishes to protect the eggs and the turtle, they should consult the proper protocols and/or consult with an expert.

8.5.8 Deer Yarding, Winter Congregation Areas and Movement Corridors

As illustrated on Figure 4 and included in Appendix H, a Stratum 2 Deer Yard occurs within the mixed wooded swamp and cedar-rich habitats in the eastern woodland tract. These

woodlands are considered movement corridors allowing deer to migrate along Indian River during the winter season. The groundwater discharge in the form of seeps and springs provides the deer with a drinking water source in the winter periods which is crucial to the wintering populations. These areas are considered SWH vital to survival of White-tailed Deer in the area.

It is expected that the SWH for White-tailed Deer on and adjacent to the property will be sufficiently protected by the establishment of the recommended VPA (discussed above) for the wetland, and groundwater discharge/recharge areas.

8.5.9 Reptile Hibernacula

The site possesses bedrock at surface along the entire eastern third of the site overlooking Quarry Lake. There is an abundance of cracks and crevasses that would likely occur at the level of the lake that would provide snake hibernacula during the winter months. The fractures in the rock can be accessed via the lake or from the surface in the woodlands. There is also an abundance of tree cover that gives cover for snakes to access the fractured rock without being completely open to predators.

The ELC communities FOC4, FOC4-1, and SWM1-1 provide areas of fractured bedrock that would allow reptiles to access the geothermally-warmed fractures to overwinter in.

The setbacks for the wetland and discharge/recharge area will protect the Reptile Hibernacula SWH on-site.

8.5.10 Waterfowl Nesting Areas

ORE staff observed both Wood Duck and Mallard-Black Duck cross within the Marsh areas of the wetland complex. It is presumed that the ducks were nesting within this feature. Therefore, the wetland would be considered SWH for nesting ducks.

Similar to the other wetland related SWH, the nesting habitat for the Mallard-Black Duck cross and Wood Duck population in this wetland would be preserved as none of the development will occur within this feature, thus retaining the SWH. In addition, the proposed development would occur more than 100 m from the nesting sites (as measured from the 30 m VPA illustrated on Figure 7).

8.5.11 Seeps and Springs

The SWH for seeps and springs (including significant recharge areas) occurs within the FOC4 and FOC4-1 communities. ORE staff consulted the Significant Wildlife Habitat Mitigation

Support Tool #30 that outlines potential mitigation techniques with respect to Residential and Commercial Development. The support tool does not recommend any type of setback or vegetation protection area with respect to seeps and springs. The mitigation tool simply states the following:

> "*Development will not be permitted within the SWH unless it can be demonstrated that there will be no negative impacts on the feature or its ecological function (OMNRF 2014). The area of the ELC forest ecosite containing the seeps/springs is the SWH.*"

Ephemeral seeps and springs were observed in the spring season sporadically within the FOC4 and FOC4-1 communities during the early spring period. Flows were non-existent during the late spring to summer season.

Figure 7 illustrates where the discharge conditions are located, containing the ephemeral seeps and springs.

The proposed development will satisfy the mitigation stated above, as none of the development is proposed to occur within the seeps and springs SWH. In addition, the residential footprints will be situated such that they are at least 30 m from the limit of the discharge zones (springs and seeps) within the FOC4 and FOC4-1 communities on Figure 7.

8.5.12 Bat Maternity Colonies

Typically, bats are found to roost in hollows of dead and dying trees (referred to as "snags") within mature forest communities. During our site inspections, snags were observed to be mostly concentrated within the woodland communities FOC4 and FOC4-1, with comparatively few snags within the FOD5-1 community. Although the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2005) does not list the FOC community as potential SWH for roosting, this quickly draining area immediately adjacent to Quarry lake is expected to provide ample habitat for bats.

As this area and a portion of the FOD5-1 community (which is listed as SWH) will be protected by the VPA (discussed above), it is expected that the SWH for bats on the property will be sufficiently protected.

8.5.13 Special Concern and Rare Wildlife Species

A total of four (4) Special Concern species were identified during the inspections, including Common Nighthawk, Eastern Wood-Pewee, Golden-winged Warbler, and Midland Painted Turtle.

The Common Nighthawk was observed in the western end of the property flying towards a farm property to the west. The FOC4 and FOC4-1 communities on-site are suitable nesting/breeding habitat for this species as it tends to utilize basic rock barren habitats for this purpose.

The proposed setbacks and preservation of the wetlands and woodlands associated with the groundwater discharge/recharge areas should be sufficient to allow this species to utilize the site for its breeding and nesting purposes.

The Eastern Wood-Pewee was overheard on the adjacent property to the north of the subject site. Some woodland habitat is available on-site for this species. However, development is not expected to impose or impact the SWH of the Eastern Wood-Pewee. The proposed 30 m VPA (discussed above) should protect the majority of the woodland habitat for this woodland flycatcher. Compensation for removal of trees within the FOD5-1 community would further mitigate any potential loss of habitat for this species.

Golden-winged Warbler was observed on the hydro-wire on the neighbouring property to the west across County Road 4. The subject site does not possess SWH for this species and therefore no recommendations are required to establish or maintain the habitat of this SAR on-site. The proposed development is at a sufficient distance from the adjacent parcel and the Golden-winged Warblers habitat that it will not impact this species.

Midland Painted Turtle was observed in the Indian River/Quarry Lake watercourse. No waterfront lots are proposed on the property, therefore, access to the lake will be minimized. In addition, the large wooded buffers that are proposed will maintain corridors within the property that this turtle may use for migration and nesting. The VPA and lawn space created by the development should be sufficient to maintain potential nesting sites that may occur within the meadow habitats of the site for this species. Impacts to Midland Painted Turtle should not result from the proposed development provided the EIS recommendations are adhered to and those using the site are made aware of potential impacts to this species.

8.5.14 Bat Hibernacula (unconfirmed)

The site does not possess any caves, however, it does possess some fairly wide, albeit shallow (<2 m deep) fractures in the bedrock face that could be used by bats to hibernate. These areas are entirely confined to the eastern extent of the property, within the FOC4 and FOC4-1 communities along the shoreline.

Regardless, the fractured rock and entryways to the rock will not be filled, altered or closed-off in any way as a result of the proposed development. As an additional precaution, it is understood that these lands are anticipated to be severed and zoned EP. As the development will occur more than 30 m from any exposed fractured rock that occurs towards the waterfront, potential impacts to Bat Hibernacula SWH by the proposed subdivision would be

undetectable.

8.6 Vegetation Protection Area (VPA)

The following applies to the VPA mitigation described in detail above.

- It is anticipated that the VPA illustrated on Figure 7 will be delineated and demarcated on-site by an Ontario Land Surveyor as part of the application to sever these lands from the parent subdivision property. However, should the demarcated boundary fade or get obscured with the passage of time, the limits shall be re-marked prior to any construction commencing.

- Silt fencing will be installed entirely within the subdivision lands parallel to the 30 m VPA and will act as a barrier to prevent construction activities from imposing on the severed lands and the contained preservation areas. The silt fence can be installed in phases, however, the fence shall be installed prior to the commencement of each phase.

- It is possible that certain Stormwater Management facilities such as vegetated swales (etc.) may have to enter the VPA in order to ensure proper function. If needed, the design and alterations necessary to incorporate the proposed technique should be included in the Stormwater Management report. The detailed drawings provided by the Stormwater Engineer should describe the proposed erosion and sedimentation controls (ESC) to the satisfaction of ORCA. The drawings should include both temporary and permanent ESC for the construction period and post-construction period, where necessary. As the VPA is anticipated to be severed from the subdivision property, easements for these features may also be required.

- This EIS recommends certain ESC that should be incorporated into the plan. If the Engineer requires more mitigation in certain areas due to steep slopes, or unstable soils, etc., the mitigation should be provided in the Stormwater report and would supercede ORE's recommendations.

- Passive recreational trails already exist within the woodlands on-site allowing the property owner access to the waterfront area. The trails could continue to be used by whomever takes ownership of this area. No building development should be allowed to occur within the VPA or the FOC4 woodland corridor in the eastern portion of the site. It is expected that both the VPA and the contained NHF will be zoned Environmental Protection (EP), or alike, to protect these features.

9.0 Consolidated Recommendations

The following section provides a brief summary of the recommended mitigation for the proposed development, as outlined in detail in Section 8 of this report. Based on our findings, it is our conclusion that the proposed development can proceed, subject to the recommendations provided in this report and the environmental constraints as illustrated on Figure 7. Other constraints may also be imposed through Planning, Engineering (e.g., grading, stormwater management, etc.), Hydrogeological considerations and/or servicing requirements. These conclusions and recommendations have been based on the available protocols and policy documents available as of the date indicated on this report.

9.1 The principal Natural Heritage Features (NHF) have been identified on-site. These include Significant Wildlife Habitat (SWH), a Provincially Significant Wetland (PSW)/unevaluated wetland complex, a sensitive Groundwater Discharge/Recharge Zone, and the observed presence of Eastern Whip-poor-will (Threatened species), Eastern Wood-Pewee (Special Concern), Common Nighthawk (Special Concern) and Midland Painted Turtle (Special Concern[2]). These features will require protection and/or mitigation as discussed in Section 8.0 of this report. These protections should be incorporated into the development agreement(s).

9.2 As illustrated by Figure 7, a 30 m environmental setback from the Warsaw Caves PSW/unevaluated wetland complex and the Groundwater Discharge/Recharge Zone will constitute a Vegetation Protection Area (VPA) as the primary constraint to future development. When combined, the VPA boundaries will form a consolidated VPA that will protect the NHF on the site. As an added mitigation measure, it is understood that the lands encompassed by the consolidated VPA will be severed from the parent property and zoned Environmental Protection (EP), or equivalent.

The establishment of a consolidated VPA also satisfies requirements of the Provincial Policy Statement, the Growth Plan for the Greater Golden Horseshoe (Growth Plan), the County of Peterborough Official Plan (OP) environmental setback requirements, Township of Douro-Dummer environmental setback requirements, Otonabee Conservation Authority's requirements and habitat protection requirements for potential SAR and SWH, prescribed by the Ministry of the Environment, Conservation and Parks (MECP).

[2] Midland Painted Turtle is designated as Special Concern by the Committee on the Status of Endangered Wildlife in Canada but has not been included in Schedule 1 of the Species at Risk Act. As a conservative measure, this report assumes this species is of Special Concern and locally significant.

9.3 Specific recommendations with regards to the establishment of the VPA have been summarized below:

- The VPA will be delineated and demarcated by an Ontario Land Surveyor as part of the severance application. However, should the demarcated boundary fade or get obscured with the passage of time, the limits shall be re-marked prior to any construction commencing.

- Silt fencing will be installed entirely within the subdivison lands parallel to the consolidated 30 m VPA boundary and will act as a barrier to prevent construction activities from imposing on these preservation areas.

- It is possible that certain Stormwater Management facilities such as vegetated swales (etc.) may need to enter the VPA. If needed, the Stormwater Management report should indicate where those alterations are necessary and provide applicable design(s). The detailed drawings provided by the Stormwater Engineer should describe the proposed erosion and sedimentation controls (ESC) to the satisfaction of ORCA. The drawings should include both temporary and permanent ESC for the construction period and post-construction period, where necessary. As the VPA is anticipated to be severed from the subdivision property, easements for these features may also be required.

- This EIS recommends certain ESC that should be incorporated into the plan. If the Engineer requires more mitigation in certain areas of the site due to slopes, etc., the mitigation should be provided in the Stormwater Management report and would supercede ORE's recommendations.

- Passive recreational trails may occur/remain within the VPA and woodlands areas, however, no other forms of development are allowed within the VPA.

- The eventual owner of the severed (VPA) lands shall be made aware of the restrictions on encroachment and development within these lands.

9.4 The following applies to filling and grading areas of the site outside of the VPA and NHFs.

- Only clean fill should be imported to the site. The fill should not contain organic materials such as plant debris or topsoil that may carry with it exotic or invasive species that could out-compete native species in the adjacent wetlands. If imported topsoil is required, then screened topsoil should be the only material applied to top dress the fill.

- The imported fill slopes prior to the limits of the buffer should be at a reasonable

grade (i.e., 3:1 or shallower) to ensure that materials do not erode past the limit once the silt fence has been removed. Any steeper embankment slopes proposed at the site will require implementation of slope stability controls, and should be incorporated into the final grading plans.

- To reduce potential post-construction sedimentation, disturbed areas should be quickly seeded or sodded to re-establish the root structure within the upper soils where areas have been disturbed and soils are exposed. Planting of native trees and shrubs is also encouraged at this stage. Once the seeding or sodding is determined to be a success and the soils are stable at each site/phase, the erosion/ sedimentation controls can be removed.

  The proponent is responsible for the success of all plantings. ORE staff will conduct a series of three (3) inspections, once after they have been planted to be sure they have been planted properly, one (1) month after the plantings have been planted, and once in the spring season the following year to be sure the trees successfully overwintered.

9.5 Passive stormwater management controls (i.e., low impact design techniques) should be incorporated into the development design, where possible, to enhance recharge that will maintain the on-site moisture regimes, especially with respect to the adjacent Wetland and Quarry Lake. These should be examined as part of the Stormwater Management Plan. The Plan should include provisions for working during storm events and regularly scheduled checks on ESC effectiveness, etc.

9.6 The Significant Wildlife Habitat Mitigation Support Tool #33, recommends reducing the overall footprint of residential developments to maintain the natural areas. Rather than reduce the footprints, ORE recommends keeping the residential footprints closer to the internal roadways. This would effectively reduce the potential for sprawling lawnspace associated with each proposed lot and allow the breeding birds in this area to continue utilizing the habitat in the rear yards. This could potentially help to effectively filter any stormwater flows in the rear yards of the lots and apply low impact design more effectively.

9.7 A pamphlet discussing and illustrating the potential SAR species should be provided to the new property owners as part of an awareness program. A copy should also be provided to the eventual owner of the severed (VPA) lands. The following are recommended to be included.

- Outdoor lighting should be kept to a minimum and directed away from the SWH adjacent to the proposed development.

- Recommendations with regards to maintaining native vegetation and discouraging the unnecessary removal of native trees and plants.

- Ensure each perspective lot purchaser is aware of their individual responsibilities to protect SAR and SAR habitat under the Endangered Species Act (ESA) and the Species at Risk Act (SARA).

- Recommendation to keep pets on a leash within the VPA or on the trails.

- Education on minimizing or avoiding the use of de-icing solutions and road salt on lots which could impact the sensitive groundwater conditions on the property.

9.8 Although SAR and SAR habitat were identified on-site, a series of measures have been incorporated into this EIS (as summarized in this section) so as not to impact any of the SAR or its habitat/residences. Therefore, it is expected that the applicant should not need to obtain a permit from MECP under the Endangered Species Act for the proposed development.

9.9 The following provides a summary of recommendations for the construction phase of the proposed development.

- Prior to any construction, a suitable silt curtain fence should be installed around each construction zone (i.e., footprint), ensuring that the erosion control measures are outside of the setbacks described above (as illustrated on Figure 7). The contractor should ensure that *no construction* occurs within the VPA.

- In addition to the silt curtain fence, bales of straw should be strategically located inside the silt fence, particularly in areas where heavier sediment loads may be transported. The bales (staked and geotextile wrapped) can also be used at the corners of the silt fence to further stabilize the fence itself. These reinforcements are particularly important when heavy equipment is being operated on-site. Construction should not continue during heavy precipitation events. Immediately after any such events, the silt fence and bales should be checked to ensure their effectiveness.

- Members of the construction crew(s) should be educated on the importance of the construction zone limitations and informed not to unnecessarily remove any additional trees or infringe with machinery on the environmental setbacks.

- As a planned action against the spread of invasive species under the Ontario Biodiversity Strategy (MNRF, 2005) and the Invasive Alien Species Strategy for

Canada (Environment Canada, 2004), only clean fill and screened topsoil should be applied to where it may be necessary to raise areas of the site. The fill and topsoil should not contain plant debris that may be a source of exotic or invasive species that can compete with native species in the nearby woodlands or wetlands.

- To reduce potential post-construction slope failure and/or erosion effects, disturbed areas should be quickly seeded or sodded to re-establish root structures within the upper soils. Planting of native species of trees and shrubs is also encouraged at this stage. Once the seeding or sodding is determined to be a success, the erosion/sedimentation controls can be removed.

- To further reduce the potential for impacts from erosion/sedimentation, excess materials should be stockpiled for only short periods and all excess materials from excavations should be removed from the site once the construction is complete. At no time should any fill materials be allowed within the VPA.

- An Erosion and Sediment Control (ESC) plan should be drafted prior to construction, illustrating the fill areas and the measures by which the developer will contain and stabilize all disturbed soils on the site as it relates to common elements (i.e., roads, etc.). Individual residential lots should be required to produce a similar ESC plan at the time of applying for a building permit.

- As per the Migratory Bird Convention Act and with regard to the nesting period described by Bird Studies Canada, trees should not be removed between April 15th to August 31st each year. Preferably any/all tree removal would be completed in the late summer or early fall season.

- Should tree clearing need to take place during the period covering April 15th to August 31st, it is recommended that a qualified assessor inspect the site for significant avian species immediately prior to these activities. If a significant species is observed or overheard during these inspections, the qualified assessor should provide recommendations on when tree clearing activities could resume.

- As a precaution to protect breeding avian, any construction activities proposed to occur between April 15th and August 31st may be limited. It is preferable that construction occur before or after this period. However, if the agencies or developer requires an opinion as to whether certain construction activity can proceed during this period, this can be provided by the author prior to commencing. In some instances, specific mitigation measures may be applied that could allow some activities to proceed, provided a non-impact statement can be approved by the agencies.

- To reduce the potential for turtle mortality on internal roadways during

construction, a light duty silt fence or a barrier should be applied to the boundary of the VPA (i.e., severed lands) and along drainage ditches. Awareness in the form of a pamphlet can be provided to contractors that recommends awareness mitigation practices.

- Barriers should be placed around the construction sites prior to April 1st of each calendar year, to prevent turtles from nesting in the open and disturbed areas of the site.

- A rock retaining wall should be constructed on either side of the main access roadway that enters the development, as turtles can often migrate up through the ditch corridors to nest in upland areas. The rock retaining wall should key into the top of the bank on either side ditch. If stormwater management requires conveyance of water through swales on-site, then similar preventative measures shall be applied to these crossings.

- While the preventative measures are being constructed, light duty silt fence should be installed during the filling and grading phase. This will allow for the work to proceed and also prevent turtles from entering the work zone during this period. The silt fence will remain in place until such time as the roadsides are deemed stable and the retaining wall becomes the stable structure in these instances.

End of EIS Report

Yours truly,
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Selected References

Argus, G.W. and K.M. Pryer. 1982-1987**,** *"Atlas of the Rare Vascular Plants of Ontario*". Four Parts. National Museum of Natural Sciences, Ottawa, Ontario.

Austen, M.J. et. al. 1995. "*Ontario Birds at Risk Program*". Federation of Ontario Naturalists and Long Point Observatory. 165 pp. OBAR website contacted September 2012.

Bezener.A. 2000. "*Birds of Ontario*".Lone Pine Publishing.. 376 pp.

Bakowsky, W., 1995. *"S-ranks for Southern Ontario Vegetation Communities".* OMNR, Natural Heritage Information Centre, Peterborough, ON. 11 pp.

Bellrose F.C. 1976. *"Ducks, Geese and Swans of North America".* Stackpole Books

Cadman, M.D. et. al., 1987**,** *"Atlas of Breeding Birds of Ontario"***,** OBBA website.

Cheskey, E.D. 1995. *"Towards Conserving Birds of Ontario*". Federation of Ontario Naturalists. 48 pp.

Environment and Climate Change Canada, 2016. *"Management Plan for the Snapping Turtle (Chelydra serpentina) in Canada [Proposed]"*. Species at Risk Act Management Plan Series. Ottawa.

Gill F.B. 2007. *"Ornithology - Third Edition".* National Audubon Society, W.H. Freeman and Company.

Jones et. al. 2008. "*The Dragonflies and Damselfies of Algonquin Park and the Surrounding Area.*" The Friends of Algonquin Park. 263 pp.

Habib, L., Bayne, E. M. & Boutin, S. *"Chronic Industrial Noise Affects Pairing Success and Age Structure of Ovenbirds Seiurus Aurocapilla*." Journal of Applied Ecology 44 (2007): 176-84.

Holmes et. al. 1991. *"The Ontario Butterfly Atlas".* Toronto Entomologists Association, Toronto, Ontario.

Holmgren, Noel H., "*Manual of Vascular Plants of Northeastern United States and Adjacent Canada - Second Edition* ", The New York Botanical Garden, 1998.

Lee, H.D. et. al.. 1998. *Ecological Land Classification for Southern Ontario -First Approximation and it's Application - SCSS FieldGuide; FG-02*. OMNR, North Bay, Ontario.

McCracken, J.D., R.A. Reid, R.B. Renfrew, B. Frei, J.V. Jalava, A. Cowie, and A.R. Couturier. 2013. Recovery Strategy for the Bobolink (Dolichonyx oryzivorus) and Eastern Meadowlark (Sturnella magna) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. viii + 88 pp.

Newcomb, L., "Nerwcomb's Wildflower Guide". Little Brown and Company(Canada) Limited, 1977.

Oldham, M.J., 1996, "*Natural Heritage Resources of Ontario, Amphibians and Reptiles"* **,**Ontario Herpetofaunal Survey (OHS),, 1996, OHS website contacted August 2012..

Peck G.K. & James R.D. 1983, "*Breeding Birds of Ontario Nidiology and Distribution Volume 1 : Nonpasserines and Volume 2: Passerines"*. Royal Ontario Museum, Toronto.

Royal Ontario Museum. 2009. "*Species at Risk*." ROM website contacted September 2012.

Sibley, D.A. 2003, "*The Sibley Field Guide to Birds of Eastern North America*". New York: Alfred A. Knopf.

Voss, Edward G., "*Michigan Flora - Part I to Part III*"; Cranbrook Institute of Science Bulletin 55 and The University of Michigan Herbarium, 1972.

Figures

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

TITLE
General Location

PROJECT # 17-2323

DATE July 2019

FIGURE NO. **1**

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

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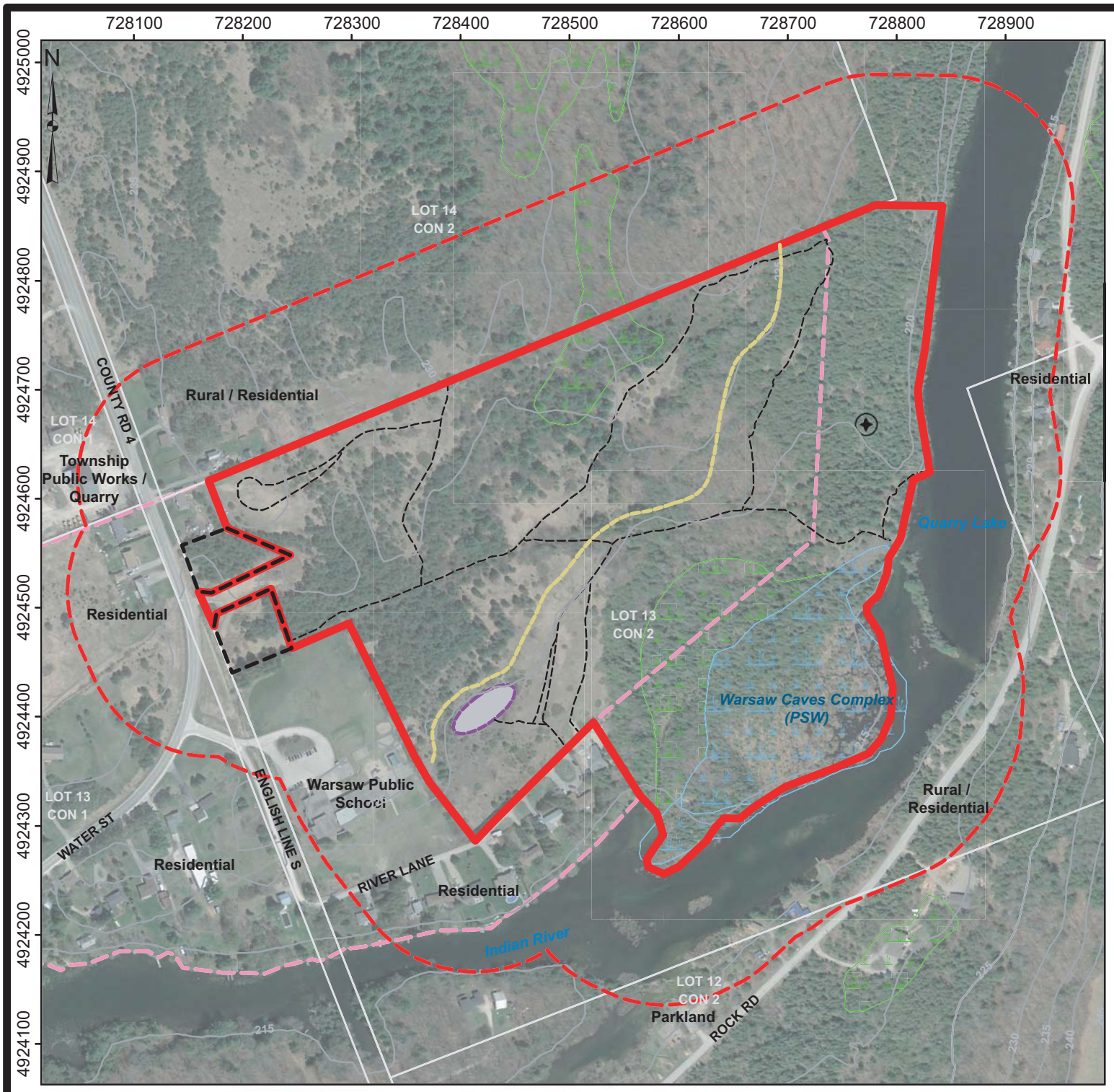
ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

- Approximate Property Boundary
- Study Area (includes 120 m from limit of property)
- Other Vacant Property Owned by Proponent
- Approximate Limit of Hamlet Designation for Warsaw
- MNRF Evaluated Wetland - Provincially Significant
- MNRF Unevaluated Wetland
- Lot Fabric
- Approximate Location of Former Aggregate Pit
- Existing Trail
- Approximate Top of Sandy Ridge Feature
- MNRF Contour (5 m interval)
- Approximate Location of Bedrock Extraction / Failure

Scale: 1:5,000

0 50 100 200 m

Notes: Base plan provided by the Ministry of Natural Resources and Forestry (MNRF, 2019).

Imagery and parcel information provided by the County of Peterborough GIS (2018).

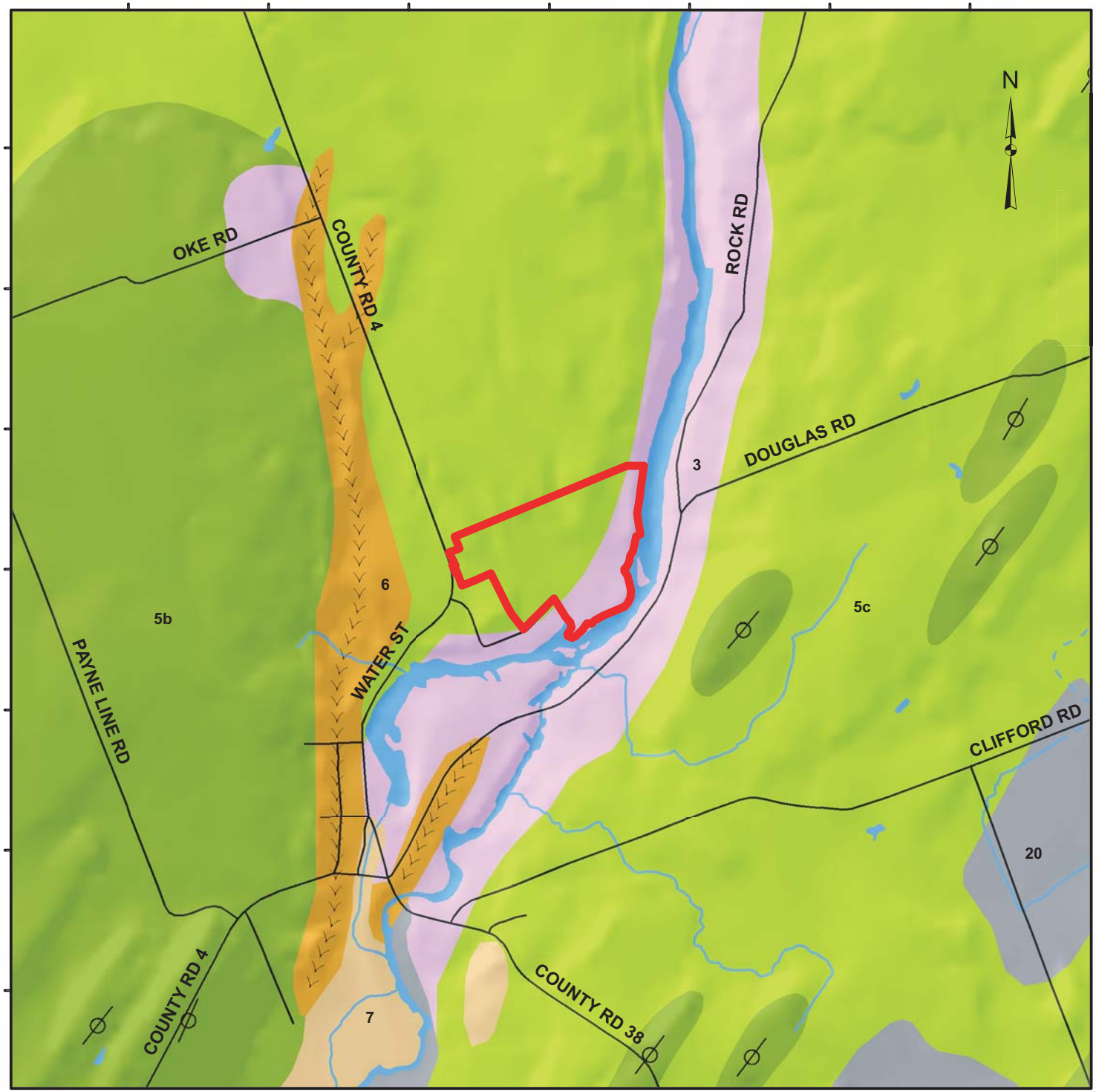
Optimized for printing by Oakridge Environmental Ltd.

TITLE

Existing Features

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**2**
DATE	
July 2019	



North American Datum 1983 Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Site Boundary
- Drumlin
- Esker
- 3 — Paleozoic Bedrock
- 5b — Glacial Deposits (Till): Stone-poor, carbonate-derived silty to sandy till
- 5c — Glacial Deposits (Till): Stony, carbonate-derived silty to sandy till
- 6 — Ice-contact Stratified Deposits
- 7 — Glaciofluvial Deposits
- 20 — Organic Deposits

Scale: 1:20,000

0 250 500 1,000 m

Note: Base map provided by Ontario Geological Survey, copyright the Queen's Printer (2010).

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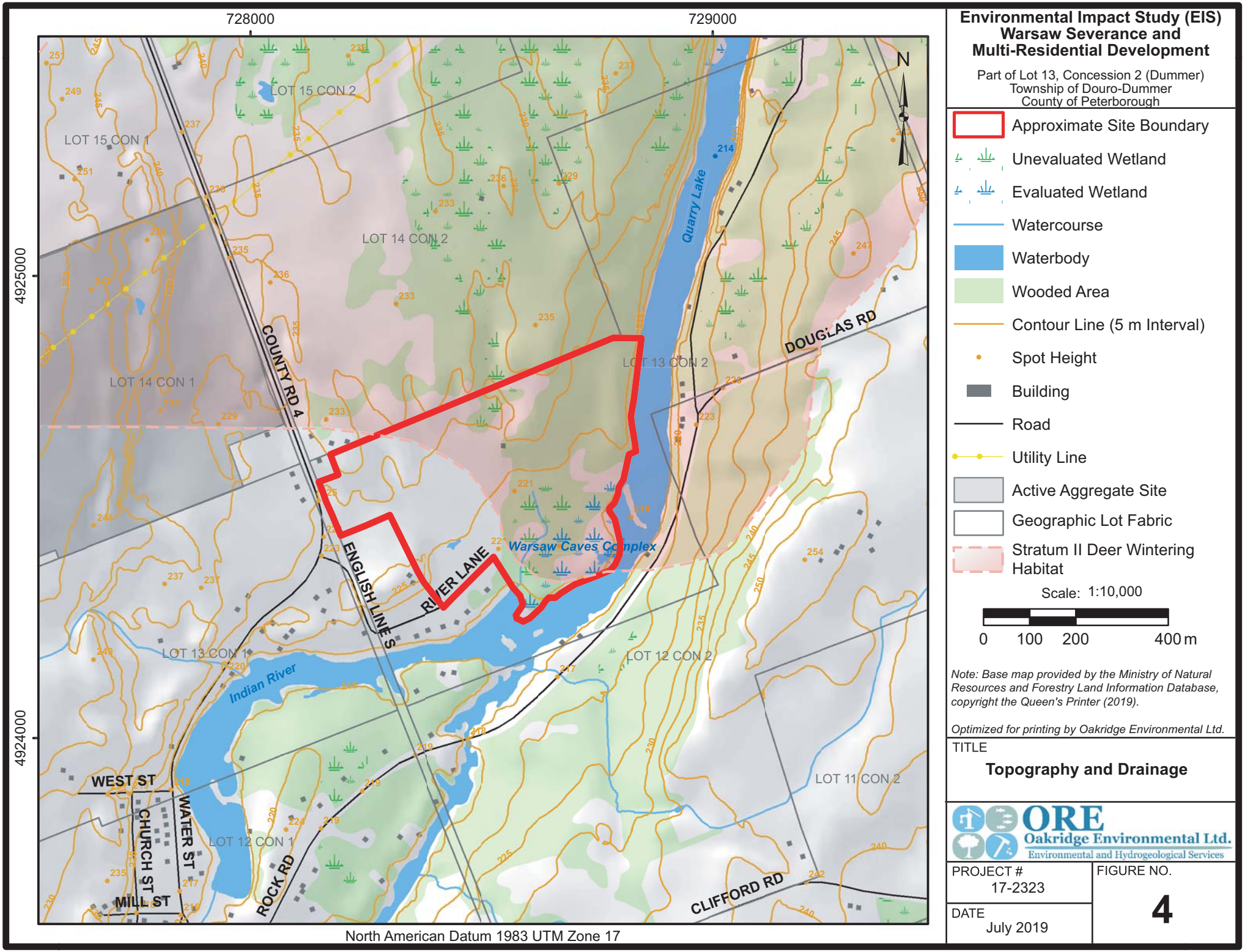
TITLE

Surficial Geology

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	3
DATE	
July 2019	



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

- Approximate Site Boundary
- Unevaluated Wetland
- Evaluated Wetland
- Watercourse
- Waterbody
- Wooded Area
- Contour Line (5 m Interval)
- Spot Height
- Building
- Road
- Utility Line
- Active Aggregate Site
- Geographic Lot Fabric
- Stratum II Deer Wintering Habitat

Scale: 1:10,000

0 100 200 400 m

Note: Base map provided by the Ministry of Natural Resources and Forestry Land Information Database, copyright the Queen's Printer (2019).

Optimized for printing by Oakridge Environmental Ltd.

TITLE

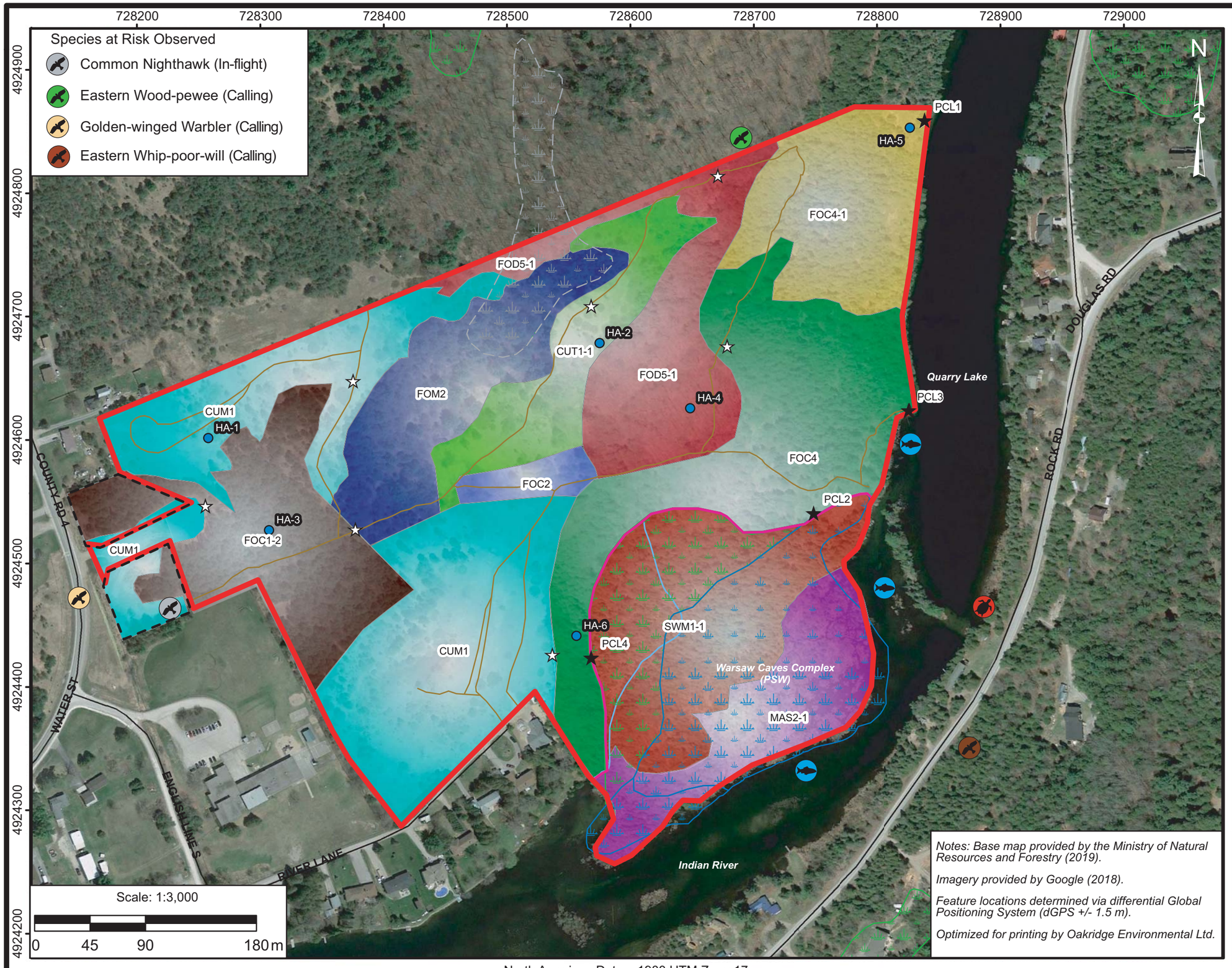
Topography and Drainage

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	4
DATE	
July 2019	

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough



North American Datum 1983 UTM Zone 17

LEGEND

- Approximate Property Boundary
- Marsh Monitoring Protocol Point Count Location
- OBBA Point Count Location
- Mineral Cultural Meadow (CUM1)
- Sumac Cultural Thicket (CUT1-1)
- Dry - Fresh White Pine - Red Pine Coniferous Forest (FOC1-2)
- Dry - Fresh Cedar Coniferous Forest (FOC2)
- Fresh - Moist White Cedar Coniferous Forest (FOC4)
- Fresh - Moist White Cedar Coniferous Forest (FOC4-1)
- Dry - Fresh Sugar Maple Deciduous Forest (FOD5-1)
- Dry - Fresh White Pine - Maple - Oak Mixed Forest (FOM2)
- White Cedar - Hardwood Mineral Mixed Swamp (SWM1-1)
- Cattail Mineral Shallow Marsh (MAS2-1)
- Warsaw Caves Complex Provincally Significant Wetland (PSW)
- Wetland (Unevaluated)
- Published Mapping Error (not wetland)
- Other Lands Owned by Proponent
- Hand Auger Locations
- Potential Fish Habitat
- Midland Painted Turtle
- Wetland Boundary
- Trail Network

Notes: Base map provided by the Ministry of Natural Resources and Forestry (2019).

Imagery provided by Google (2018).

Feature locations determined via differential Global Positioning System (dGPS +/- 1.5 m).

Optimized for printing by Oakridge Environmental Ltd.

TITLE

Vegetation Communities

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**5**
DATE	
July 2019	

Photo A (Left): Shows a trail going through Mineral Cultural Meadow (CUM1). Photo taken looking east.

Photo B (Right): Photo taken off the trail in the Dry - Fresh Sugar Maple Deciduous Forest (FOD5-1). This photo was taken facing west from Eastern White Cedar Forest (FOC4).

Photo C (Left): Photo taken in the Cattail Mineral Shallow Marsh (MAS2-1). Photo taken facing East.

Site photos were taken on August 1st, 2017 and July 4th, 2018.

Environmental Impact Study (EIS)
Warsaw Severance and
Multi-Residential Development
Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

TITLE
Site Photos

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT # 17-2323

DATE July 2019

FIGURE NO. **6**

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

728200 728300 728400 728500 728600 728700 728800 728900 729000

4924900 4924800 4924700 4924600 4924500 4924400 4924300 4924200

ENVIRONMENTAL CONSTRAINTS
- Wetland Boundary
- Wetland Buffer (30 m setback)
- Limit of Important Groundwater Discharge / Recharge
- Limit of Consolidated Vegetation Protection Area (VPA)

N

FOC4-1
FOD5-1
VEGETATION PROTECTION AREA (VPA)
CUT1-1
FOD5-1
FOM2
CUM1
Quarry Lake
DOUGLAS RD
ROCK RD
FOC4
FOC2
COUNTY RD 4
CUM1
FOC1-2
VEGETATION PROTECTION AREA (VPA)
SWM1-1
CUM1
Warsaw Caves Complex (PSW)
MAS2-1
WATER ST
ENGLISH LINE S
RIVER LANE
Indian River

Scale: 1:3,000
0 45 90 180 m

Notes: Base map provided by the Ministry of Natural Resources and Forestry (2019).

Imagery provided by Google (2018).

Feature locations determined via differential Global Positioning System (dGPS +/- 1.5 m).

Optimized for printing by Oakridge Environmental Ltd.

North American Datum 1983 UTM Zone 17

LEGEND
- Approximate Property Boundary
- Other Lands Owned by Proponent
- Mineral Cultural Meadow (CUM1)
- Sumac Cultural Thicket (CUT1-1)
- Dry - Fresh White Pine - Red Pine Coniferous Forest (FOC1-2)
- Dry - Fresh Cedar Coniferous Forest (FOC2)
- Fresh - Moist White Cedar Coniferous Forest (FOC4)
- Fresh - Moist White Cedar Coniferous Forest (FOC4-1)
- Dry - Fresh Sugar Maple Deciduous Forest (FOD5-1)
- Dry - Fresh White Pine - Maple - Oak Mixed Forest (FOM2)
- White Cedar - Hardwood Mineral Mixed Swamp (SWM1-1)
- Cattail Mineral Shallow Marsh (MAS2-1)
- Warsaw Caves Complex Provincally Significant Wetland (PSW)
- Wetland (Unevaluated)
- Published Mapping Error (not wetland)
- Former Aggregate Pit
- Bedrock Extraction / Failure
- Existing Trails
- Sandy (Vegetated) Ridge
- Approximate Warsaw Hamlet Limit

TITLE

Development Constraints

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

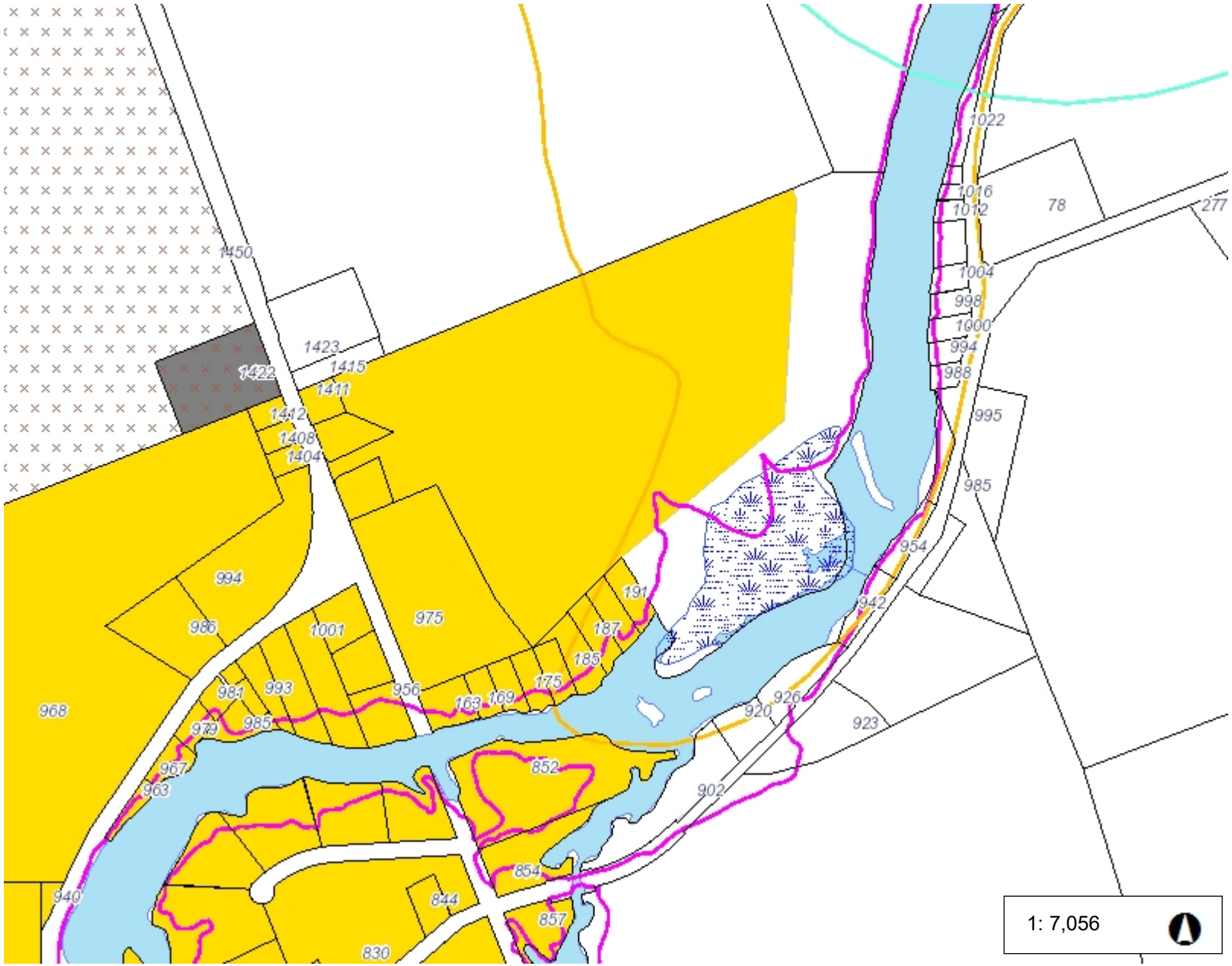
PROJECT #	FIGURE NO.
17-2323	7
DATE	
July 2019	

Appendix A

Warsaw Hamlet Boundary Limit

County of Peterborough

Warsaw



Legend

- Civic Address
- Parcel Fabric
- Parcel First Nations - Canada
- Douro-Dummer OP WM 500m
- Douro-Dummer OP ANSI
  - ANSI, Life Science
  - ANSI, Earth Science
- Douro-Dummer OP ECA
- Douro-Dummer OP Extractivel
- Douro-Dummer OP Special Se
- Douro-Dummer Landuse
  - Residential
  - Seasonal Residential
  - Hamlet
  - Rural
  - Recreational - Open Space
  - First Nations
  - Commercial
  - Extractive Industrial Licenced
  - Industrial
  - Waste Management Area - (Former
  - Waste Management Area - (Active
  - DNA Cluster
  - Provincially Significant Wetland
  - Locally Significant Wetland
  - Highway Commercial

1: 7,056

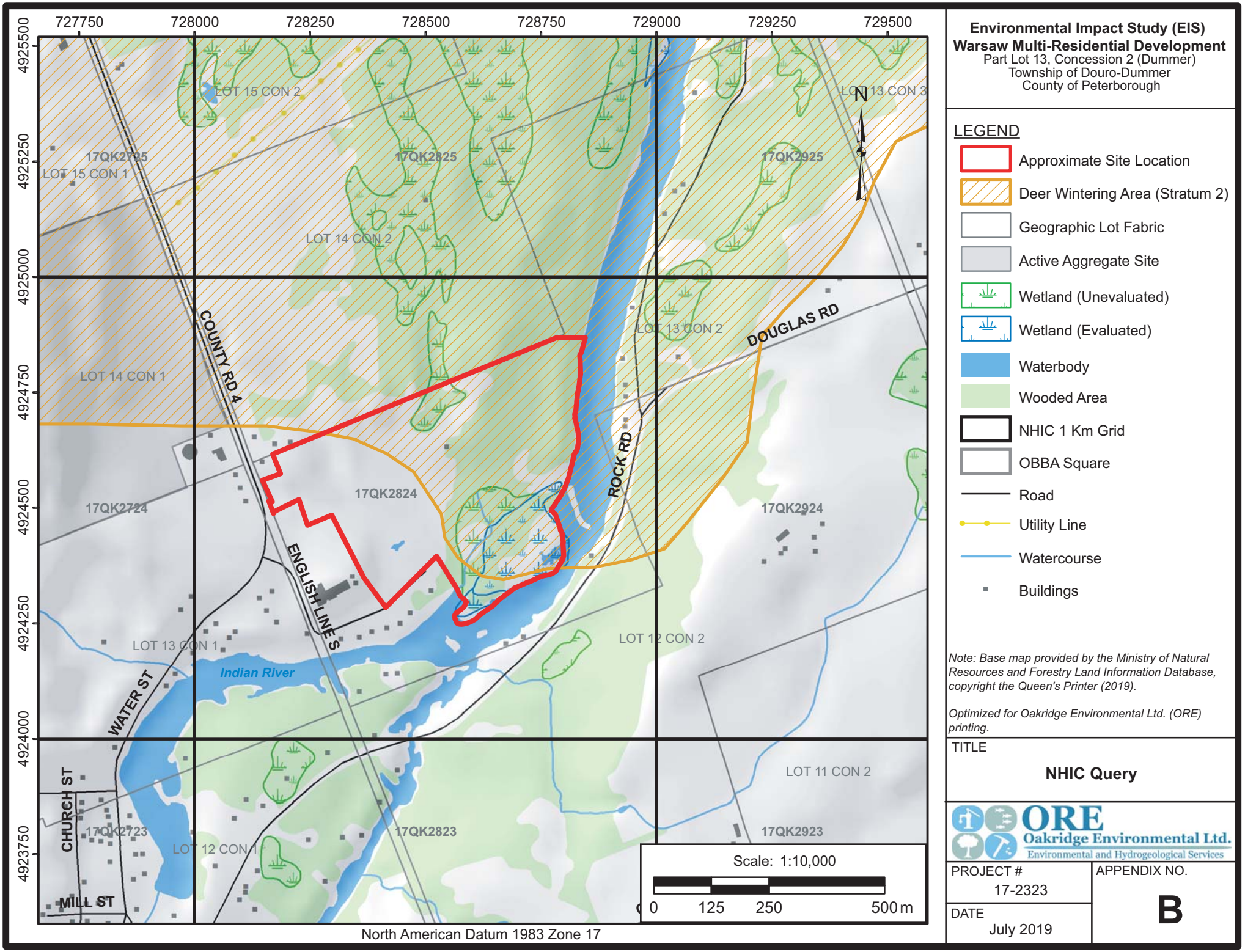
Notes

358.5 0 179.23 358.5 Meters

North_American_1983_CSRS_UTM_Zone_17N

Appendix B

NHIC Query & MNRF Correspondence



Environmental Impact Study (EIS)
Warsaw Multi-Residential Development
Part Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Site Location
- Deer Wintering Area (Stratum 2)
- Geographic Lot Fabric
- Active Aggregate Site
- Wetland (Unevaluated)
- Wetland (Evaluated)
- Waterbody
- Wooded Area
- NHIC 1 Km Grid
- OBBA Square
- Road
- Utility Line
- Watercourse
- Buildings

Note: Base map provided by the Ministry of Natural Resources and Forestry Land Information Database, copyright the Queen's Printer (2019).

Optimized for Oakridge Environmental Ltd. (ORE) printing.

TITLE

NHIC Query

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	APPENDIX NO.
17-2323	**B**
DATE	
July 2019	

NHIC Query

Eastern Wood-Pewee is listed as "Special Concern" by SARO and is not protected under the ESA. This species prefers mixed deciduous and coniferous woodlands which are open or considered edge habitat. Nesting occurs on a tree branch as the species catches insects from a perch.

[Français]

Ontario

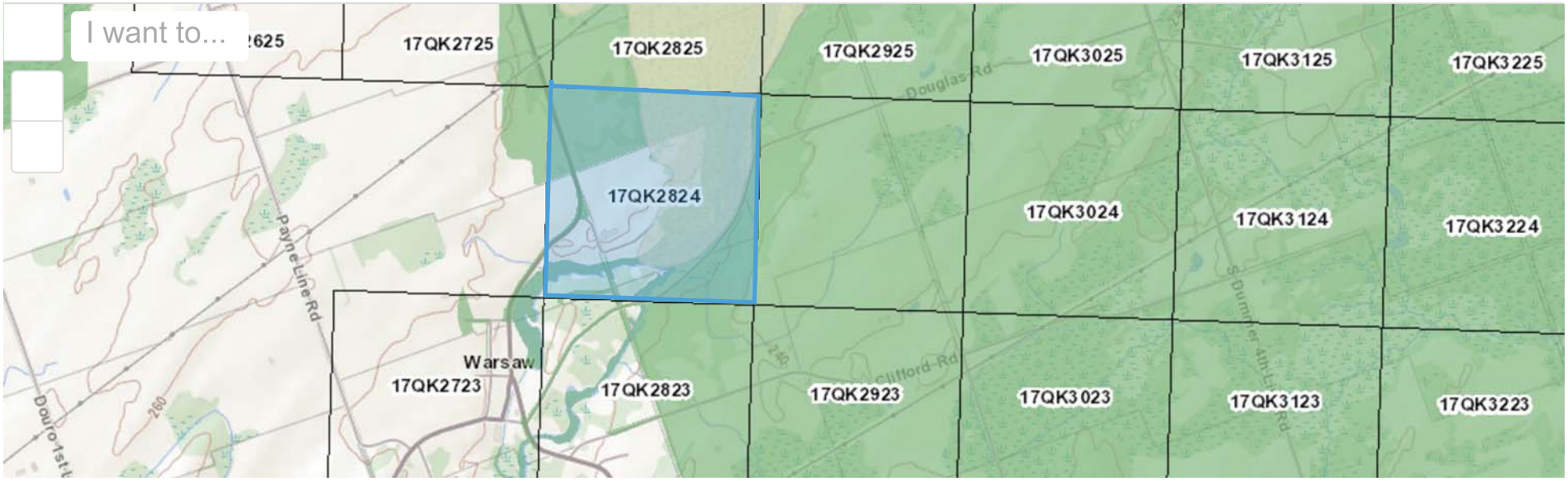
Ministry of Natural Resources and Forestry

Make A Map: Natural Heritage Areas

Looking for a Park, Reserve or Wetland? Enter the name

About | Bookmarks | Map Layers | Find Information | Markup & Printing | Measure

Printing | Polygon | Styles | Edit | Erase | Clear All | Pan | Zoom In | Zoom Out | Initial View | Previous Extent | Next Extent | Help



NHIC Data -- Grid ID = 1062118

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID	Details URL
NATURAL AREA	Warsaw Caves						1691	http://nhic.mnr.gov.on.c
NATURAL AREA	Warsaw Caves Complex						8216	http://nhic.mnr.gov.on.c
SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC		180294	http://http://nhic.mnr.go

Rob West

From: Spang, Elizabeth (MNRF) [Elizabeth.Spang@ontario.ca]
Sent: March 21, 2019 2:09 PM
To: Rob West
Subject: RE: Terms of Reference, Warsaw Subdivision; MNRF file 18-DUMM-PET-INF-2800, PB2018-0518
Attachments: 2019_MNRFresponseWarsawSubdivision.pdf; Bat Survey Methods_2015.docx

Hi Rob:

I am cleaning up some of our files and I found this file for which it appears our comments were never sent out. I apologize for not getting back to you on this request!
I recognize that these comments may no longer be useful at this late stage but I thought I would pass them along anyway in the event that you need to do any follow-up work for the approval authorities this coming field season. The information can be found in the attachment. To address your question below regarding bats, any time proposed development will impact forested areas, we recommend surveys for bats. In this case, we would especially recommend surveys for bats given the nearby Warsaw Caves ANSI, which has been documented as a possible bat hibernacula. Our latest bat survey methods are attached for your reference, if not for this file then for other files you may be working on. Note that snag surveys need to be done in the leaf-off period. If you haven't done any yet, there is still some time to complete them before leaf out this spring.

Apologies again for not getting back to you,

Liz Spang, M.Pl

District Planner
Peterborough District
Ontario Ministry of Natural Resources and Forestry
300 Water Street, 1st Floor South
Peterborough, ON K9J 8M5
Tel: (705) 755-3360
Fax: (705) 755-3125
Email: Elizabeth.Spang@ontario.ca

From: Rob West <rob@oakridgeenvironmental.com>
Sent: May 14, 2018 3:22 PM
To: Griffin, Lara (MNRF) <Lara.Griffin@ontario.ca>
Subject: RE: Terms of Reference, Warsaw Subdivision

Hi Lara,

Please see the attached OBM figure to help you identify where the property is located. The site occurs on Part Lot 13, Concession 2 (Dummer), Township of Duoro-Dummer, Peterborough County. We have completed deer wintering habitat surveys, observed/overheard Eastern Wood-pewee, and overheard Whip-poor-will to the southeast of the site (across the Indian River) thus far. The Whip-poor-will call was very faint and it was during the last full moon phase. We checked for Butternut and have not identified any so far. We will be back to complete two more night time surveys and two more early morning surveys for SAR birds.

Appendix C

OBBA Data and General Species Descriptions

Square Summary (17QK22)

#species (1st atlas)				#species (2nd atlas)				#hours		#pc done	
poss	prob	conf	total	poss	prob	conf	total	1st	2nd	road	offrd
31	43	26	100	49	34	38	121	39	36	25	0

Region summary (#16: Peterborough)

#squares	#sq with data		#species		#pc done	target #pc
	1st	2nd	1st	2nd		
60	60	60	171	185	1995	750

Target number of point counts in this square: 21 road side, 4 off road (2 in treed wetlands, 1 in coniferous forest, 1 in pasture/grassland). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Canada Goose	H	FY	31	93	Cooper's Hawk		S	28	41	Great Horned Owl	S	AE	75	46
Mute Swan			0	1	Northern Goshawk			26	38	Barred Owl		FY	48	63
Wood Duck	H	V	90	96	Red-should Hawk †			35	63	Long-eared Owl		S	5	13
Gadwall ‡			1	3	Broad-winged Hawk		T	66	86	North Saw-whet Owl			53	30
American Black Duck	P	FY	63	41	Red-tailed Hawk	P	NB	78	68	Common Nighthawk	S	S	73	40
Mallard	P	T	93	100	American Kestrel	T	T	70	66	Whip-poor-will	T		75	53
Blue-winged Teal	P	P	48	40	Merlin		CF	3	46	Chimney Swift		H	76	21
Northern Shoveler ‡	H		3	3	Virginia Rail		S	21	71	Ruby-thr Hummingbird	T	P	98	96
Northern Pintail ‡			3	0	Sora	S	S	20	36	Belted Kingfisher	AE	CF	100	98
Green-winged Teal			0	18	Common Moorhen	D		23	15	Red-headed Woodpecker †	P		30	10
Ring-necked Duck		T	18	46	American Coot ‡			10	5	Yellow-bellied Sapsucker	NY	S	95	100
Hooded Merganser		FY	36	83	Coot/Moorhen			0	0	Downy Woodpecker	D	H	91	98
Common Merganser			30	50	Sandhill Crane ‡		FY	0	1	Hairy Woodpecker	P	H	95	100
Red-breast Merganser ‡			3	0	Killdeer	A	NE	90	85	Black-backed Woodpecker			13	21
Ruffed Grouse	P	D	91	100	Rock Dove	FY	P	61	73	Northern Flicker	D	P	100	98
Wild Turkey		H	0	56	Spotted Sandpiper	H	T	76	66	Pileated Woodpecker	S	T	93	100
Common Loon	FY	P	85	95	Upland Sandpiper	A	T	31	26	Olive-sided Flycatcher	H		53	28
Pied-billed Grebe		S	8	48	Common Snipe	D	T	63	78	Eastern Wood-Pewee	T	T	96	100
Double-crest Cormorant ‡§			3	1	American Woodcock	D	H	71	78	Yellow-bellied Flycatcher			21	16
American Bittern	NY	S	55	81	Wilson's Phalarope †			1	1	Alder Flycatcher	S	S	60	96
Least Bittern †	NE	H	18	25	Ring-billed Gull ‡§			1	8	Willow Flycatcher	T	S	35	50
Great Blue Heron §	NY	H	100	91	Herring Gull §			45	45	Least Flycatcher	S	S	98	100
Green Heron §	H	H	55	50	Caspian Tern †			1	1	Eastern Phoebe	T	P	96	100
Black-crown N.-Heron † §			3	0	Black Tern † §	NY	NY	30	21	Gr Crested Flycatcher	T	NE	100	100
Turkey Vulture	H	H	90	100	Common Tern §			18	5	Eastern Kingbird	NE	AE	100	100
Osprey	NY		78	80	Mourning Dove	T	D	75	96	Loggerhead Shrike †			13	1
Bald Eagle †			6	6	Black/Yell-billed Cuckoo			0	46	Yellow-throated Vireo			50	53
Northern Harrier	NY	H	63	46	Black-billed Cuckoo	H	CF	48	80	Blue-headed Vireo		S	35	68
Sharp-shinned Hawk	H	H	45	60	Eastern Screech-Owl			11	15	Warbling Vireo	S	S	98	98

next page >>

Ontario Breeding Bird Atlas - Summary Sheet for Square 17QK22 (page 2 of 3)

SPECIES	Code		%		SPECIES	Code		%		SPECIES	Code		%	
	1st	2nd	1st	2nd		1st	2nd	1st	2nd		1st	2nd	1st	2nd
Philadelphia Vireo ‡			6	8	American Robin	NY	NY	100	100	Common Yellowthroat	A	DD	100	100
Red-eyed Vireo	T	NY	100	100	Gray Catbird	A	CF	98	86	Canada Warbler			66	83
Gray Jay		P	20	21	Northern Mockingbird ‡			1	1	Eastern Towhee	P		45	45
Blue Jay	P	P	100	100	Brown Thrasher	T	P	95	81	Chipping Sparrow	S	CF	100	100
American Crow	FY	NB	98	100	European Starling	CF	CF	96	91	Clay-colored Sparrow ‡			1	20
Common Raven		CF	46	78	Cedar Waxwing	N	A	100	100	Field Sparrow	S	S	68	73
Horned Lark		S	30	28	Golden-winged Warbler			53	40	Vesper Sparrow	S	S	75	43
Purple Martin			53	28	Blue/Gold-wing Warbler			0	25	Savannah Sparrow	T	CF	78	73
Tree Swallow	AE	AE	100	100	Brewster's Warbler †			1	8	Grasshopper Sparrow	S	T	15	28
North Rgh-wing Swallow	NY	H	66	53	Tennessee Warbler ‡			1	1	Song Sparrow	CF	CF	100	100
Bank Swallow §	AE		76	36	Nashville Warbler	S	S	100	100	Swamp Sparrow	CF	FY	100	100
Cliff Swallow §		AE	81	36	Northern Parula			20	18	White-throat Sparrow	T	S	100	100
Barn Swallow	NE	V	96	95	Yellow Warbler	A	P	100	100	Dark-eyed Junco			30	35
Black-capped Chickadee	P	AE	100	100	Chestn-sided Warbler	T	CF	98	100	Scarlet Tanager	S	H	91	98
Red-breast Nuthatch		S	71	91	Magnolia Warbler		S	60	75	Northern Cardinal		S	23	48
White-breast Nuthatch	H	S	91	100	Cape May Warbler ‡			1	8	Rose-breast Grosbeak	T	S	100	100
Brown Creeper		S	55	83	Black-thr Blue Warbler			43	78	Indigo Bunting	S	S	100	98
House Wren	AE	AE	76	78	Yellow-rumped Warbler	S	NY	83	91	Bobolink	P	FY	85	68
Winter Wren	S	S	80	93	Black-thr Green Warbler	S	CF	73	100	Red-wing Blackbird	NE	CF	100	100
Sedge Wren			11	20	Blackburnian Warbler		S	66	78	Eastern Meadowlark	D	CF	70	63
Marsh Wren	A	S	25	51	Pine Warbler		T	40	88	Western Meadowlark ‡	T		1	1
Golden-crown Kinglet		S	33	55	Prairie Warbler †			3	6	Common Grackle	CF	CF	100	100
Ruby-crown Kinglet			20	15	Cerulean Warbler †			8	5	Brown-head Cowbird	H	S	98	95
Blue-gr Gnatcatcher ‡			11	1	Black-white Warbler	S	S	100	100	Orchard Oriole ‡			1	3
Eastern Bluebird	NY	CF	45	66	American Redstart	S	T	95	100	Baltimore Oriole	CF	P	100	90
Veery	T	T	100	100	Ovenbird	T	T	100	100	Purple Finch		P	88	100
Swainson's Thrush			36	40	North Waterthrush	S	S	96	100	House Finch		P	5	43
Hermit Thrush		S	66	78	Louis Waterthrush †			1	0	Red Crossbill			20	5
Wood Thrush	T	S	91	96	Mourning Warbler		S	75	83	White-winged Crossbill ‡		S	0	1

<< previous page next page >>

Ontario Breeding Bird Atlas - Summary Sheet for Square 17QK22 (page 3 of 3)

SPECIES	Code		%	
	1st	2nd	1st	2nd
Pine Siskin		T	33	41
American Goldfinch	P	FY	98	100
Evening Grosbeak			48	71
House Sparrow	CF	V	70	50

This list includes all species found during the Ontario Breeding Bird Atlas (1st atlas: 1981-1985, 2nd atlas: 2001-2005) in the region #16 (Peterborough). Underlined species are those that you should try to add to this square. They have not yet been reported during the 2nd atlas, but were found during the 1st atlas in this square or have been reported in more than 50% of the squares in this region during the 2nd atlas so far. In the species table, "BE 2nd" and "BE 1st" are the codes for the highest breeding evidence for that species in square 17QK22 during the 2nd and 1st atlas respectively. The % columns give the percentage of squares in that region where that species was reported during the 2nd and 1st atlas (this gives an idea of the expected chance of finding that species in region #16). Rare/Colonial Species Report Forms should be completed for species marked: § (Colonial), ‡ (regionally rare), or † (provincially rare). Current as of 16/01/2019. An up-to-date version of this sheet is available from http://www.birdsontario.org/atlas/summaryform.jsp?squareID=17QK22

<< previous page

Bank Swallow is listed as "Threatened" by *Species at Risk Ontario* (SARO) and is protected under the *Endangered Species Act* (ESA). This avian species nests in burrows in natural and human-made settings where there are silt and sand deposits. Nests tend to be found on banks of rivers and lakes. The Bank Swallow also tends to inhabit sand and gravel pits. Typically, this species forages on insects that it can catch in flight, but will also eat both land and water-based insects if available.

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

Black Tern is listed as "Special Concern" by SARO but is afforded neither species nor habitat protection under the ESA. The Black Tern prefers shallow, freshwater cattail marshes, wetlands, lake edges and sewage ponds with emergent vegetation. Nesting occurs on dead plant material piled upon aquatic floating vegetation. The Black Tern hunts small insects and minnows along the surface of the water.

Bobolink is listed as "Threatened" by SARO and is protected under the ESA. The Bobolink prefers large tracts of tallgrass areas, either true prairies or hay fields as it forages low to the ground in search for adult insects larvae and seeds. The call of this species is distinctive and can be heard within tall grass agricultural borders. Although the call is not as loud as most other avian species calling during the breeding bird period, it is easily detected.

Canada Warbler is listed as "Special Concern" by SARO and is afforded neither species nor habitat protection under the ESA. It prefers large tracts of mixed forests on bottomlands within wetlands or drainage courses. The species nests within the upper extremities of the canopy in deciduous and coniferous trees. The Canada Warbler feeds on beetles, caterpillars and common insects.

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

Common Nighthawk is listed as "Special Concern" by SARO and is afforded neither species nor habitat protection under the ESA. The Common Nighthawk is part of the Nightjar family which prefers forest openings, bogs and sometimes open field/meadow areas. Nesting occurs on bare ground where both adults feed the young. Feeding can take place during day or night, while the species constantly forages for all types of insects. This species has a very distinct mating flight and call, which can easily be detected in the evening hour surveys.

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

Eastern Wood-Pewee is listed as "Special Concern" by SARO and is afforded neither species nor habitat protection under the ESA. This species prefers mixed deciduous and coniferous woodlands which are open or considered edge habitat. Nesting occurs on a tree branch as the species catches insects from a perch.

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

The Loggerhead Shrike is listed as "Endangered" by SARO and is protected under the ESA. The Loggerhead Shrike is commonly observed perched at the top of a shrub or fence in open meadow areas. Typically, this species is easy to spot with their distinctive plumage pattern. This robin sized species has white underparts, gray back with a black tail and side feathers along with a black mask. The leading cause of the population decline has been linked to intensive farming, reforestation and development. In some situations, predation may guide a Shrike to a roadway leading to an injury and death caused by oncoming vehicles. Currently this Shrike is at major risk of extirpation having an Endangered status both Federally and Provincially.

Only 20-25 breeding pairs are known to occur in Ontario. This species can sometimes be misidentified in the early fall season as its close relative the Northern Shrike can utilize similar habitats. The Northern Shrike is similar in appearance, however, does have some distinct differences in appearance, in addition to the time of year this species occurs within Southern Ontario (from October to April).

Red-bellied Woodpecker is not listed as a species at risk by SARO but is considered regionally rare in the area of the subject site. It prefers to create its nest in the trunk of dead trees and will often return to these nests in consequential years. The Red-bellied Woodpecker diet consists primarily of insects but is also known to feed on seeds and fruit.

Red-headed Woodpecker is listed as "Special Concern" by SARO and is afforded neither species nor habitat protection under the ESA. It prefers a combination of deciduous forests and rural development areas, similar to a park-like setting. The deciduous species can be oak or maple, however, the understorey must be meadow-like or low-cut maintained lawnspace. The species will nest within cavities that it constructs or it will take over cavity nests that other woodpeckers have constructed. The Red-headed Woodpecker feeds on beetles, caterpillars and common insects that are found within the bark of trees.

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

small mammals, birds, reptiles and amphibians.

Whip-poor-will is listed as "Threatened" by SARO and is protected under the ESA. The Whip-poor-will prefers a combination of large natural tracts of forest, watercourses and edge habitat consisting of meadow areas with open, deciduous and pine woodlands. The Whip-poor-will does not construct a nest, but rather utilizes the soft leaf litter on the ground to form a nest and lay the eggs directly on the ground. The Whip-poor-will is a nighttime hunter, calling its own name while searching for large flying insects, beetles, moths, mosquitos and sometimes grasshoppers. The Whip-poor-will often choose pine species adjacent to waterways to call and forage from as it conceals them well. The call of this species is very distinctive and evening surveys during the full moon phases are best for their detection.

Wood Thrush is listed as "Threatened" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and is protected under the *Species at Risk Act* (SARA). The Wood Thrush enjoys relatively undisturbed, mature woodlands. Nesting occurs low in the fork of a tree as this species forages for berries and insects at ground level

Appendix D

E-Bird Hotspot Data

eBird Menu

< Hotspot Map

Warsaw Caves Conservation Area

Peterborough County, Ontario, CA — Get Directions

All Months | All Years | Set | Submit Data | Send feedback

Overview | Recent Visits | Illustrated Checklist

111 Species | 72 Checklists

Updated 4 sec ago.

Last Seen | First Seen | High Counts | Bar Charts | Printable Checklist | Show All Details

	SPECIES NAME	COUNT	DATE	BY
1	Canada Goose	1	21 Apr 2019	Robby Marrotte
2	Mallard	2	21 Apr 2019	Robby Marrotte
3	Common Merganser	2	21 Apr 2019	Robby Marrotte
4	Mourning Dove	2	21 Apr 2019	Robby Marrotte
5	White-breasted Nuthatch	1	21 Apr 2019	Robby Marrotte
6	American Robin	5	21 Apr 2019	Robby Marrotte
7	Ruffed Grouse	2	20 Apr 2019	Kathryn Sheridan
8	Yellow-bellied Sapsucker	1	20 Apr 2019	Kathryn Sheridan
9	Hairy Woodpecker	1	20 Apr 2019	Kathryn Sheridan
10	Northern Flicker	2	20 Apr 2019	Kathryn Sheridan
11	Eastern Phoebe	1	20 Apr 2019	Kathryn Sheridan
12	Blue Jay	10	20 Apr 2019	Kathryn Sheridan
13	American Crow	1	20 Apr 2019	Kathryn Sheridan
14	Black-capped Chickadee	27	20 Apr 2019	Kathryn Sheridan
15	Red-breasted Nuthatch	2	20 Apr 2019	Kathryn Sheridan
16	Brown Creeper	4	20 Apr 2019	Kathryn Sheridan
17	Winter Wren	5	20 Apr 2019	Kathryn Sheridan
18	Golden-crowned Kinglet	18	20 Apr 2019	Kathryn Sheridan
19	Hermit Thrush	9	20 Apr 2019	Kathryn Sheridan
20	White-throated Sparrow	3	20 Apr 2019	Kathryn Sheridan
21	Sandhill Crane	1	9 Sep 2018	Michael Mechan
22	Turkey Vulture	2	8 Sep 2018	Michael Mechan
23	Belted Kingfisher	3	8 Sep 2018	Michael Mechan
	Downy/Hairy Woodpecker	1	8 Sep 2018	Michael Mechan
24	Pileated Woodpecker	1	8 Sep 2018	Michael Mechan
25	Swainson's Thrush	5	8 Sep 2018	Michael Mechan
26	Cedar Waxwing	6	8 Sep 2018	Michael Mechan
27	Bay-breasted Warbler	2	8 Sep 2018	Michael Mechan

Recent Visits

Checklists submitted within the last hour are not shown.

OBSERVER	DATE	SPECIES
Robby Marrotte	21 Apr 2019	6
Kathryn Sheridan	20 Apr 2019	18
Michael Mechan	9 Sep 2018	1
Alexandra Anderson	9 Sep 2018	1
Michael Mechan	8 Sep 2018	17
Alexandra Anderson	8 Sep 2018	17
Eliza Montgomery	30 Aug 2018	12
Colin Jones	20 Aug 2018	8
Mike V.A. Burrell	9 Aug 2018	7
Donald A. Sutherland	9 Aug 2018	7

More Recent Visits...

Top eBirders

BY SPECIES | BY CHECKLISTS

Updated 4 sec ago.

1	Travis Cameron	67
2	Donald A. Sutherland	62
3	Luke Berg	45
4	Colin Jones	38
5	Scott Gibson	37
6	Bart Young	35
7	Dave Milsom	34
7	Martin Parker	34
7	Brian Wales	34
10	Glenn Desy	32

	SPECIES NAME	COUNT	DATE	BY
28	**Black-throated Blue Warbler**	1	8 Sep 2018	Michael Mechan
29	**Yellow-rumped Warbler**	2	8 Sep 2018	Michael Mechan
30	**Black-throated Green Warbler**	1	8 Sep 2018	Michael Mechan
31	**Rose-breasted Grosbeak**	1	8 Sep 2018	Michael Mechan
	hawk sp.	1	30 Aug 2018	Eliza Montgomery
	flycatcher sp. (Tyrannidae sp.)	1	30 Aug 2018	Eliza Montgomery
32	**American Goldfinch**	2	30 Aug 2018	Eliza Montgomery
33	**Black-and-white Warbler**	1	30 Aug 2018	Eliza Montgomery
34	**Magnolia Warbler**	1	30 Aug 2018	Eliza Montgomery
35	**Canada Warbler**	1	30 Aug 2018	Eliza Montgomery
	warbler sp. (Parulidae sp.)	1	30 Aug 2018	Eliza Montgomery
36	**Eastern Wood-Pewee**	1	20 Aug 2018	Colin Jones
37	**Olive-sided Flycatcher**	1	9 Aug 2018	Mike V.A. Burrell
38	**Song Sparrow**	2	9 Aug 2018	Mike V.A. Burrell
39	**Common Yellowthroat**	1	9 Aug 2018	Mike V.A. Burrell
40	**Blue-headed Vireo**	1	9 Aug 2018	Mike V.A. Burrell
41	**Red-eyed Vireo**	2	9 Aug 2018	Mike V.A. Burrell
42	**Ring-billed Gull**	1	2 Aug 2018	Mike V.A. Burrell
43	**Chipping Sparrow**	4	27 Jul 2018	Mike V.A. Burrell
44	**Alder Flycatcher**	2	30 May 2018	Colin Jones
45	**Great Crested Flycatcher**	2	30 May 2018	Colin Jones
46	**Brown Thrasher**	1	30 May 2018	Colin Jones
47	**Purple Finch**	1	30 May 2018	Colin Jones
48	**Ovenbird**	1	30 May 2018	Colin Jones
49	**Nashville Warbler**	2	30 May 2018	Colin Jones
50	**Pine Warbler**	1	30 May 2018	Colin Jones
51	**Field Sparrow**	1	30 May 2018	Colin Jones
52	**Northern Waterthrush**	1	30 May 2018	Colin Jones
53	**Blackburnian Warbler**	1	30 May 2018	Colin Jones
54	**Eastern Whip-poor-will**	1	30 May 2018	Amanda Guercio
55	**Barred Owl**	1	30 May 2018	Amanda Guercio
56	**Common Nighthawk**	1	29 May 2018	Amanda Guercio
57	**Red-bellied Woodpecker**	1	20 May 2018	Luke Berg
58	**Downy Woodpecker**	1	20 May 2018	Luke Berg
59	**Eastern Kingbird**	4	20 May 2018	Luke Berg
60	**Common Raven**	4	20 May 2018	Luke Berg
61	**Barn Swallow**	2	20 May 2018	Luke Berg

	SPECIES NAME	COUNT	DATE	BY
62	House Wren	1	20 May 2018	Luke Berg
63	Veery	1	20 May 2018	Luke Berg
64	Baltimore Oriole	1	20 May 2018	Luke Berg
65	Red-winged Blackbird	15	20 May 2018	Luke Berg
66	Brown-headed Cowbird	2	20 May 2018	Luke Berg
67	Common Grackle	8	20 May 2018	Luke Berg
68	American Redstart	4	20 May 2018	Luke Berg
69	Yellow Warbler	2	20 May 2018	Luke Berg
70	Chestnut-sided Warbler	1	20 May 2018	Luke Berg
71	Pine Siskin	2	18 May 2018	Colin Jones
72	Rock Pigeon	5	27 Apr 2018	John Davey
73	Common Loon	1	27 Apr 2018	John Davey
74	European Starling	5	27 Apr 2018	John Davey
75	Dark-eyed Junco	5	27 Apr 2018	John Davey
76	Rusty Blackbird	2	27 Apr 2018	John Davey
77	Northern Cardinal	2	27 Apr 2018	John Davey
78	House Sparrow	3	27 Apr 2018	John Davey
79	Hooded Merganser	2	21 Apr 2018	Miriam Oudejans
80	Gray Catbird	1	31 Aug 2017	Donald A. Sutherland
81	Yellow-bellied Flycatcher	1	7 Aug 2017	Donald A. Sutherland
82	Least Flycatcher	1	7 Aug 2017	Donald A. Sutherland
83	Wood Thrush	1	7 Aug 2017	Donald A. Sutherland
84	Scarlet Tanager	1	7 Aug 2017	Donald A. Sutherland
85	Great Blue Heron	1	25 Jul 2017	Susan Paradisis
86	Osprey	1	25 Jul 2017	Susan Paradisis
87	Swamp Sparrow	1	25 Jul 2017	Susan Paradisis
88	Green Heron	1	8 Jul 2017	Matthew Garvin
89	Tree Swallow	2	24 May 2015	Dave Milsom
90	Ruby-crowned Kinglet	2	27 Apr 2015	Kevin Young
91	Warbling Vireo	1	28 Aug 2013	Matthew Garvin
92	American Kestrel	1	27 Apr 2013	Scott Gibson
93	Evening Grosbeak	5	14 Nov 2012	Brendan Boyd
94	Common Redpoll	4	14 Nov 2012	Brendan Boyd
95	White-winged Crossbill	3	14 Nov 2012	Brendan Boyd
96	Fox Sparrow	1	18 Oct 2012	Brendan Boyd
97	Indigo Bunting	1	8 Jun 2012	Scott Gibson
98	Yellow-throated Vireo	1	27 May 2012	Glenn Desy
99	Tennessee Warbler	1	27 May 2012	Glenn Desy
100	House Finch	3	28 Apr 2012	Bart Young

	SPECIES NAME	COUNT	DATE	BY
101	Palm Warbler	1	18 May 2011	Travis Cameron
102	Sharp-shinned Hawk	1	11 May 2011	Travis Cameron
103	Bald Eagle	1	11 May 2011	Travis Cameron
104	Broad-winged Hawk	1	11 May 2011	Travis Cameron
105	Merlin	1	11 May 2011	Travis Cameron
106	White-crowned Sparrow	3	11 May 2011	Travis Cameron
107	Cape May Warbler	7	11 May 2011	Travis Cameron
108	Northern Parula	2	11 May 2011	Travis Cameron
109	Red-tailed Hawk	2	18 May 2008	Bart Young
110	Killdeer	2	30 May 2007	Donald A. Sutherland
111	Grasshopper Sparrow	1	19 May 1997	Anonymous eBirder

Appendix E

Species List

Species Occurrences

Amphibians

COMMON NAME	SCIENTIFIC NAME	SRANK	COSEWIC	SARO
American Toad	Anaxyrus americanus	S5		
Gray Treefrog	Hyla versicolor	S5		
Spring Peeper	Pseudacris crucifer	S5		
Green Frog	Lithobates clamitans	S5		

Birds

COMMON NAME	SCIENTIFIC NAME	SRANK	COSEWIC	SARO
Osprey	Pandion haliaetus	S5B		
Turkey Vulture	Cathartes aura	S5B		
Canada Goose	Branta canadensis	S5		
Ruby-throated Hummingbird	Archilochus colubris	S5B		
Eastern Whip-poor-will	Antrostomus vociferus	S4B	THR	THR
Common Nighthawk	Chordeiles minor	S4B	THR	SC
Killdeer	Charadrius vociferus	S5B,S5N		
Mourning Dove	Zenaida macroura	S5		
Belted Kingfisher	Megaceryle alcyon	S4B		
Ruffed Grouse	Bonasa umbellus	S4		
Common Loon	Gavia immer	S5B,S5N	NAR	NAR
Red-winged Blackbird	Agelaius phoeniceus	S4		
Eastern Wood-pewee	Contopus virens	S4B	SC	SC
Field Sparrow	Spizella pusilla	S4B		
Ovenbird	Seiurus aurocapilla	S4B		
Gray Catbird	Dumetella carolinensis	S4B		
Eastern Meadowlark	Sturnella magna	S4B	THR	THR
Baltimore Oriole	Icterus galbula	S4B		
Eastern Kingbird	Tyrannus tyrannus	S4B		
Golden-winged Warbler	Vermivora chrysoptera	S4B	THR	SC
Savannah Sparrow	Passerculus sandwichensis	S4B		
Brown Thrasher	Toxostoma rufum	S4B		
Indigo Bunting	Passerina cyanea	S4B		
Great Crested Flycatcher	Myiarchus crinitus	S4B		
Rose-breasted Grosbeak	Pheucticus ludovicianus	S4B		
Red-breasted Nuthatch	Sitta canadensis	S5		

Blue Jay	Cyanocitta cristata	S5
Northern Cardinal	Cardinalis cardinalis	S5
Black-capped Chickadee	Poecile atricapillus	S5
Black-and-white Warbler	Mniotilta varia	S5B
Nashville Warbler	Oreothlypis ruficapilla	S5B
Common Yellowthroat	Geothlypis trichas	S5B
American Redstart	Setophaga ruticilla	S5B
Yellow Warbler	Setophaga petechia	S5B
Song Sparrow	Melospiza melodia	S5B
Black-throated Green Warbler	Setophaga virens	S5B
White-throated Sparrow	Zonotrichia albicollis	S5B
Common Grackle	Quiscalus quiscula	S5B
Pine Warbler	Setophaga pinus	S5B
American Robin	Turdus migratorius	S5B
Brown Creeper	Certhia americana	S5B
Winter Wren	Troglodytes hiemalis	S5B
House Wren	Troglodytes aedon	S5B
Cedar Waxwing	Bombycilla cedrorum	S5B
American Crow	Corvus brachyrhynchos	S5B
Red-eyed Vireo	Vireo olivaceus	S5B
Warbling Vireo	Vireo gilvus	S5B
American Goldfinch	Spinus tristis	S5B
Eastern Phoebe	Sayornis phoebe	S5B
European Starling	Sturnus vulgaris	SNA
Northern Flicker	Colaptes auratus	S4B
Hairy Woodpecker	Picoides villosus	S5
Pileated Woodpecker	Dryocopus pileatus	S5
Yellow-bellied Sapsucker	Sphyrapicus varius	S5B

Fish

COMMON NAME	SCIENTIFIC NAME	SRANK	COSEWIC	SARO
Muskellunge	Esox masquinongy	S4		
Rock Bass	Ambloplites rupestris	S5		

Mammals

COMMON NAME	SCIENTIFIC NAME	SRANK	COSEWIC	SARO
White-tailed Deer	Odocoileus virginianus	S5		

Red Squirrel	Tamiasciurus hudsonicus	S5
Porcupine	Erethizon dorsatum	S5

Vascular Plants

COMMON NAME	SCIENTIFIC NAME	SRANK	COSEWIC	SARO
Wild Carrot	Daucus carota	SNA		
Jack-in-the-pulpit	Arisaema triphyllum	S5		
Field Thistle	Cirsium discolor	S3		
Early Goldenrod	Solidago juncea	S5		
Canada Goldenrod	Solidago canadensis var. canadensis	S5		
Field Pussytoes	Antennaria neglecta	S5		
Oxeye Daisy	Leucanthemum vulgare	SNA		
Orange Hawkweed	Pilosella aurantiaca	SNA		
Meadow Hawkweed	Pilosella caespitosa	SNA		
Common Ragwort	Senecio vulgaris	SNA		
Common Yarrow	Achillea millefolium	SNA		
Yellow Goat's-beard	Tragopogon dubius	SNA		
Bull Thistle	Cirsium vulgare	SNA		
Common Dandelion	Taraxacum officinale	SNA		
Field Chickweed	Cerastium arvense ssp. arvense	SNA		
White Campion	Silene latifolia	SNA		
Alternate-leaved Dogwood	Cornus alternifolia	S5		
Red-osier Dogwood	Cornus stolonifera	S5		
Eastern Star Sedge	Carex radiata	S5		
Pennsylvania Sedge	Carex pensylvanica	S5		
White-grained Mountain-ricegrass	Oryzopsis asperifolia	S5		
Canada Bluegrass	Poa compressa	SNA		
Common Timothy	Phleum pratense	SNA		
Smooth Brome	Bromus inermis	SNA		
Orchard Grass	Dactylis glomerata	SNA		
Tartarian Honeysuckle	Lonicera tatarica	SNA		
Marsh Horsetail	Equisetum palustre	S5		
Tufted Vetch	Vicia cracca	SNA		
Red Clover	Trifolium pratense	SNA		
Low Hop Clover	Trifolium campestre	SNA		
Tall Yellow Sweet-clover	Melilotus altissimus	SNA		

Alfalfa	Medicago sativa ssp. sativa	SNA
Eastern Hop-hornbeam	Ostrya virginiana	S5
Sensitive Fern	Onoclea sensibilis	S5
Bracken Fern	Pteridium aquilinum	S5
Common Oak Fern	Gymnocarpium dryopteris	S5
Ostrich Fern	Matteuccia struthiopteris	S5
Common Milkweed	Asclepias syriaca	S5
European Swallow-wort	Cynanchum rossicum	SNA
Herb-Robert	Geranium robertianum	S5
Bitternut Hickory	Carya cordiformis	S5
Canada Mint	Mentha canadensis	S5
Common Viper's-bugloss	Echium vulgare	SNA
Wild Leek	Allium tricoccum var. tricoccum	S4
White Trillium	Trillium grandiflorum	S5
False Solomon's-seal	Maianthemum racemosum	S5
Eastern Rose Twisted-stalk	Streptopus lanceolatus var. lanceolatus	S5?
Purple Loosestrife	Lythrum salicaria	SNA
Eastern Hemlock	Tsuga canadensis	S5
White Spruce	Picea glauca	S5
Common Juniper	Juniperus communis	S5
Eastern White Pine	Pinus strobus	S5
Eastern White Cedar	Thuja occidentalis	S5
Balsam Fir	Abies balsamea	S5
Eastern Red Cedar	Juniperus virginiana	S5
Scots Pine	Pinus sylvestris	SNA
Gay-wing Milkwort	Polygaloides paucifolia	S5
Wild Columbine	Aquilegia canadensis	S5
White Baneberry	Actaea pachypoda	S5
Early Meadow-rue	Thalictrum dioicum	S5
Tall Buttercup	Ranunculus acris	SNA
Virginia Creeper	Parthenocissus quinquefolia	S4?
Riverbank Grape	Vitis riparia	S5
Common Buckthorn	Rhamnus cathartica	SNA
Hooked Agrimony	Agrimonia gryposepala	S5
Choke Cherry	Prunus virginiana	S5
Old-field Cinquefoil	Potentilla simplex	S5

Barren Strawberry	Geum fragarioides	S5
Black Raspberry	Rubus occidentalis	S5
Prickly Gooseberry	Ribes cynosbati	S5
Wild Black Currant	Ribes americanum	S5
Common Red Raspberry	Rubus idaeus ssp. idaeus	SNA
Common Apple	Malus pumila	SNA
Garden Stonecrop	Hylotelephium telephium	SNA
Wild Strawberry	Fragaria virginiana ssp. virginiana	SU
Smooth Bedstraw	Galium mollugo	SNA
Sweet Bedstraw	Galium odoratum	SNA
Balsam Poplar	Populus balsamifera	S5
Common Prickly-ash	Zanthoxylum americanum	S5
Eastern Poison Ivy	Toxicodendron radicans var. radicans	S5
Staghorn Sumac	Rhus typhina	S5
Sugar Maple	Acer saccharum	S5
Red Maple	Acer rubrum	S5
Manitoba Maple	Acer negundo	S5
White Ash	Fraxinus americana	S4
Common Mullein	Verbascum thapsus	SNA
Common St. John's-wort	Hypericum perforatum	SNA
American Elm	Ulmus americana	S5
Downy Yellow Violet	Viola pubescens var. pubescens	S5

Appendix F

ELC Cards

ELC Primary Data Card

Version: 8 Feb 2018

Page 1 of 2

(1) **Polygon Code** Cultural Meadow
Plot(s)
Site Name Warsaw
Polygon area
Date June 5 2018
Time
Surveyor(s) JC, DH
Waypoint(s) HA-1
Photo(s) IMG_20180529_182647

Zone 17
Easting 728253
Northing 4924626

(2)

sampling scale	sampling cards	size/shape
☐ Plot	☐ Field Desc's	☐ 1 m²
☒ Polygon	☐ Assoc Desc's	☐ 25 m²
sampling effort	☐ Assoc Desc's 2	☐ 100 m²
☐ verification	☐ Site+Substrate	☒ 400 m²
☒ survey	☐ Species List	☐ circular
☐ research	☐ DBH, Age, Ht	☐ square
	☐ Man. / Dist.	☒ rectangle

(10) **Land Cover**
☐ natural
☒ anthropogenic

Energy
☐ active
☐ not active

System
☒ terrestrial
☐ wetland
☐ aquatic
☐ subterranean

Topographic Feature

☐ lake / pond / wet dep.	☒ rolling upland
☐ river / creek / stream	☐ shoreline
☐ depression	☐ bluff
☐ bottomland	☐ sand dune
☐ terrace	☐ cliff
☐ valley slope	☐ talus
☐ seep	☐ level rockland
☐ tableland	☐ rolling rockland
	☐ crevice / cave

(4) **Vegetation Summary** of prevailing conditions (4 species X 4 layers)

Layer	Cover	species in order of decreasing dominance (">>" much greater than, ">" greater than, "=" equal to) (9) Ecosystem Coverage (%)
>10 m	1	
2 - 10 m	1	
0.5 - 2 m	4	Canada Golden rod >> New England Aster
< 0.5 m	2	Ox-Eye Daisy > orange Hawkweed
other		
< 0.5 m		
> 0.5 m		

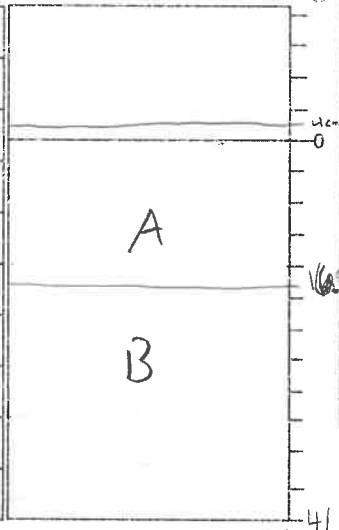
cover codes: 1 = 0 - 10%, 2 = 10 - 25%, 3 = 25 - 60%, 4 = > 60%

(9)

condition	Management / Disturbance	intensity	extent	score
	Historical use, Rock Piles			

(8)

depth augered	0.41m
mottles	—
gley	—
bedrock	0.41
carbonates	—
water table	—
depth of organics	0.04m
effective texture	Sandy Loam
moisture regime	Dry - Fresh
position on slope	Level



Site Coverages (%) (8)

	bedrock (rockiness)
	coarse frag. (stoniness)
X	mineral substrate
	organic material
	woody debris
	moss
	vegetation
	vernal pooling

Site (11)
☐ open water
☐ shallow water
☐ parent mineral
☐ mineral soil
☒ coarse fragments
☐ bedrock
☐ organic

Material Family (11)
☒ bedrock
☐ coarse fragments
☐ sandy
☐ coarse loamy
☐ silty
☐ fine loamy
☐ clayey
☐ organic - folic (dry)
☐ organic - peat (wet)

Treed Ecosystem

Age (5)
☐ pioneer
☐ young
☐ mid - age
☐ mature
☐ old growth

Substrate Depth (8)
☐ rock (< 5 cm)
☐ very shallow (5 - 15 cm)
☐ shallow (15 - 30 cm)
☒ moderate (30 - 60 cm)
☐ moderately deep (60 - 120 cm)
☐ deep (> 120 cm)

Community Class (11)

☐ still water	☐ rockland	☐ treed swamp
☐ flowing water	☐ crevice / cave	☐ shrub swamp
☐ beach / bar	☐ mineral barren	☐ fen
☐ sand dune	☒ meadow	☐ bog
☐ bluff	☐ prairie	☐ marsh
☐ cliff	☐ shrubland	☐ agriculture
☐ talus	☐ treed	☐ actively managed
		☐ constructed

Chemistry (11)
☐ calcareous
☐ non-calcareous
☐ saline

Vegetation Form (5)
☐ lichen
☐ algal
☐ bryophyte
☐ mixed non-vascular
☒ forb
☒ graminoid
☐ mixed herbaceous
☐ floating-lvd aquatic
☐ suberged aquatic
☐ mixed aquatic
☒ coniferous shrub
☐ evergreen shrub
☐ mixed shrub
☐ deciduous shrub
☐ coniferous treed
☐ mixed treed
☐ deciduous treed

Vegetation Cover (5)
☐ not vegetated
☐ non-vascular
☐ sparse herbaceous
☒ herbaceous
☐ sparse low shrub
☐ low shrub
☐ sparse tall shrub
☐ tall shrub
☐ sparse low treed
☐ low treed
☐ sparse tall teed
☐ semi-closed tall treed
☐ closed tall treed

Classification	code	name	2	3	4
(12) Substrate Type	SL	Dry-Fresh Sandy Loam			
(13) Vegetation Type					
(14) Ecosite	CUM	Cultural Meadow			
(16) Ecoelement	CuM1-1				
1st or 2nd Approx					

I / C

(9) Ecosystem Coverage (%)

Polygon Code Caltural Meadow | Version 2 Feb 2012 | **Field Descriptions** | **Page** 2 of 2

plant species list for prevailing (1) ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5
Canada Goldenrod	N	N	A	A			
New England Aster	N	N	O	A			
Milkweed	N	N	R	O			
Queen Anne Lace	N	N	O	O			
Orange Hawkweed	N	N	N	O			
Ox-Eye Daisy	N	N	N	O			

plant species list for _____ ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5

⑩

cond	type	Wildlife Species Code	#
		Porcupine	1
		Red Squirrel	3
		Skunk	1

⑥

size class analysis (cm)	<10	10 - 25	25 - 50	>50
live				
standing dead				
deadfall				

codes: **N** = none **R** = rare **O** = occasional **A** = abundant

Prism Sweeps ⑥ prism factor

⑦ condition/auger #	__/__	__/__	__/__	__/__	__/__
depth augered	41cm				
mottles	—				
gley	—				
bedrock	41				
carbonates	—				
water table	—				
organics	0-4cm				
effective texture	SL				
moisture regime	Dry-fre				
positiion on slope	Level				
Substrate Type					

tree species code	__/__	__/__	__/__	__/__	__/__	totals	rel avg
totals							100
basal area							
standing dead tally							

ELC Primary Data Card

Version: 8 Feb 2012

Page 1 of 2

Polygon Code	Thicket
Plot(s)	
Site Name	Warsaw
Polygon area	
Date	June 5, 2018
Time	
Surveyor(s)	JC, DH
Waypoint(s)	HA-2
Photo(s)	IMG_20180524_202425

Zone 17
Easting 728602
Northing 4924668

(2) sampling scale: ☐ Plot ☒ Polygon
sampling effort: ☐ verification ☒ survey ☐ research
sampling cards: ☐ Field Desc's ☐ Assoc Desc's ☐ Assoc Desc's 2 ☐ Site+Substrate ☐ Species List ☐ DBH, Age, Ht ☐ Man. / Dist.
size/shape: ☐ 1 m² ☐ 25 m² ☐ 100 m² ☒ 400 m² ☐ circular ☐ square ☒ rectangle

(10) Land Cover: ☐ natural ☒ anthropogenic
Energy: ☐ active ☐ not active
System: ☒ terrestrial ☐ wetland ☐ aquatic ☐ subterranean
Topographic Feature: ☐ lake / pond / wet dep. ☐ river / creek / stream ☐ depression ☐ bottomland ☐ terrace ☒ valley slope ☐ seep ☐ tableland ☒ rolling upland ☐ shoreline ☐ bluff ☐ sand dune ☐ cliff ☐ talus ☐ level rockland ☐ rolling rockland ☐ crevice / cave

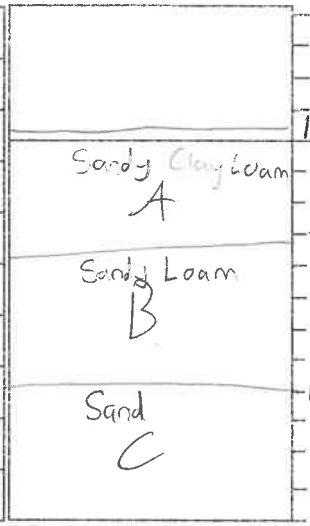
(4) **Vegetation Summary** of prevailing conditions (4 species X 4 layers)

Layer	Cover	species in order of decreasing dominance (">>" much greater than, ">" greater than, "=" equal to) (9) Ecosystem Coverage (%)
> 10 m	1	
2 - 10 m	3	Staghorn Sumac
0.5 - 2 m	2	Common Juniper = Canada Goldenrod = Zigzag Goldenrod
< 0.5 m	1	Columbine = Ox-eye Daisy
other		
< 0.5 m		
> 0.5 m		

cover codes: **1** = 0 - 10%, **2** = 10 - 25%, **3** = 25 - 60%, **4** = > 60%

(8) (9)

depth augered	85 cm
mottles	—
giey	—
bedrock	85
carbonates	—
water table	—
depth of organics	0-1 cm
effective texture	Sandy loam
moisture regime	Dry-Fresh
position on slope	level



condition	Management / Disturbance	intensity	extent	score
	Historical use, Rock Pile			
	Small Trails are present			

Site Coverages (%) (8)

	bedrock (rockiness)
	coarse frag. (stoniness)
X	mineral substrate
	organic material
	woody debris
	moss
	vegetation
	vernal pooling

Site (11): ☐ open water ☐ shallow water ☐ parent mineral ☒ mineral soil ☐ coarse fragments ☐ bedrock ☐ organic

Material Family (11): ☒ bedrock ☐ coarse fragments ☐ sandy ☐ coarse loamy ☐ silty ☐ fine loamy ☐ clayey ☐ organic - folic (dry) ☐ organic - peat (wet)

Treed Ecosystem
Age (5): ☒ pioneer ☐ young ☐ mid - age ☐ mature ☐ old growth
Substrate Depth (8): ☐ rock (< 5 cm) ☐ very shallow (5 - 15 cm) ☐ shallow (15 - 30 cm) ☐ moderate (30 - 60 cm) ☒ moderately deep (60 - 120 cm) ☐ deep (> 120 cm)

Community Class (11): ☐ still water ☐ flowing water ☐ beach / bar ☐ sand dune ☐ bluff ☐ cliff ☐ talus ☐ rockland ☐ crevice / cave ☐ mineral barren ☒ meadow ☐ prairie ☐ shrubland ☐ treed ☐ treed swamp ☐ shrub swamp ☐ fen ☐ bog ☐ marsh ☐ agriculture ☐ actively managed ☐ constructed

Chemistry (11): ☐ calcareous ☐ non-calcareous ☐ saline

Vegetation Cover (5): ☐ not vegetated ☐ non-vascular ☐ sparse herbaceous ☐ herbaceous ☐ sparse low shrub ☒ low shrub ☒ sparse tall shrub ☐ tall shrub ☐ sparse low treed ☐ low treed ☐ sparse tall teed ☐ semi-closed tall treed ☐ closed tall treed

Vegetation Form (5): ☐ lichen ☐ algal ☐ bryophyte ☐ mixed non-vascular ☒ forb ☒ graminoid ☐ mixed herbaceous ☐ floating-lvd aquatic ☐ suberged aquatic ☐ mixed aquatic ☐ coniferous shrub ☐ evergreen shrub ☐ mixed shrub ☐ deciduous shrub ☐ coniferous treed ☐ mixed treed ☐ deciduous treed

Classification	code	name	2	3	4
(12) Substrate Type	SL	Dry-fresh Sandy Loam			
(13) Vegetation Type					
(14) Ecosite	CuT	Mineral Cultural Thicket			
(16) Ecoelement	CuT 1-1	Sumac Cultural Thicket			
1st or 2nd Approx					

I / C

(9) Ecosystem Coverage (%)

Polygon Code Thicket

Field Descriptions

Page ____ **of** ____

plant species list for prevailing (1) ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5
Staghorn Sumac	N	A	R	R			
Common Juniper	N	O	O	O			/
Canada Golden rod	N	N	O	R			
Zigzag Goldenrod	N	N	O	R			
M. Ykweed	N	N	R	O		/	
Oxeye Daisy	N	N	O	O			
Cow vetch	N	N	N	O	/		
red clover	N	N	N	O			

plant species list for _____ ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5

⑩

cond	type	Wildlife Species Code	#
		Red Squirrel	4
		Porcupine	1
		Skunk	1

⑥

size class analysis (cm)	< 10	10 - 25	25 - 50	> 50
live				
standing dead				
deadfall				

codes: **N** = none **R** = rare **O** = occasional **A** = abundant

Prism Sweeps ⑥ prism factor ____

⑦ condition/auger #	__/__	__/__	__/__	__/__	__/__
depth augered	85cm				
mottles	—				
gley	—				
bedrock	95				
carbonates	—				
water table	—				
organics	0-1cm				
effective texture	Sandy loam				
moisture regime	Dry-fresh				
positiion on slope	Level				
Substrate Type					

tree species code	__/__	__/__	__/__	__/__	__/__	totals	rel avg
totals							100
basal area							
standing dead tally							

ELC Primary Data Card

Version 3 Feb 2012 — Page 1 of 2

Polygon Code	Pine Forest
Plot(s)	
Site Name	Wars Scar
Polygon area	
Date	June 5, 2018
Time	
Surveyor(s)	JC, DH
Waypoint(s)	HA-3
Photo(s)	Img_20180529_191836

Zone: 17T — Easting: 728307 — Northing: 4624527

(2) sampling scale: ☐ Plot ☒ Polygon

sampling effort: ☐ verification ☒ survey ☐ research

sampling cards: ☐ Field Desc's ☐ Assoc Desc's ☐ Assoc Desc's 2 ☐ Site+Substrate ☐ Species List ☐ DBH, Age, Ht ☐ Man. / Dist.

size/shape: ☐ 1 m² ☐ 25 m² ☐ 100 m² ☒ 400 m² ☐ circular ☒ square ☐ rectangle

(10) Land Cover: ☒ natural ☐ anthropogenic

Energy: ☐ active ☐ not active

System: ☒ terrestrial ☐ wetland ☐ aquatic ☐ subterranean

Topographic Feature: ☐ lake / pond / wet dep. ☐ river / creek / stream ☐ depression ☐ bottomland ☐ terrace ☐ valley slope ☐ seep ☒ tableland ☐ rolling upland ☐ shoreline ☐ bluff ☐ sand dune ☐ cliff ☐ talus ☐ level rockland ☐ rolling rockland ☐ crevice / cave

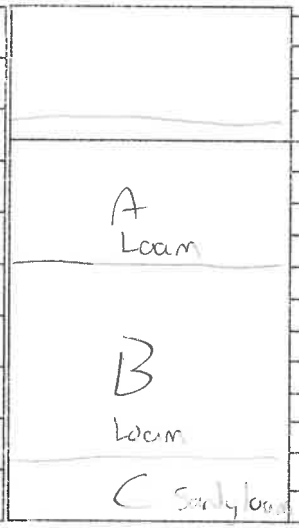
(4) **Vegetation Summary** of prevailing conditions (4 species X 4 layers)

Layer	Cover	species in order of decreasing dominance (">>" much greater than, ">" greater than, "=" equal to)
> 10 m	4	White Pine = Scots Pine > Red pine
2 - 10 m	1	White Pine
0.5 - 2 m	1	Buckthorn
< 0.5 m	1	Poison Ivy > River Bank grape
other		
< 0.5 m		
> 0.5 m		

(9) Ecosystem Coverage (%)

cover codes: **1** = 0 - 10%, **2** = 10 - 25%, **3** = 25 - 60%, **4** = > 60%

(8) depth augered: 64 cm
mottles: —
gley: —
bedrock: 64
carbonates: —
water table: —
depth of organics: 0-2cm
effective texture: Loam
moisture regime: Dry-Fresh
position on slope: level



condition	Management / Disturbance	intensity	extent	score
	Possible old plantation			

Site Coverages (%) (8)

	bedrock (rockiness)
	coarse frag. (stoniness)
X	mineral substrate
	organic material
	woody debris
	moss
	vegetation
	vernal pooling

Site (11): ☐ open water ☐ shallow water ☐ parent mineral ☒ mineral soil ☐ coarse fragments ☐ bedrock ☐ organic

Material Family (11): ☐ bedrock ☐ coarse fragments ☐ sandy ☐ coarse loamy ☐ silty ☐ fine loamy ☐ clayey ☐ organic - folic (dry) ☐ organic - peat (wet)

Treed Ecosystem

Age (5): ☐ pioneer ☐ young ☐ mid - age ☒ mature ☐ old growth

Substrate Depth (8): ☐ rock (< 5 cm) ☐ very shallow (5 - 15 cm) ☐ shallow (15 - 30 cm) ☒ moderate (30 - 60 cm) ☐ moderately deep (60 - 120 cm) ☐ deep (> 120 cm)

Community Class (11): ☐ still water ☐ flowing water ☐ beach / bar ☐ sand dune ☐ bluff ☐ cliff ☐ talus ☐ rockland ☐ crevice / cave ☐ mineral barren ☐ meadow ☐ prairie ☐ shrubland ☒ treed ☐ treed swamp ☐ shrub swamp ☐ fen ☐ bog ☐ marsh ☐ agriculture ☐ actively managed ☐ constructed

Chemistry (11): ☐ calcareous ☐ non-calcareous ☐ saline

Vegetation Cover (5): ☐ not vegetated ☐ non-vascular ☐ sparse herbaceous ☐ herbaceous ☐ sparse low shrub ☐ low shrub ☐ sparse tall shrub ☐ tall shrub ☐ sparse low treed ☐ low treed ☐ sparse tall teed ☐ semi-closed tall treed ☒ closed tall treed

Vegetation Form (5): ☐ lichen ☐ algal ☐ bryophyte ☐ mixed non-vascular ☐ forb ☐ graminoid ☐ mixed herbaceous ☐ floating-lvd aquatic ☐ suberged aquatic ☐ mixed aquatic ☐ coniferous shrub ☐ evergreen shrub ☐ mixed shrub ☐ deciduous shrub ☒ coniferous treed ☐ mixed treed ☐ deciduous treed

Classification	code	name	2	3	4
(12) Substrate Type	Loam	Dry-Fresh Loam			
(13) Vegetation Type					
(14) Ecosite	Foc 1	Coniferous Forest			
(16) Ecoelement	Foc 1-2	Dry-Fresh White Pine			
1st or 2nd Approx					

I / C

(9) Ecosystem Coverage (%)

Polygon Code Pine Forest

Field Descriptions

plant species list for prevailing (1) ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5
White Pine	A	O	N	N			
Scots Pine	A	O	N	N			
Red Pine	R	R	N	N			
Buckthorn	N	R	O	N			
Poison Ivy	N	N	A	O			
River Bankgrape	N	N	A	O			

plant species list for _____ ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5

⑩

cond	type	Wildlife Species Code	#

⑥

size class analysis (cm)	< 10	10 - 25	25 - 50	> 50
live				
standing dead				
deadfall				

codes: **N** = none **R** = rare
O = occasional **A** = abundant

Prism Sweeps ⑥ prism factor

⑦

condition/auger #	__/__	__/__	__/__	__/__	__/__
depth augered	64cm				
mottles	—				
gley	—				
bedrock	64				
carbonates	—				
water table	—				
organics	0-2cm				
effective texture	Loam				
moisture regime	Drofres				
positiion on slope	level				
Substrate Type					

tree species code	__/__	__/__	__/__	__/__	__/__	totals	rel avg
totals							100
basal area							
standing dead tally							

ELC Primary Data Card

Version: 6 Feb 2012 — Page 1 of 2

(1) Polygon Code	Deciduous Forest
Plot(s)	
Site Name	Warsaw
Polygon area	
Date	July 4, 2018
Time	
Surveyor(s)	JC
Waypoint(s)	HA-4
Photo(s)	IMG_20180704_063016.JPG

Zone: 17T
Easting: 728647
Northing: 4926419

(2) sampling scale: ☐ Plot ☑ Polygon

sampling effort: ☐ verification ☒ survey ☐ research

sampling cards: ☐ Field Desc's ☐ Assoc Desc's ☐ Assoc Desc's 2 ☐ Site+Substrate ☐ Species List ☐ DBH, Age, Ht ☐ Man. / Dist.

size/shape: ☐ 1 m² ☐ 25 m² ☐ 100 m² ☒ 400 m² ☐ circular ☐ square ☒ rectangle

(10) Land Cover: ☒ natural ☐ anthropogenic

Energy: ☐ active ☐ not active

System: ☒ terrestrial ☐ wetland ☐ aquatic ☐ subterranean

Topographic Feature: ☒ rolling upland ☐ lake / pond / wet dep. ☐ river / creek / stream ☐ depression ☐ bottomland ☐ terrace ☐ valley slope ☐ seep ☐ tableland ☐ shoreline ☐ bluff ☐ sand dune ☐ cliff ☐ talus ☐ level rockland ☐ rolling rockland ☐ crevice / cave

(4) **Vegetation Summary** of prevailing conditions (4 species X 4 layers)

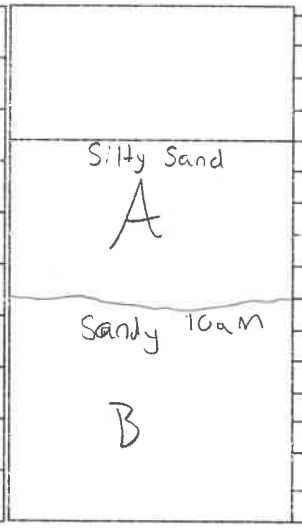
Layer	Cover	species in order of decreasing dominance (">>" much greater than, ">" greater than, "=" equal to)
> 10 m	4	Sugar Maple > B. Walnut Hickory
2 - 10 m	1	Ironwood
0.5 - 2 m	2	Sugar Maple
< 0.5 m	2	White Trillium = False Soloman Seal = Hairy Soloman Seal
other		
< 0.5 m		
> 0.5 m		

(9) Ecosystem Coverage (%)

cover codes: **1** = 0 - 10%, **2** = 10 - 25%, **3** = 25 - 60%, **4** = > 60%

(8) Soil

depth augered	40cm
mottles	—
gley	—
bedrock	40cm
carbonates	—
water table	—
depth of organics	—
effective texture	Sand
moisture regime	Dry-Fresh
position on slope	~~mid-slope~~ Back Slope



condition	Management / Disturbance	intensity	extent	score
	Natural Forest			
	Refusal shortly after start			

Site Coverages (%) (8)

bedrock (rockiness)	
coarse frag. (stoniness)	
mineral substrate	
organic material	
woody debris	
moss	
vegetation	
vernal pooling	

(11) Site: ☐ open water ☐ shallow water ☐ parent mineral ☒ mineral soil ☐ coarse fragments ☐ bedrock ☐ organic

Material Family (11): ☒ bedrock ☐ coarse fragments ☐ sandy ☐ coarse loamy ☐ silty ☐ fine loamy ☐ clayey ☐ organic - folic (dry) ☐ organic - peat (wet)

Treed Ecosystem

Age (5): ☐ pioneer ☐ young ☐ mid - age ☒ mature ☐ old growth

Substrate Depth (8): ☐ rock (< 5 cm) ☐ very shallow (5 - 15 cm) ☒ shallow (15 - 30 cm) ☐ moderate (30 - 60 cm) ☐ moderately deep (60 - 120 cm) ☐ deep (> 120 cm)

Community Class (11): ☐ still water ☐ flowing water ☐ beach / bar ☐ sand dune ☐ bluff ☐ cliff ☐ talus ☐ rockland ☐ crevice / cave ☐ mineral barren ☐ meadow ☐ prairie ☐ shrubland ☐ treed ☐ treed swamp ☐ shrub swamp ☐ fen ☐ bog ☐ marsh ☐ agriculture ☐ actively managed ☐ constructed

Chemistry (11): ☐ calcareous ☐ non-calcareous ☐ saline

Vegetation Cover (5): ☐ not vegetated ☐ non-vascular ☐ sparse herbaceous ☐ herbaceous ☐ sparse low shrub ☐ low shrub ☐ sparse tall shrub ☐ tall shrub ☐ sparse low treed ☐ low treed ☐ sparse tall teed ☐ semi-closed tall treed ☒ closed tall treed

Vegetation Form (5): ☐ lichen ☐ algal ☐ bryophyte ☐ mixed non-vascular ☐ forb ☐ graminoid ☐ mixed herbaceous ☐ floating-lvd aquatic ☐ suberged aquatic ☐ mixed aquatic ☐ coniferous shrub ☐ evergreen shrub ☐ mixed shrub ☐ deciduous shrub ☐ coniferous treed ☐ mixed treed ☒ deciduous treed

Classification	code	name	2	3	4
(12) Substrate Type	S	Dry-Fresh Sand			
(13) Vegetation Type					
(14) Ecosite	FOD1	Deciduous Forest			
(16) Ecoelement	FOD5-1	Sugar maple Deciduous			
1st or 2nd Approx					

I / C

(9) Ecosystem Coverage (%)

Polygon Code Deciduous Forest

Field Descriptions

plant species list for prevailing (1) ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5
Sugar Maple	A	O	O	N			
Iron wood	O	R	O	R			
Bitternut Hick	A	R	N	N			
Beech	O	R	N	N			
Red Oak	R	N	N	N			
Poplar	R	R	N	N			
Basswood	R	R	N	N			
Black cherry	R	R	N	N			
White Birch	R	R	N	N			
White Trillium	N	N	N	A			
False Solomon Seal	N	N	N	O			
[illegible] Solomon Seal	N	N	N	O			
Star Flower	N	N	N	R			
Wild Sarsaparilla	N	N	N	R			
Trout Lily	N	N	N	R			

plant species list for _____ ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5

⑩

cond	type	Wildlife Species Code	#
		Porcupine	
		Deer mice	

⑥

size class analysis (cm)	< 10	10 - 25	25 - 50	> 50
live				
standing dead				
deadfall				

codes: **N** = none **R** = rare
O = occasional **A** = abundant

Prism Sweeps ⑥ prism factor

⑦ condition/auger #	__/__	__/__	__/__	__/__	__/__
depth augered	40cm				
mottles	—				
gley	—				
bedrock	40cm				
carbonates	—				
water table	—				
organics	—				
effective texture	Sand				
moisture regime	Dry fresh				
positiion on slope	Back Slope				
Substrate Type					

tree species code	__/__	__/__	__/__	__/__	__/__	totals	rel avg
totals							100
basal area							
standing dead tally							

ELC Primary Data Card

Version 3 Feb 2012 — Page 1 of 2

(1) Polygon Code	White cedar @ N
Plot(s)	
Site Name	Warsaw
Polygon area	
Date	July 4 2018
Time	
Surveyor(s)	JC.
Waypoint(s)	HA-5
Photo(s)	IMG_20180529_205130

Zone 17T
Easting 726826
Northing 4924851

(2) sampling scale: ☐ Plot ☒ Polygon

sampling effort: ☐ verification ☒ survey ☐ research

sampling cards: ☐ Field Desc's ☐ Assoc Desc's ☐ Assoc Desc's 2 ☐ Site+Substrate ☐ Species List ☐ DBH, Age, Ht ☐ Man. / Dist.

size/shape: ☐ 1 m² ☐ 25 m² ☐ 100 m² ☐ 400 m² ☐ circular ☐ square ☐ rectangle

(10) Land Cover: ☒ natural ☐ anthropogenic

Energy: ☐ active ☐ not active

System: ☒ terrestrial ☐ wetland ☐ aquatic ☐ subterranean

Topographic Feature: ☐ lake / pond / wet dep. ☐ river / creek / stream ☐ depression ☐ bottomland ☐ terrace ☐ valley slope ☐ seep ☐ tableland ☐ rolling upland ☐ shoreline ☐ bluff ☐ sand dune ☐ cliff ☐ talus ☒ level rockland ☐ rolling rockland ☐ crevice / cave

(4) **Vegetation Summary** of prevailing conditions (4 species X 4 layers)

Layer	Cover	species in order of decreasing dominance (">>" much greater than, ">" greater than, "=" equal to) (9) Ecosystem Coverage (%)
> 10 m	1	N/A
2 - 10 m	B	White cedar >> red cedar > Sugar maple
0.5 - 2 m	1	red cedar > white cedar
< 0.5 m	1	Viper Buggloss = Pineapple weed >> columbine = dandelion
other		
< 0.5 m		
> 0.5 m		

cover codes: **1** = 0 - 10%, **2** = 10 - 25%, **3** = 25 - 60%, **4** = > 60%

(8) depth augered: To shallow
mottles: to gain
gley: Soil information
bedrock:
carbonates:
water table:
depth of organics:
effective texture:
moisture regime:
position on slope:

N/A

(9)

condition	Management / Disturbance	intensity	extent	score

Site Coverages (%) (8)

bedrock (rockiness)	
coarse frag. (stoniness)	
mineral substrate	
organic material	
woody debris	
moss	
vegetation	
vernal pooling	

Site (11): ☐ open water ☐ shallow water ☐ parent mineral ☐ mineral soil ☐ coarse fragments ☒ bedrock ☐ organic

Material Family (11): ☒ bedrock ☐ coarse fragments ☐ sandy ☐ coarse loamy ☐ silty ☐ fine loamy ☐ clayey ☐ organic - folic (dry) ☐ organic - peat (wet)

Treed Ecosystem

Age (5): ☐ pioneer ☐ young ☒ mid - age ☐ mature ☐ old growth

Substrate Depth (8): ☒ rock (< 5 cm) ☐ very shallow (5 - 15 cm) ☐ shallow (15 - 30 cm) ☐ moderate (30 - 60 cm) ☐ moderately deep (60 - 120 cm) ☐ deep (> 120 cm)

Community Class (11): ☐ still water ☐ flowing water ☐ beach / bar ☐ sand dune ☐ bluff ☐ cliff ☐ talus ☒ rockland ☐ crevice / cave ☐ mineral barren ☐ meadow ☐ prairie ☐ shrubland ☒ treed ☐ treed swamp ☐ shrub swamp ☐ fen ☐ bog ☐ marsh ☐ agriculture ☐ actively managed ☐ constructed

Chemistry (11): ☐ calcareous ☐ non-calcareous ☐ saline

Vegetation Cover (5): ☐ not vegetated ☐ non-vascular ☐ sparse herbaceous ☐ herbaceous ☐ sparse low shrub ☐ low shrub ☐ sparse tall shrub ☐ tall shrub ☐ sparse low treed ☐ low treed ☒ sparse tall treed ☐ semi-closed tall treed ☐ closed tall treed

Vegetation Form (5): ☐ lichen ☐ algal ☐ bryophyte ☐ mixed non-vascular ☐ forb ☐ graminoid ☐ mixed herbaceous ☐ floating-lvd aquatic ☐ suberged aquatic ☐ mixed aquatic ☐ coniferous shrub ☐ evergreen shrub ☐ mixed shrub ☐ deciduous shrub ☐ coniferous treed ☐ mixed treed ☐ deciduous treed

Classification	code	name	2	3	4
(12) Substrate Type	—	—			
(13) Vegetation Type	—	—			
(14) Ecosite	FOC	Fresh - moist Coniferous			
(15) Ecoelement	FOC4-1	Fresh Moist White cedar Forest			
1st or 2nd Approx					

I / C

(9) Ecosystem Coverage (%)

Polygon Code _____ **Field Descriptions** **Page** 2 **of** 2

plant species list for prevailing (1) ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5
White Cedar	A	A	O	N			
redcedar	O	O	O	N			
Sugar maple	N	R	N	N			
Viper Buggloss	N	N	O	O			
Pineapple weed	N	N	O	R			
Columbine	N	N	R	R			
dandelion	N	N	O	O			
mullein	N	N	O	R			

plant species list for _____ ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5

⑩

cond	type	Wildlife Species Code	#

⑥

size class analysis (cm)	<10	10 - 25	25 - 50	>50
live				
standing dead				
deadfall				

codes: **N** = none **R** = rare
O = occasional **A** = abundant

Prism Sweeps ⑥ prism factor _____

⑦ condition/auger #	__/__	__/__	__/__	__/__	__/__
depth augered					
mottles					
gley					
bedrock					
carbonates					
water table					
organics					
effective texture					
moisture regime					
positiion on slope					
Substrate Type					

tree species code	__/__	__/__	__/__	__/__	__/__	totals	rel avg
totals							100
basal area							
standing dead tally							

ELC Primary Data Card

Version 3 Feb 2012

Page 1 of 2

(1) **Polygon Code** White Cedar Surrounds Wet
Plot(s)
Site Name Warsaw
Polygon area
Date June 5 2018
Time
Surveyor(s) JC, DH
Waypoint(s) WA-6
Photo(s)

Zone 17T
Easting 728571
Northing 4924438

(2) sampling scale: ☐ Plot ☒ Polygon

sampling effort: ☐ verification ☒ survey ☐ research

sampling cards: ☐ Field Desc's ☐ Assoc Desc's ☐ Assoc Desc's 2 ☐ Site+Substrate ☐ Species List ☐ DBH, Age, Ht ☐ Man. / Dist.

size/shape: ☐ 1 m² ☐ 25 m² ☐ 100 m² ☒ 400 m² ☐ circular ☐ square ☒ rectangle

(10) Land Cover: ☐ natural ☐ anthropogenic

Energy: ☐ active ☐ not active

System: ☒ terrestrial ☒ wetland ☐ aquatic ☐ subterranean

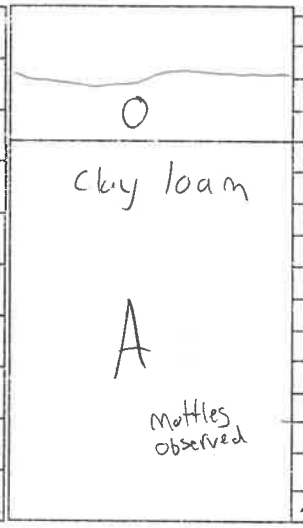
Topographic Feature: ☐ lake / pond / wet dep. ☐ river / creek / stream ☒ depression ☐ bottomland ☐ terrace ☐ valley slope ☐ seep ☐ tableland ☐ rolling upland ☐ shoreline ☐ bluff ☐ sand dune ☐ cliff ☐ talus ☐ level rockland ☐ rolling rockland ☐ crevice / cave

(4) **Vegetation Summary** of prevailing conditions (4 species X 4 layers)

Layer	Cover	species in order of decreasing dominance (">>" much greater than, ">" greater than, "=" equal to) (9) Ecosystem Coverage (%)
> 10 m	4	White cedar > White birch > Green Ash
2 - 10 m	2	White cedar = Sugar maple
0.5 - 2 m	1	N/A
< 0.5 m	1	Sensitive fern > Ostrich fern = Club moss
other		
< 0.5 m		
> 0.5 m		

cover codes: **1** = 0 - 10%, **2** = 10 - 25%, **3** = 25 - 60%, **4** = > 60%

(8) depth augered 28 cm
mottles 20cm
gley —
bedrock 25
carbonates —
water table 24
depth of organics 11
effective texture Clay loam
moisture regime Fresh moist
position on slope Shoulder Slope



(9)

condition	Management / Disturbance	Intensity	extent	score

Site Coverages (%) (8)

4	bedrock (rockiness)
	coarse frag. (stoniness)
	mineral substrate
1	organic material
	woody debris
15	moss
80	vegetation
	vernal pooling

Site (11): ☐ open water ☐ shallow water ☐ parent mineral ☐ mineral soil ☐ coarse fragments ☒ bedrock ☐ organic

Material Family (11): ☒ bedrock ☐ coarse fragments ☐ sandy ☐ coarse loamy ☐ silty ☐ fine loamy ☐ clayey ☐ organic - folic (dry) ☐ organic - peat (wet)

Treed Ecosystem

Age (5): ☐ pioneer ☐ young ☒ mid - age ☐ mature ☐ old growth

Substrate Depth (8): ☐ rock (< 5 cm) ☒ very shallow (5 - 15 cm) ☐ shallow (15 - 30 cm) ☐ moderate (30 - 60 cm) ☐ moderately deep (60 - 120 cm) ☐ deep (> 120 cm)

Community Class (11): ☐ still water ☐ flowing water ☐ beach / bar ☐ sand dune ☐ bluff ☐ cliff ☐ talus ☐ rockland ☐ crevice / cave ☐ mineral barren ☐ meadow ☐ prairie ☐ shrubland ☒ treed ☐ treed swamp ☐ shrub swamp ☐ fen ☐ bog ☐ marsh ☐ agriculture ☐ actively managed ☐ constructed

Chemistry (11): ☐ calcareous ☐ non-calcareous ☐ saline

Vegetation Cover (5): ☐ not vegetated ☐ non-vascular ☐ sparse herbaceous ☐ herbaceous ☐ sparse low shrub ☐ low shrub ☐ sparse tall shrub ☐ tall shrub ☐ sparse low treed ☐ low treed ☐ sparse tall treed ☐ semi-closed tall treed ☐ closed tall treed

Vegetation Form (5): ☐ lichen ☐ algal ☐ bryophyte ☐ mixed non-vascular ☐ forb ☐ graminoid ☐ mixed herbaceous ☐ floating-lvd aquatic ☐ suberged aquatic ☐ mixed aquatic ☐ coniferous shrub ☐ evergreen shrub ☐ mixed shrub ☐ deciduous shrub ☐ coniferous treed ☐ mixed treed ☐ deciduous treed

Classification	code	name	2	3	4
(12) Substrate Type	Clay loam				
(13) Vegetation Type					
(14) Ecosite	FOC	Coniferous Forest			
(16) Ecoelement	FOC4	Fresh-moist White Cedar			
1st or 2nd Approx					

I / C

(9) Ecosystem Coverage (%)

Polygon Code White cedar Swamp Mix — **Field Descriptions** — **Page** 2 **of** 2

plant species list for prevailing (1) ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5
White Cedar	A	O	R	N			
White Birch	R	N	N	N			
Green Ash	R	R	N	N			
[illegible]	—	—	—	—			
Sugar Maple	N	R	R	N			
Sensitive fern	N	N	O	A			
Ostrich fern	N	R	O	A			
Club moss	N	N	R	A			

plant species list for _____ ecosystem condition

③ plant species code	>10	2-10	0.5-2	<0.5	other	<0.5	>0.5

⑩ cond	type	Wildlife Species Code	#

⑥ size class analysis (cm)	< 10	10 - 25	25 - 50	> 50
live				
standing dead				
deadfall				

codes: **N** = none **R** = rare **O** = occasional **A** = abundant

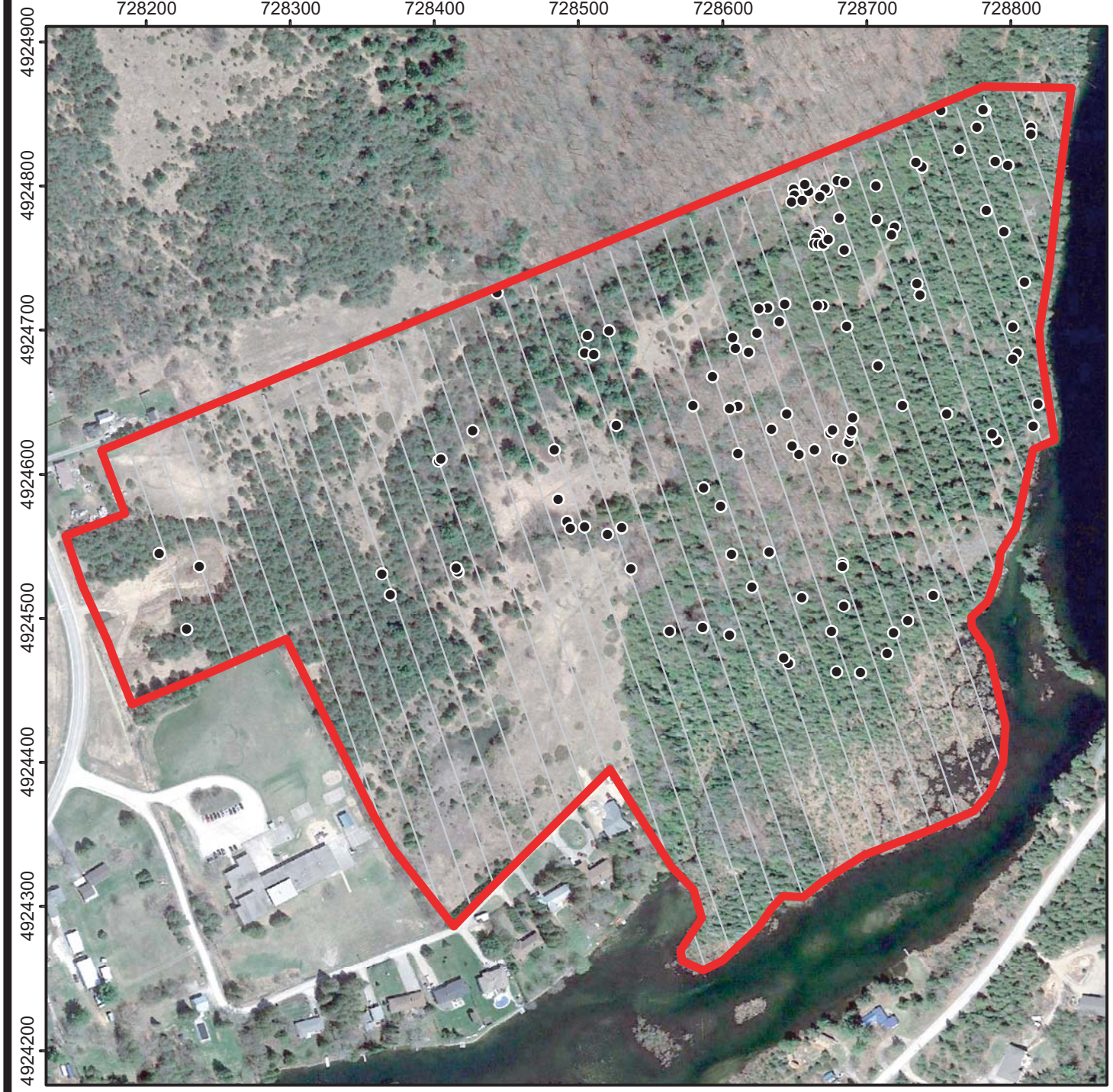
Prism Sweeps ⑥ prism factor

⑦ condition/auger #	__/__	__/__	__/__	__/__	__/__
depth augered	0.25				
mottles	0.2				
gley	—				
bedrock	0.25				
carbonates	—				
water table	0.24				
organics	10cm				
effective texture	Clay loam				
moisture regime	Fresh				
positiion on slope	Shoulder				
Substrate Type					

tree species code	__/__	__/__	__/__	__/__	__/__	totals	rel avg
totals							100
basal area							
standing dead tally							

Appendix G

Bat Snag Survey Data Summary



North American Datum 1983 Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Site Boundary
- Transect (white) - 20 m spacing
- Identified Snag

N

Scale: 1:4,000

0 50 100 200 m

Notes: Base plan provided by the Ministry of Natural Resources and Forestry (MNRF, 2019).

Imagery and parcel information provided by the County of Peterborough GIS (2018).

Optimized for printing by Oakridge Environmental Ltd.

TITLE

Bat Snag Data

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT # 17-2323

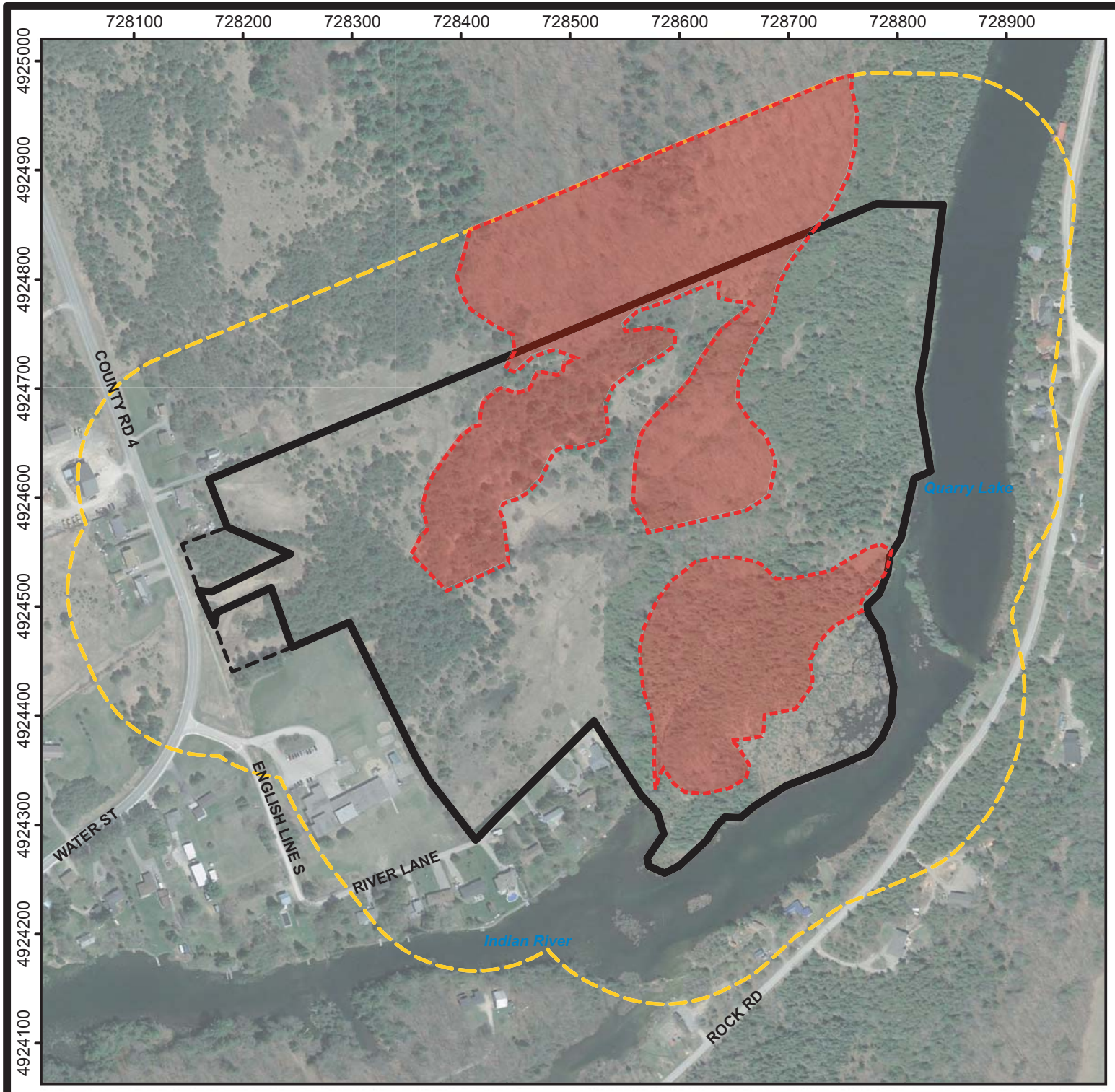
DATE July 2019

APPENDIX **G**

Appendix H

Significant Wildlife Habitat Summary

Significant Wildlife Habitat Screening				
Signficant Wildlife Habitat Type	**General Habitat Description**	**ELC Observed**	**SWH Present**	**Report Mitigation**
Wildlife Concentration Areas				
Raptor Wintering Area	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors	FOC4, FOC4-1, FOD5-1, FOM2, FOC2 adjacent to CUM1 and CUT1-1	Assumed	Refer to Section 8.5.4
Bat Hibernacula	Caves, mine shafts, underground foundations and Karsts. Hibernacula relatively poorly known	Fractures in bedrock, no matching ELC on-site	Unconfirmed - Shallow Fractured Bedrock	Refer to Section 8.5.14
Bat Maternity Colonies	Mature forests with >10 ha of large diameter (>25 cm dbh) wildlife trees, 21 snags per hectare preferred	FOD5-1 as it continues offsite and FOM2 as it connects with FOD community	Assumed	Refer to Section 8.5.12
Turtle Wintering Areas	Within core habitat, water must be deep enough not to freeze and have soft mud substrates	MAS2-1, Open Water	Assumed	Refer to Section 8.5.7
Reptile Hibernaculum (Turtles assessed separately)	Below frost lines in burrows, rock crevices and other natural or naturalized locations. Rock crevices, talus slopes, etc.	FOC4-1, FOC4-Fractures are noted along Quarry Lake	Assumed - No congregations observed	Refer to Section 8.5.9
Deer Yarding Areas	Core (Stratum I) is located within Stratum II. Core is the critical habitat for survival of deer during winter months	MNRF Mapped most of forest along the eastern extent of site. FOC4 and FOC4-1 could provide thermal cover	Confirmed - Stratum II	Refer to Section 8.5.8
Specialized Habitat for Wildlife				
Waterfowl Nesting Area	Extends 120 m from a wetland (>0.5 ha) or a wetland (>0.5 ha) and any small wetlands or a cluster of 3 small wetlands where waterfowl nesting is known to occur	MAS2-1	Unlikely, congregations of nesting species not observed	Refer top Section 8.5.10
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	ELC Forests: FOD, FOM, FOC, SWD, SWM directly adjacent to riparian areas	FOC4, FOC4-1 and FOD5-1	No active nests observed, SWH not present	Suitable habitat retained by VPA
Woodland Raptor Nesting Habitat	Forested ELC Ecosites but may also be found in SWC, SWM, SWD and CUP3	FOC4, FOC4-1, FOD5-1, FOM2, FOC2 adjacent to CUM1 and CUT1-1	Assumed	Refer to Section 8.5.4
Turtle Nesting Areas	Exposed mineral soil area adjacent (<100m) or within MAS1 to 3, SAS1, SAM1, SAF1, BOO1, FEO1	MAS2-1 and FOC4	Assumed	Refer to Section 8.5.7
Seeps and Springs	Any forested area (with >25% meadow/field/pasture) within headwaters of a stream or river system	FOC4-1, FOC4; sensitive hyrological features located within this area	Confirmed - Seasonal	Refer to Section 8.2.2 through Section 8.2.4
Amphibian Breeding Habitat (Woodland)	Presence of a wetland, pond or woodland pool >500m^2, within or adjacent to woodland	FOC4, FOC4-1	Confirmed	Refer to Section 8.5.5
Amphibian Breeding Habitat (Wetlands)	Wetlands >500m^2 (25m diameter), supporting high species diversity	SWM1-1, MAS2-1	Confirmed	Refer to Section 8.5.6
Woodland Area-Sensitive Breeding Bird Habitat	Habitats where interior forest birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha	FOD5-1, FOC4, SWM1-1 and FOC4-1.	Potential	Refer to Section 8.5.2
Habitat of Species of Conservation Concern (other than Threatened or Endangered)				
Marsh Breeding Bird Habitat	MAM1 to 6, SAS1, SAM1, SAF1, FEO1, BOO1 Green Heron: SW, MA, CUM1	MAS2-1	Potential, nesting pairs not observed in study area	Refer to Section 8.5.3
Special Concern and Rare Wildlife Species	All Special Concern and Provincially Rare plant and animal species. May also consider Area Sensitive and Culturally Sensitive Species	Common Nighthawk Golden-winged Warbler Eastern Wood-pewee Eastern Whip-poor-will Midland Painted Turtle (COSEWIC)	Confirmed within study area	Refer to Section 8.5.13
Animal Movement Corridors				
Aphibian Movement Corridors	All Ecosites associated with water	MAS2-1, SWM1-1, FOC4 and FOC4-1	Confirmed	Main eastern corridor protected by VPA
Deer Movement Corridors	All forested Ecosites	Contiguous forest communities along the east side of site.	Confirmed	Main eastern corridor protected by VPA



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Potential SWH - Bat Maternity

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

Potential Significant Wildlife Habitat (SWH) based on ELC description

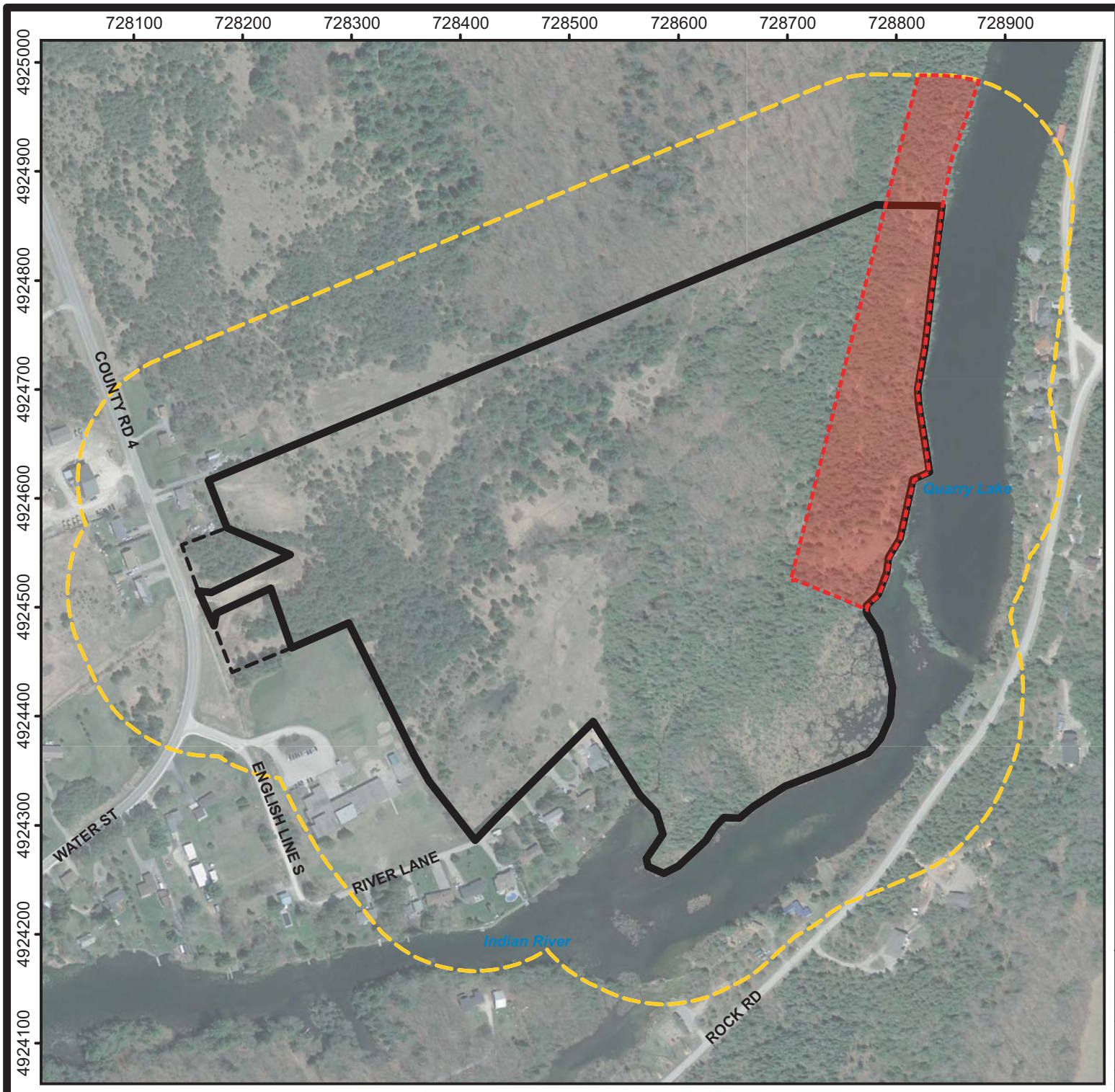
Optimized for printing by Oakridge Environmental Ltd.

TITLE

Potential SWH Bat Hibernacula

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**H-1**
DATE	
July 2019	



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Potential Habitat - Bat Hibernacula

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

Potential suitable habitat based on site observations of fractured bedrock environment

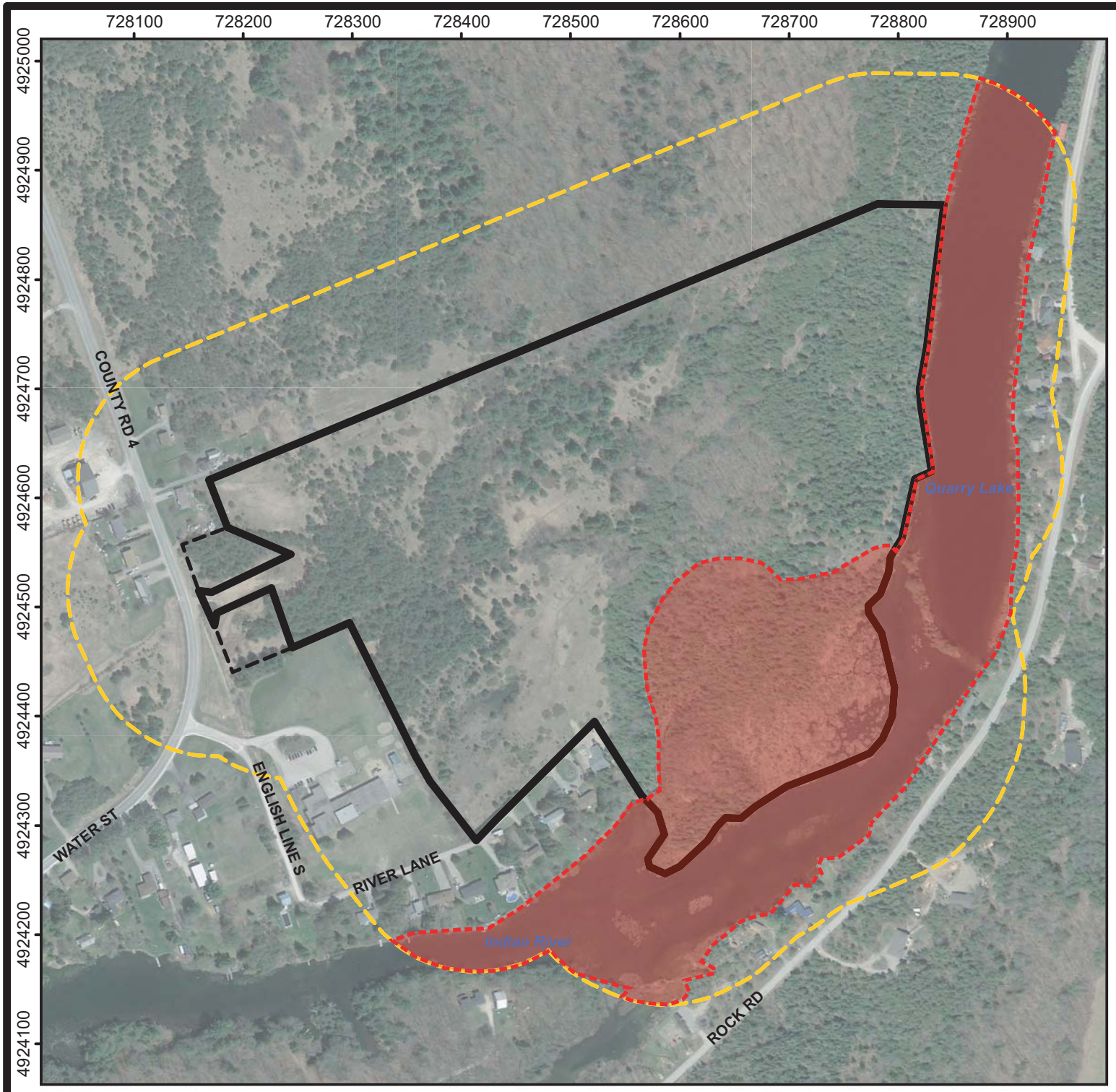
Optimized for printing by Oakridge Environmental Ltd.

TITLE

Potential Suitable Habitat Bat Hibernacula

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**H-2**
DATE	
July 2019	



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Potential SWH - Turtle Wintering

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

Potential Significant Wildlife Habitat (SWH) based on ELC description

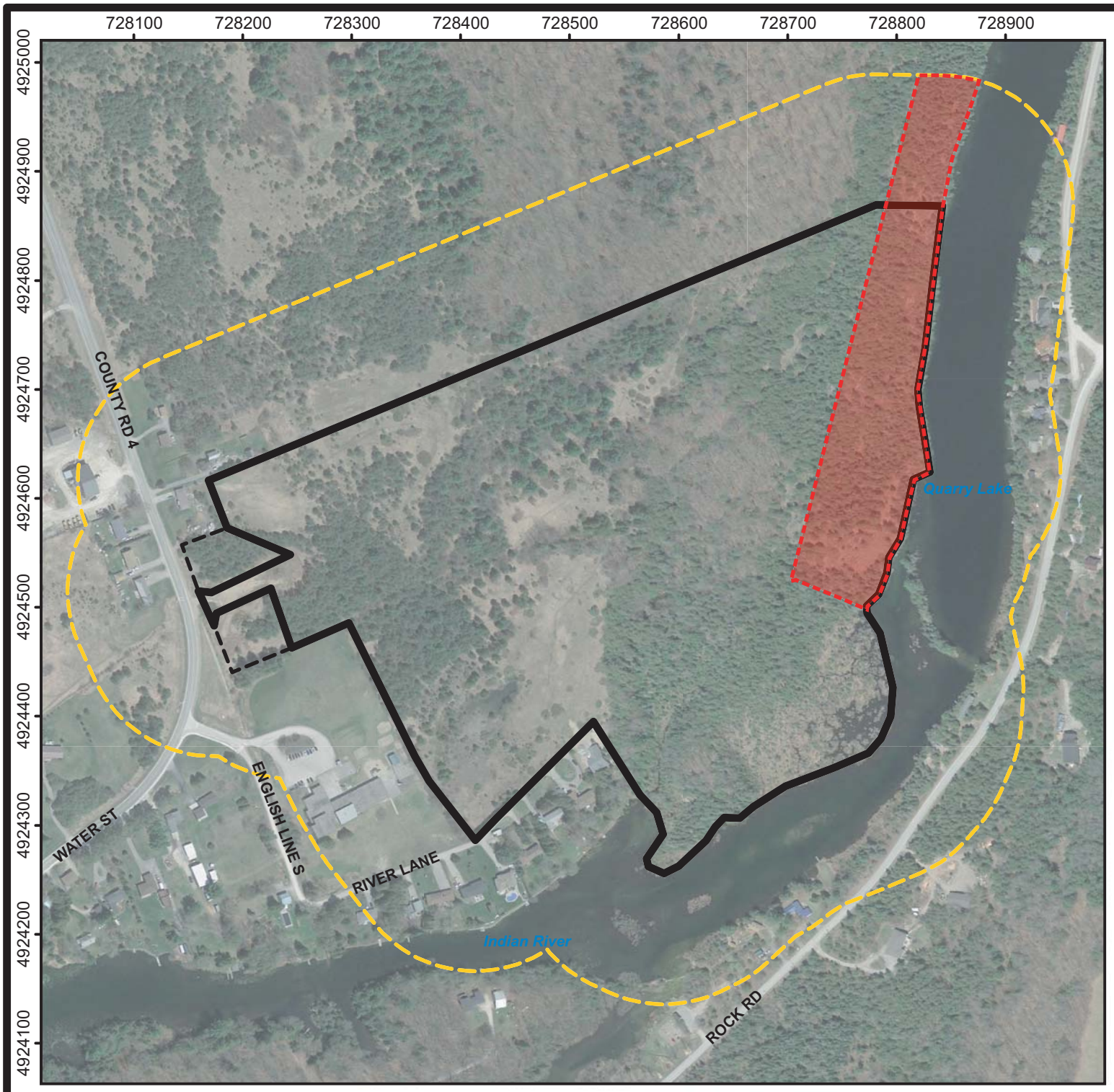
Optimized for printing by Oakridge Environmental Ltd.

TITLE

Potential SWH Turtle Wintering

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**H-3**
DATE	
July 2019	



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Potential SWH - Reptile Hibernacula

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

Potential Significant Wildlife Habitat (SWH) based on site observations of fractured bedrock environment, no congregations of species found on-site

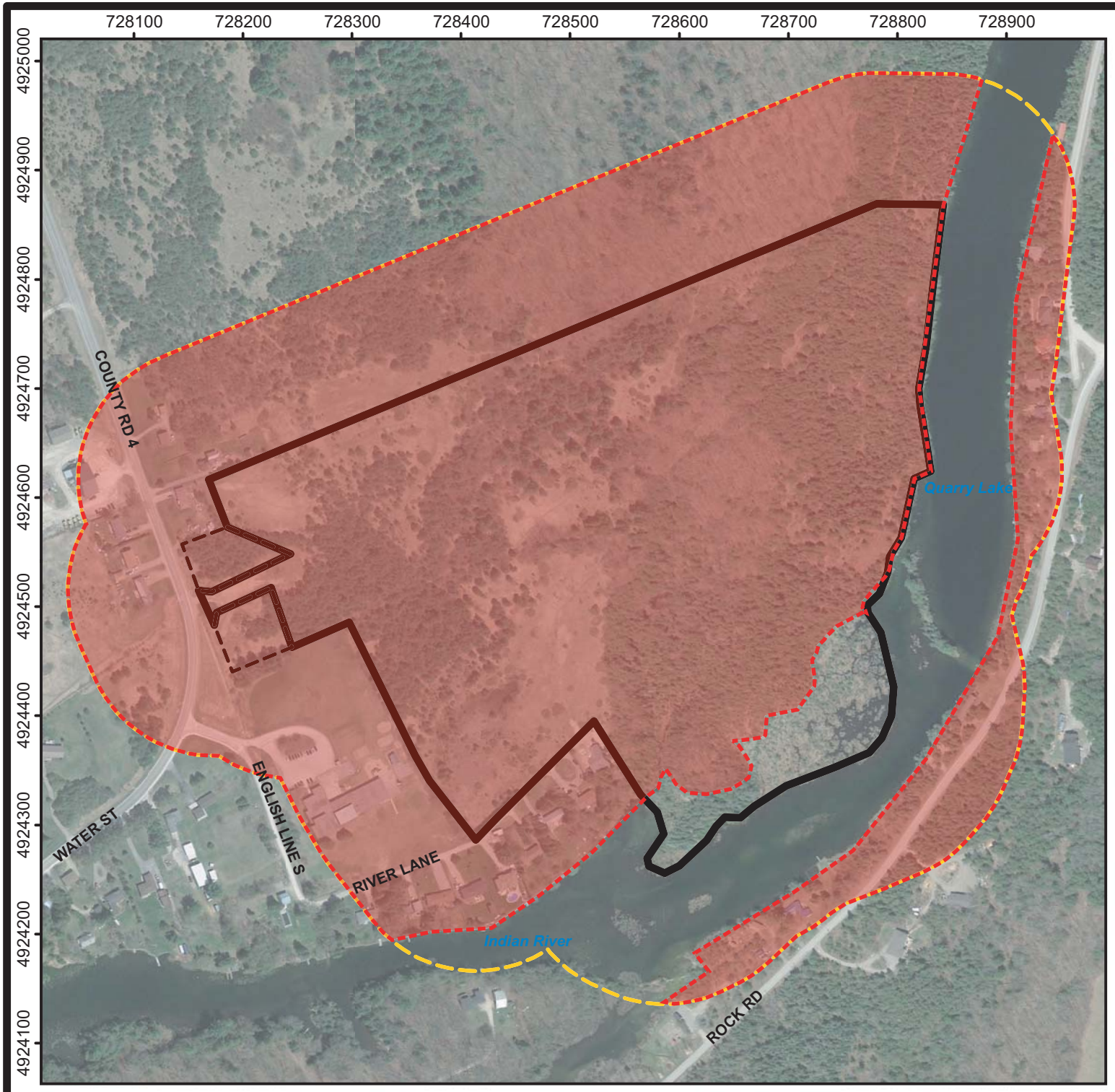
Optimized for printing by Oakridge Environmental Ltd.

TITLE

Potential SWH
Reptile Hibernacula

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**H-4**
DATE	
July 2019	



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Potential SWH - Raptor Wintering & Nesting Habitat (potentially suitable habitat for observed Common Nighthawk).

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

Potential Significant Wildlife Habitat (SWH) based on ELC communities

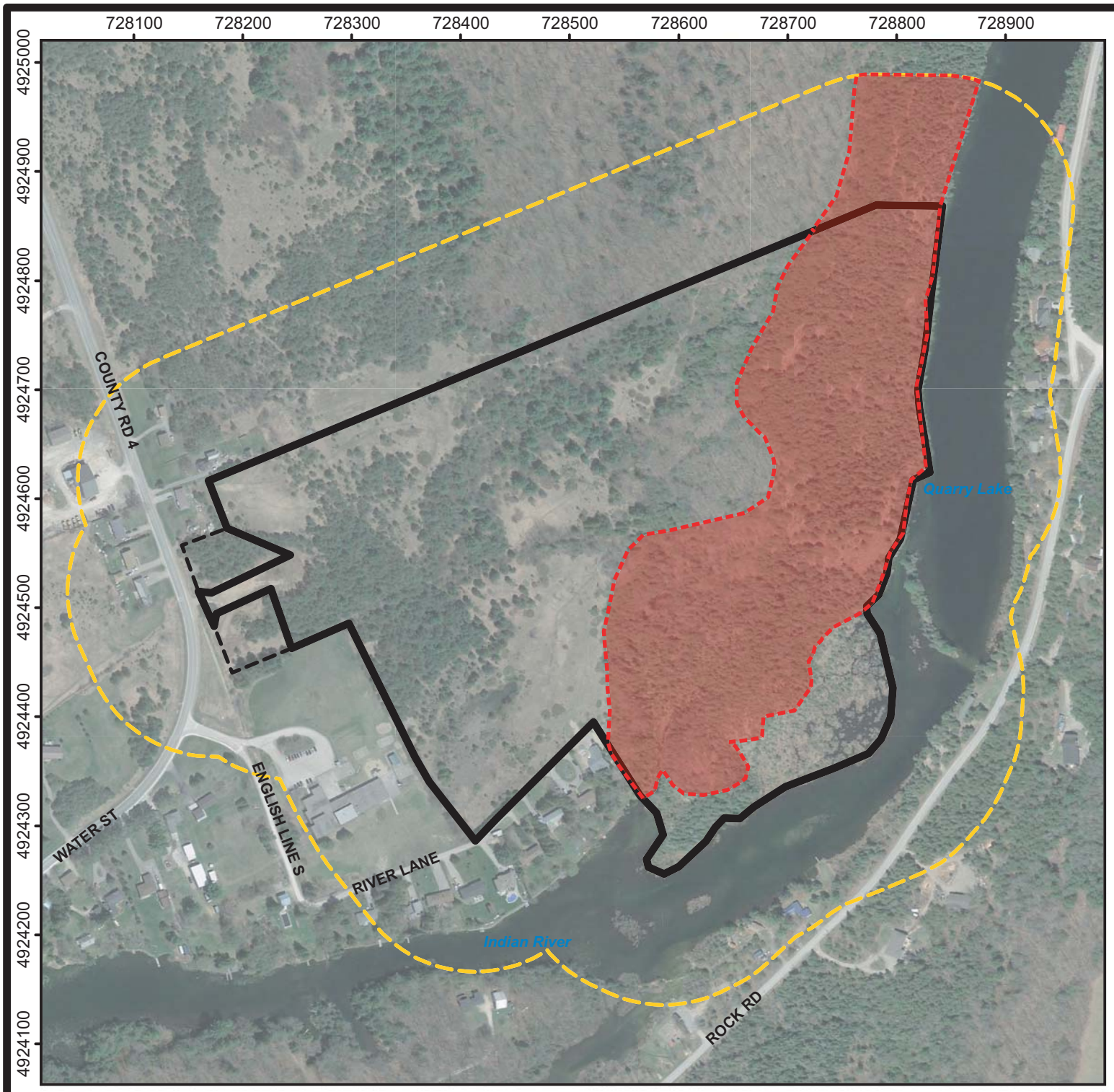
Optimized for printing by Oakridge Environmental Ltd.

TITLE

Potential SWH
Raptor Wintering and Nesting

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**H-5**
DATE	
July 2019	



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Potential SWH - Deer Yarding

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

Potential Significant Wildlife Habitat (SWH) based on ELC community and presence of groundwater discharge and thermal cover

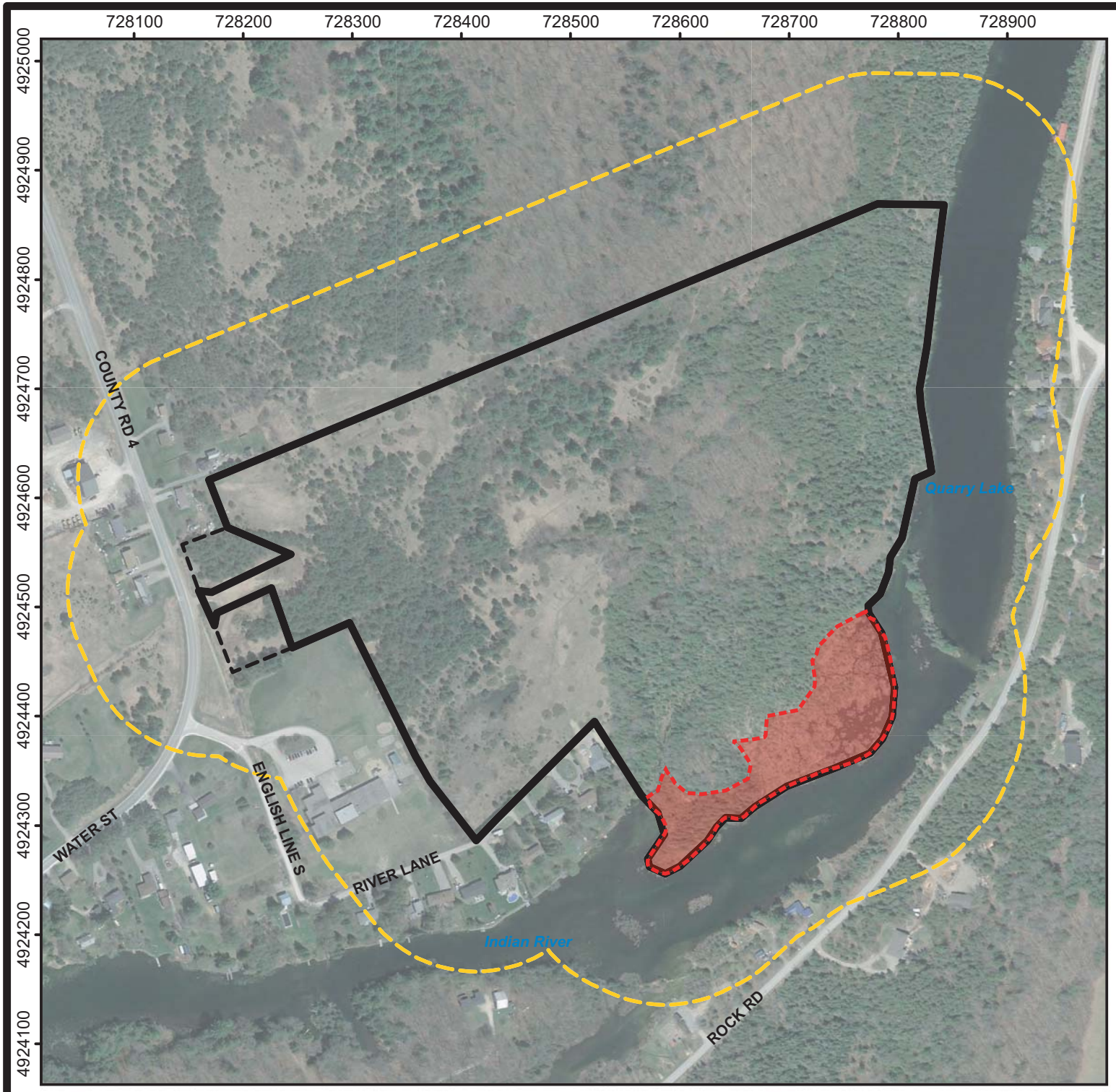
Optimized for printing by Oakridge Environmental Ltd.

TITLE

Potential SWH Deer Yarding

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**H-6**
DATE	
July 2019	



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Potential SWH - Waterfowl Nesting and Marsh Breeding Bird

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

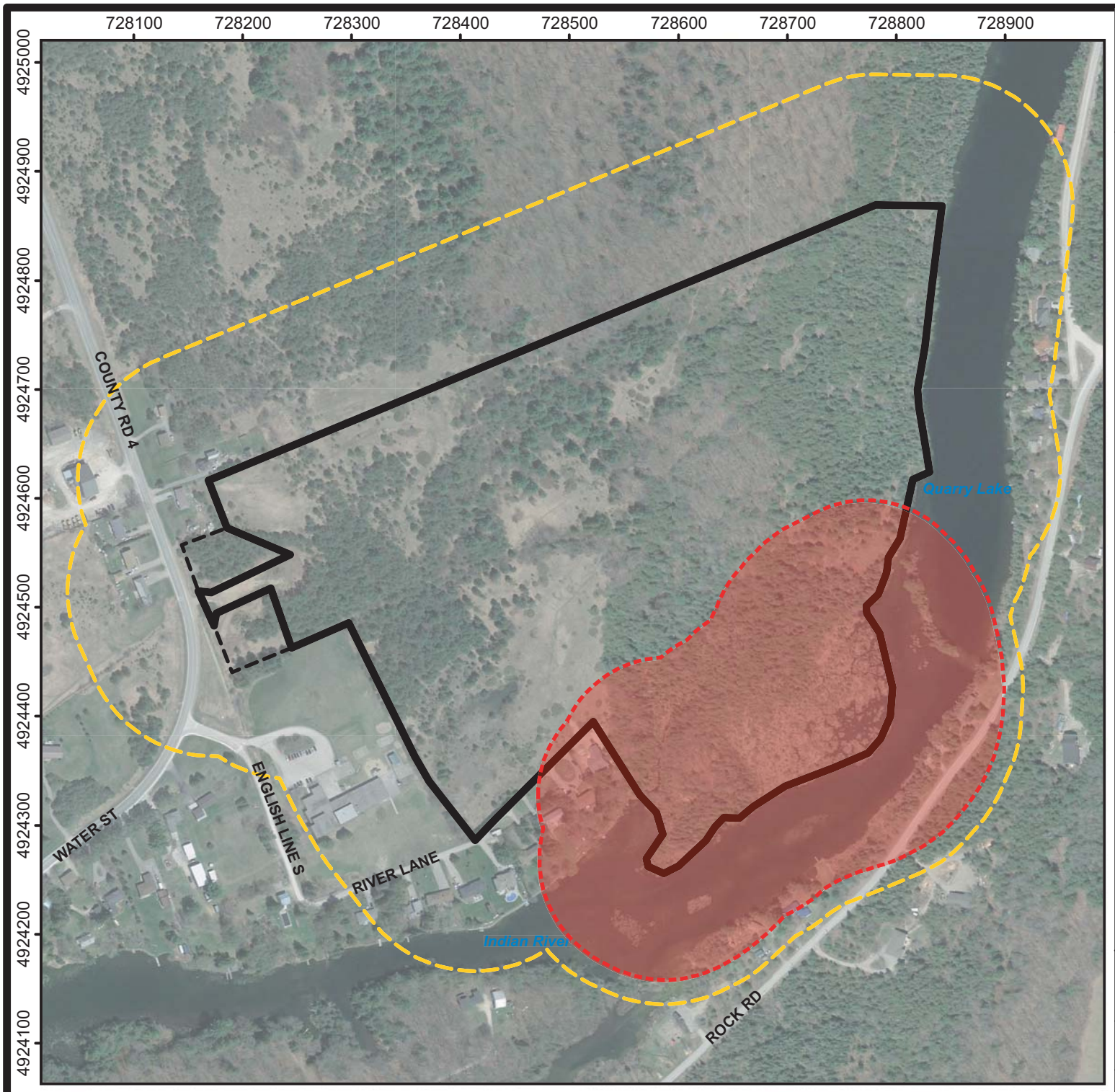
Potential Significant Wildlife Habitat (SWH) based on ELC community

Optimized for printing by Oakridge Environmental Ltd.

TITLE **Potential SWH Waterfowl Nesting and Marsh Breeding Bird**

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	H-7
DATE	
July 2019	



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Potential SWH - Turtle Nesting

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

Potential Significant Wildlife Habitat (SWH) based on 100 m adjacent lands to listed ELC community

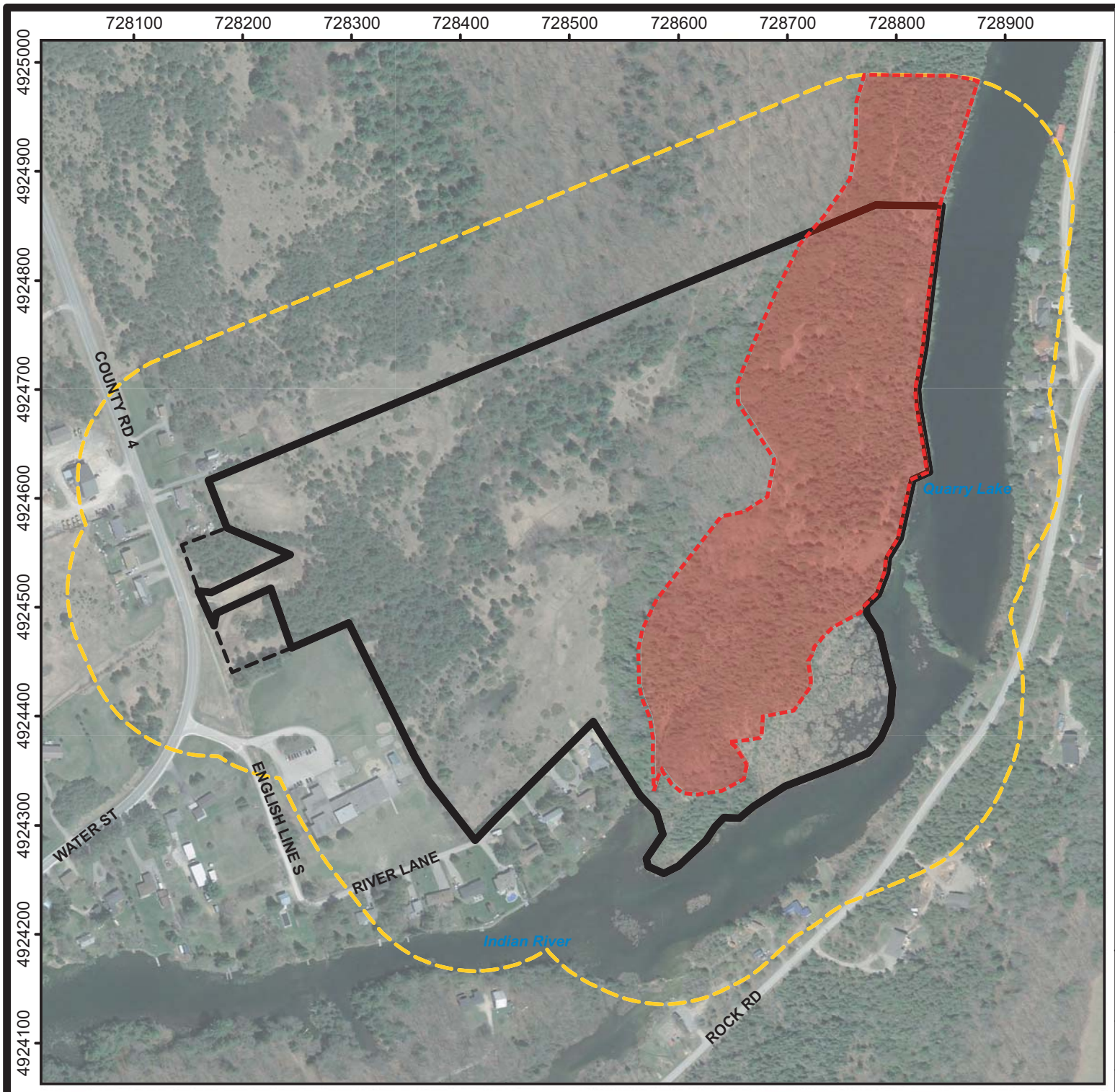
Optimized for printing by Oakridge Environmental Ltd.

TITLE

Potential SWH Turtle Nesting

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**H-8**
DATE	
July 2019	



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Confirmed SWH - Seeps/Spring and Recharge

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

Significant Wildlife Habitat (SWH) based on limit seasonal groundwater discharge and important recharge area

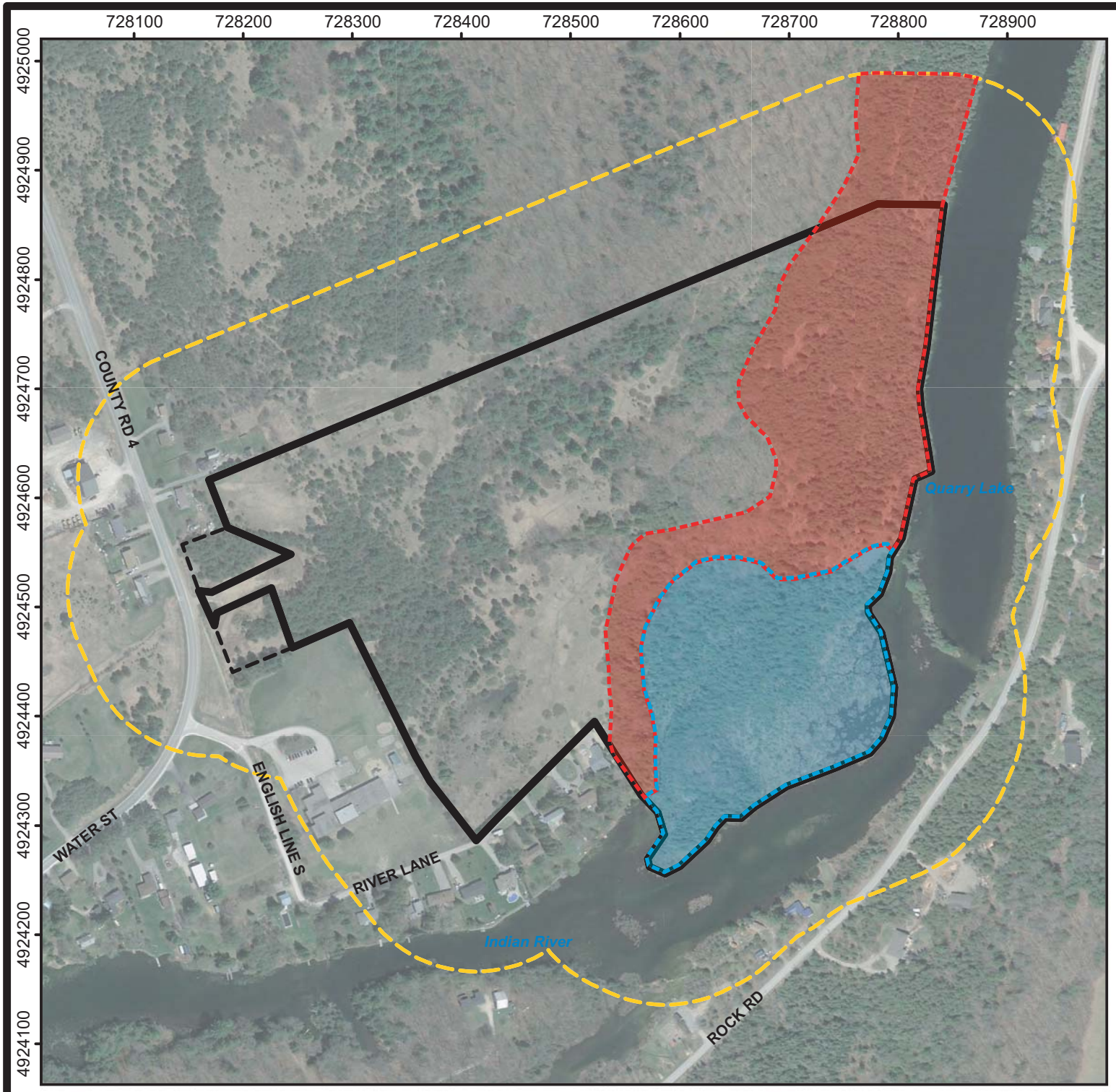
Optimized for printing by Oakridge Environmental Ltd.

TITLE

Confirmed SWH Seeps/Springs and Recharge

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**H-9**
DATE	
July 2019	



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Confirmed SWH - Amphibian Breeding (Woodland)
- Confirmed SWH - Amphibian Breeding (Wetland)

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

Significant Wildlife Habitat (SWH) based on ELC community and amphibian surveys

Optimized for printing by Oakridge Environmental Ltd.

TITLE

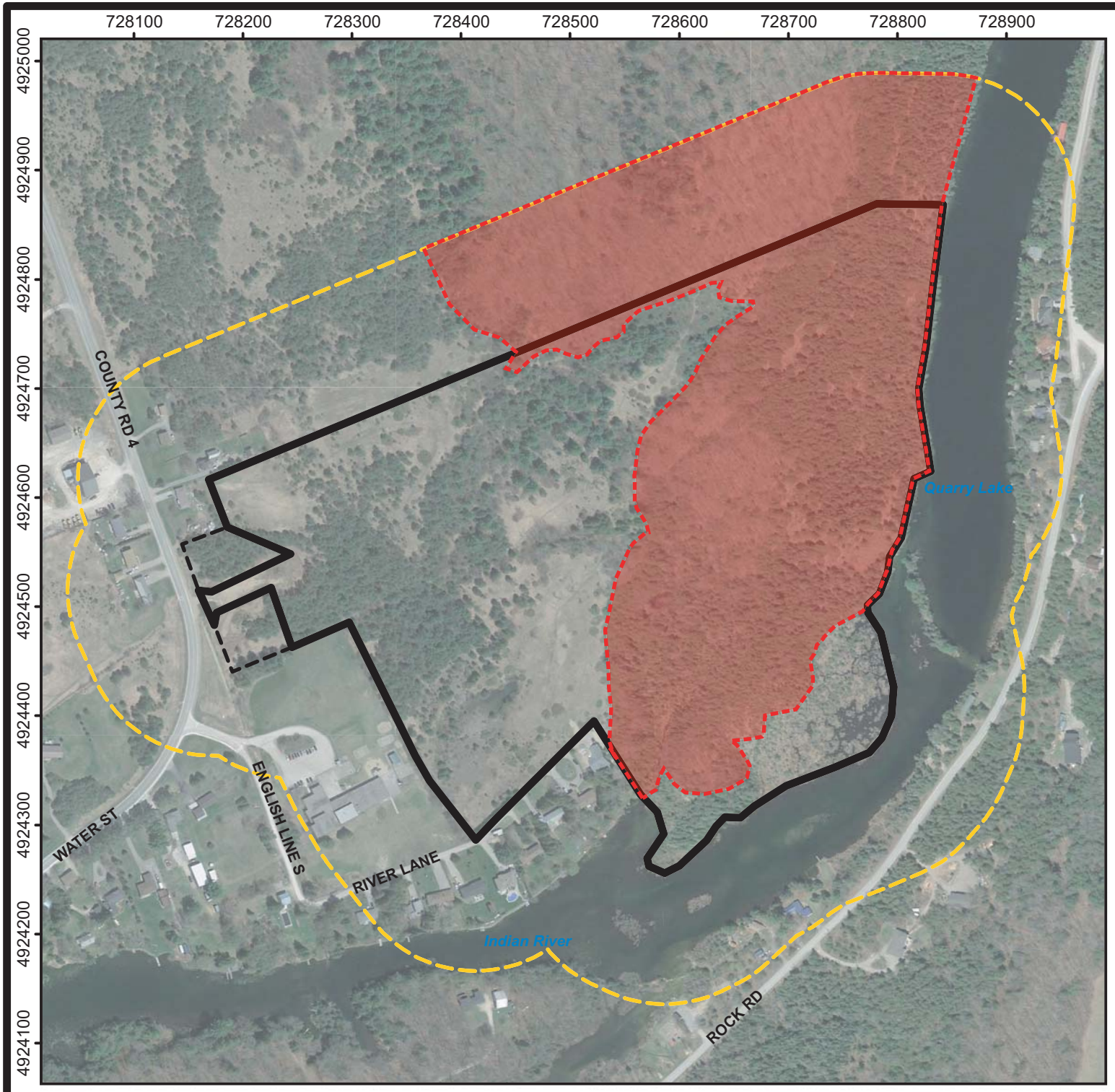
Confirmed SWH Ambhibian Breeding

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT # 17-2323

DATE July 2019

FIGURE NO. **H-10**



North American Datum 1983 UTM Zone 17

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

LEGEND

- Approximate Property Boundary
- Other Lands Owned by Proponent
- Study Area
- Potential SWH - Woodland Sensitive Birds & Potential Suitable Habitat for Eastern Wood-Pewee and Eastern Whip-poor-will

N

Scale: 1:5,000

0 50 100 200 m

Notes: Base image provided by GoogleEarth (2018)

Potential Significant Wildlife Habitat (SWH) based on ELC community

Optimized for printing by Oakridge Environmental Ltd.

TITLE

Potential SWH
Woodland Sensitive Birds

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**H-11**
DATE	
July 2019	

Addendum

County of Peterborough Peer Review Response and

Otonabee Region Conservation Authority Review Response

ORE
Oakridge Environmental Limited
Environmental and Hydrogeological Services

October 25th, 2024

Riel Contracting Inc.
213 Lonsberry Lane
Douro-Dummer, ON
K0L 3A0

Attention: **Jason Riel**, President/Owner

Re: Addendum to Environmental Impact Study (EIS)
Response to County of Peterborough Peer Review and Response to Otonabee Regions Conservation Authority Comments,
Warsaw Severance and Multi-Residential Development
Part Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer, County of Peterborough
Our Project No. 17-2323

Dear Mr. Riel:

Subsequent to preparation of our EIA report of July 31st, 2019, review comments were provided by the County of Peterborough and Otonabee Region Conservation Authority (ORCA).

Both of our responses to those comments were prepared by our firm on July 26, 2024. The responses are provided as attachments to this addendum.

Yours truly,
Oakridge Environmental Ltd.

Rob West, HBSc.
Senior Ecologist

attachments:
Response to County of Peterborough Peer Review Comments
Response to ORCA Review Comments

ORE
Oakridge Environmental Limited
Environmental and Hydrogeological Services

July 26th, 2024

Riel Contracting Inc.
213 Lonsberry Lane
Douro-Dummer, ON
K0L 3A0

Attention: **Jason Riel**, President/Owner

Re: Response to County of Peterborough Peer Review Comments,
Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development
Part Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer, County of Peterborough
Our Project No. 17-2323

Dear Mr. Riel:

1.0 Introduction

Oakridge Environmental Ltd. is pleased to provide this response to the peer review comments provided by Stantec Consulting Ltd. on June 12, 2023 regarding our *Environmental Impact Study (EIS), Warsaw Severance and Multi-Residential Development* report dated July 31st, 2019, completed in support of the proposed development within the hamlet of Warsaw, Ontario. ORE staff have completed additional addenda including the 1st (Regarding Conceptual Lot Layout Plan) dated, April 29, 2022 and a 2nd (2020 Provincial Policy Statement – Environmental Impact Study) on August 21, 2020.

2.0 Response to Stantec Consulting Ltd. Comments

2.1 Wetlands and Waterbodies

Under wetland and waterbodies on Page 5 of the review, it states the following:

"*It was noted that no flood plain hazard mapping was included in the EIA; therefore, Stantec could not determine if the proposed properties were at risk.*"

ORE Response

The flood elevation has been added to the ORE constraints Figure 8 - Conceptual Site Plan, which is now Figure 8r, presented at the end of this response.

2.2 Significant Wildlife Habitat - FOC Communities

On page 5 of the review, it states the following under Significant Wildlife Habitat:

"*It was noted in the report in several sections that avoidance of FOC4 and FOC4-1 were included as mitigation measures to reduce the potential for impacts on Whip-poor-will and other species; however, based on mapping in Figure 7, it appears that FOC4-1 is not completely protected within the VPA. Some further context is recommended.*"

ORE Response

The newest plan has been revised to remove any/all development outside the FOC4 and FOC4-1 SWH areas, as illustrated on Figure 8r, included at the end of this response.

2.3 Significant Wildlife Habitat - FOD5-1 Community

Under the same heading as the previous review comment, the following was stated in regards to the Deciduous woodland habitat (FOD5-1):

"*Of note, regarding FOD 5-1 in Section 7.3.4 of the EIA it indicated:*

As this mature upland woodland community represents the only deciduous community on the site, it is expected that this Ecosite would be considered SWH for a wide variety of species (some Special Concern) known to frequent the general area. As a result, mitigation will need to be considered if development is anticipated to encroach or enter this community.

It appears that approximately 50% of FOD5-1 occurs outside of the VPA and there were other comments regarding preserving FOD5-1. In addition, it was noted that some of the FOC4 occurs outside of the of the VPA and areas proposed for lot development. Stantec recommends additional discussion be added on how negative impacts to SWH will be avoided to maintain conformance with the PPS."

ORE Response

The plan has been revised to protect the FOD5-1, FOC2 and FOC4 woodland limits in a natural state on each lot - any development will have to remain outside these wooded areas. The limit of protection occurs directly along the drip-line. The lot-line between lots 10 and 11 has been adjusted to allow more area within the Cultural Meadow habitat for Lot 10 to accommodate a septic system footprint outside the woodland area.

Considering the above mentioned concessions have been made, the SWH associated with these areas will be entirely avoided (no negative impacts) which will meet the Significant Wildlife Mitigation Support Tool (SWHMiST) criteria. Therefore, the PPS requirements with respect to SWH are also met as there will be no negative impact to the woodland SWH's form or function as per Section 2.1.5 d in the 2024 PPS. According to Marnie Saunders at D.M. Wills and Associates, a restrictive zoning can be placed on those lots which contain woodland whereby the lot owner cannot remove any of the trees within these areas unless it is hazard tree. Given that the property owner will likely want to situate the dwelling and septic system back from the drip-line of the trees to protect these development components, no setback is required/recommended.

2.4 Significant Woodlands

Under Significant Woodlands heading, the County Peer Reviewer stated the following:

"*However, in Section 4.4 (Otonabee Region Conservation Authority), correspondence with (ORCA) indicated the following:*

"*The Significance of the woodland cover as per criteria outlined in the Natural Heritage Reference Manual will be required. Otherwise, treat the natural cover as significant. Unfortunately, neither the Township nor the County has a percentage base for woodland cover in their jurisdictions…*"

Therefore, the project did not appear to be in conformance with terms of reference (TOR) provided by ORCA."

ORE Response

Under the new Conservation Authorities Act, Conservation Authorities no longer provide Natural Heritage recommendations, however, in keeping with the Terms of Reference we provide the following response.

The wooded areas described in the SWH section of the EIS will be retained in an entirely

natural state as per the recommendations in the previous SWH section. It is recommended that any buildings, septic systems (etc.), occur outside the wooded areas to keep them in an entirely natural state. Therefore, the comments by ORCA and seconded by the County Peer Reviewer, will comply/be addressed, regardless.

2.5 Impact Assessment and Mitigation Measures - Wetlands, Waterbodies and Fish Habitat

The following was stated under the Impact Assessment and Mitigation Measures - Wetlands, Waterbodies and Fish habitat section of the County Peer Review on Page 7:

"*Wetlands, waterbodies and fish habitat were avoided by implementing a minimum 30 m VPZ from KHF identified within the subject property. Discussion regarding potential flooding is recommended. However, Stantec assumes that a CA permit will be completed as part of the proposed project and will address potential flooding concerns.*"

ORE Response

According to the new Conservation Authority Act requirements, provided no development occurs within 30 m of a wetland or watercourse and/or within a floodplain, no permit is required. Formerly, a permit was required under ORCA's jurisdiction if a development was proposed within 120 m of a wetland or watercourse.

The proposed development elements (according to the new lot areas) will be greater than 30 m from the shoreline of the river and the associated wetland areas as identified within Figure 8r, included at the end of this plan. Furthermore, the development will occur well outside the limit of the floodplain. Therefore, it does not appear that the proponent should be required to obtain a permit from ORCA for this proposed development.

2.6 Species at Risk

"*Several species were identified to potentially be occurring within the subject property and the adjacent areas within the Study Area for the project. Mitigation measures were provided which were appropriate. However, the following concerns were noted.*

- *There was noted to be potential for turtles in the wetlands and waterbodies both within and adjacent to the subject property and mitigation measures were provided. A retaining wall was proposed to limit interactions with turtles. Stantec recommends that ORE provides the County the specifications of the retaining wall and potential review by the MECP as part of an Information Gathering Form*

(IGF).

- *If Blanding's Turtle habitat is present adjacent or within the subject property, consultation with the MECP occur via the submission of an IGF.*

- *That turtle isolation fencing should be to the standards of: Best Management Practices for Mitigating the Effects of Roads on Amphibian and Reptile Species at Risk in Ontario (MNRF, 2015).*

- *Stantec recommends timing windows for turtles be considered and how it effects the installation timing for the isolation fencing.*

There were no mitigation measures specifically to bats (including SAR bats) within the EIA. Mitigation measures should be including in the EIA to reduce the potential impacts to bats. Mitigation measures for bats are also recommended to be part of an IGF recommended to be filed with the MECP to determine conformance to the ESA, 2007."

ORE Response

1. Bullet 1 - The retaining wall was not specified/recommended to prevent Species at Risk turtles from overtopping the entrance road due to the presence of SAR turtles being documented in this area. The ditch does not represent habitat of SAR turtles and the proposed mitigation to construct a retaining wall entrance is simply an extra measure to ensure, in the event a turtle migrates via the ditch towards the subject property (which they sometimes do), that the turtles are unable to overtop the entrance road in this area and potentially be harmed by vehicles entering or exiting the proposed development.

   MECP will not be contacted in this regard as it is a general turtle protection measure and not specific to any Threatened or Endangered SAR detected on or directly adjacent to the subject property.

2. Bullet 2 - There is always the potential for Blanding's Turtle to occur in any waterway such as a river or wetland. However, no Blanding's Turtles were detected even though ORE staff completed numerous inspections to detect Blanding's Turtle according to the Ministry's protocol. In addition to completing the surveys according to the Ministry's Blanding Turtle detection protocol, ORE staff searched the river by canoe and utilized a drone whereby two (2) sets of passes were completed along the proponent's shoreline, throughout Quarry Lake, as well as along the adjacent land's shorelines within 200 m of the subject parcel.

Both the in-flight camera imagery and the recorded imagery were reviewed to detect the types of turtle species that occur within the 200 m corridor of the river. No Blanding's Turtles were observed/detected within the river or wetland fringe areas of the river during the surveys. Therefore, even though Blanding's Turtle could be present within the waterway, a 2nd season/year of detection according to the protocol (and beyond) did not detect this species in the waterway. Therefore, without this species being present within 120 m or more of the subject site, the subject property does not appear to be habitat for this species. Consequently, there are no requirements under the Endangered Species Act (ESA) to report either the presence or potential habitat of this species to MECP.

Although Blanding's Turtle was not detected, Snapping Turtle and Midland Painted Turtle were detected during the site surveys. Both of these species have a status of Special Concern and do not have any Endangered Species Act implications. The 30 m setback from the river and on-site wetland habitats are sufficient to avoid the SWH associated with these Special Concern turtle species.

3. Bullet 3 - ORE staff agrees with Bullet 3. We also recommend that heavy-duty silt fence be installed along the limit of the development to prevent turtles from entering the work areas as per the website:

   https://www.ontario.ca/page/reptile-and-amphibian-exclusion-fencing

   Light-duty silt fence is the most common fence material applied to developments, however, it is not listed as a turtle exclusion fence. Even though Blanding's Turtle and other SAR turtles may not occur within 200 m or more along the river corridor in either direction, they can migrate significant distances to reach disturbed/exposed soil areas adjacent to waterways.

4. Bullet 4 - The heavy-duty silt fence should be installed if any of the on-site alterations are proposed to be completed between April 1st and October 1st each year. If the site alterations can occur outside the active period for turtles (while they are hibernating), the property owner can install light-duty silt fence. Once any unconsolidated materials possess seed/vegetation cover, the exclusion fence can be removed.

5. Last comment/no Bullet regarding bats - ORE staff returned to the site in 2024 to obtain data regarding bats on the subject parcel.

   A total of three (3) Anabat Swift bat detectors were deployed at the site from June 3rd to June 14th, 2024. Over the course of eleven (11) nights, the detector recorded a total of

1,760 sound (.wav) files. The sound files were processed using SonoBat 4.4.1 North America. The software's built-in algorithm assigns each identifiable echolocation call with a confidence level for the purpose of compiling a quick inventory of individual species of bats. Provided each sound file contains a sufficient quantity of repeatedly identifiable calls, the software assigns a species to that sound file. Given the sensitivity of the omni-directional microphone on the bat detector, many files contain background "noise", especially near infrastructure (i.e., hydro lines, etc) and do not provide any identifiable calls. A manual check was conducted to verify/authenticate the detections.

A summary of the data is provided at the end of this response and the bat detection locations have been added to Figure 8r. According to the data, only one (1) Species at Risk bat was detected in the area of the best quality snags identified during the snag survey. ORE staff situated the three (3) detectors within the good quality woodland habitats overlooking the best quality snag trees on-site (Figure 5r included at the end of this response), and all except for one (1) species were common bat species.

The single detection of Eastern Small-footed Myotis was most likely a transient bat species as Eastern Small-footed Bats tend to stay close to their hibernaculum and typically occur in greater numbers near the overwintering habitats.

The large numbers/presence of common bat species detected in the June 2024 bat surveys suggest the wooded areas represent an SWH for maternity roosting bat species. According to the January 2015 - Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E, the following bat detections are required for it to be considered an SWH:

"*1) Maternity Colonies with confirmed use by;*

- *>10 Big Brown Bats.*
- *>5 Adult Female Silver-haired Bats.*"

The number of confirmed Big Brown occurrences was thirty-four (34,) and the number of Silver-haired was twelve (12), which likely meets the SWH criteria (bat detector data is included at the end of this response). It is not possible to determine whether the Silver-haired Bats were male or female based on detector data, thus we presume at least 5 adult females were present.

Therefore, the recommendations discussed previously to protect these wooded areas would apply to the bat findings in these wooded areas.

Although one (1) Species at Risk bat was detected on-site, it is the type of species that should have been detected with more of the same species of bat near the hibernaculum. The single occurrence of Eastern Small-footed Myotis was likely a single bat flying

through the woodland toward the Warsaw Caves area where presumably its hibernaculum and other Eastern Small-footed Myotis are roosting and nursing young. Notwithstanding, there is no requirement to contact MECP in this regard for a single occurrence and no ESA requirement, either. If SAR bats attend the woodland in subsequent years, the woodland habitats will be retained via the drip-line limit preclusion measure and the recommendation to not clear any vegetation on-site between April 1st and September 30th each year, which is the bat roosting/breeding window and one of the main mitigation criteria MECP requires if SAR bats are present.

2.7 Impact Assessment and Mitigation Measures - Significant Wildlife Habitat

On Page 7 of the review, it states the following:

"*Primarily, the identified SWH was located within FOC4 and FOC4-1 which was protected and generally part of the VPA and protected area on the east side of the proposed lots. Stantec agrees that most of the candidate SWH habitat would be protected. However, it was noted that potential bat maternity roost trees and habitat was identified during surveys throughout the subject property that will be disturbed. In the absence of acoustic surveys, Stantec recommends that additional context is provided to determine that the proposed development addresses the provision within the PPS regarding development within SWH.*"

According to the bat detector data (included at the end of this response), the wooded areas (FOD5-1, FOC4 and FOC4-1) represent SWH for maternity roosting habitat, as per the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E.

These areas will be avoided by the development, whereby, none of the site alterations (as defined by the PPS) will be allowed to impose on those areas. A drip-line limit has been applied to those lots where these woodland types impose on the lot fabric. By doing so, the woodland areas will be retained in a natural condition and absolutely no site alterations will be allowed beyond the drip-line boundary. If any site alterations cause the death/decay of any edge trees, this will not be considered a negative impact, as it will increase the number of snags for roosting bats on-site.

2.8 Summary

On Page 8 of the review, it states the following:

"*It is Stantec's opinion that additional information is recommended to be provided by ORE in support of the application:*

1. Discussion regarding potential flood mapping is recommended.

2. Further discussion on potential presence and impacts to Blanding's Turtle and Eastern Hog-nosed Snake.

3. Consideration of additional mitigation measures for turtles.

4. An IGF is recommended to be filed with the MECP in support of the project to determine MECP's acceptance of mitigation measures to maintain conformance with the ESA, 2007. This could be completed post approval but is recommended as a condition.

5. Mitigation measures for the removal of potential Bat Maternity Trees is recommended including in the filing of the IGF to the MECP.

6. Based on mapping in Figure 7, it appears that FOC4 is not completely protected within the VPA. Some further context is recommended.

7. Since the PPS indicates that "Development and site alteration shall not be permitted in:… d) significant wildlife habitat", and development is proposed in candidate SWH identified in the EIA, it should be clear in the EIA, how the proposal is in conformance with the policy.

8. It was noted that although FOC4 was identified for protection, there were some areas of the FOC4 ecosite that appear to be impacted as a result of the proposed severance. FOC4 is not completely protected within the VPA but the text in the reports infers that it is fully protected. Some further context is recommended."

<u>ORE Response</u>

Re: No. 1 - The flood elevation has been added to the revised constraints plan Figure 8r. It occurs nowhere near any of the proposed lots in the revised site plan.

Re: No. 2 - ORE staff completed surveys during the May and June period of 2024 according to Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario (August 2015) and the Survey Protocol for Ontario's Species at Risk Snakes (December 2016) to detect Eastern Hog-nosed Snake.

ORE staff completed multiple hours of Visual Encounter Surveys within the river and associated wetland settings within 200 m of the subject parcel. ORE staff included a detailed drone survey of the river corridor in addition to kayak and canoe searches. ORE staff also conducted nesting surveys within the site to detect any nest sites or tracks of turtles venturing onto the subject property, none were identified. Furthermore, Road Surveys were completed on either side of the existing entrance on-site and no dead-on-road (DOR) turtles were observed. Subsequently, no SAR turtles appear to be coming on-site to utilize the subject

property therefore no habitat was detected and no requirements need to be met for the ESA. ORE completed two (2) additional days of surveys attempting to detect SAR turtles on-site. These days were in addition to the days spent attempting to detect turtles for the purpose of preparing the original EIS.

As for the Eastern Hog-nosed Snake, ORE staff applied the following criteria from the SAR snake detection protocol:

"*A visual encounter survey is a standard, effective method for carrying out presence / absence surveys for snakes (Guyer and Donnelly 2012). This technique is effective for assessing presence / absence of all Ontario SAR snakes; however, the Eastern Hognosed Snake is very difficult to detect with any survey method. Combining VES with other techniques, such as road surveys or artificial cover object (ACO) surveys, helps to improve the overall chances of species detection.*"

ORE staff completed visual encounter surveys on-site and overturned as many lift-able downed timbers, artificial cover objects, and inspected any/all crevasses in the bedrock that could be used as cover by Eastern Hog-nosed Snake. ORE spent the greater part of two (2) days inspecting these cover objects for snakes (in addition to the time spent to detect snakes for the purpose of preparing the original EIS), in addition to completing roadside surveys for DOR specimens.

After going to great lengths, no Eastern Hog-nosed Snakes were detected on-site while applying the SAR snake protocol.

Consequently, the site does not appear to be habitat for either Blanding's Turtle nor Eastern Hog-nosed Snake. It is ORE's opinion that MECP should not be contacted based on the exhaustive efforts to detect these species both on and within the adjacent lands associated with the river corridor.

Re: No. 3 - ORE recommends installing heavy-duty silt fence around the site alteration areas on the subject property to prevent turtles from entering onto the subject property during the construction phase. Heavy-duty silt fence, unlike light-duty silt fence is considered a turtle exclusion fence material and capable of keeping larger turtles such as Snapping Turtle from entering the work areas.

Re: No. 4 - Typically, an Information Gathering Form (IGF) is submitted when a study identifies a Threatened or Endangered species on, or adjacent to, the site. According to our findings, which were completed to provincial protocols/standards, no Threatened or Endangered species appear to be utilizing the site for any part of their life-cycle. We conducted site inspections in two (2) separate years/seasons which should have revealed whether or not an Endangered or Threatened species was present on or directly adjacent to

the site. Therefore, neither MECP or NHIC has to be contacted in regards to any findings/detections directly on the property, as there does not appear to be any requirement to file an IGF.

Only Special Concern species were detected on/near the subject property. These included Snapping Turtle along the subject property's shoreline and Eastern Wood-Pewee.

Re: No. 5 - Based on the drip-line limit, no site alterations will be allowed to occur within the wooded area as it represents SWH for bats and other species. The SWHMiST states that avoidance is the key mitigation measure to sustain the habitat. The lot lines have been adjusted between lots 10 and 11 to allow for a larger footprint within lot 10 to construct the dwelling, any outbuildings and the septic system outside the drip-line of the wooded areas identified on Figure 8r. The lot lines can extend into the woodland SWH and there will be no setback applied to this feature as there is no requirement to setback from the woodland in either the OP or PPS. Provided a suitable building envelope can occur outside the wooded areas within each lot, and the drip-line limit is respected, the residential/commercial development recommendations under the SWHMiST (including the primary measure which is to avoid the SWH), will comply.

There is no requirement to submit an IGF with respect to Bat Maternity Roosting habitat to the MECP as there was no roosting Species at Risk detected within the woodland habitats on-site. Only common/secure bat species were identified by the detectors. A single SAR bat was detected, however, it was only detected during one evening and never returned on any subsequent evenings while the detectors were on-site, suggesting it was a transient detection.

Re: No. 6 - the *FOC4* community is now included within the no site alteration drip-line limit that will retain the woodland habitat. The lot lines have been adjusted between Lot 10 and 11 (as mentioned above) to create a suitable building envelope outside the drip-line limit to retain the SWH.

Re: No. 7 - Provided the no site alteration drip-line limit is applied to those lots that back onto the woodland area identified in Figure 8r, the development will comply with the SWH requirements under the PPS.

Re: No. 8 - Again, provided the no site alteration drip-line is applied to the trees along the edge of the FOC4, FOD5-1, and FOC2 woodland areas, the OP and PPS requirements will be met with respect to the proposed development on the subject property. The Planners at D.M. Wills and Associates should determine how to zone the drip-line limit such that the woodland cannot be removed (i.e., on title with each lot that contains these woodland areas).

This on-site limitation should be demarcated in the field by a qualified professional and the limit identified by an Ontario Land Surveyor (OLS), if the environmental limit is deemed acceptable by the authorities.

3.0 Closure

The revised attached *Conceptual Lot Layout Plan* (July 2024) prepared by D.M. Wills appears to have regard for the recommendations provided in this response.

We trust that this addendum adequately addresses the conceptual plan. Should you have any questions or concerns, please feel free to contact the undersigned.

–End of Response to County of Peterborough Peer Review Comments–

Oakridge Environmental Ltd.

Rob West, HBSc.
Senior Ecologist
cc: file
att. revised Figure 5r and Figure 8r

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

728100 728200 728300 728400 728500 728600 728700 728800 728900 729000

4924900 4924800 4924700 4924600 4924500 4924400 4924300 4924200

N

Species at Risk Observations
- Golden-winged Warbler (calling)
- Common Nighthawk (in-flight)
- Eastern Wood-pewee (calling)
- Eastern Whip-poor-will (calling)
- Midland Painted Turtle
- Snapping Turtle

FOC4-1
FOD5-1
CUT1-1
HA-2
FOD5-1
FOM2
CUM1
HA-1
HA-4
FOC4
FOC2
FOC1-2
HA-3
CUM1
SWM1-1
HA-6
PCL4
CUM1
MAS2-1
HA-5
PCL1
PCL3
PCL2
Quarry Lake
Indian River
COUNTY RD 4
ROCK RD
WATER ST
ENGLISH LINE S
RIVER LANE

LEGEND
- Approximate Property Boundary
- Marsh Monitoring Protocol Point Count Location
- OBBA Point Count Location
- Mineral Cultural Meadow (CUM1)
- Sumac Cultural Thicket (CUT1-1)
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- White Cedar - Hardwood Mineral Mixed Swamp (SWM1-1)
- Cattail Mineral Shallow Marsh (MAS2-1)
- Warsaw Caves Complex Provincally Significant Wetland (PSW)
- Wetland (Unevaluated)
- Published Mapping Error (not wetland)
- Hand Auger Locations
- Bat Detector
- Predated Turtle Nest
- Bat Snag
- Trail Network
- Flood Limit (Peterborough County, 2018)
- Wetland Boundary
- Drip Line

Notes: Base map provided by the Ministry of Natural Resources and Forestry (2019).

Imagery provided by Google (2018).

Feature locations determined via differential Global Positioning System (dGPS +/- 1.5 m).

Optimized for printing by Oakridge Environmental Ltd.

NAD 1983 UTM Zone 17N

TITLE

Vegetation Plan

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**5r**
DATE	
July 2024	

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

Part of Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer
County of Peterborough

728200 728300 728400 728500 728600 728700 728800 728900

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Ecological Land Classification

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TW-1 TW-2 TW-3 TW-4 TW-5 TW-6 TW-7 TW-8 TW-9 TW-10 W-1 W-3

Notes:
OBC - Ontario Building Code

Feature locations determined using mapping-grade differential Global Positioning System (dGPS, test wells +/- 1 m, other features +/- 1.5 m).

Site plan after D.M. Wills Associates Limited (September 9, 2024)

Base map provided by Land Information Ontario (2021).

Flood limit mapping provided by County of Peterborough (2018).

Imagery provided by Google Earth (2018).

Optimized for Oakridge Environmental Ltd. printing.

NAD 1983 UTM Zone 17N

- Approximate Site Boundary
- Proposed Subdivision Lot / Block
- Proposed Road Allowance
- Existing Test Well (To be utilized or abandoned)
- Existing Domestic / Public Well (with 15 m OBC clearance)
- Conceptual Domestic Well (with 15 m OBC clearance)
- Conceptual Dwelling (3,000 sq.ft)
- Conceptual Conventional Class 4 Sewage System (fully-raised with 4:1 side slopes, based on 3,000 L/day, T = 10 min/cm)
- Unevaluated Wetland
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- Wetland Boundary
- Hydrological Feature Buffer (30 m)
- Flood Limit
- Woodland Drip Line Limit & Limit of Consolidated Vegetation Protection Area
- Topographic Contour
- Sandy (Vegetated) Ridge

Scale: 1:2,500

0 25 50 100m

TITLE

Conceptual Site Plan

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
17-2323	**8r**
DATE	
July 2024	

ORE
Oakridge Environmental Limited
Environmental and Hydrogeological Services

July 26th, 2024

Riel Contracting Inc.
213 Lonsberry Lane
Douro-Dummer, ON
K0L 3A0

Attention: **Jason Riel**, President/Owner

Re: Response to Otonabee Region Conservation Authority Review Comments,
Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development
Part Lot 13, Concession 2 (Dummer)
Township of Douro-Dummer, County of Peterborough
Our Project No. 17-2323

Dear Mr. Riel:

1.0 Introduction

Oakridge Environmental Ltd. is pleased to provide this response to the Otonabee Region Conservation Authority (ORCA) review comments provided on May 25, 2023 regarding our *Environmental Impact Study (EIS), Warsaw Severance and Multi-Residential Development* report dated July 31st, 2019, completed in support of the proposed development within the hamlet of Warsaw, Ontario. ORE staff had also completed additional addenda, including the 1st (Regarding Conceptual Lot Layout Plan), dated April 29, 2022 and the 2nd (2020 Provincial Policy Statement – Environmental Impact Study), dated August 21, 2020.

2.0 Response to ORCA Comments

2.1 Page 2 - Comment No. 1

On Page 2 of the ORCA review, it asked the question:

"*1.The EIS Addendum references an April 2022 Conceptual Lot Layout Plan prepared by DM Wills – is this the same as the February 2023 version recently circulated?.*"

ORE Response

It was not the same version, however, the Concept Plan has recently been revised once again based on the outcome of the County Peer Review comments and the Significant Wildlife Habitat (SWH) associated with the woodland content on the property. The revised site plan has been overlain on our revised Figure 8r, provided at the end of this response.

We believe that the revisions to Figure 8 and compliance with the Concept Plan should address the majority of ORCA's review comments. The revised Concept Plan, based on the new constraint/limitation along the woodland drip-line, increases the vegetation buffer to all hazard lands and associated Natural Heritage Features identified on the subject property. All of the development will be located outside of ORCA's regulated area, including the floodplain elevation which has been added to Figure 8r.

2.2 Page 2 - Comment No. 2

On Page 2 of the review, there are three (3) comments that are part of Comment No. 2, which are copied below:

"*2. Please update the Site Plan prepared by DM Wills to identify natural hazards/regulated area appropriately in accordance with the definitions/tests of the Conservation Authorities Act.*

a. Due to the presence of karst bedrock and organic soils, the "limit of consolidated vegetation protection area" should be renamed as "hazardous site/wetland".

b. Please add wetland boundary, the 30-m wetland buffer, and hazardous site boundary – this includes limit of organic soils and unstable bedrock, and/or the "limit of important groundwater discharge/recharge", for the permit submission, if applicable.

c. ORE has not confirmed how, and if, the limit the Drumlin Complex Terrain illustrated on Figure 3 (hydrogeological study) was field verified. Please address N. MacFarlane's comments in support of satisfying Otonabee Conservation policies 6.0(1) and 6.1(1).."

ORE Response

Re: Part a) - Does not appear to require ORE's attention, but rather D.M. Wills Associates Ltd. engineering staff need to address this comment. That being said, the new Woodland Drip-line Limit illustrated on ORE's revised Figure 8r and the revised Concept Plan should address this comment as it now represents the worse-case limitation to development on the subject property.

Re: Part b) - Does not appear to require ORE's attention, however, D.M. Wills Associates Ltd. engineering staff need to address this comment. The new Woodland Drip-line Limit illustrated on ORE's revised Figure 8r should apply, rather than the former Limit of Consolidated Vegetation Protection Area identified in the original report.

Re: part c) According to the hydrogeological team at ORE, this comment was already addressed as per their response. The Dummer Till deposits are easily observable as a series of undulating hillsides on the site. These are mainly associated with the FOD5-1 deciduous community and the undulating topography associated with the cultural meadow towards the mid to western portion of the property.

The epikarst terrain is easily distinguishable by the angular boulders of limestone strewn on the ground surface adjacent to the river. The thin soils within the coniferous habitats between the meadow and deciduous woodland where these two (2) areas meet is typically situated toward the drumlin's toe-of-slope. Therefore, the Limit of Important Groundwater Discharge/Recharge in the former Figure 8 of the EIS somewhat identifies the boundary between the base of the drumlin and karstic areas toward the river (especially within the wetland area where it is very discrete). However, ORE staff note that there were some fingerling discharge areas that occurred further upgradient of where the epikarst and drumlin materials intersect, which were captured in the delineation of the Discharge/Recharge limit. As such, where these two (2) overburden-bedrock habitats intersect is not always defined by the Discharge/Recharge setting/boundary on the Figures.

2.3 Page 2 - Comment No. 3

A copy of Comment No. 3 which has two (2) parts to address is included below:

"*3. The EIS Addendum did not review or provide best management practices (BMPs) to minimize risk to the wetland from the redirected storm water as suggested in the proposed SWM design/easement.*

a. Provided the proposed SWM infrastructure/easement remains out of the 30-m wetland area of interference, the SWM design demonstrates no negative impact to wetland hydrology/water balance or an increased risk of erosion to features, and satisfies N. MacFarlane's engineering comments, Otonabee Conservation wetland policies appear to be satisfied. This has not yet been demonstrated.

b. If SWM infrastructure encroaches into the regulated area, a submission addendum may be required to confirm BMPs, including a final Erosion Sediment Control and Work Sequence Plan, in support of the permit application.."

ORE Response

Re: Part a) - Does not appear to require ORE's attention, but rather, D.M. Wills Associates Ltd. engineering staff should reply. It is understood that the SWM infrastructure will be located outside the ultimate development limit boundary, which is now defined as the Woodland Drip-line Limit on revised Figure 8r. The new limit/boundary is situated in excess of 30 m from the natural hazard areas defined in the EIS, which exceeds ORCA's requirements. Consequently, there should be no negative impacts to the hydrological/epikarst hazard features identified in the ORE EIS and addenda, based on this new development limit and corresponding proposal.

Re: Part b) - The new SWM location is outside the Woodland Drip-line limit, therefore, will not occur within the regulated area. Subsequently, this item does not appear to require ORE's attention, although D.M. Wills Associates Ltd. engineering staff should address this comment via the Concept Plan and Concept Plan notes.

3.0 Closure

The revised attached *Conceptual Lot Layout Plan* (July 2024) prepared by D.M. Wills Associated Ltd. appears to have regard for the recommendations provided in this response. It also complies with the constraints outlined in the revised Figure 8r, which protects the woodland vegetation/communities adjacent to the wetland/epikarst/recharge/discharge hazard features in excess of 30 m. Considering that all of the development will occur outside the Natural Heritage Features identified on and directly adjacent to the subject property, there will be no negative impacts on these features, nor does the development (including SWM) appear to occur within any ORCA regulated area.

We trust that this response adequately addresses the ORCA review comments from ORE's perspective (hydrogeological and natural environment point of view). Should you have any questions or concerns, please feel free to contact the undersigned.

–End of Response to ORCA Review Comments–

Oakridge Environmental Ltd.

Rob West, HBSc.
Senior Ecologist
cc: file
att. revised Figure 8r

Environmental Impact Study (EIS)
Warsaw Severance and Multi-Residential Development

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